Developing an Effective Risk Communication Model for Vulnerable Communities

Peter O’Neill, NSW State Emergency Service, 2003

Summary

While there have been many disaster education resources developed in Australia, there has been little research into linking these programs to an appropriate risk communication model that explains the relationship between vulnerable communities and their willingness to act on safety programs designed by emergency agencies (Boura, 1).

This paper examines issues relating to risk communication models in the context of a severe hazard such as a flood. It investigates the concept of risk perception and the elements that contribute to an effective risk communication program. It also reviews traditional approaches to community education and suggests a need for a more integrated communication model that acknowledges community perceptions about the risks they face, and while encouraging self reliance, also acknowledging the limitations of this approach.

Introduction

Although community safety programs are traditionally under-funded, additional resources alone will not improve residents’ ability to cope with a major disaster. Even well funded programs in related areas, such as the road safety campaign, have been criticised for a lack of success. According to the 2002 Safety Strategy Report, “It is likely that millions of dollars have been wasted each year on road safety advertising in Victoria since 1989” (Sinclair, 2).

The key to behavioural change lies in risk communication programs designed to change people’s perception of the risk and encouraging a community response to managing it. Risk communication is usually defined as an interactive process of exchanging information and opinions between stakeholders regarding the nature and associated risks of a hazard on the individual or community and the appropriate responses to minimise the risks.

Understanding the Hazard and Risk

Integral to this approach is the belief that people do not categorise all risks as identical and will react differently according to their perception of the impact of the hazard on their lives. This paper will use the example of a Hawkesbury-Nepean valley flood to identify the factors that influence a person’s attitude towards different risks.

The NSW Government is responsible for managing a program called the Hawkesbury-Nepean Floodplain Management Strategy, which is designed to reduce the impact of a significant flood along the Hawkesbury-Nepean River. The Hawkesbury-Nepean valley, located on the western fringes of metropolitan Sydney has a number of unusual physical features that influence flood behaviour. The inflow of water from this large catchment (22,000 sq kms) is funnelled through narrow gorges below Sackville. This produces a ‘bathtub’ effect where water flows in faster than it can escape out to the sea at Broken Bay. The depth of potential flooding is unique in the Hawkesbury-Nepean valley and flood risks to life and property escalate dramatically with increasing flood severity (Hawkesbury-Nepean Floodplain Management Strategy Report, 3).

The largest recorded Hawkesbury-Nepean River flood since European settlement occurred in 1867 and devastated areas around Emu Plains, Penrith, Richmond, Windsor and Riverstone. A recurrence of the 1867 flood would inflict a catastrophe on this area, as the floodplains now include many riverside towns, villages and farms, with a population of over
66,000, giving the potential for isolation and eventual total inundation of many homes and businesses. However, even larger floods are possible then the 1867 flood. Adverse effects on community health could be expected from experiencing a severe flood due to the need to evacuate, damage to the family home and the ensuing post-flood recovery stress.

Researching the Approaches to Community Education

One of the issues in selecting appropriate risk communication strategies for a community education campaign is the need to understand how people adopt appropriate behaviours, based on their view of the nature of the hazard and the associated risk. Many health promotion campaigns identify clear behavioural changes that the target audience should adopt. For example, there is sound epidemiological evidence that having a sensible diet and moderate exercise will reduce the risk of heart attacks. However, in the example of a severe flood, most of the desired behavioural changes that are being advocated are only applicable during a flood event. Evidence of intention therefore may need to be used as a predictor of future behaviour. This in turn, has implications for the type of educational programs that are developed and their evaluation.

According to the Institute of Medicine (4), while the ultimate goal of public communication should be to change and reinforce a given behaviour, communication also creates changes or reinforces specific beliefs. These beliefs in turn influence attitudes, perceived norms and self-efficacy - which are indicators of one's intent to engage in the appropriate behaviour. Identification of these beliefs requires an understanding of the benefits and barriers to performing the appropriate action, from the perspective of the targeted community.

Factors That Influence Risk Perception

Wade et al (5) recognised the factors that affect individuals' perception of risk or outrage. Risk may be described as the exposure to possible danger or loss because of a hazard. Keys (6) also identified this same sense of outrage or denial as being true in the case of flood hazards. Wade et al, wrote, “Risk is equated to the nature of the hazard, times the magnitude, times the probability of the event, plus people's perception of the risk (outrage)” (Wade et al, 5, p4). This equation should not be seen as a quantifiable formula, but rather as a means of identifying an individual’s attitude towards adopting behavioural change because of their perception of the likely risk.

How then do people determine the degree of risk to which they are willing to expose themselves and their families? While there have been attempts to establish an empirical relationship between the hazard and people's recognition of the associated risk, the reality is that most people have a more subjective attitude towards risk. Wade et al (5) identified the variables that a person may use to determine their acceptance or denial of a specific risk. Thus, a person may be vulnerable to a specific risk because of their denial of the risk, which in turn will influence their willingness to adopt safety messages.

