4

RISK PERCEPTION AND COMMUNICATION

Saving Lives

Starting Point

Go to www.wiley.com/college/Lindell to assess your knowledge of the basics of risk perception and communication.
Determine where you need to concentrate your effort.

What You'll Learn in This Chapter

- Responses to warnings
- Risk communication during the hazard phase
- Risk communication during crisis and emergency response

After Studying This Chapter, You'll Be Able To

- Analyze how people respond to warnings
- Involve the media and the public in risk communication
- Experiment using local and national information channels

Goals and Outcomes

- Design a risk communication plan
- Create and implement a risk communication plan
- Perform a protective action assessment

INTRODUCTION

As we have seen in many hurricanes, floods, and other disasters, people will not protect themselves if they don't believe their lives are at risk. Changing the way people perceive danger is an important way to save lives. To change the way people think, you must have specific plans for communicating the risks they face.

Risk is the *possibility* that people or property could be hurt. Risk is defined as the likelihood that an event will occur at a given location within a given time period and will inflict casualties and damage. This risk must be effectively communicated to the people who are likely to be affected. You must share information about hazards and hazard adjustments. *Sharing* is important because you must find out from different population segments how they think about hazards. Regardless of whether a hazard is natural, technological, or terrorist, the same basic principles of risk communication apply.

This chapter examines how people respond to warnings and includes an outline and discussion of the eight stages of information processing. It also shows how you influence perceptions by building credibility with those you need to influence. This chapter also discusses risk communication during the continuing hazard phase and during a crisis. This chapter shows you how to save lives by communicating. The best communication involves clarity, trust, and timing.

4.1 Household Response to Warnings

A **warning** is a risk communication about an imminent event and is intended to produce an appropriate disaster response. Examples of disaster responses include evacuating and sheltering in-place (Drabek, 1986; Mileti, Drabek and Haas, 1975). There are eight stages of a person's information processing during a warning. However, before these stages begin, people must receive, heed, and comprehend information about the risks. Let's take the case of an approaching tornado and examine what needs to happen before people seek shelter.

1. **People must *receive* information.** Warnings transmitted through television and radio are only effective if people receive them. Consequently, these warning mechanisms are much less effective between 11:00 pm and 6:00 am when most people are asleep. Of course, most televisions and radios are completely ineffective when power is lost.
2. **People must *heed* (pay attention to) available information.** Many people in tornado-prone areas know spring is the peak season for tornado activity. During those months, they should check weather forecasts more frequently. They should look for environmental cues, such as

cloud formations. However, others may not pay attention to their environment. People who engage in tasks requiring intense concentration are less likely to notice gathering storm clouds and might not notice warnings.

3. **People must *comprehend* the information.** Environmental cues must be correctly processed; that is, people must know a funnel cloud is a sign of a tornado. Warnings and communication efforts must be understood as well. Warnings given in English will not help Spanish speakers. A tornado siren will not mean anything to someone who doesn't understand what the signal means. Only a few people will understand highly specialized technical terms such as *millirem* and *pyroclastic flow*.

4.1.1 Step 1: Risk Identification

Decisions about how to respond to a hazard begin with risk identification. As noted earlier, this process begins with the detection of environmental cues. However, the most important sources of risk identification are warning messages from authorities, the media, and peers. The first step you must take is to disseminate your message widely. Try to attract the attention of those at risk and inform them of the potential for disaster that threatens their health, safety and property.

Those at risk must answer the basic question of risk identification, "Is there a real threat that I need to pay attention to?" Those who do not believe the threat is real are likely to continue their normal activities.

4.1.2 Step 2: Risk Assessment

Risk assessment involves evaluating the personal consequences if the disaster occurs (Otway, 1973; Perry, 1979a). The primary question at this stage is "Do I need to take protective action?" A positive response to this question results in **protection motivation.** People's personal risk assessment—their risk perception—is critical in understanding their disaster response (Mileti and Sorensen, 1987). If people think they are in danger, then they are more likely to protect themselves.

Peoples' risk assessments include the perceived probability, magnitude, and immediacy of the disaster impact. Perceived probability of impact affects people's judgments of the likelihood that they will be affected, whereas perceptions of event magnitude increase their perceptions of the severity of personal consequences, including death, injury, and property damage. As perceived probability and magnitude increase, so do a person's likelihood of taking protective action. The perceived immediacy of disaster impact affects people in a different way.

Instead of affecting a person's *likelihood* of acting, perceived immediacy increases a person's *urgency* to act.

4.1.3 Step 3: Protective Action Search

The primary question in protective action search is "How can I protect myself?" Residents' first attempts to answer this question often involve a search for what can be done by *someone else* to protect them against the hazard. However, when disaster impact is imminent, household owners must rely mostly on their own resources to achieve protection. In many instances, an individual's knowledge of the hazard suggests what type of protection to seek. People are likely to recall actions they have taken on previous occasions if they have had experience with that hazard. Alternatively, they might consider actions they took in similar hazards. For example, they might recognize that the impact of a volcanic mudflow is similar to that of a flood and, thus, they might take the protective responses that they took for a flood during a mudflow.

Information is also received from outside sources. For example, people might observe neighbors packing their cars in preparation for a hurricane evacuation. People also are likely to consider actions they have read or heard about. Such vicarious experiences are frequently transmitted by the news media and relayed by peers. Finally, people are also aware of appropriate protective actions when warnings include *guidance* about what to do. However, do not assume warning recipients will follow the recommendation even if the warning mentions only one protective action. People will always recognize that continuing their normal activities is an option; however, they might invoke other alternatives by remembering or observing the actions of others.

4.1.4 Step 4: Protective Action Assessment

At this point, the primary question is What is the best method of protection? The answer to this question is an **adaptive plan.** Those at risk generally have at least two options—taking protective action or continuing normal activities. Sometimes, those at risk must choose between two alternatives, but they don't really like either of them. During a hurricane, for example, evacuation protects people, but abandons property to storm damage (Perry, Lindell, and Greene, 1981; Lindell and Perry, 1990). On the other hand, emergency measures to protect property (e.g., sandbagging) require the property owner to remain in a hazardous location. When there is even a moderate amount of forewarning, households can engage in a combination of actions. For example, if a flood is forecast to arrive within a few hours, people could perform

emergency flood proofing by placing sandbags around the building. They could also elevate the building's contents to higher floors. Finally, they could evacuate family members before floodwater reaches a dangerous level.

