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ABSTRACT

Top-down communication approaches have not significantly influenced the extent to which people prepare for future pandemics. Research suggests that to develop and deliver effective risk management information for a pandemic, it is necessary to gain an understanding of how people interpret information, and how individual and environmental factors influence these interpretations. This qualitative study set out to provide these insights.

Eleven people were interviewed for this study, between October 2007 and January 2008. Interviews were semi-structured and in-depth, with an average duration of just under two hours. The sample of participants was reasonably diverse with respect to personal and environmental characteristics as well as covering a range of preparedness levels for influenza pandemic. The study was undertaken during a period in which bird flu was not prominent in the public eye; undertaking this study during a period of quiescence provided insights into the most challenging period for risk communication.

Participants' level of preparedness varied in accordance with their level of perceived risk. Those who perceived a low level of risk (7 of the 11 participants) had undertaken basic preparedness measures, and were content to keep a watching brief on the situation. Those who perceived bird flu to be a real and imminent threat had prepared more. In general, participants believed that the threat posed by bird flu can change rapidly, and that people's levels of preparedness can be rapidly adjusted in response to the perceived level of threat.

Specific preparations varied widely among participants. The five basic elements of preparedness were: stockpiling of food and water supplies; developing resilience to loss of mains electricity; acquiring first aid supplies and developing knowledge of infection control procedures; acquiring camping equipment; and acquiring specific medication such as Tamiflu. Long-term preparation strategies employed by several of the participants included developing inner strength and a strong sense of self-efficacy; maintaining or improving physical and psychological health and developing a culture of self-sufficiency and reducing reliance on external resources.

To be effective, risk communication and management strategies need to address the complex web of interacting individual and environmental factors both by encouraging preparedness activities and counteracting factors impeding preparation. Participants had useful suggestions for how such information could be made as meaningful as possible to the public. Suggestions included: framing messages positively; showing how specific actions mitigate specific consequences so that people are convinced of the purpose of recommended actions; presenting information with honesty and integrity; and couching messages in appropriate language.

Specific suggestions for risk communication that arise from this study include the following:
- Adjust the content of education programmes to the actual level of pandemic risk, with the complexity of content increasing with increased risk.
- Identify and correct misconceptions about pandemic risk and preparedness.
- Incorporate pandemic preparedness communication into an all-hazards communication strategy.
- Utilise the principles of persuasive communication to increase the credibility and effectiveness of pandemic risk communication.
- Engage communities in the development and delivery of key messages.

KEYWORDS

1.0   INTRODUCTION

Over the last ten years, it has become clear that the practice of top-down communication approaches based on general dissemination of preparedness information has not significantly influenced the extent to which people prepare for disasters (Paton et al., 2005; Paton, 2006). These studies suggest that this is not primarily because of problems with receiving information, but rather, has more to do with how people manage and interpret the information. Consequently, in order to develop and deliver effective risk management information for a pandemic, it is necessary to gain a better understanding of how people interpret and use such information, and how individual and environmental factors influence these interpretations to affect preparedness.

In recognising the importance of understanding people's interpretations of preparedness information, the Ministry of Health and the Ministry of Civil Defence and Emergency Management commissioned a qualitative project that focussed on this topic in the context of a potential outbreak of bird flu. This brief report presents a summary of the key findings. For further detail refer to the full research report by Bürgelt, Paton and Johnston (2009).

2.0   RESEARCH DESIGN AND METHODS

This project adopted a grounded theory approach (Charmaz, 2006; Strauss and Corbin, 1990, 1998). Grounded theory is particularly suited for exploring phenomena about which not much is known as it emphasises the generation of theory from data rather than vice versa.

The main research questions were:
- How do people interpret (perceive, think, and feel about) bird flu pandemic hazards, preparedness, and response plans?
- What psychological and environmental factors influence the interpretive process, and how do these factors interact to determine whether or not people prepare?

Eleven participants were involved in this study. These participants were selected to capture a range of personal and environmental characteristics. Of particular importance was the level of pandemic preparedness, and efforts were made to include participants who had prepared and those who had not prepared. Participants were recruited via 'snowballing' – a widely-used sampling strategy in qualitative studies (Kadkhoda, 2001; Patrick, Pruchno and Rose, 1998; Watters and Biernacki, 1989). In-depth, semi-structured interviews were conducted with the participants between October 2007 and January 2008. Ten interviews were conducted by telephone and one with an exchange of emails over several weeks. The telephone interviews ranged length from one hour 14 minutes to three hours 22 minutes, with an average length of one hour 55 minutes and median length of one hour 36 minutes. These interviews were recorded and transcribed in full.

