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# **Increasing household preparedness for earthquakes:**

**Understanding how individuals make meaning of earthquake  
information and how this relates to preparedness**

A thesis presented in fulfilment of the requirements for the degree of

Doctor of Philosophy

in

Psychology

at Massey University, Wellington,

New Zealand.

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# Abstract

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New Zealand's susceptibility to experiencing damaging earthquakes makes managing the associated risk a societal imperative. A prominent component of earthquake risk management is fostering household earthquake preparedness. This involves encouraging people to acquire survival items (e.g. food, water, torches, and other essential items), implement mitigation measures (e.g. retrofit buildings), make emergency plans, learn survival skills and engage in socially-based preparedness activities.

Despite considerable effort and expenditure incurred by emergency management to encourage such activities, levels of overall preparedness remain low in New Zealand. This identifies a need for more effective earthquake education programmes. To develop more effective programmes, it is important to understand how people make sense of hazards and make decisions about how to manage the associated risk.

One particular gap in current understanding relates to how individuals render earthquake hazard and preparedness information meaningful and how this influences actual preparedness. In particular, questions remain about how individual, community and societal factors interact to influence how people interpret risk and decide whether to prepare or not.

This thesis explores the earthquake information meaning-making and preparedness processes. A series of qualitative interviews using grounded theory methodology was undertaken in 2008 with household residents in three New Zealand locations at risk of earthquakes. The interviews explored personal, community and societal influences on how people interpret and impose meaning on earthquake information and how the outcome of this process relates to undertaking actual preparedness actions.

Three main types of information were identified: passive; interactive; and experiential information. Each type of information makes unique contributions to the interpretation and preparedness process. Passive information has a more restricted effect, and interactive and experiential information a wider-ranging effect. People utilise all these types of information when interpreting and making meaning of hazard and preparedness

issues. Consequently, future earthquake education programmes should accommodate passive, interactive and experiential information in their design and implementation.

In making meaning of information, and making decisions about whether to prepare or not, a number of aspects were found to be important to the overall process including: raising awareness and knowledge of earthquakes and preparedness; understanding earthquake consequences; stimulating thought and discussion; developing skills; information seeking; salient beliefs; emotions and feelings; societal influences; intentions to prepare; and resource issues. Key societal influences on meaning-making and preparedness include: community (community participation, sense of community); leadership; responsibility (responsibility for preparing, responsibility for others); social norms; trust; and societal requirements. Earthquake education programmes also need to take such factors into account in their design.

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I could not have been able to complete this research without the sound guidance of my supervisors. My thanks go to Associate Professor David Johnston of the Joint Centre for Disaster Research at Massey University and GNS Science who has always believed in me and encouraged me to undertake a PhD; to Professor Douglas Paton at the University of Tasmania who spent many hours with me helping me understand the field, and providing invaluable and timely advice; and to Professor Kevin Ronan at Central Queensland University who provided a complementary perspective on my research area.

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On a personal level I would like to acknowledge the on-going support of my husband, Jonathan Povey, who has spent approximately 5 years listening to me ‘talk PhD’. I’d like to thank my immediate and wider family as well, all of whom believed I could complete a PhD and provided encouragement along the way. Friends have also assisted me in keeping sane during the process. I was able to share many frustrations with fellow PhD student and colleague Wendy Saunders along the way, and I’d like to thank Wendy for her unwavering support. Ian de Terte and I also shared many conversations over the duration of our candidature for which I am grateful. Finally, I’d like to express my thanks to the wider social science team at GNS Science who were very patient with me while I was undertaking my research and writing the dissertation.

This thesis is dedicated to the memory of my grandfather, Walter Herbert Gibbons, who passed away on the 21 November 2010. His continual quest for knowledge and belief in the importance of education inspired me to want to seek knowledge for myself. My search for new knowledge has been realised in undertaking and completing this PhD.

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# Chapter 1 Introduction

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## 1.1 Geological background

New Zealand is situated along a tectonic plate boundary, and as a consequence is subject to a variety of geological hazards (Figure 1.1) including earthquakes, volcanoes, tsunamis and landslides (Officials' Committee for Domestic and External Security Coordination, 2007). In addition, New Zealand also has a history of extreme meteorological events, and is subject to both technological and biological hazards.

One particular hazard that is of low frequency, but potentially high impact, is earthquakes. Earthquakes pose a significant risk to the New Zealand population, infrastructure and economy, particularly when they occur in populated areas. Unlike other hazards such as flooding, they strike without warning. Past events have shown the adverse impact earthquakes can have, for example, 220,000 were reported dead in the 2010 Haiti earthquake; 88,289 in the 2008 Wenchuan earthquake in China (Spence, So, & Scawthorn, 2011) and 181 are reported to have died on the day of the 2011 Christchurch earthquake (Brown, 2011; McSaveney, 2011; New Zealand Police, 2011; The Press, 2011)<sup>1</sup>. It is critical, therefore, that we think about how to deal with earthquake risk before an event happens, so as to minimise any impacts that may occur.