People are unlikely to consider protective action unless the action is considered to be effective. Thus, *efficacy,* which is measured by the degree of reduction in vulnerability to the hazard, refers to success in protecting both persons and property (Cross, 1980; Kunreuther et al., 1978). In some cases, such as sandbagging during floods, property protection is the goal. In other cases, people protect buildings because this also protects the people inside those buildings. People also consider the *safety* of the recommended action. For example, some people are reluctant to evacuate because they are concerned about the traffic accident risks involved.

Protective actions are also assessed in terms of perceived *time requirements.* Evacuation is time consuming. By contrast, time requirements for in-place protection are small. Occupants must shut off sources of outside air and the HVAC system (Lindell and Perry, 1992). A major problem in large-scale evacuations such as those for hurricanes is people's underestimation of the time needed to reach their destinations. Residents have accurate expectations about the time required to pack their bags and other tasks, but they underestimate the amount of travel time needed to clear the risk area. People take the typical routes out of the city and assume it will take the usual amount of time. People fail to account for immense traffic, which can turn a two-hour trip into a twenty-hour trip.

The *perceived implementation barriers* inhibiting residents from taking protective action include

- **Lack of knowledge and skill.** In the case of evacuation, this may include a lack of knowledge of a safe place to go and a safe route to travel.
- **Lack of access to a personal vehicle.** Many evacuations require traveling long distances to reach safety, so those who don't have their own vehicles must rely on other means. Some evacuees who lack their own vehicles are able to find rides with friends, relatives, neighbors, or coworkers, but others must rely on buses organized by their local governments.
- **Lack of personal mobility due to physical handicaps.** A small but significant percentage of the population requires assistance because they (and, frequently, other members of their households) are unable to evacuate themselves (see Figure 4-1).
- **Separation of family members.** Some family members may be away from home when an evacuation occurs and the other family members do not want to leave until they return. Until family members establish communication contact and agree upon a place to meet, evacuation is unlikely to occur (Killian, 1952; Drabek and Boggs, 1968; Drabek and Key, 1976; Haas, Cochrane and Eddy, 1977).

Figure 4-1

Those who have a lack of physical mobility need assistance evacuating.

▲ **Perceived cost of actions to protect personal safety. Such costs include out-of-pocket expenses, opportunity costs (e.g., lost pay), and effort.** The high cost can lead people to delay taking protective action until they are certain it is necessary.

When no one option seems better than other options or continuing normal activities, it is difficult for people to decide what to do. For example, evacuation is a superior protective action than seeking shelter during a hurricane, but it also costs more in terms of money and time. For people on the fringes of an evacuation area, the risk of staying may be offset by the cost of evacuating. This can cause people to wait for further information about the hurricane to see if the risk has changed enough to push the balance more clearly one way or the other.

The result of protective action assessment is an adaptive plan. People's adaptive plans vary widely, with some plans being only vague goals and others being extremely detailed. At minimum, a specific evacuation plan includes a destination, a route of travel, and a means of transportation. More detailed plans include

▲ A procedure for reuniting families if members are separated.
▲ Advance contact to confirm the destination is available.

- Alternative routes.
- Alternative methods of transportation.

Those who do not have a detailed plan are more likely to suffer negative consequences. A classic example is an interview with the recipient of an evacuation warning that contained no information on safe evacuation routes or safe destinations: "We couldn't decide where to go. So we grabbed our children and were just starting to move outside...if it had just been ourselves, we might have taken out. But we didn't want to risk it with the children." (Hamilton, Taylor, and Rice, 1955, p. 120)

4.1.5 Step 5: Protective Action Implementation

Protective action implementation occurs when those at risk know they have to take action (see Figure 4-2). A primary question at this stage is Does protective action need to be taken now? The answer is crucial because people sometimes postpone taking action even when faced with danger. For example, some recipients of hurricane warnings often endanger their safety by waiting until the last minute to evacuate. Unfortunately, they fail to recognize that bad weather and a high

Figure 4-2

Sandbagging is a protective action.

traffic volume reduces the speed of evacuating vehicles. These conditions may lead to an incomplete evacuation before the arrival of storm conditions (Baker, 1979, 1980, 1993; Dow and Cutter, 2002; Prater, Wenger, Grady, 2000). The problem of procrastination is worse for long-term hazard adjustment without specific timetables. For example, an earthquake prediction might indicate a 75% chance of a severe earthquake within the next 20 years. This type of prediction often fails to motivate immediate protective action because people can rationalize that it is quite reasonable to worry about the problem later.

4.1.6 Step 6: Information Needs Assessment

People who are taking protective action need information. Before taking action, they must decide if they have enough information. Any confusing messages or expressed doubts from officials will cause people to seek more information. If the answer to the questions at any of the previous stages cannot be answered with a definite *yes*

Table 4–1: Warning Stages and Actions

Steps	*Activity*	*Question*	*Outcome*
1	Risk identification	Is there a real threat that requires my attention?	Threat belief
2	Risk assessment	Do I need to take protective action?	Protection motivation
3	Protective action search	What can I do to achieve protection?	Decision set (alternative actions)
4	Protective action assessment	What is the best method of protection?	Adaptive plan
5	Protective action implementation	Do I need to take protective action now?	Threat response
6	Information needs assessment	What information do I need to answer my questions?	Identified information need
7	Communication action assessment	Where and how can I obtain this information?	Information search plan
8	Communication action implementation	Do I need the information now?	Decision information

Adapted from Lindell and Perry (2004).

or *no,* people will ask, "What information do I need to answer my question?" Through this process, people identify an **information need.** Take, for example, the case of someone who does not know the answer to the question What is the best method of protection? They can search for additional information about alternative protective actions to make it clearer which option is best. People frequently seek additional information because the consequences of a decision error are very serious (e.g., failing to evacuate in time can result in death or injury) and they rarely have all the information they need to make a confident decision.