The timing of the study was important as it coincided with a period in which bird flu issues were not prominent in the public eye. By undertaking this study during a period of quiescence, it was possible to assess perceptions and actions during a quiet time, and so provide insight into the most challenging period for risk communication. It should be noted

that this study was completed prior to the swine flu pandemic (Influenza A – H1N1) declared in 2009.

Interview data were systematically analysed by using grounded theory strategies (Charmaz, 2006; Strauss and Corbin, 1990, 1998). Data were coded using open, axial, and selective coding. The interviews were first broken down into discrete instances, events, and happenings by analysing them line by line and by conceptualising them (open coding). During and after the open coding, we reassembled these "mosaic stones" into meaningful mosaic parts and identified their interrelationships (axial coding). We condensed the concepts or codes into more generic and abstract categories, by organising or grouping codes into categories and sub-categories according to their relationships. Lastly, we systematically related the various categories to one another, and integrated the categories into a coherent theory (selective coding).

3.0 SCOPE OF THIS STUDY

This study was intended to be the first phase of a larger project. While eleven participants may appear to be a small sample size, it was an appropriate number for achieving the objectives of this project, particularly considering its preliminary and exploratory nature.

3.1 Sample composition

While the participants were diverse with respect to some characteristics, more highly-educated people are over-represented in the sample relative to the general population of New Zealand, as are people middle-aged or older. The following groups are under-represented in the sample: younger people, people of lower socioeconomic status, less well-educated people, inner city dwellers and Māori. Also, while the sample included five immigrants from Western countries, it did not include immigrants from elsewhere who may have limited competency in English.

Thus, caution must be used in applying the findings of this study more widely.

4.0 KEY FINDINGS

4.1 Preparedness status

'Being prepared' for a particular situation is more usefully thought of as a dynamic process rather than a one-off event or an either/or state. This process leads to various states of preparedness at any given time, and thus preparedness needs to be conceptualised along a continuum ranging from 'not preparing at all' to 'preparing comprehensively.'

Participants' level of actual preparedness varied greatly, and most participants' preparation fell between the two ends of the continuum of preparedness. Their perceptions regarding their own degree of preparedness relative to what constitutes sufficient preparedness also varied widely. These findings indicate that people's self-identified preparation status is not necessarily accurate, but a matter of their subjective perceptions and interpretations of what constitutes sufficient preparation for a particular perceived level of risk.

From the interviews, four areas of interest emerged: knowledge of and information about bird flu; awareness of local and national preparedness and response plans; emergency kits; and long-term resources.

4.1.1   Participants' perceived level of knowledge about bird flu

The degree to which participants considered themselves to be well-informed about and prepared for bird flu was found to vary considerably. All participants had at least a general overview about bird flu and appropriate preparedness measures for a bird flu pandemic. It became clear that participants in this study tended to regard themselves as discerning consumers of information and some reported themselves as unlikely to automatically accept information at face value. The extent to which these participants are willing to accept and use information appears to be related to their level of trust in the source of information.

4.1.2   Awareness of local and national preparedness and response plans

Awareness of response planning and preparedness for bird flu at community and national levels was low. Only three participants were aware of formal plans and strategies. These three people also had knowledge of planning content and how plans would be applied in detail. While much has been achieved in establishing preparedness and response systems in the health and education system, there were concerns about the sustainability of such planning over time. To maintain the momentum generated and the goodwill that has been established, study participants considered that ongoing coordination, maintenance of work relationships, guidance, updating, and motivation is of crucial importance.

Four of the eleven participants indicated their interest in contributing to the development of plans in their local region, whereas the other seven participants were hesitant. For study participants, factors that would increase the likelihood of involvement in community preparedness included:

- Developing inner strength and a strong sense of self-efficacy;
- A high level of priority being assigned to preparedness for bird flu;
- A belief by individuals that they have relevant knowledge and/or skills;
- A belief by individuals that involvement would be personally enriching;
- A belief that the support of the community is likely to be vital during a pandemic and that strengthening community preparedness will contribute to their survival;
- A belief in 'bottom-up', community based approaches;
- The scope to negotiate the extent and content of individual's involvement.