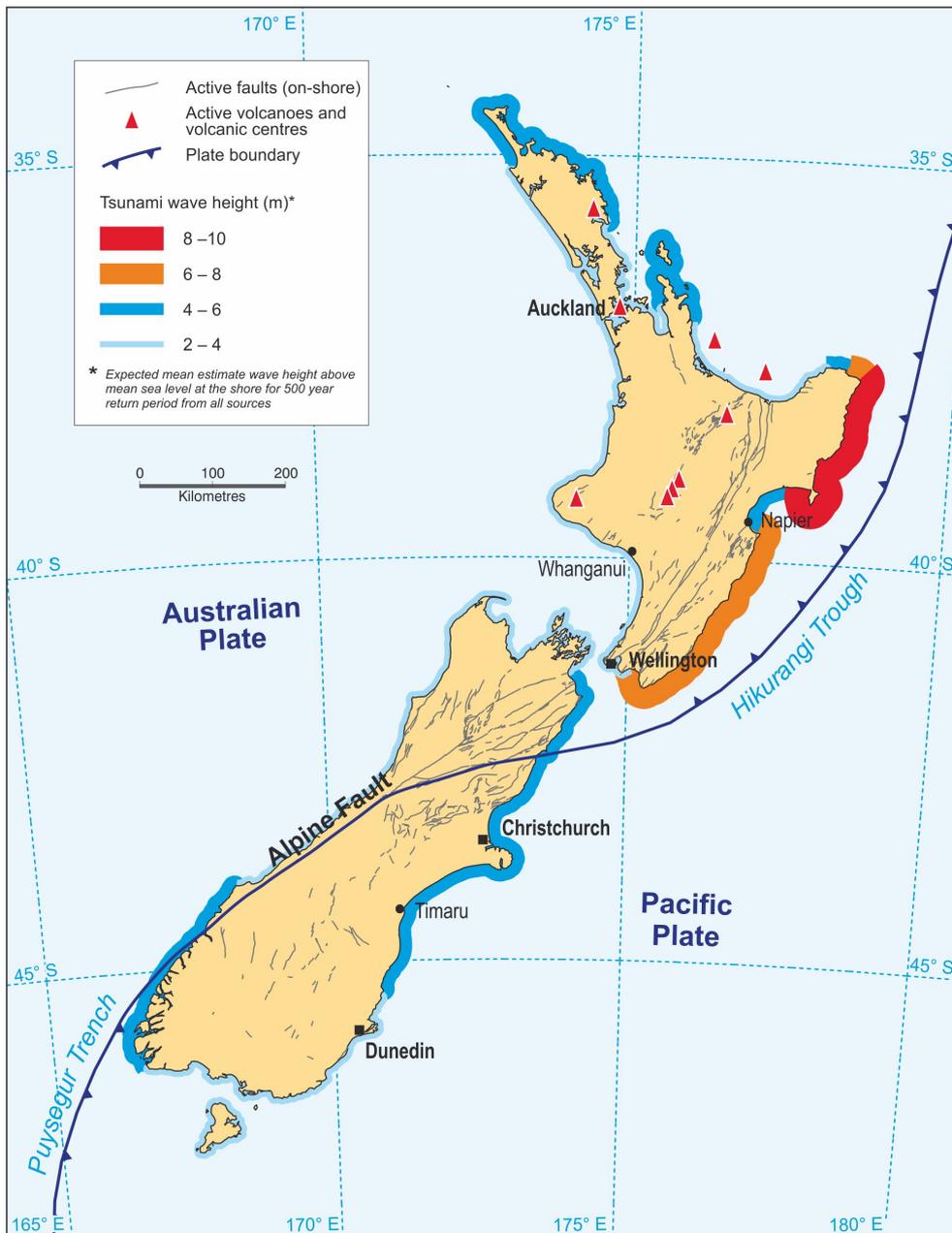
## 1.2 Earthquakes in New Zealand

An earthquake occurs when strain along a fault (or fracture in the earth's crust) is released suddenly. Earthquakes can be measured in two main ways; the first being in terms of *magnitude* or 'size', with magnitude being a measure of energy released in the earthquake. The 'magnitude' is the term probably most often used in the media and most familiar to the public. A second way of describing an earthquake is in terms of its *intensity* or 'strength', intensity being a measure of how strong the ground shaking is at

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<sup>1</sup> 172 names had been officially released on the NZ Police website as of 7 April 2011, with a further 9 individuals whose bodies had not been formally identified. The Press (2011) also reports that while 181 people died on the day of the earthquake (22 February 2011), another person died from injuries several days later, and four other potentially earthquake-related deaths have been referred to the coroner.

a particular location. In New Zealand the Modified Mercalli (MM) intensity scale is used to describe the intensity experienced during an earthquake (Appendix 1). Researchers argue that while the concept of magnitude is most often relayed to the public, it is better to use intensity because it more accurately describes what people experience at a given location, and gives people a more accurate perception of impacts (Celsi, Wolfenbarger, & Wald, 2005).

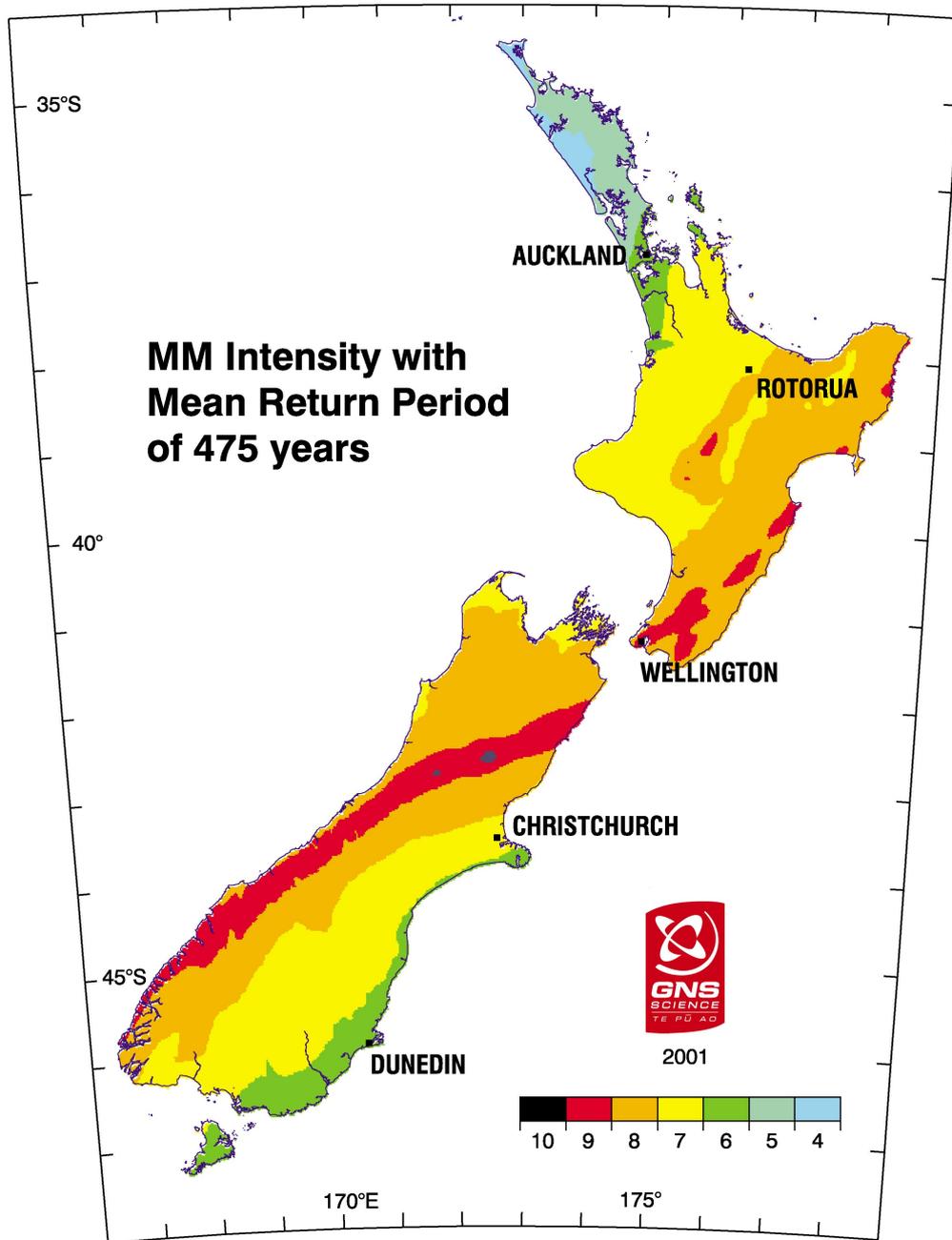


**Figure 1.1** Geologic hazards affecting New Zealand, including active faults that may be the source of earthquakes, active volcanoes and potential tsunami wave heights. Landslides are not depicted on the map due to their widespread and distributed nature. Coastal erosion and extreme meteorological hazards are also not depicted (adapted from Glavovic, Saunders, & Becker, 2010a, 2010b).

Because the country straddles two constantly moving and straining plates, many places in New Zealand are subject to earthquakes. The most hazardous areas are located closest to the plate boundary (i.e. within 100 km). Areas most likely to experience a large earthquake include Gisborne, Hawke's Bay, Wairarapa, Wellington, Marlborough, North Canterbury, Buller, the Southern Alps, and Fiordland (Officials' Committee for Domestic and External Security Coordination, 2007). However significant earthquakes can also occur in places further away from the plate boundary, as was demonstrated by the Darfield and Christchurch earthquakes on 4 September 2010 and 22 February 2011 respectively, which affected Christchurch and the Canterbury region.