4.1.7 Step 7: Communication Action Assessment

The next question is Where and how can I obtain this information? Addressing this question leads to an **information search plan.** Uncertainty about risk identification and risk assessment can stimulate questions directed to officials and, more likely, the news media (Lindell and Perry, 1992). People often rely on the news media to confirm information they received about the hazard from other sources. However, people often consult their peers about what to do and how to do it. It is difficult for people to reach authorities because they are usually busy handling other calls. People are often forced to rely on the media and their peers even when they would prefer to contact authorities.

4.1.8 Step 8: Communication Action Implementation

The last question is, Do I need the information now? If the answer is *yes,* then people will seek the information. People will go to great lengths, contacting

FOR EXAMPLE

Risk Assessment and Hurricanes

After every hurricane, researchers find that some people failed to evacuate because they didn't believe the threat was likely to affect them. Part of this is due to the difficulty in predicting hurricanes. Sometimes forecasters predict that a strong hurricane will make landfall in one place but it turns and strikes somewhere else. This can lower people's perceived probability of a hurricane strike. Other times people expect the hurricane to strike but they don't expect it to affect them. For example, it is common to hear people say "I survived the last storm, I can survive this one." In this case, the perceived severity of the event will tend to be low. Although many authorities are concerned about a "cry wolf" effect, these types of experiences do not seem to decrease people's intentions to evacuate in future hurricanes (Dow and Cutter, 1998) this change should probably be rejected. The most likely explanation is that people understand that hurricane behavior is inherently uncertain, so forecast errors are inevitable.

many people over a short period of time (Drabek and Stephenson, 1971). However, people will not work as hard to get information unless the threat is imminent. For example, many residents close to Mt. St. Helens checked radio news bulletins several times a day after the initial ash and steam eruptions led authorities to believe there was a high probability of a larger eruption. Without specific threat information, people tend to *passively monitor* the situation. For example, residents might only check the morning paper or the evening news for information about the hazard rather than checking many times a day. This passive monitoring continues until the threat escalates and people need to resume active monitoring.

Communication action implementation can have one of three outcomes. First, people confirm the threat and proceed to take protective action. Second, if the information source is unavailable, people try to find different sources. Third, if the new information contradicts previous information, then people try to resolve the conflict. Often this involves considering the relative credibility of the information sources.

SELF-CHECK

- Define **adaptive plan** and **information search plan.** List the reasons for needing each.
- Define **protection motivation.**
- Define **risk** and **risk assessment.**
- Define **warning.**
- Name the three possible outcomes of a communication action implementation.

4.2 Risk Communication during the Continuing Hazard Phase

The continuing hazard phase is marked by a low probability that a catastrophic incident will threaten public safety, property, and the environment. During this phase, you should engage in hazard mitigation, emergency preparedness, and recovery preparedness actions. In addition, you should also pursue an active program of risk communication.

There are five basic risk communication functions to address in the continuing hazard phase. Table 4-2 identifies these as strategic analysis, operational analysis, resource mobilization, program development, and program implementation.

Table 4-2: Tasks for the Continuing Hazard Phase
Strategic analysis
Conduct a community hazard vulnerability analysis
Analyze the community context
Identify the community's prevailing perceptions of the hazards and hazard adjustments
Set appropriate goals for the risk communication program
Operational analysis
Identify and assess feasible hazard adjustments for the community and its households/businesses
Identify ways to provide incentives, sanctions, and technological innovations
Identify the available risk communication sources in the community
Identify the available risk communication channels in the community
Identify specific audience segments
Resource mobilization
Obtain the support of senior appointed and elected officials
Enlist the participation of other government agencies
Enlist the participation of nongovernmental (nonprofit) and private sector organizations
Work with the mass media
Work with neighborhood associations and service organizations
Program development for all phases
Staff, train, and exercise a crisis communications team
Establish procedures for maintaining an effective communication flow in an escalating crisis and in emergency response
Develop a comprehensive risk communication program
Plan to make use of informal communication networks
Establish procedures for obtaining feedback from the news media and the public
Program implementation for the continuing hazard phase
Build source credibility by increasing perceptions of expertise and trustworthiness

Use a variety of channels to disseminate hazard information
Describe community or facility hazard adjustments being planned or implemented
Describe feasible household hazard adjustments
Evaluate program effectiveness

Adapted from Lindell and Perry (2004).

The tasks are listed in the table as if they should be performed in sequence. However, you will perform some tasks at the same time. In addition, you will repeat some steps frequently.

4.2.1 Step1: Conduct a Strategic Analysis

You must understand who is at risk. You must understand the likelihood of different hazards. Knowing what types of hazards are a threat helps identify what actions people should take to protect themselves. Identifying the geographic areas at greatest risk makes it possible to identify the most vulnerable population segments and types of businesses. Knowing the vulnerable population segments and types of businesses provides information about how to communicate the risk. This information also helps you pick which incentives and sanctions will get people to adopt hazard adjustments.

Analyze the Community Context

You should know the following information about your community:

- Ethnic composition.
- Availability of communication channels.
- Perception of authorities.
- Levels of education.
- Income distribution.

Build support within your community. If managing hazards is not a community priority, show how easy it can be. Begin with a small hazard management program, demonstrate effectiveness, and build support (Lindell, 1994b). In developing a risk communication program, determine how much money the community can afford to spend. Talk to other agencies and explore how you can work together to develop a comprehensive risk communication program.

Identify the Community's Perception of Hazards and Hazard Adjustments

The hazards that produce the greatest community conflict are those having a potential for inflicting significant harm on bystanders. These hazards include

nuclear power plants and chemical facilities. People perceive these risks as greater than those of other technologies and other natural hazards (Lindell and Earle, 1983; Slovic, 1987). Some of the reasons, called "outrage factors" by Hance et al. (1988) are because people believe the risk is

- Not natural.
- Not familiar.
- Not understood by scientists.
- Difficult to detect.
- Associated with untrustworthy information sources.
- Not controllable by those exposed.
- Characterized by involuntary exposures.
- Unfair in its distribution of risks and benefits.