These themes converge well with a previous study of Paton et al. (2008), who identified the roles of (a) community participation, (b) people's ability to determine what they should do (problem solving), and (c) being empowered to act as crucial determinants of peoples' involvement in community preparedness.

4.1.3   Emergency kits

The contents of interviewees' emergency kits consisted mainly of five elements: food and water; equipment independent of mains power; medical and infection control equipment and

procedures; camping equipment, and medication such as Tamiflu and alternative remedies. Participants' capacity to sustain themselves with food and water varied from a few days to indefinitely. Several participants had alternative power and cooking resources. Some designed their houses and surroundings in a way that reduced their dependence on power. While most participants had at least a basic first aid kit, infection control equipment and knew about the importance of hygiene routines, some participants had more elaborate medical supplies and infection control equipment. Camping equipment was also perceived as a vital part of the emergency kit.

All participants knew that isolation is the most important strategy for preventing infection and spread of bird flu, and were aware of the importance of hygiene routines such as frequent hand-washing and containing sneezes. It was notable, however, that none of the participants showed an awareness of 'social distancing' (keeping a distance of at least one metre between oneself and others in social situations) despite this being a strategy promoted by the Ministry of Health.

The study participants were inclined to doubt the effectiveness of Tamiflu and to have concerns about its possible side effects, although two participants had purchased it. Alternative treatment options such as homeopathic and natural remedies were considered by several of the participants.

4.1.4 Long-term resources

Long-term preparation strategies employed by study participants included:

- Developing inner strength and a strong sense of self-efficacy;
- Maintaining or improving physical and psychological health;
- Developing a culture of self-sufficiency and reducing reliance on external resources.

Several participants perceived inner strength as their most vital resource and this was derived from an extensive and deep self-knowledge and a wide variety of life experiences. The more knowledge of self and life experience a person had, the more extensive a tool kit of attitudes, beliefs, knowledge and skills they had for dealing with challenging situations like pandemics. Greater self knowledge and more life experience was also linked to higher confidence in their ability to cope in difficult situations and to a higher ability to cooperate with other people.

Strengthening their immune system as much as possible was for many participants an integral part of preparing for a bird flu outbreak. Several participants had consciously chosen to live in a rural area due to rural areas having a lower population density and being closer to food production. Several participants with diverse backgrounds felt that becoming more self-sufficient and less dependent on external resources was a central part of their longer-term preparedness strategy.

Key findings of this section:
- *Preparing is a process over time that leads to various states of preparedness at any given time, rather than being a one-off event or an either/or state. Preparedness needs to be conceptualised along a continuum ranging from 'not preparing at all' to 'preparing comprehensively'.*
- *Participants' self-reported preparation status is not necessarily realistic, but a matter of their subjective perceptions and interpretations of what constitutes sufficient preparation for a particular perceived level of risk. Actual levels of preparedness varied widely.*
- *The extent to which study participants accept and use information appears to be largely a function of their levels of trust in the sources of that information.*
- *Participants' emergency supplies and preparations varied, but the five basic elements were: food and water, equipment independent of mains electricity, first aid supplies and knowledge, camping equipment and specific medication such as Tamiflu and alternative remedies.*
- *Long-term preparation strategies utilised by participants included: developing inner strength and a strong sense of self-efficacy; maintaining or improving physical and psychological health and working towards greater self-sufficiency.*

4.2   How do people make the decision to prepare?

The growing complexity of contemporary life and competing demands on one's time and resources have resulted in people progressively having to prioritise how they use their time and resources. Thus, decisions regarding whether and to what extent to prepare for a particular situation depend on the level of priority assigned to that situation. Only if people perceive bird flu as a <u>relevant and immediate</u>, or salient, issue will they pay attention to it and become proactive in implementing preparedness measures. Conversely, if people perceive bird flu as something that will *not* affect their lives negatively in the immediate future, they are more likely to assign a low priority to preparedness activities.

4.2.1   Perceptions of pandemic risk

At the time of the study, seven of the 11 participants perceived that the risk of a bird flu outbreak was non-existent to low, whereas the other four perceived a high to very high level of risk. Those who perceived a high level of risk appeared to be influenced in this perception by beliefs that the bird flu (and other similar viral threats) is part of a deliberate strategy by 'the powers that be' to control overpopulation, and that therefore the risk of an outbreak is real and imminent, and that the pharmaceutical industry has created viruses to sell more vaccines.