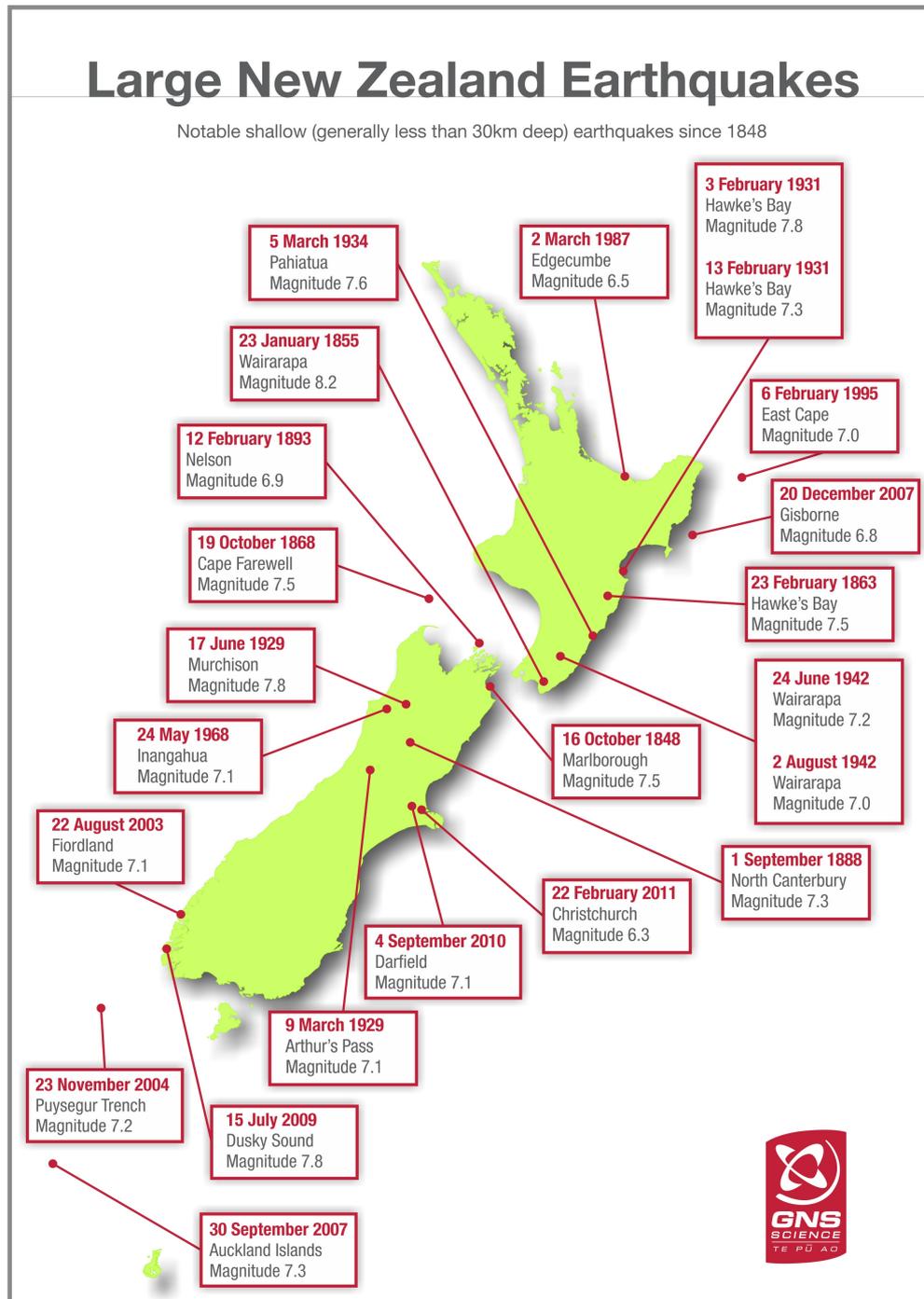
Research has been undertaken to model the probabilistic earthquake seismic hazard across the country (Stirling et al., 2000; Stirling et al., in prep; Stirling, Wesnousky, & Berryman, 1998). Figure 1.2 represents the probabilistic seismic hazard for New Zealand in terms of MM intensity for an average earthquake return period of 475 years. As described earlier the highest level of earthquake hazard tends to follow the pattern of the plate boundary, with the hazard lessening the further away from the boundary you get.

Earthquakes produce a number of distinct hazards. The first and most obvious hazard is that of ground shaking. The intensity of ground shaking depends on a number of factors including the magnitude of the earthquake, distance from the epicentre, and the make-up of the local geology. Sandy or silty sediments tend to amplify ground shaking, while shaking effects are slightly less in areas of more solid rock. Liquefaction, where sediments behave like a fluid and are forced to the ground's surface, can occur in areas where there are saturated fine-grained sediments. Lateral spread may also occur, for example, next to waterways (whereby waterway banks move toward any water source, opening up large cracks on the adjacent land). Another hazard related to earthquakes is that of surface fault rupture. In an earthquake, when a fault ruptures it may sometimes propagate to the surface of the earth, resulting in a distinct break on the ground. Fault rupture may take many forms including strike-slip, normal or reverse. The rupture may also be either well defined (i.e. a distinct rupture with little deformation around it) or distributed (i.e. a rupture that creates an area of wider deformation). Finally, earthquakes can also contribute to the creation of secondary hazards such as landslides and tsunamis.



**Figure 1.2** Map showing the distribution of MM intensity with a current Annual Exceedance Probability of 1/475, derived from the National Probabilistic Seismic Hazard Model (personal communication, W. Smith, 2001; based on data from Stirling, et al., 2000).

In terms of its seismic history, New Zealand has on average experienced 10 to 20 magnitude 5 earthquakes each year; one magnitude 6 earthquake each year; and one magnitude 7 earthquake each decade (Officials' Committee for Domestic and External Security Coordination, 2007). However, despite the averages, such earthquakes have not been distributed evenly over time, with the majority of large earthquakes occurring from the mid-1800s to mid-1940s (Figure 1.3).



**Figure 1.3** Significant historic earthquakes in New Zealand (Source: GNS Science).

The most damaging earthquake in the 20<sup>th</sup> Century was the magnitude 7.8 Hawke’s Bay Earthquake in 1931 (Figure 1.4). In this earthquake 256 people officially died and thousands more were injured (Dowrick, 1998; Officials' Committee for Domestic and External Security Coordination, 2007). Masonry buildings collapsed, and while wooden buildings generally survived the earthquake itself, many were razed by the fires that broke out following the earthquake. Severe damage to infrastructure occurred, with roads splitting open, buckling of the wharf, and damage to essential services such as

electricity, water and gas (Dowrick, 1998). The hospitals were badly damaged, resulting in temporary emergency hospitals being set up in recreational areas. Many people were unable to stay in their homes, as most homes lacked water, electricity, sewerage and chimneys. As a consequence people camped in open areas, and a tent city sprung up that could house 2,500 people (McSaveney, 2009).

The Hawke's Bay earthquake was New Zealand's first large earthquake to demonstrate the impact such an event could have, and highlight the need to reduce risk for future events. The earthquake provided impetus for the development of guidelines for constructing more earthquake-resistant buildings in New Zealand (Dowrick, 1998; McSaveney, 2009; Nathan, 2011). The Hawke's Bay earthquake, followed by two earthquakes in the Wairarapa Valley in 1942, also had an influence on the establishment of earthquake insurance provisions through the Earthquake and War Damages Commission (Nathan, 2011). Finally, the Hawke's Bay earthquake provided a reminder to the wider population that earthquakes can happen, and that we all should be prepared for them as much as possible.