Most people believe the risks of technological facilities are greater than those of natural hazards. And yet, the annual fatality rate is the same for both types of hazards (Slovic, 1987). You can address this problem by explaining the concepts of risk analysis. However, you should recognize that it is difficult even for experts to understand small probabilities of occurrence such as one in a million. Some experts believe that if people accept risks having higher fatality rates, like driving, they also should accept risks having a lower fatality rate such as having a nuclear power plant nearby. This ignores the fact that the facility risk will be added to the lifestyle risk, not substituted for it. In addition, the facility risk is estimated from analytical models but the lifestyle risk is computed from a large database. Even local residents who cannot articulate these distinctions seem to be aware of them intuitively and reject risk analysis results.

Set Goals for the Risk Communication Program

Hazard awareness is an important first step in the process of hazard adjustment. People must be informed about the hazards to which their community is exposed and should be given this information from different perspectives. For example, people should know what a disaster would mean in terms of the public health. In addition, they need to know how likely it is that a disaster will occur where they live. In the case of hurricanes, a reasonable goal is to ensure residents understand the causes of hurricanes, the probabilities of being struck by a hurricane over the next ten years, and the threats hurricanes bring. Also, local residents should understand the risk to themselves and their families, damage to their property, and disruption to daily activities. To help people understand, a risk communication program should provide detailed maps showing areas at risk from wind, storm surge, and inland flooding. Explain the vulnerability of different buildings to these threats. For example, you can define the areas that would be affected by hurricanes, using the Saffir-Simpson Hurricane Scale (a 1-5 rating). Display these risk areas on large-scale maps. Such maps should indicate streets, rivers, political boundaries,

and other local landmarks that help people identify the risk areas in which their homes and workplaces are located. Provide information about the personal consequences of hazard impact by showing drawings of different types of structures. Show mobile homes, typical single-family residences, and typical multifamily structures and the level of expected damage from each hurricane category. Develop this information carefully as recent studies found that only one- to two-thirds of coastal residents can accurately identify their hurricane risk areas (Arlikatti, Lindell, Prater and Zhang, 2004; Zhang, Prater and Lindell, 2004).

To be successful, your risk communication program must foster people's sense of personal responsibility for self-protection. Remind local residents of the limits to what local government and industry can do in reducing hazard damage. Remind residents that they can prevent death or injury to themselves and their families and damage to their homes. Through risk communication, people should be made aware of the available hazard adjustments. To get people to adopt hazard adjustments, you must convince them the hazard adjustments have high efficacy and low resource requirements. This should motivate people to take protective actions. However, recognize that even the most scientifically sound and effectively implemented risk communication program will not lead a large percentage of people to take immediate protective action. Nonetheless, a long-term perspective will put environmental hazards on the political agenda and achieve important results over time (Birkland, 1998; Prater and Lindell, 2000).

4.2.2 Step 2: Perform an Operational Analysis

As an emergency manager, there are five tasks you must perform when performing an operational analysis.

Task 1: Identify and assess feasible hazard adjustments for the community and its households/businesses

The purpose of this task is to make sure people know how to protect themselves. (Lindell and Perry, 2000). You can access resources such as the American Red Cross Web site (www.redcross.org/services/disaster/beprepared). At this site, you will find information about recommended household adjustments for a wide range of hazards. You can help people evaluate these in terms of resource requirements, such as financial cost, time and effort, knowledge and skill, tools and equipment, and required cooperation with others.

Task 2: Identify ways to provide incentives, sanctions, and technological innovations

To encourage people to protect themselves, you may have to punish them with sanctions, reward them with incentives, or inform them about technological innovations. Sanctions are appealing because they avoid the obvious costs associated with incentives. For example, ticketing drivers who don't wear seatbelts was a successful sanction. However, sanctions require enforcement. Your jurisdiction

can reduce the costs of preparing for hazards by providing incentives such as grants, low interest rate loans, or tax credits. An alternative incentive, providing specific plans or checklists for hazard adjustments, is informational rather than financial. For example, providing plans for homeowners to bolt their houses to their foundations helps do-it-yourselfers who have a modest level of construction experience. Adding a community tool bank also makes this feasible for those who lack the necessary tools and equipment.

Task 3: Identify the available risk communication sources in the community

Sources can be categorized as authorities, news media, and peers. These sources are judged in terms of their credibility, which is a combination of expertise and trustworthiness. Perceptions of credibility vary depending upon whether a source is speaking about hazards or hazard adjustments. Official sources are generally the most credible. People look for sources to have impressive credentials, previous experience, or the respect of others (Perry & Lindell, 1990b).

Ethnic minorities trust different types of sources. Research has focused on the perceptions that Mexican Americans, African Americans, and Caucasians have of source characteristics. Authorities (particularly firefighters and members of the police department) tend to be regarded as credible by the majority of all three ethnic groups (Lindell and Perry, 1992). African Americans and Caucasians tend to be more skeptical of the mass media than Mexican Americans. In general, Mexican Americans are more likely than other groups to consider peers to be the most credible sources. There is evidence, however, that the results vary by community. This reflects historical differences in relationships between ethnic groups and authorities in these specific communities.

You must identify what groups trust which risk information source in your community. Know which minority groups live and work in the community, if the members are located in one area (and where), and how they view the risk information sources. You can gain this knowledge from census data, informants, and personal observation. Census data can identify those areas having a greater than average percentage of ethnic minorities. Informants can supplement this data and can give you an inside view on how different groups and neighborhoods view sources of information. For example, Does a particular group trust the Mayor? It is important to identify the opinion leaders in each ethnic group. Contact these opinion leaders to see if they are willing to serve as additional sources for your risk communication program. The best information comes from long-term outreach programs. Meet with people and speak at neighborhood associations and civic organizations. Involve a diverse group of citizens in advisory committees. Community involvement provides you with information about how the residents regard information sources. It also enhances your visibility, fosters dialogue, and gives citizens access to accurate information.

Task 4: Identify the available risk communication channels in the community

Electronic and print media are available in most communities. Using the media is one way to communicate risks to the community. Additional ways include informal face-to-face conversations and formal meetings (Hance et al., 1988; Mileti, Fitzpatrick & Farhar, 1990). Even though you have access to all of these channels, you may be limited by your budget. To gain access to low-cost opportunities for publicity, you must establish contacts with local media. In addition, a long-term relationship with local businesses sometimes generates contributions to pay for low cost items such as brochures and posters.