How participants assess the risk posed by bird flu at a particular time is determined by the geographical location and extent of known cases and the manner of transmission; this information is summarised in Table 1.

4.2.2   Preparedness in relation to perceived risk

Participants' level of preparedness was in accordance with their level of perceived risk. Those who perceived a low level of risk had undertaken basic preparedness measures, and

were content to keep a watching brief on the situation. Those who perceived bird flu to be a real and imminent threat had prepared more. In general, participants were aware that the threat posed by bird flu can change rapidly, and that people's levels of preparedness can be rapidly adjusted in response to the perceived level of threat.

Table 1 How study participants assess risk of bird flu at a particular time

Perceived level of risk posed by bird flu	Location of known bird flu cases and transmission characteristics
I (low risk)	Cases remote from New Zealand, no human to human transmission
II	Isolated cases of human to human transmission outside New Zealand
III	Human to human transmission moving closer to New Zealand
IV	Many human to human transmission cases outside New Zealand, and/or isolated cases within New Zealand
V (high risk)	Widespread transmission within New Zealand

Key findings of this section:
- *Only if people perceive bird flu as a salient risk will they pay attention to it and prioritise preparedness activities. The level of priority assigned to preparedness derives from the perceived level of risk, which can change rapidly.*
- *At the time of the study, seven of the 11 study participants perceived the risk of a bird flu pandemic in New Zealand to be low; the other four perceive a high to very high level of risk.*
- *Participants' levels of preparedness varied in accordance with perceived risk, with those who perceived a low level of risk having undertaken basic preparations, and those who perceived a higher level of risk having undertaken more extensive preparations.*

4.3 Factors that reduce preparedness

From participants' comments, a range of factors could be identified that may act as barriers to preparedness. These include:

4.3.1 Bird flu not being a "hot topic"

If an issue does not have a high public profile, people are less likely to consider it salient. This was the case for bird flu at the time this study was carried out; however, participants were aware that this situation can change rapidly.

4.3.2 Busy lives

The more competing demands there are on a person's life, the less likely it is that a particular issue will receive priority.

4.3.3   New Zealand as a 'safe haven'

Several participants perceived that New Zealand is a relatively safe place to be in the event of a global pandemic, due to its pre-existing level of readiness for natural disasters, its remoteness and its agricultural self-sufficiency. This may have the effect of discouraging people from taking personal responsibility for preparedness.

4.3.4   Belief that authorities in New Zealand will manage a pandemic effectively

This may also have the effect of discouraging individual preparedness efforts.

4.3.5   Uncertainty about effects of a pandemic

In the face of significant uncertainty about how a pandemic might unfold, people are uncertain about what preparations to make.

4.3.6   Lack of trust in information providers

Several participants reported that if they were suspicious that the risk was not genuine (for instance, if it were manufactured in order to serve a particular agenda) they would be disinclined to take it seriously and make the appropriate preparations. Reasons and examples cited in support of this lack of trust were: that the media creates scare stories to increase sales; that the actions of governments may be dictated to by large corporations; and that the actions of the medical profession and the pharmaceutical industry are motivated by profit-seeking.

4.3.7   Confidence in one's own immune system

Participants who considered themselves to have strong immune systems were more likely to consider that this would protect them in the event of a pandemic, which in turn reduces the likelihood that preparations are considered urgent. The same comment also applies to those who see themselves as strong and resilient and with a belief that they will be able to cope with whatever happens.

4.3.8   Workplaces not taking preparedness seriously

People are less likely to make individual efforts to prepare if they feel significant uncertainty about how their employers will respond during a pandemic.

4.4   Factors that increase preparedness

Conversely, a range of factors could be identified that may act to increase the likelihood of preparedness actions being taken:

4.4.1 Bird flu threat increasing

Participants were aware that while bird flu was not a 'hot topic' at the time of the study, this situation can change rapidly. They indicated that they would rapidly reassign priority to this issue as appropriate.

4.4.2 Belief that bird flu is a manufactured hazard

Several participants believed that the bird flu (and other similar viral threats) is part of a deliberate strategy by 'the powers that be' to control overpopulation, and that therefore the risk of an outbreak is real and imminent. This belief apparently made them more inclined to take the threat seriously and to prepare. Note, however, from Section 4.3.6, that other participants were more inclined to be suspicious of how genuine this threat might be. Respondents' views on this topic were complex and sometimes contradictory, and in some cases, a tendency to dismiss the threat was also associated with an increased level of preparedness activity.