**Figure 1.4** Napier after the 1931 Hawke's Bay earthquake (Source: Alexander Turnbull Library, Wellington).

From the mid-1940s to 2009, New Zealand experienced a relative period of quiescence with only two onshore earthquakes being greater than magnitude 7 (Officials' Committee for Domestic and External Security Coordination, 2007) and located in areas away from high population densities. More recently the period of quiescence has been broken with the Canterbury region experiencing a damaging series of earthquakes.

The Darfield earthquake of magnitude 7.1 occurred on 4 September 2010, causing damage to the immediate Darfield area, and as far away as Christchurch and Kaiapoi. Significant building damage occurred mostly from ground shaking and liquefaction (Figures 1.5 and 1.6). Unreinforced masonry buildings suffered damage, as well as residential houses located in areas of liquefaction and lateral spread (Wood, Robins, & Hare, 2010). Rupture of the Greendale Fault also resulted in some limited building damage, but was not extensive as the fault was located in a rural area. Transport, electricity, water and sewerage systems were disrupted, with the most notable damage to sewerage systems (anticipated 18 month restoration times for some areas). Luckily, no lives were lost, only two major injuries occurred, and the majority of injuries (over 2,250) were minor (personal communication, Accident Compensation Corporation, 2011). The low level of serious injury was most likely due to the earthquake occurring at 4.35 am when most people were at home sleeping (Wood, et al., 2010).

The main Darfield earthquake was followed by a series of aftershocks, many of which occurred close to Christchurch city. On 22 February 2011 at 12.51 pm a shallow aftershock of magnitude 6.3 occurred near Lyttleton and Christchurch. The nature of this aftershock was such that it caused severe ground shaking that resulted in the collapse of a number of unreinforced masonry buildings and two multi-storey office buildings, and caused structural and non-structural damage to other buildings. Liquefaction and lateral spread was also more widespread than in the 2010 earthquake. Unfortunately during this severe midday aftershock 181 people were not as lucky as in September and lost their lives (McSaveney, 2011), and there were many serious injuries. The recorded deaths were predominantly due to collapsing buildings, falling objects both outside and inside buildings (e.g. falling masonry fell on two buses, killing 6 people; a television fell on an infant inside a home), and earthquake-induced landslides (McSaveney, 2011). Liquefaction again proved a problem in both residential and commercial areas, with properties and streets affected by thick layers of water and

silt. Severe damage occurred to people's homes from liquefaction and ground shaking, and many residents were displaced. Infrastructure was also hit hard, with transport, electricity, water and sewerage systems disrupted. While electricity was restored to most of Christchurch and Lyttleton within days to weeks, many suburbs continue to face on-going issues with disruption to water and sewerage, some of which will take years to be resolved.

The Canterbury earthquakes have provided a timely reminder of the need to understand New Zealand's earthquake environment, to reduce the risks posed by earthquakes, and to build resilient communities capable of surviving, responding to and recovering from disaster.



**Figure 1.5** Damage to unreinforced masonry buildings caused by ground shaking during the Darfield earthquake (Photograph: Julia Becker, 8 September 2010).



**Figure 1.6** Minor liquefaction on a residential property in Christchurch (Photograph: Julia Becker, 7 September 2010).

### 1.3 Developing earthquake-resilient communities

A number of options are available for creating earthquake-resilient communities. These options include land use planning, engineering, earthquake warnings, earthquake preparedness and community capacity-building. Land use planning is one of the first options for dealing with earthquake risk (Kerr et al., 2004). In particular, new development can be avoided in areas of known earthquake risk (e.g. fault zones, areas prone to liquefaction). If development already exists in an area, then further development can be controlled or restricted. For example, further development on a fault trace might be prohibited or future activities at the site could be restricted (e.g. type or placement of structures could be restricted).

Engineering can provide a second option for reducing risk and building resilient communities. New Zealand's building code (under the Building Act 2004) requires that new buildings are built to avoid major structural damage in an earthquake, primarily to prevent collapse and protect life. The Building Act also requires that older buildings be

strengthened to bring them up to the earthquake code. The strengthening of older buildings is still a work in progress, and as a consequence a significant number of vulnerable unreinforced masonry buildings and older concrete and steel buildings still exist in New Zealand (Officials' Committee for Domestic and External Security Coordination, 2007). Damage to older buildings during the Canterbury earthquakes is testimony to the fact that much retrofitting still needs to be undertaken in New Zealand. Engineering of important lifelines to withstand earthquakes (e.g. bridges, roads, train lines, water and sewerage networks, electrical networks, telephone networks) is also an important practice for creating resilient communities (Brunsdon & Evans, 2003; Johnston, Becker, & Cousins, 2006).

Thirdly, despite the fact that earthquakes occur virtually instantaneously, some limited opportunity exists to provide warnings for earthquakes. Some earthquake warning systems do exist in countries like Japan, but are not available in New Zealand. Such systems give seconds to minutes warning of an impending earthquake and enable organisations to undertake activities such as shut down essential services or alert the public (Gasparini, Manfredi, & Zschau, 2011; Satriano, Wu, Zollo, & Kanamori, 2011). However, as New Zealand does not possess such technology, any kind of advance warning for an earthquake is currently not a viable option.

Finally, earthquake preparedness is also an important part of ensuring community resilience (McIvor & Paton, 2007; Paton, 2006; Paton, McClure, & Bürgelt, 2006; Paton, Smith, Johnston, Johnston, & Ronan, 2003). Preparedness for earthquakes may occur at a societal level, a community level or an individual household level. At all of these levels there are opportunities to make preparations to reduce the effects of an earthquake, such as creating earthquake response and recovery plans, undertaking earthquake mitigation actions (e.g. retrofitting) or gathering essential survival items that can be used following a disaster (e.g. food, water). Capacity building can assist with developing the skills and attributes required by people to get prepared and respond to an event.

From the preceding discussion, it is apparent that a number of options exist to reduce the risk from earthquakes; however, this research project cannot investigate all of these options in depth. Therefore, the focus of this dissertation is on individual household preparedness for earthquakes.

## **1.4 What does it mean to be individually prepared for earthquakes?**

### **1.4.1 Individual household preparedness**

Being prepared for a disaster at a household level typically involves undertaking a variety of activities, from collecting essential survival items, through to more complex tasks such as making a household emergency plan or retrofitting a building. Generic disaster preparedness can be undertaken for range of disasters (e.g. stored food and water will be useful whether the disaster is a flood or an earthquake), however there are some distinct tasks that need to be undertaken specifically to ensure earthquake safety (e.g. securing moveable items within a house or retrofitting a building).

To study household preparedness for earthquakes, researchers in the past have often broken down preparedness into two distinct types: survival actions versus mitigation actions (Russell, Goltz, & Bourque, 1995; Spittal, McClure, Siegert, & Walkey, 2008). Survival actions include ensuring that there are enough emergency items stored such as water and food, or ensuring that there is alternative cooking and lighting available. Mitigation actions are tasks that are undertaken to mitigate death, injury or damage from an earthquake, such as securing objects that may fall in an earthquake or retrofitting a building to ensure it is safe. Kirschenbaum (2002, 2004) has broken disaster preparedness down further into four factors to better reflect and measure different tasks: levels of essential provisions stocked in the household; knowledge of and ability to use survival skills; having household emergency plans; and the presence of structural mitigation measures (e.g. a safe building to take shelter in). Lindell, Arlikatti and Prater (2009) take the viewpoint that while personal actions contribute to preparedness (e.g. survival actions, mitigation actions, and emergency planning), social actions can also be considered aspects of preparedness too. These include actions such as joining an earthquake-related organisation or attending meetings about earthquake hazards.