Task 5: Identify specific audience segments

It is easier and cheaper to develop one communication message for the entire community, but it won't be as effective as tailoring your message to different groups. Individuals have different concerns. To develop specific messages for different groups

- Know the geographic and demographic characteristics of your community.
- Know where each group likes to find information. Radio stations, in particular, focus on specific audiences defined by age and ethnicity.
- Make sure messages are in the appropriate languages for different groups of nonEnglish speakers. Some communities have dozens of different languages and dialects spoken there.
- If members of a community group tend to be fatalistic about hazards, be sure to target them with messages emphasizing hazard adjustments that are easiest to implement. Maintaining a four day supply of food and water is a good starting point.
- Ensure your messages are understood. Follow up with people face-to-face to see if they are taking the appropriate actions.

4.2.3 Step 3: Mobilize Resources

As an emergency manager, there are five tasks you must perform to mobilize resources for risk communication.

Task 1: Obtain the support of senior appointed and elected officials

You need the support of senior officials (Lindell, 1994b). They help you acquire resources and help put emergency management on the political agenda. Getting this support is also an important step toward obtaining the participation of other government agencies. If you can't get senior officials or organizations to support you, work with their staff members. Staff members can sometimes convince their bosses to support critical issues. You must successfully stress that the community is at risk and hazard mitigation can reduce disaster impacts. You should also propose emergency preparedness measures and recovery preparedness measures as effective solutions.

Task 2: Enlist the participation of other government agencies

No matter how supportive senior officials are, they have limited resources. This means you should work with other agencies to share the cost of risk communication. Ensure that each agency is aware of the risk communication programs being planned by other governmental agencies, nongovernmental organizations, and hazardous technological facilities. Gather the resources of multiple agencies within local government (Drabek, 1990; Gillespie et al., 1993; Lindell et al., 1996). Identify ways you can work together to achieve the goals of both organizations. For example, work with the police department to ensure that neighborhood watch groups are provided with information about environmental hazards.

Task 3: Enlist the participation of nongovernmental and private sector organizations

Organizations such as the American Red Cross and the Salvation Army play an important role. They help communities prepare for emergencies and recover from disasters. They routinely work with needy families. Consequently, they can identify areas with a high concentration of population that are most vulnerable to disasters. These organizations can also identify methods of assisting households to prepare for emergencies, reduce the vulnerability of their homes, or find safer places to which they can move.

In addition, water, wastewater, fuel, and electric utilities play a significant role in promoting the adoption of hazard adjustments. Most of these respond to routine emergencies such as severe storms, so they are aware of the demands disasters can place on the community. In addition, these organizations routinely send bills to the residents of their service areas. This gives you an opportunity to include notices about hazards and hazard adjustments to customers in their bills.

Task 4. Work with the mass media

The mass media, with all the television channels, Web sites, newspapers, and radio stations, reach many residents each day. Working with the media allows you to get your message out. With more people seeing your message, more people will become aware of the role of emergency management within the community. Also, reporters know their audiences and focus on them. This allows you to target messages to specific audience groups. These groups are defined by gender, age, ethnicity (and language), and socioeconomic status.

Reporters do not always consider hazard information to be newsworthy. To combat this, federal agencies such as the National Weather Service urge government officials to "declare" weeks for hazards such as tornadoes and hurricanes. You can take advantage of the publicity generated by these agencies. Work with the news media to develop the background materials reporters need in an escalating crisis, emergency response, or disaster recovery. Anticipate what types of information reporters are likely to seek during these events. Prepare fact sheets and other "boilerplate" that can be used no matter what conditions occur during an emergency.

Task 5: Work with neighborhood associations and civic organizations

Most communities have many neighborhood groups and civic organizations whose members are active in their community (Chavis and Wandersman, 1990; Florin and Wandersman, 1984). These groups work with the community and their members and can help instruct them on the hazards and hazard adjustments. Time is often available for this because many of these organizations want to meet on a regular schedule but do not have enough activities to fill their agendas. Consequently, they are often willing to host speakers whose topics will interest their members.

4.2.4 Step 4: Develop a Program

As an emergency manager, there are four tasks you must perform when developing a program.

Task 1. Staff and train a crisis communication team

Establish a crisis communication team. The team forms a critical link between experts and the population. The team must be able to communicate effectively with both groups. There should be one spokesperson on the team who understands the scientific aspects of the situation and can explain it to everyone at a level they can understand. Spokespersons with technical credentials will generally be considered credible. And spokespersons with previous disaster experience will be seen as credible as well. It also is helpful if team members receive training from public relations experts (Hance et al., 1988).

The crisis communication team should have written operating procedures that include documentation of all emergency response activities. They should also maintain an event log that records what information has been requested and released. Criteria used to guide critical decisions, such as those involving protective actions for the public, should also be documented. The team should monitor the news media and designate a rumor control center. This center should be staffed by operators who are frequently updated on the status of the incident and the response to it.

The crisis communication team should recognize that reporters describe events in terms of stories that are framed by five questions—*who, what, when, where,* and *why* (Churchill, 1997). Reporters want to know the specific causes of an event. Other questions include who was (or will be) affected. They want information on casualties, property damage, and economic disruption. They want to know what authorities have done (and will do) to respond to the situation. It frequently is difficult to answer these questions because information is lacking. The spokesperson should avoid speculation (and especially premature blame), but, rather, admit he or she does not know the answer and will find out as soon as possible.

Reporters rarely have scientific backgrounds, so technical details might be unnecessary and confusing. All technical jargon must be translated into plain English. If you help reporters do this, you will have a better chance in getting your message out. Work with local reporters to make sure the information is

easily understood, but recognize that this will not solve all problems. Some major crises draw reporters from outside the U.S. Reporters from national or international media will not cover stories in exactly the same way as local reporters, but the most important information needs will be common to all categories of reporters.

Finally, the risk communication plan and procedures should be evaluated using drills and exercises. Each drill or exercise should be followed by an evaluation of the plan and procedures, as well as the staffing, training, and materials used.