4.4.3 Doubts that the health system will cope

Participants who reported doubts that the health system would cope with a pandemic were more inclined to take personal responsibility for becoming prepared.

4.4.4 Desire for self-sufficiency

Several of the study participants expressed a desire to become more self-sufficient; this was generally within a sustainability context but the benefits of self-sufficiency in the event of a pandemic was clear to these people.

4.4.5 A desire to improve physical, psychological and spiritual health

As for the above factor, participants perceived these goals as being intrinsically worthwhile and important as well as increasing resilience in the event of a pandemic.

4.4.6 General benefits of preparedness

Many participants saw strong benefits in making generalised preparations as they were aware that New Zealand is a disaster-prone country. They believed that preparing for disasters in general will help in coping with a bird flu outbreak.

4.5 Responses during a pandemic

In the event of a pandemic, people will activate as many resources and apply as many strategies as they possibly can to safeguard their lives. Participants believed that an actual pandemic would bring out the worst and best in people and society at large. They thought that major disruptions would be inevitable and have far-reaching consequences for individuals (loss of income, difficulties obtaining food and water) and society at large (mass hysteria, breakdown of social order). However, some participants believed that a bird flu outbreak would also lead to a rise in community spirit, to a breaking up of structures that do not serve people any more and an opening-up of structures to serve humanity better, and to people becoming more humble.

Just as participants reported a sceptical attitude towards information received about preparedness *prior to* a pandemic, the same scepticism was also evident when participants described how they might respond to official information issued *during* a pandemic. Participants reported that they would not blindly follow instructions, but would assess any such instructions and respond in a manner that makes sense to them and is in accordance with their own values.

4.5.1 Attitudes towards isolation

All participants recognised isolation as a vital response strategy. Isolation made sense to them, which would in turn increase the likelihood that they would implement this strategy. However, participants also acknowledged dilemmas that could affect the viability of this strategy. The most major of these was in weighing up the need for isolation to protect their own (and their household's) health versus the need to leave home for work and to procure essential supplies, and to assist others in need. Several participants believed that people in general are unlikely to be highly self-reliant and that may in turn imply that isolation is unlikely to be workable for many people.

Potentially serious consequences for society could occur in the event that people cannot afford *not* to work and there are no systems in place to continue to pay them or to waive their regular financial commitments. The following issues were of concern to participants:

- Failure to pay bills and service rent or mortgage payments may lead to suspension of essential services (such as electricity) and possible loss of homes. Some participants were concerned that this could lead to social upheaval.
- People may feel pressured into going to work even if they should be in isolation, which would put others at risk.
- Participants were concerned about disruption to essential services if staff are required to isolate themselves.

In terms of assisting significant others, the participants indicated that it is important to them to reach out to others, to fulfil their own needs for emotional and physical support, and to pool resources to stand a better chance to cope with and survive an outbreak. It was clear from participants' comments that there is a strong human need for social interactions to sustain psychological, social and emotional well-being. This may present difficulties in situations where complete isolation is required, as participants reported intentions to gather with family members and friends, and assist in the wider community.

Key findings of this section:
- *Participants believe that a pandemic would bring out the worst and best in people and society at large.*
- *Participants tended to be distrustful of official information sources; if this view is widely shared it may be a challenge for authorities.*
- *Participants believe that a pandemic is likely to cause a range of serious consequences for society at large.*
- *All participants recognised isolation as vital response strategy. However, there is a strong human need for social interactions, which may pose difficulties in enforcing an isolation strategy.*

4.6 What education needs do people have?

While participants perceived education as one vital part of the overall strategy to enhance preparation, they identified several specific factors they believed would greatly enhance the relevance and usefulness of information to them. Because people's receptivity to information is influenced by the salience of the issue, the content of information should be tailored to the actual level of risk. Another key finding was that the effectiveness of an education programme can be greatly enhanced by developing a long-term strategy that coordinates a variety of media and sources that are mutually reinforcing. Furthermore, educational initiatives will be more effective if they are combined with natural disaster preparation initiatives, and integrated into existing societal structures.