The following series of lists (1-4) present typical preparedness activities for earthquakes that can be employed prior to a disaster (adapted from Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Mileti & Darlington, 1997; Mulilis, Duval, & Lippa, 1990; Ronan & Johnston, 2001, 2003, 2005; Spittal, Walkey, McClure, Siegert, & Ballantyne, 2006):

1. Essential survival actions or items

- Stockpile food and water for three days
- Have a torch
- Have a transistor radio
- Have spare batteries
- Store other emergency equipment (e.g. plastic bags, toilet paper, tools, tents, etc.)
- Have a fire extinguisher
- Have a smoke detector
- Have a first aid kit
- Put aside essential medication
- Have access to an alternative cooking source
- Put wrench by gas turn-off valve.

2. Mitigation actions

- Rearrange and/or secure breakable household items
- Put strong latches on cupboard doors
- Fasten heavy furniture to the wall
- Fasten other moveable objects (e.g. computer, television)
- Add lips to shelves to keep things from sliding off
- Store heavy items down low
- Don't store water on top of electrical equipment (e.g. a fish bowl on top of the television)

## Chapter 1 Introduction

- Store hazardous materials safely
- Secure water heater
- Install flexible piping to gas appliances
- Secure house walls
- Strengthen roof
- Strengthen chimney
- Bolt house to the foundations and arrange bracing for foundations
- Buy insurance
- Have home inspected for earthquake resistance.

### 3. Emergency planning

- Pick an emergency contact person outside the area
- Have a family emergency plan
- Have a house plan showing exits, assembly areas, where to turn off utilities
- Know who is responsible for collecting children from school
- Know school emergency plan
- Know where a child would meet family/leave message if no-one is at home
- Have a plan or preparedness items for the workplace.

### 4. Skills

- Find out about earthquake hazards in the area
- Learn first aid
- Ensure that someone in the family has learned to put out fires

- Attend an education programme about hazards and preparation.

#### 5. Social actions

- Join an earthquake-related organisation
- Contact a relevant agency that deals with emergency management (e.g. local government, Red Cross)
- Attend meetings about earthquake hazards
- Write a letter about earthquake hazards.

Some items and activities listed above coincide with items or activities already in daily use (e.g. having a torch or radio), while others are specific to preparing for earthquakes (e.g. securing a water heater). This has implications for both preparedness practice and research. For example, people may claim to have gathered specific items together for an emergency, when in reality they have already obtained those items for use in daily life (Paton, Smith, & Johnston, 2005). Thus, rather than people making a conscious decision to prepare for earthquakes, other motivations may have influenced their state of 'preparedness'. Caution must therefore be exercised when using lists of such items in attempting to understand behaviour with respect to earthquake adjustment adoption.

#### **1.4.2 Individual psychological preparedness**

Another aspect with respect to preparedness is that of psychological 'preparedness'. It has been found by a number of researchers that if people within communities are more psychologically prepared for a traumatic event such as a disaster, then they will cope better when it actually occurs (Lahad, 2005; Morrissey & Reser, 2003). Such psychological preparedness may include an understanding of the events that will take place, the impact of those events, and how an individual might feel about those events; belief that individuals or communities will be able to 'help themselves' in a disaster; or knowledge and trust that community and organisational support systems are in place to help deal with a disaster (Lahad, 2005).

## 1.5 Preparedness in the New Zealand policy context

The concept of resilience is advocated at central government level by New Zealand's Ministry of Civil Defence & Emergency Management (MCDEM), and is a core focus of their National Strategy entitled "*A Resilient New Zealand*" (Ministry of Civil Defence & Emergency Management, 2004, 2007a). The 2002 Civil Defence Emergency Management Act and the National Plan also outline the importance of, and requirement for preparedness (Civil Defence Emergency Management Act, 2002; Ministry of Civil Defence & Emergency Management, 2006). All of these documents focus on the "4R"s of Reduction, Readiness, Response and Recovery, of which household preparedness falls primarily under the concept of Readiness.

Many educational strategies in the past have focused on disseminating information to the public to raise awareness of hazards, in the hope that people will prepare in response to what they see or hear. The current MCDEM public education strategy acknowledges that raising awareness is not enough, however, and that it is necessary to promote action in communities (Ministry of Civil Defence & Emergency Management, 2007b). They have pledged to run a two-step educational programme whereby they first focus on raising awareness and understanding, and then move on to building commitment and preparedness. However, despite a desire to eventually get people prepared, all of the objectives in the strategy are specific to building awareness and understanding rather than motivating preparedness (Ministry of Civil Defence & Emergency Management, 2007b, p. 7). Running alongside the public education work, a new work programme is currently underway that shows promise for tackling the motivation issue: its focus is on building resilience, rather than raising awareness (personal communication, L. Mamula-Seadon, 2010).

While MCDEM acknowledges that hazards and preparedness information should not be relied on solely to motivate preparedness, such information does form one component of encouraging the public to prepare (Ronan & Johnston, 2005). In terms of information available, MCDEM has developed a range of information resources. Currently they run the "Get Ready, Get Thru" campaign, advocating general preparedness for disaster (Ministry of Civil Defence & Emergency Management, 2011a). As part of this campaign, television advertisements are run on TV and radio,

supported by resources such as preparedness pamphlets, household emergency checklists, public activities and a website. Information is provided on potential hazards/disasters, how to prepare at home, how to make an emergency plan, and how to make a getaway kit. There are also specific instructions on what to do before, during and after an earthquake. Every year they hold a “Get Ready Week” (called “Disaster Awareness Week” prior to 2010) to highlight the importance of preparing for disaster. Key messages as part of the “Get Ready, Get Thru” campaign include:

- “In a disaster, would you get through?”;
- “This could happen in New Zealand”;
- “If you've seen the news, you know why you should be prepared”;
- “In a major disaster there could be too many people affected and not enough rescuers”;
- “You could be at work, you could be anywhere when disaster strikes.”
- “No power, no phones... in a disaster, would you get thru?”
- “Chris and his family have survived a major disaster because he and his family knew what to do and they were ready”.

MCDEM also distribute hazards and preparedness information via schools in the form of a resource kit called “*What’s the Plan Stan*” (Ministry of Civil Defence & Emergency Management, 2011c), and provide information for businesses to use. Additionally they have produced a document to give guidance to agencies on consistent messaging entitled, “*Working From the Same Page: Consistent Messages for CDEM*” (Ministry of Civil Defence & Emergency Management, 2010b)<sup>2</sup>.

While MCDEM is responsible for emergency management at a national level, New Zealand is broken into 16 regional Civil Defence Emergency Management (CDEM) groups, roughly geographically located within Regional Council (local government) boundaries. These groups are responsible for emergency management-related tasks in their region, including encouraging individuals and communities to be prepared for disasters. The regional CDEM groups undertake educational activities with respect to hazards and preparedness, and provide information in a variety of formats. Sometimes

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<sup>2</sup> “*Working from the Same Page: Consistent Messages for CDEM*” is based on “*Talking About Disasters: Guide for Standard Messages*”, a document produced by the National Disaster Education Coalition, for which the American Red Cross provided project management.