Task 2: Establish procedures for maintaining an effective communication flow during an escalating crisis or emergency response

All organizations should establish procedures for coordinating information. It is critical that each organization receives all the information it needs as promptly as possible. The types of information needed in an escalating crisis depends on the circumstances. Recommendations regarding the content of incident notifications for nuclear and chemical facilities are summarized in Table 4-3. Adopt this table as a template because it is based upon extensive experience with escalating crises and disaster responses. It is *essential* that you discuss this with facility operators. You both need to understand your information capabilities and needs. Agree in advance what information will be exchanged when the need arises.

Task 3: Develop a comprehensive risk communication program

The four key factors when designing a message are

- Personal risk.
- Personal responsibility.
- Guidance for protective action.
- Sources for further information.

You should design messages to address all of these factors. Messages should include any important details but, generally, be short and concise. Too many details can overwhelm people and prevent them from listening. Information should be presented in a way that attracts attention, so people will understand and remember it more easily. Address risk perception but do not over emphasize it. You should address risk perception because probabilities are difficult for many to understand. The statement "there is a 1% probability of a damaging earthquake within the next year" might have little impact on people's behavior. However, adding probabilities over time by making the mathematically equivalent statement that there is roughly a 20% chance of an earthquake in the next twenty years makes more of a difference in risk perception (Kunreuther, 2001; Slovic et al., 1978). However, increasing the accuracy of people's risk perceptions does not help if people fail to take action to protect themselves. When

Table 4-3: Essential Incident Data
Date and time of report
Name, affiliation, and telephone number of information source
Location, type, and current status of the incident
(a) Derailment, containment failure, fire, explosion, liquid spill, gaseous release
(b) Hazardous material name, physical properties (gas, liquid, solid), environmental cues (sights, sounds, smells), and potential health effects
(c) Hazardous material release duration and quantity released
(d) Casualties and damage already incurred
Incident prognosis
(a) Potential for fire or explosion at site
(b) Potential for fire or explosion affecting residential, commercial, or industrial areas
(c) Hazardous material quantity available for release and expected release duration
(d) Locations and populations requiring protective action
(e) Types of protective actions recommended: evacuation, sheltering in-place, expedient respiratory protection, interdiction of food/water
Weather conditions (current and forecast wind speed and direction)
Chronology of important events in the development of the incident
Current status of response
(a) Facility/shipper/carrier actions: assessment, preventive, corrective, population protective actions
(b) Local/state/federal agency actions: assessment, preventive, corrective, and population protective actions

issuing warnings, you can increase the accuracy of people's risk perceptions by addressing four questions about the risk they face:

- What is the risk?
- Where is it going to happen?

- When is it going to happen?
- What will the effects be (Mileti, 1993)?

Discussing how people need to take responsibility for their own safety is important. Letting residents know that they must be self-sufficient for 72 hours increases personal responsibility for self-protection (Lindell and Perry, 2004). Some people expect the government to come to their aid right away. You must explain to them that there are limits not only to what the government can provide but also how quickly the government can provide those things. Residents become more self sufficient when they know how to protect themselves.

Residents should be given specific instructions on what protective actions to take and, in some cases, how to implement those actions. In the case of evacuation, for example, people should be reminded of items to take with them that may not be obvious (e.g. important legal records such as birth certificates). If some evacuation routes are hazardous or congested, residents should also be given alternate routes that are available. If people don't have their own cars, they should be informed about bus pickup points.

Finally, sources for further information should be addressed because residents might need specific information that hasn't been addressed in the warning message. Some residents might need information about evacuation procedures for children at school. Others might need information about what number to call for assistance in evacuating physically handicapped members of their households.

Task 4: Plan to make effective use of informal communication networks

It is important for you to recognize that people talk to their peers throughout all phases of emergency management. Use these informal networks to increase the level of hazard adjustment adoption. However, friends, relatives, neighbors, and coworkers might not understand a message, or they might not remember the message correctly. To reduce confusion, release information through several channels. Provide many opportunities for people to hear messages so they will retain the common elements of these messages.

Task 5: Establish procedures for obtaining feedback from the news media and the public

Feedback is a critical part of any communication process. It provides receivers an opportunity to confirm that they have comprehended the message, to reconcile inconsistencies within or between messages, or to obtain information that is not available in the messages they have received. Feedback is part of informal face-to-face discussions, but opportunities for receiving feedback are more limited in public hearings. Public comments frequently are limited to a few minutes at the end of a meeting. The need for feedback is why many experts recommend informal channels of communication (e.g., Committee on Risk Perception and Communication,

1989; Covello, 1986; Hance, et al, 1988). Therefore, agency procedures that require public hearings should be supplemented by less formal meetings.

During emerging crises, reporters might unintentionally distort your message because they didn't quite understand what you were saying. This makes it important to read local newspapers, listen to radio, and view television broadcasts to see if your information is being correctly presented. In addition, you can obtain feedback from citizens via rumor control centers, using a telephone number or a Web site that has been publicized in advance.

4.2.5 Step 5: Implement the Risk Communication Program

As an emergency manager, there are five tasks you must perform when implementing the risk communication program.

Task 1: Build source credibility by increasing perceptions of expertise and trustworthiness

It is important for personnel from each agency to develop a history of effective job performance that enhances their credibility. This experience is gained during minor incidents, such as minor floods, that cause damage and disruption of normal activities. Credibility is also enhanced by effective performance in public hearings or in meetings with neighborhood associations and civic organizations. Of course, expertise is only one component of credibility; trustworthiness is also essential. Earn a community's trust by being competent, caring, honorable, and considering outrage factors when working with the public (Covello et al., 1988; Hance et al., 1988).

Task 2: Use a variety of channels to disseminate hazard information

Use not only the news media, but informal channels to communicate your message. Also use opportunities to meet with neighborhood associations and civic organizations.

Task 3: Describe community or facility hazard adjustments being planned or implemented

Inform residents of any actions being taken to reduce the probability of an incident so they understand that their risk is being reduced. Acknowledge that there is no action that can guarantee complete safety. For example, land-use and building construction practices can reduce, but not eliminate, the threat of natural hazards. The same can be said about engineered safety features in connection with technological hazards. In addition, describe actions being taken to facilitate a response to an emergency should one occur.