Determining a Community’s Vulnerability

People do not make decisions about their attitude towards a risk in isolation. Their response will be determined in consultation with their family and in the context of their community’s perception of the risk. The Institute of Medicine (4) referred to this ‘perceived norm’ model as one of the significant factors in predicting willingness to adopt appropriate safety behaviour. Community vulnerability refers to the community’s degree of risk of injury to themselves or their environment through interaction with a hazard. It is this combination of actual and perceived risk plus the perceived benefits and costs of behavioural change that determines the vulnerability of a community and their willingness to accept safety messages. While technical bodies may recognise a high actual risk, if the community regard it as a low risk, detailed or involved risk communication may be counter-productive.
Research carried out by Young (7) on the community’s attitude towards the Hawkesbury-Nepean flood hazard, indicates that residents believe that there is low perceived risk, while experts believe that there is a high actual risk. In this situation, a long-term communication and marketing campaign needs to be developed that will overcome people's natural indifference or hostility to the flood message, and incorporate messages aimed at the different attitudes of stakeholders towards the risk.

The issue of how to communicate the consequences of a significant but infrequent flood hazard is at the core of this issue. It is therefore important that emergency agencies responsible for safety messages are perceived to have a high degree of authority and credible messages. These messages need to address the sense of ‘outrage’ that unprepared people will be experiencing during a flood. The factors that increase this sense of ‘outrage’ include a lack of information on the hazard, if the hazard is infrequent, if the risk is high and if the community is ill prepared for the disaster (Wade et al, 5, p4).

Some of these factors will be triggered with the initial launch of the campaign. However, the most significant potential for ‘outrage’ will occur during the flood warning stage, because significant numbers of people may not have acted on previous flood safety advice. This sense of ‘outrage’ may be expressed through complaints to politicians, the emergency services or the media. If this ‘outrage’ is not addressed quickly, it has the potential to derail the entire community safety program.

**Decision-Making for Flood Protection**

Many factors will influence a person’s decision to adopt flood protection behaviour. One of the important variables is their perception of their vulnerability to the risk. For people to be prepared to try new behaviour, the perceived benefits have to be greater than the cost of acting. If they perceive the risk to themselves or their family as high, they will be more prepared to act because the benefits will be seen as substantial. Families that are able to make such a decision to act independently and evacuate by their own means, will lessen the burden placed on the emergency agencies during an emergency.

In situations such as the Hawkesbury-Nepean environment, the decision-making process is compounded by the complex variables that influence an individual’s perception of the risk. Festinger (8) identified this issue in his Theory of Cognitive Dissonance where he examined situations where there are often mutually incompatible alternatives that ensure conflict in the decision-making process. The greater the conflict before the decision, the greater the dissonance. To reduce this dissonance, a person may try to justify a decision by increasing the attractiveness of the chosen alternative and decreasing the attractiveness of the rejected alternative.

For example, people who are confronted with the devastating effects of a future severe flood may deny that it can happen and reject safety information. This is because they may consider there to be a low risk from a severe flood, coupled with low benefits from becoming flood prepared and a high cost to adopt flood protection behaviour in terms of their time and effort. Thus, they would consider their vulnerability as being low and would make a decision not to become involved in any risk-management programs. When a severe flood occurs, these people will not be prepared and require the assistance of emergency agencies to evacuate.

**Approaches to Community Education**

Historically, when emergency services have undertaken ‘community awareness’ activities, they have used a simple, unsophisticated approach to inform the community about risks, by distribution of prepared material on actions residents can undertake to protect themselves
and their property (Information-Action model). The communication was often one-off and one-way, and assumed that the audience was an indistinguishable group that had the same needs and values, with the emergency professional seen as the ‘active agent’ and the community member seen as the passive recipient of appropriate messages (Macdonald, 9). The effectiveness of this traditional approach was measured by the number of resources distributed, the ability of the individual to demonstrate an awareness of the safety messages presented and the extent to which individuals implemented the safety messages.

Implicit in this approach was the assumption that there was a direct correlation between awareness raising and behavioural change. The supposition that merely informing the individual or community about a hazard, will lead to awareness and awareness to actions, and then to sustained behavioural change, was a failing of the traditional Information-Action model. Boura (1) identifies the weakness in the belief that there is a strong and direct causal link between receiving information and taking action and new research has questioned the effectiveness of this approach in changing people’s behaviour. The literature on risk communication indicates that distribution of information on the hazard and associated risk, by itself, will not make a significant difference in attitude, perception or behaviour.

It is apparent that emergency agencies need to look beyond these traditional approaches to change models, such as those used in health promotion campaigns, that include reference to behavioural theories. While the Institute of Medicine (4) has identified three major determinates which indicate intention to undertake behavioural change, (attitude, community norms and degree of self-efficacy), Macdonald (9) also highlights the significance of the social setting in encouraging people to take actions to reduce their exposure to the risk.