MCDEM's information may be used, but as CDEM Groups have control over their own jurisdiction they may also produce local information for the public as well.

Information about hazards and preparedness is not limited to the civil defence emergency management sector. Other agencies also provide information about hazards and preparedness, for example, the Ministry of Health is an information provider for pandemic hazards. For earthquakes, the Earthquake Commission (EQC), New Zealand's earthquake insurer, provides information about the earthquake hazard in New Zealand, past events, and how to prepare for an earthquake. The EQC have a comprehensive website called EQ-IQ, where information is available on what to do before, during and after an earthquake (Earthquake Commission, 2010). They encourage people to quake-safe their homes by "fixing, fastening and forgetting". Practical instructions are also provided to assist with some of the more complicated preparedness actions, such as strapping a hot water cylinder. Other resources are also available (e.g. pamphlets) and the EQC is involved in organising activities such as museum displays and community preparedness projects (Johnston, Coomer, & Becker, 2010).

While the majority of disaster education has been based on traditional information dissemination strategies, some community-based education does take place in New Zealand. Becker et al. (2010) outline a range of initiatives related to preparedness and response planning that involves the community in a more participatory fashion. For example, in Northland the CDEM Group has worked with local communities to empower them to develop their own tsunami evacuation plans. Another example is from the small village of Mount Lyford, where representatives from Canterbury CDEM Group visited each of the 17 households for a one-hour conversation about hazards and preparedness. Three weeks later the facilitator revisited the 17 households to check progress and find out whether people had prepared or not. Thus some community-based education does take place in New Zealand, but this appears to still be undertaken only in a minority of cases.

## **1.6 Household preparedness figures**

Ronan and Johnston (2005) analysed the outcomes of a number of New Zealand and international studies and found that overall levels of household preparation are

universally low, including in risk-prone areas. This is despite increased funding for public preparedness, and the implementation of hazard education and information programmes. There have been some improvements in certain geographic areas over time (e.g. earthquakes in California, Lindell & Perry, 2000) but not to exceedingly high standards.

Figures for household preparedness for disasters in New Zealand reflect international findings. In a nationwide survey undertaken by the Ministry of Civil Defence & Emergency Management in 2010 (Colmar Brunton, 2010), only 24% of New Zealanders reported that they were fully prepared for a disaster at home (i.e. with essential survival items and an emergency plan) and only 11% were prepared both at home and work. The EQC has also undertaken specific national earthquake preparedness research. Their latest figures indicate that over half (51%) of New Zealanders have done nothing to reduce or prevent damage from earthquakes (Earthquake Commission, 2011). When asked about specific mitigation actions only 15% had secured tall furniture, and a variety of other actions (e.g. secure hot water cylinders or check the house is structurally sound) were undertaken by less than 10% of the population. The latest EQC data also indicates that while the Canterbury earthquakes have had some influence on individuals undertaking earthquake preparedness activities, increases in people undertaking action have still been modest and more evident within the confines of the Canterbury region.

## **1.7 Concluding comments**

Given continuing low levels of preparedness, it is evident that more work needs to be done both in terms of improving understanding of the processes that lead people to prepare, and in developing educational strategies that reflect research findings. This thesis aims to contribute to our understanding of earthquake preparedness and how agencies can better influence preparedness for disasters. In particular it explores the link between hazards and preparedness information, people's interpretation and use of that information, and how information can best be used to encourage people to undertake preparedness actions. The research will provide new insights into how to improve current models of preparedness and resilience, and advice on the improvement of educational strategies.

## 1.8 Structure of thesis

The current chapter (Chapter 1) has provided a brief overview of New Zealand's earthquake problem, evidence of the need to prepare for earthquakes at societal, community and individual household levels, and a summary of the current situation regarding earthquake preparedness and education. The following chapters will outline knowledge regarding current influences on earthquake preparedness and gaps in our knowledge (Chapter 2); describe the research undertaken as part of this project to address those gaps (Chapter 3); discuss the findings of the research (Chapters 4-8); and finish with some concluding comments (Chapter 9). Briefly the overall structure of the dissertation is:

Chapter 1 Introduction

Chapter 2 Literature review

Chapter 3 Methodology

Chapter 4 Paper 1: Re-conceptualising hazards and preparedness information: types, use and effectiveness

(Becker, Johnston, Paton, & Ronan, submitted-b)

Chapter 5 Paper 2: A model of household preparedness for earthquakes

(Becker, Paton, Johnston, & Ronan, submitted-a)

Chapter 6 Paper 3: The role of prior experience in informing and motivating earthquake preparedness

(Becker, Johnston, Paton, & Ronan, submitted-c)

Chapter 7 Paper 4: Salient beliefs about earthquake hazards and household preparedness (Becker, Paton, Johnston, & Ronan, submitted-b)

Chapter 8 Paper 5: Societal factors of earthquake information meaning-making and preparedness (Becker, Paton, Johnston, & Ronan, submitted-c)

Chapter 9 Discussion

This thesis consists of a mixture of conventional chapters (Chapters 1, 2, 3 and 9) and papers that have been submitted for publication in peer-reviewed journals (Chapters 4, 5, 6, 7 and 8). The papers are written in the style of the journal that they are intended to be published in. A linking statement introducing each of the papers is placed at the end of each preceding chapter. As the papers need to be self-contained, some information is necessarily repeated throughout the dissertation (e.g. rationale, description of research methods, description of limitations, some figures). Appendix 2 contains the “Statement of Contribution” sign-off sheets for each of the papers, showing the percentage contribution to each paper by the candidate. While the style of referencing for the submitted papers differs depending on the target journal, referencing for the thesis itself has been kept consistent. All references appear in one section following the concluding chapter and use the American Psychological Association (APA) 6<sup>th</sup> edition style of referencing.

# Chapter 2 Literature review

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## 2.1 Introduction

Chapter 1 discussed how earthquakes pose a risk to New Zealand and suggested that individual household preparedness was one way of addressing the earthquake issue. However, it also noted that levels of household preparedness remain low in New Zealand and that improving such preparedness remains a challenge. Chapter 2 reviews existing research on household preparedness for earthquakes, and discusses the influences on preparedness that have already been identified. It then goes on to discuss gaps in our knowledge, and how new research could potentially fill these knowledge gaps and contribute to the development of more effective earthquake preparedness strategies.

## 2.2 Review of predictors of preparedness for earthquakes

Household preparedness for earthquakes is possibly one of the most studied fields in disaster research. In general the majority of studies have been quantitative, making use of questionnaires to ask people about aspects of adjustment adoption. These studies have assisted in understanding some of the factors that are correlated with differing levels of preparedness. Previous studies have been comprehensively summarised in review papers by Lindell and Perry (2000) and Solberg, Rossetto, and Joffe (2010), and in a U.S National Academies of Sciences review (National Research Council of the National Academies, 2006). This section will discuss some of the key identified influences on adoption of seismic hazard adjustments.

### 2.2.1 Risk and preparedness perceptions

Solberg et al. (2010) note that in the range of studies undertaken, risk perception is only weakly correlated with household adoption of seismic hazard adjustments (i.e. there is no strong evidence that people's understanding of earthquake risk motivates them to

directly prepare). This is confirmed by studies that are concerned with other types of hazards (Kirschenbaum, 2005). However risk perception is a wide-ranging subject and Lindell and Perry (2000) make the important point that possibly not all aspects of risk perception have been fully explored in relation to earthquakes, and thus not all predictors accurately identified. For example, they suggest that research has often focused on individuals' judgement of the probability and severity of earthquake consequences, but not widely explored other risk perceptions.