Task 4: Describe feasible household hazard adjustments

As described in previous sections, let people know what actions they can take to protect themselves and reduce damage to their homes.

FOR EXAMPLE

Hurricane Katrina: Those Who Were Left Behind

In New Orleans, 30% of the population lived below the poverty line before Hurricane Katrina. Many of them lived the 9th Ward, a low lying area that was wiped out by the flooding. Some of these people had no cars of their own, or the cars they had were so unreliable that they could not be used for long distance travel. As a result, even those who wanted to evacuate could not do so.

Task 5: Evaluate program effectiveness

Set goals for the risk communication program and determine how they should be measured. It is very common for emergency managers to measure program effectiveness by reporting the number of meetings attended and the number of brochures distributed. Better measures of effectiveness include increases in the number of households with hazard insurance, family emergency plans, earthquake-prone homes with water heaters strapped to the foundations, and hurricane-prone homes with window shutters.

SELF-CHECK

- Describe why it is important to set goals for the risk communication program.
- List the key message factors in a risk communication program.
- Name four tasks in the program development step.
- Name five tasks you must perform when implementing the risk communication program.

4.3 Risk Communication during an Escalating Crisis or Emergency Response

An **escalating crisis** is a situation in which there is a significantly increased probability of an incident occurring that will threaten the public's health, safety, or property. Not everyone will agree that there is a crisis. As a practical matter, a crisis exists if authorities, the news media, or a significant proportion of residents

believe there is one. The principle behind this is that "perception is reality." If the news media or local residents believe there is a crisis, then there is a crisis unless authorities can convince them otherwise. Thus, authorities must be prepared to explain specifically why they believe a situation is or is not a crisis.

4.3.1 Step 1: Classify the Situation

You can exert control over people's definition of a situation by defining a system for classifying threat levels. For example, the National Weather Service has established a classification system that consists of watches and warnings. A tornado warning is more serious than a tornado watch. The US Nuclear Regulatory Commission (1980) classifies a nuclear power plant incident as an Unusual Event, Alert, Site Area Emergency, or General Emergency. The categories in the emergency classification system correspond to meaningful differences in the levels of response by local authorities. The classification system needs to be established in advance, defined objectively, and agreed to by all responding organizations (Lindell and Perry, 1992). By establishing an emergency classification system, authorities commit themselves to taking specific actions when certain criteria are met. With this system, decisions are made based on rational scientific considerations rather than emotion or other considerations.

4.3.2 Step 2: Implement a Risk Communication Program

Once there is an emergency, authorities will act. Some of the actions will include protecting the population, protecting the environment, and assessing the situation. One of the most important incident management actions is risk communication. As an emergency manager, you must perform six tasks when implementing an emergency response program.

Task 1: Activate the crisis communication team promptly

You need to contact all appropriate authorities. Make sure all communication links are open and all sources of information and expertise are used. Monitor information from other organizations so you can identify any disagreement. If there is disagreement, prepare an explanation for it before the media contacts you about the disagreement. Your explanation will be more credible if you contact the news media than if you wait until they contact you.

Review the information in press kits and background materials. Contact personnel who are in the crisis and brief them regularly. This will help them answer questions if they are contacted by friends or the media.

Review your communication objectives (Churchill, 1997). Evaluate all press releases, press conferences, and public meetings in light of these objectives. In most environmental emergencies, the principal objective is to save lives. This objective could be expressed in evacuation orders. One of the objectives should

not be to prevent panic, which disaster researchers have found to be extremely rare (Drabek, 1986; Lindell and Perry, 1992). Nor should authorities make fun of what they consider to be unnecessary protective actions by those who *think* they are at risk, as long as such actions do not prohibit the protection of those whom the authorities believe *are* at risk. Do not attempt to promote one protective action by criticizing another. For example, some misguided attempts have been made to promote sheltering in-place by asserting that people will get into major traffic accidents if they evacuate. Not only is this incorrect (the accident risks in evacuation appear to be no greater than those of normal driving; Lindell and Perry, 1992), but it is likely to lead those at risk to believe that there is nothing they can do to protect themselves.

Task 2: Determine the appropriate time to release sensitive information

You must determine when to alert others of the danger. Your team needs to know when to release information. There are no hard and fast rules about when information should be released. Early information often turns out to be incorrect as the facts are still coming in. However, an early release can enhance your credibility and give you more control. Being the first to break bad news allows you to put the information into an appropriate context. In addition, controlling the timing of a press release can have a significant impact on the amount of attention it receives. A press release distributed on a slow news day might receive more coverage than the same information released on a busy day or on a Friday afternoon. The disadvantage of delaying the release of information is that this can be misinterpreted as a cover-up if the information is leaked (Hance et al., 1988). It is also important to respond to reporters' questions when they are aware that something important is happening. Statements of "no comment" are interpreted as meaning authorities are withholding important information.

Task 3: Select the communication channels that are appropriate to the situation

An escalating crisis is newsworthy, so you will have little difficulty in obtaining media coverage. Initiate communication with reporters through press releases and press conferences. Press releases give you the most control over the agenda, and interviews with individual reporters provide the least control. You need to ensure reporters are accurately disseminating the information. However, this alone cannot ensure those at risk are receiving, heeding, and comprehending the information they need. You need to promote dialogue through two-way communication, preferably in small groups.

Task 4: Maintain source credibility with the news media and the public

You must obtain timely and accurate data. If the available data is incomplete, you should be honest about what is and is not known. A candid confession of

ignorance might be uncomfortable at the time, but it is less dangerous to one's credibility than making up an answer that is later found out to be incorrect.

The news media have many sources of information. This is why it is important to respond to reporters when they need information for a deadline. If you do not respond, they will obtain whatever information they can from whatever sources are available at the time (Churchill, 1997). If you don't have information, it is better to explain that data is being collected, describe how it will be analyzed, and indicate when the information will be released.

Trust is a major issue. There is little trust in society and what is there can be lost easily. Television anchors tend to be among the few people other than independent scientists that are generally trusted (Kasperson, 1987). Television anchors are trusted because they are familiar, authoritative, and have developed a track record of accuracy. You may be stereotyped as a typical bureaucrat. This is the reason why it is important to work with the community on issues before crises arise and publicize your accomplishments.