Health Promotion Models

The behavioural paradigms that have influenced the development of the various health promotion models are summarised in Speaking of Health (Institute of Medicine, 4). The first of these models is the Health Belief Model. According to this model, two main factors contribute to a person’s willingness to adopt appropriate health behaviours. The person must believe that there is a significant risk to them and the suggested benefits will compensate for the cost of undertaking the appropriate behaviours. The second is the Social Cognitive Theory that emphasises the importance of individual self-efficacy, to give the person confidence they can exercise control over their behaviour and the outcomes they want to achieve. The benefits and costs of behaviour change also need to be assessed by the individual before they attempt change. The Theory of Reasoned Action asserts that the extent of behaviour change can be viewed as a function of a person’s attitude towards performing the action and a person’s perception of what his/her peers’ attitude is towards performing the task. The identification of community norms as an incentive or hindrance to change is an important factor in a low perceived/ high actual risk environment such as the Hawkesbury-Nepean and highlights the need to work closely with community expectations.

All these models are valid and contribute to an integrated public communication approach in the risk communication area. However, the limitations of these models have been recognised by Young and O’Neill (10), who addressed the issue of improving behavioural change programs applied to communities in high-risk environments.

The literature suggests that rather than people undertaking instantaneous behaviour change, they work their way towards it gradually, often going through clearly definable stages. A useful model of these stages has been developed by Prochaskau et al (11), who suggest that people move through five stages as they go from ignorance or indifference towards experimenting with the behaviour to becoming committed to it.

Encouraging Flood Preparation
According to Prochaskau et al (11), people in the pre-contemplation stage may not be aware of the need to be ‘flood prepared’ or may not see flood readiness as something that is appropriate or desirable for them. Acceptance that they live in a high-risk environment is required to shift people from pre-contemplation to contemplation through raising awareness and communicating the positive consequences of becoming prepared.

When people are in the contemplation stage, “the most effective behaviour change strategy is to emphasise the benefits of the new behaviour” (Andreasen, 12, p231). Emphasis also needs to be placed on the cost of involvement in terms of time and effort, as well as key benefits such as prevention of death or injury. Communities of interest (eg. Safer Communities), need to be identified and promoted as a way of engaging people in the education process, by demonstrating that it makes a positive contribution to community safety.

People also need to be provided with the skills, confidence and resources to give them the confidence to attempt behavioural change (self-efficacy). To shift behaviour it is useful to identify any barriers that prevent or make it harder for people to change their behaviour. Once people have undertaken action to become flood-prepared, it is very important that this behaviour be reinforced, so that this behaviour is maintained. If flooding occurs infrequently, reminders involving community activities may prompt people to sustain safety activities.

**Communicating Risk**

The approach outlined above will have a significant impact on those people who are concerned about the flood risk and are able or are prepared to take responsibility for their own protection. However, the perceived high cost/ low benefits of behavioural change in a risk environment such as the Hawkesbury-Nepean, means that only a small percentage of the population will undertake such behavioural change. Therefore, an effective risk communication model also needs to acknowledge the differing perceptions that will guide individuals and communities towards an understanding of the flood hazard, their vulnerability to the flood risk and their willingness to develop their own risk-management plans. This risk communication model recognises that individuals or communities will be at different levels of readiness and willingness to change because of their perception of the flood risk.

Carney (13) hypothesised that when communicating about a risk, there is a need to develop a contingency model that takes into consideration both the actual risk of the situation and the perceived risk. The specific environment and the needs of the target audience will thus determine the best communication strategies for any situation. Given the nature of the risk identified in this paper, it may be argued that it is unrealistic to expect the majority of the communities to adopt appropriate sustained behaviour. The research carried out by Young (7) suggests that some individuals will only engage in the education/communication process as long as it satisfies a need and will then exit rather than move through to the next behavioural stage. Therefore, the success of the program may be measured in terms of a person’s knowledge and understanding of the risk, as discrete components in the communication program, rather then these stages only being regarded as steps towards achieving behavioural change. In addition, this model would also place more emphasis on the development and delivery of effective warning messages and management of the media during significant response operations.

**Conclusion**

Emergency services across Australia are expanding their roles and taking a strategic view of their responsibilities. There is now a greater emphasis on mitigation, including community safety, rather than agencies being seen and acting as emergency responders. The greatest potential for encouraging safety preparation is to enhance community self-reliance, through long-term community education that has been developed with the support of residents. This
in turn will reduce the immediate cost of a severe flood in terms of life and property and the cost of social dislocation and psychological distress that occurs when vulnerable communities are exposed to a disaster.

The risk communication model presented in this paper seeks to develop an effective public communication program that increases knowledge and encourages appropriate attitudes and actions in flood-affected communities. It also recognises that people will have different perceptions about the hazard and associated risk and that community education programs need to acknowledge the validity of these views. Programs that recognise this and take an integrated communication approach that emphasise community partnerships will be more successful, and directly reduce the risk of vulnerable communities to severe hazards.

References
4. Institute of Medicine, (2002). *Speaking of Health,* The National Academies Press, Washington D.C.,

The views expressed in this paper are entirely those of the author and are not necessarily those of the NSW SES.