Some particular risk perceptions that have been found to correlate with earthquake preparedness include: hazard salience (Jackson, 1977, 1981; Paton, McClure, et al., 2006); high disaster awareness (Tanaka, 2005); having earthquake knowledge (Hurnen & McClure, 1997); participating in rescue and solidarity activities in previous earthquakes (Tekeli-Yeşil, Dedeoğlu, Braun-Fahtlaender, & Tanner, 2010); understanding of risk (Turner, Nigg, & Heller-Paz, 1986); thinking about an earthquake as an extraordinary event (Turner, 1983); expected earthquake occurrence (Rüstemli & Karanci, 1999); perceived likelihood of an event (Farley, Barlow, Finkelstein, & Riley, 1993); perceived likelihood of an event and expected property damage (Kunreuther et al., 1978); belief in an earthquake prediction (Endo & Nielsen, 1979; Farley, et al., 1993); and personalisation of risk (Mileti & Fitzpatrick, 1993; Turner, et al., 1986). A number of researchers (e.g. Gregg, Houghton, Paton, Swanson, & Johnston, 2004; Paton, et al., 2005; Paton, Smith, et al., 2003; Ronan & Johnston, 2005) have also found that the likelihood of people preparing is higher if they believe that a damaging hazard event is imminent (e.g. will occur within the next year). However the breadth of potential risk perceptions that people hold, and the relationship with preparedness, has not been explored comprehensively.

Risk perception can be influenced by a number of factors. Critical awareness (reflected in the degree to which people think and talk about earthquakes) has been found to link with risk perception and preparedness (Lindell & Perry, 2011; Lindell & Prater, 2000; McIvor & Paton, 2007; Mileti & Darlington, 1995, 1997; Mileti & Fitzpatrick, 1992, 1993; Paton, 2003, 2007a; Paton, Kelly, Bürgelt, & Doherty, 2006; Paton, McClure, et al., 2006; Paton, et al., 2005; Paton, Smith, et al., 2003). The more frequent the thoughts and discussion, the more reminders there are about the threat that needs to be addressed (Lindell & Prater, 2000). Discussion can also lead to people not preparing,

particularly if the discussion is not directed in a positive way towards preparing (Paton, McClure, et al., 2006; Paton, et al., 2005).

A number of biases may also influence people's risk perception, including 'optimistic bias' or people's optimism that they will be not harmed or impacted in an event when compared with others (Burger & Palmer, 1992; Helweg-Larsen, 1999; McClure, 1998; Spittal, McClure, Siegert, & Walkey, 2005; Weinstein, 1980, 1984); and 'normalisation bias' or people's belief that they were okay in a previous event, so are likely to get through the next, possibly without taking further interventions (Johnston, Bebbington, Lai, Houghton, & Paton, 1999; Mileti & O'Brien, 1992; Nguyen, Shen, Ershoff, Afifi, & Bourque, 2006; Russell, et al., 1995).

Risk perception may also be influenced by demographic characteristics, for example, Solberg et al. (2010) found in their review that age has been shown to be an influence in many studies, with older people being less likely to see earthquakes as a risk. Also significant is that women often have been found to have a higher level and differing nature of perceived risk than men (e.g. Cutter, Tiefenbacher, & Solecki, 1992; Lai & Tao, 2003; Mulilis, 1999; Paradise, 2005, 2006), which may mean that the two genders engage in slightly different types of preparedness activities. Additionally, those with more 'material risk', such as owning property exposed to earthquakes, often have a heightened risk perception (Armaş & Avram, 2008; Karanci & Aksit, 1999; Rüstemli & Karanci, 1999). Armaş (2008) found that those who were in a situation of increased social vulnerability also were better at acknowledging seismic risk.

People's perceptions about preparing can also influence seismic adjustment adoption. Outcome expectancy of the effectiveness of preparing (also known as response efficacy in the literature) has an influence on whether individuals will undertake adjustment adoption (Davis, 1989; Farley, et al., 1993; Garcia, 1989; Lindell & Whitney, 2000; McIvor & Paton, 2007; McIvor, Paton, & Johnston, 2009; Mulilis & Duval, 1995; Mulilis & Lippa, 1990; Paton, 2003; Paton, Bajek, Okada, & McIvor, 2010; Paton & Johnston, 2008; Paton et al., 2010; Paton, et al., 2005; Paton, Smith, et al., 2003; Şakioroğlu & Karanci, 2008). People who hold a positive outcome expectancy (i.e. "If I prepare, I will have a better outcome after a disaster") are more likely to undertake adjustment adoption than those who hold a negative outcome expectancy (i.e.

“Preparing won’t make difference in a disaster”) (Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Sagala, et al., 2010).

### **2.2.2 Other attitudes and beliefs**

Other individual attitudes and beliefs can have an influence on adjustment adoption as well. People’s self-efficacy, or the belief that they can do something to control the outcome of an earthquake, has a bearing on adjustment adoption (Cowan, McClure, & Wilson, 2002; Duval & Mulilis, 1999; Lindell & Prater, 2002; Lindell & Whitney, 2000; McClure, Allen, & Walkey, 2001; McClure, Sutton, & Sibley, 2007; McClure, Sutton, & Wilson, 2007; McClure, Walkey, & Allen, 1999; Mulilis & Duval, 1995; Rüstemli & Karanci, 1999; Şakioroğlu & Karanci, 2008). Those that see the situation as uncontrollable (often because they attribute the cause of a disastrous earthquake to the event itself, rather than the actions of human beings) can become fatalistic and choose not to prepare because they don’t think it will make a difference (McClure, 1998, 2006; McClure, et al., 2001; Turner, et al., 1986). As a consequence, self-efficacy is linked closely with outcome expectancy (Paton, 2003, 2007a; Paton, et al., 2005). Duval and Mulilis (1999) found a relationship between personal resources (represented by self-efficacy and outcome expectancy) and risk perception, in that those with high levels of personal resources were more likely to prepare the higher the perceived threat; conversely individuals with low levels of personal resources were more likely to prepare the lower the perceived threat. Collective efficacy or the belief that collectively a community can do something to control the outcome of an earthquake has also been shown to link with adjustment adoption by having an influence on empowerment (Mclvor, et al., 2009; Paton, 2007b; Paton, Bajek, et al., 2010; Paton, Frandsen, & Tedim, 2011; Paton et al., 2008; Paton et al., 2009; Paton, Sagala, et al., 2010). Collective efficacy is itself influenced by self-efficacy (Paton, Bajek, et al., 2010).

Fatalism (mentioned previously) is a common phenomenon that has been described by many researchers that prevents people from undertaking earthquake preparedness (e.g. Asgary & Willis, 1997; Farley, 1998; Farley, et al., 1993; McClure, et al., 2001; McClure, et al., 1999; Turner, et al., 1986). Fatalism is related to locus of control, and those who have an external locus of control are more likely to experience learned helplessness with respect to events they think are uncontrollable, a tendency to be

fatalistic and thus less likely to prepare (McClure, 1998, 2006; Paton, McClure, et al., 2006; Turner, et al., 1986). Conversely, those with an internal locus of control may think damage is more preventable, and be more likely to prepare (McClure, et al., 1999; Simpson-Housley & Bradshaw, 1978; Spittal, et al., 2008). Fatalism can often manifest itself in people's beliefs that an earthquake is an "Act of God" (Kasapoğlu & Ecevit, 2004a; Paradise, 2005, 2006; Plapp & Werner, 2006; Turner, et al., 1986).