Participants also suggested the following criteria for information to be effective:
- Information needs to be provided honestly and to demonstrate it is designed with people's best interests at heart;
- Information needs to be relevant to people's immediate, day to day lives;
- Information should be framed positively and constructively rather than negatively, which can be perceived as scaremongering;
- The sensationalising of information should be avoided by presenting information in a factual, realistic, rational and objective way;
- Information should demonstrate how specific actions can mitigate specific consequences;
- Everyday language should be used. Rhymes, songs, stories and games may also have a role to play in communicating messages;
- Memorable messages that create the right habits now (immediately) are likely to be most effective.

4.6.1 Using a range of media

Participants indicated that the greater the variety of media used to present information, the more likely it is that messages will get through to people and be remembered. Brochures with checklists distributed via letterboxes or the phone book are believed to be of value if they are geared towards all disasters and pandemics. Information should be distributed in hard copy as well as an electronic format. Participants indicated that a combination of passive TV and radio advertisements, documentaries, newspaper articles, websites, government releases to the media and health reports would be the most appropriate media for getting continuous messages across. Information provided via the various media needs to be consistent, with government taking a leadership role to ensure this information is consistent. Local community papers would be a valuable resource in this respect. Active community participation in the risk communication process would be useful. This could entail trained volunteers following up theoretical, passive information with a personal visit that actively involves people in discussing local preparedness and response plans, personal preparedness and response options, and advice provided where necessary.

Participants predominately perceived their local councils and the government as being responsible for supplying them with New Zealand specific information as part of their leadership role. However, information should also come from various organisations at local, national and international level: the media, doctors and other health professionals, work, neighbourhood, kindergarten/play centres, and schools.

Three main types of audiences for information, and promoters/multipliers of information emerged: children of different ages (e.g. kindergarten/play centres, primary and secondary school), adolescents and young adults (e.g. secondary school, polytechnics, universities), and adults of different ages and roles (e.g. parents, grandparents, elderly, employers and employees, volunteers). The considerable community diversity that characterises contemporary New Zealand suggests that a differentiated approach to risk communication is necessary to increase the likelihood that it will reach each audience type. Information needs to be tailored for different end-users.

These education features are consistent with the principles of persuasive communication and with disaster research (e.g. Paton, McClure and Bürgelt, 2006; Paton, Parkes, Daly and Smith, 2008).

Key findings of this section:
- *Participants perceive provision of appropriate information as a critical element of a preparedness strategy.*
- *The effectiveness of an education programme can be greatly enhanced by developing a long-term strategy that coordinates a variety of media and sources that are mutually reinforcing.*
- *Participants had a range of practical suggestions for effective communication of preparedness messages.*
- *As contemporary New Zealand society is very diverse, different strategies will be required to communicate information to different groups.*

5.0   SUGGESTIONS FOR FURTHER WORK

While this project represents a useful starting point for understanding factors influencing preparedness for bird flu, it has generated many new questions. To develop a more comprehensive theoretically-grounded holistic model built from the bottom up, the following areas would be interesting and useful avenues for future exploration:

- A follow-up qualitative study using the same research design, but targeting groups under-represented in the initial study;
- A quantitative study to test the findings of the pilot study, utilising a questionnaire designed based on findings of the two qualitative studies to find out about the perspectives of the wider population. For instance, it is important to determine whether misconceptions in public understanding of pandemic risk and preparedness identified in this report (e.g. that New Zealanders are protected from a global pandemic by geographical isolation) are widely held.
- A qualitative investigation of work and community preparedness to identify psychosocial factors that influence work and community preparedness.
- The development of a broader perspective on rapidly transmissible infections on general influenza-type outbreaks rather than just 'bird flu'.
- Development of 'best preparedness practices' utilising experiences in New Zealand and elsewhere.

6.0 RECOMMENDATIONS

To be effective, risk communication and management strategies need to address the complex web of interacting individual and environmental factors that influence both the process of preparing and the degree of preparedness. Specific suggestions for risk communication that arise from this study include the following:

- Adjust the content of education programmes to the actual level of pandemic risk, with the complexity of content increasing with increased risk; this suggestion is supported by other literature (Paton et al., 2005; Paton et al., 2006).
- Identify and correct misconceptions about pandemic risk and preparedness.
- Incorporate pandemic preparedness communication into an all-hazards communication strategy.
- Utilise the principles of persuasive communication to increase the credibility and effectiveness of pandemic risk communication.
- Engage communities in the development and delivery of key messages.

For further recommendations drawn from a closely related study (Paton et al. 2008) refer to Appendix 1.