Task 5: Provide timely and accurate information about the hazard to the news media and the public

Press releases should be no longer than two pages with simple short sentences in plain English. They should contain

- A dateline (date and location of release)
- The organizational source (including point of contact) for the information
- A summary lead sentence
- A brief description of any attachments

Press releases should be supplemented by fact sheets, which contain background information. There should be attachments including a biographical summary of the spokesperson and other details about the hazard and official responses (Churchill, 1997).

Be prepared to describe the process by which risks are being assessed and what the risks are. In general, it is important to presume the average member of the audience is intelligent but uninformed about environmental risks. Avoid acronyms and technical jargon. Also anticipate the possibility of confrontational tactics by the news media or some members of the public. If confronted with different interpretations, be prepared to calmly restate your scientific qualifications, support your own position, and explain the weaknesses in alternative positions.

Task 6: Evaluate performance through post-incident critiques

Organizations must learn from experience. Thus, each incident in which you must disseminate risk information to the news media or the public should be followed by a thorough critique of performance (Lindell and Perry, 1992;

FOR EXAMPLE

Being in the Know During a Hurricane

Michael Brown, head of FEMA during Hurricane Katrina, shocked people in a television interview with CNN claiming he didn't know New Orleans residents had taken shelter in the New Orleans convention center. This claim was made despite days of television reporting about the lack of medical help, food, supplies, or police protection.

National Response Team, 1987). All members of the crisis communication team should review the goals of the risk communication program, the event logs kept during the incident, and other available documentation to identify weaknesses in performance. Experiences in drills, exercises, and incidents have demonstrated the importance of focusing on the performance of the organization rather than the performance of individuals because this enhances a spirit of cooperation. Thus, each participant should be encouraged to follow up on any weaknesses by identifying potential improvements in plans, procedures, and training.

SELF-CHECK

- Define **escalating crisis.**
- List some actions that authorities should take when there is an emergency.
- Describe why television anchors are generally trusted.
- Describe what members of the crisis communication team should review when evaluating performance through post-incident critiques.

SUMMARY

We get caught up in our daily lives. How many times have you driven someplace familiar only to arrive not knowing how you got there? If this feeling is familiar, then you understand how people ignore life-threatening risks unless they think the risks are real. They'll go about their daily lives as if nothing is happening around them. As an emergency manager, it's up to you to make sure

they don't become involved in a disaster wondering how that happened to them. In this lesson, you learned how critical communication is when it comes to influencing people's perceptions of danger. Apply the communication skills this lesson discussed and you just might save lives.

KEY TERMS

Adaptive plan — The answer to the question "What is the best method of protection?" Those at risk generally have at least two options—taking protective action or continuing normal activities.

Escalating crisis — A situation in which there is a significantly increased probability of an incident occurring that will threaten the public's health, safety, or property.

Information need — A need that results from the question, "What information do I need to answer my question?"

Information search plan — A plan that results from addressing the question, "Where and how can I obtain this information?"

Protection motivation — A positive response to the question of whether there will be personal consequences if disaster occurs.

Risk — The *possibility* that people or property could be hurt. Risk is defined in terms of the likelihood that an event will occur at a given location within a given time period and will inflict casualties and damage. This risk must be effectively communicated to the people who are likely to be affected.

Risk assessment — An evaluation of what will be the personal consequences if the disaster occurs.

Warning — A risk communication about an imminent event that is intended to produce an appropriate disaster response.

ASSESS YOUR UNDERSTANDING

Go to www.wiley.com/college/Lindell to evaluate your knowledge of the basics of risk perception and communication.
Measure your learning by comparing pre-test and post-test results.

Summary Questions

1. Those who do not believe the threat is real are likely to continue their normal activities. True or False?
2. As perceived probability and magnitude increase, so do people's likelihood of taking protective action. True or False?
3. What is *not* one of the five basic risk communication functions to address in the continuing hazard phase?
   (a) Strategic analysis
   (b) Operational analysis
   (c) Resource mobilization
   (d) Program development
   (e) Capability assessment
4. Most people do not believe the risks of technological facilities are greater than those of natural hazards. True or False?
5. The hazards that produce the greatest community conflict are those having a potential for inflicting significant harm on bystanders. True or False?
6. You cannot exert control over people's definition of a situation by defining a system for classifying threat levels. True or False?

Review Questions

1. What is a risk perception and why is it important?
2. What affects people's perception of risks?
3. What is a protective action? Give one example.
4. What three things need to happen for people to seek shelter?
5. What are three of the *perceived implementation barriers* inhibiting residents from taking protections action?
6. What are the components of a good, detailed adaptive plan?
7. Name the possible outcomes of communication action implementation.
8. Name the eight warning stages and actions of a communication action implementation plan.

9. What are the five basic risk communication functions you should address in the continuing hazard phase?
10. When analyzing the community, what do you need to know about the community?
11. What are the five tasks to complete when performing an operational analysis?
12. What are three things you must do to develop specific messages different groups?
13. One of the most important incident management actions is risk communication. What are the tasks of risk communication?

Applying This Chapter

1. Local residents have ignored your community's tornado hazard because they think they are protected by a large hill west of town. What information sources can you use to tell community residents that the hill won't protect them and that they need to take action to protect themselves?
2. Your county health department has found some traces of a toxic chemical in wells located near a pesticide factory. The chemical plant manager, who has been very cooperative with local government in the past, doesn't think the chemical is coming from his plant. Should you release information about possible chemical contamination now? If not now, when (if ever)?
3. You have been asked by your city manager to evaluate the community's risk communication program. The city council doesn't think it's necessary to spend money evaluating the program. How would you convince them of the importance of evaluating the communication program?

YOU TRY IT

Risk Communication

You know a Category 5 hurricane is scheduled to make landfall in your city. How do you effectively communicate the risk?

Evacuation: Tailor Your Message

Knowing that many who did not evacuate New Orleans were poor and geographically concentrated in low-lying areas, how would you tailor your message? What concerns would the poor have that you would need to address?

Maintaining Credibility

How can you maintain credibility with the public and the media during a crisis? What steps can you take to ensure your own personal performance does not distort your message?