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APPENDIX 1   RECOMMENDATIONS FROM PATON ET AL. (2008)

The following recommendations relate more generally to the role of community engagement in preparedness activities, but are provided here as a useful resource for this study. They are drawn from a closely related study by Paton et al. (2008).

1. Enhance emergency preparedness and response systems by integrating preparedness and response measures into existing social structures in which people's lives are largely embedded. A combination of the following strategies would contribute to a holistic preparedness system:
   - include pandemic in all-hazards planning that covers and integrates the generic aspects common to all emergencies as well as the particular aspects specific to each type of emergency;
   - assist community preparedness by developing individual members' problem solving and planning skills and facilitating the availability of local leadership;
   - use and integrate existing social structures (e.g., groups, work and education spaces, public spaces) into the preparedness and response strategy); and
   - facilitate community leadership to promote the development and implementation of community engagement strategies which empower people.

2. Encourage and support self-reliance. This could have potentially substantial immediate benefits for both people and society, and can be achieved to a great extent in both rural and urban environments.
   - Support schemes designed promoting and implementing self-reliability and self-sufficiency are already underway in New Zealand such as Transition Towns, Sustainable Cities, Sustainable Living Programs, Living Economies – Pathways to Sustainability, Sustainable Business Network, Farmers Markets, Eco Village Movements, Environment Networks, Eco-Architecture, Environment and Conservation Organisations of Aotearoa New Zealand; and
   - Draw inspiration from strategies designed to facilitate self-reliability and self-sustainability in urban environments (e.g., 'dachas' (allotment gardens) in Russia, 'Victory Gardens' in the UK, US and Canada, community gardens on community land and replacing ornamental plants with edible plants in public spaces).

3. Consider supporting preparedness work by making it one of the Government's areas of national interest (ANI), and by establishing a structure that coordinates work on preparedness activities and assists companies and organisations practically in developing and implementing their specific preparedness strategies. Provide the motivation and ongoing funding to establish and maintain the work preparedness structure.

4. Encourage and support group preparedness, in particular pre-existing groups that have formed of their own accord. Strategies to promote and support group preparedness could consist of:
   - conducting a qualitative study into group preparedness initiatives to pool their knowledge and find out about issues they experience; and
   - publishing stories about specific group preparedness initiatives, and encouraging

preparedness discussions.

5. Create safe interaction environments that make it as safe as possible for people to go to work and/or to reach out to people. Organisations need their employees to work, and they can reduce the dilemma by ensuring as much as possible that working in the company is safe and that working from home is an option. Strategies that companies and organisations could apply to enable their employees and volunteers to work from home could include:

- decide and communicate *before* a pandemic whether employees will be required to come to work at all and if yes, under which circumstances they will need to continue working and what their roles are likely to include;
- prepare employees for these specific roles, which are likely to differ from their normal roles,
- explore all general and organisation-specific ramifications and scenarios of working from home and design together with the employees who could work from home preparation and response plans *before* an outbreak;
- prepare employees theoretically and practically on an ongoing basis;
- ensure as much isolation and safety as possible on the way to and from work and at work; and
- ensure that only healthy and essentially-required employees are working at the company.

6. Reduce physical and emotional impacts on health professionals and social/community workers. Strategies to encourage this group to provide their vital services could comprise:

- the government enlisting personnel and resource assistance from public services and appropriate community groups to pool resources and distribute the medical and psychological work onto more shoulders;
- the companies/organisations providing the highest available level of protection gear and of infection control measures at work and for private use; and
- the government and/or companies/organisations providing essential provisions and assist dealing with household work to reduce stress.

7. Develop strategies that enable people to survive without an income for an extended time. Social measures to minimise the need for people to leave their homes could consist of:

- developing emergency schemes which people can use for fixing life essential equipment or issues (e.g. breakdown of power, phone lines) and establishing what constitutes life essential;
- creating group preparation schemes in which families, circle of friends, neighbourhoods and/or community groups prepare together and then cope together during an outbreak as an isolated group.

8. Ensure ongoing maintenance and improvement of established schemes and practices. Valuable strategies could include:

- embedding preparedness strategies and systems within the existing infrastructure;
- providing funding on an ongoing basis; and
- establishing annual nationwide emergency preparation exercises or simulations locally and nationally to provide private sector, non-profit organisations and government structures to practice preparedness and response plans.