### **2.2.3 Emotions and feelings**

Emotions and feelings in relation to earthquakes have been studied from time to time. While it is purported that people must be concerned about earthquakes to want to prepare, studies have found that having general concern about earthquakes may not always lead to getting prepared, as reported by Lehman and Taylor (1987) with respect to their study of college students, and Palm and Hodgson (1992) in their study of householders.

In terms of feelings, anxiety in particular can have positive and negative implications for preparing (Paton, et al., 2005; Paton, Smith, et al., 2003). In some cases anxiety has been found to reduce the likelihood that people will prepare for disasters (McClure, 1998; Paton, et al., 2005; Paton, Smith, et al., 2003), and is often linked with denial and fatalism. McClure (2006, p. 8) states that, "denial is a way of coping with an anxiety-producing event where the person denies the seriousness of the risk in order to reduce their anxiety". Some studies have shown that denial is present in relation to natural disasters and it has an inverse relation to the adoption of precautionary measures (Lehman & Taylor, 1987; McClure, 2006).

In contrast to these findings, other studies suggest that anxiety (reflected in worry, fear or concern about future disasters) can directly influence and motivate preparedness (Dooley, Catalano, Mishra, & Serxner, 1992; Heller, Alexander, Gatz, Knight, & Rose, 2005; Karanci & Aksit, 2000; Karanci, Aksit, & Dirik, 2005; Kiecolt & Nigg, 1982; Rüstemli & Karanci, 1999; Showalter, 1993; Siegel, Shoaf, Afifi, & Bourque, 2003; Turner, 1983).

Paton et al. (2005; 2003) found that different levels of anxiety can create a different response (i.e. very high levels of anxiety may be a hindrance to the preparedness process, while lower levels may be helpful). Unfortunately, research to date has not

explored the true nature of emotions and feelings in an earthquake hazard and preparedness context. Thus there remains a gap in our understanding over how certain emotions (including levels of emotions) operate and interact within the wider context, and how they actually influence the preparedness process.

#### **2.2.4 Previous earthquake experience**

Previous seismic experience also produces mixed correlations for future seismic adjustments. Some researchers have reported small or non-significant correlations between earthquake experience and seismic adjustment (Asgary & Willis, 1997; Kiecolt & Nigg, 1982; Lehman & Taylor, 1987; Mileti & Darlington, 1997; Mileti & O'Brien, 1992; Palm, 1995; Tanaka, 2005). Other researchers have found adjustment has occurred under certain types of earthquake experience, such as feeling ground shaking (Nguyen, et al., 2006); the number of earthquakes experienced (Russell, et al., 1995); experience of damage (Davis, 1989; Palm & Hodgson, 1992; Perry & Lindell, 2008); the amount of earthquake damage and losses (Heller, et al., 2005; Jackson, 1977, 1981; Russell, et al., 1995); severity of exposure to an earthquake (Şakioroğlu & Karanci, 2008); being physically financially or emotionally injured (Nguyen, et al., 2006); experience of personal loss or loss by a family member (Turner, et al., 1986); whether a person was more directly impacted (Palm & Hodgson, 1992); proximity to the epicentre (Nguyen, et al., 2006; Russell, et al., 1995); being evacuated (Russell, et al., 1995); experiencing an earthquake that scared an individual (Dooley, et al., 1992; Russell, et al., 1995); or participating in rescue and solidarity activities in previous earthquakes (Tekeli-Yeşil, et al., 2010).

Previous earthquake experience has also been shown to influence risk perception (e.g. Clark, Veneziano, & Atwood, 1993; Dooley, et al., 1992; Jackson & Mukerjee, 1974; Karanci & Aksit, 1999; Lindell & Prater, 2000; Palm & Hodgson, 1992), however in the Solberg et al. (2010) review paper they note that the strength of the relationship may depend on how risk perception is measured (Lindell & Perry, 2000) and the outcome of the experience for individuals, i.e. whether they suffered personal loss or not (Helweg-Larsen, 1999; Mileti & O'Brien, 1992). A number of researchers mention that disaster experience also stimulates critical awareness (Lindell & Prater, 2000, 2003; Turner, et al., 1986), can enhance self-efficacy (Mulilis, Duval, & Rogers, 2003), can have an influence on concern and anxiety (Dooley, et al., 1992; Heller, et al., 2005; Rüstemli &

Karanci, 1999; Siegel, et al., 2003) and can contribute to normalisation (Mileti & O'Brien, 1992) and optimistic biases (Burger & Palmer, 1992; Helweg-Larsen, 1999).

In a study by Lindell and Prater (2000, p. 334) they found that hazard experience had a higher average correlation with hazard adjustment than with risk perception or hazard intrusiveness (i.e. frequency of thought and discussion about hazards, and access to passive hazard-relevant information). They note that it suggests that "...hazard experience affects hazard adjustment via additional mediating mechanisms that are unrelated to risk perception and hazard intrusiveness".

### **2.2.5 Social influences**

Social influences have been studied by some researchers and found to have an influence on earthquake preparedness. Work by Mileti and Fitzpatrick (1992) and Mileti and Darlington (1997) demonstrated that many people who undertook seismic adjustment adoption did so after observing adjustment adoption undertaken by others. This suggests that social norms have a part to play in earthquake preparedness (Solberg, et al., 2010). Community participation in both hazards and preparedness issues and other community activities has been identified by a number of researchers as being a key influence on getting prepared (Heller, et al., 2005; McIvor, et al., 2009; Paton, 2008; Paton, Bajek, et al., 2010; Paton, et al., 2011; Paton, Houghton, et al., 2008; Paton, et al., 2009; Paton, Parkes, Daly, & Smith, 2008; Paton, Sagala, et al., 2010; Paton, Smith, Daly, & Johnston, 2008). Other research on social influences has found that the articulation of problems (comparable to collective efficacy) and empowerment all have a bearing on whether people develop intentions to prepare for hazards such as earthquakes (McIvor, et al., 2009; Paton, 2007b, 2008; Paton, Bajek, et al., 2010; Paton, Sagala, et al., 2010; Paton, Smith, et al., 2008). 'Sense of community' has had mixed results, with some researchers suggesting a link to intended adjustment adoption (Bishop, Paton, Syme, & Hancarrow, 2000; Paton, et al., 2011; Paton, Kelly, et al., 2006; Prior & Paton, 2008) and others finding no significant relationship (Paton, Millar, & Johnston, 2001; Paton, et al., 2005). In a similar vein to 'sense of community', Russell et al. (1995) suggest that a number of demographic variables such as length of time in a community, home ownership, number of children at home and other variables may enhance a feeling of 'community bondedness' and thus encourage a desire to take responsibility for oneself and others by preparing. In a general disaster preparedness

context, Kirschenbaum (2004) found that socially robust communities, with dense community networks, had greater levels of individual preparedness.

Having trust in institutions connected to earthquake hazard management is important for motivating earthquake preparedness, while distrust will do the opposite (Basolo, Steinberg, et al., 2008; Johnston, Karanci, Arikani, & Nosek, 2006; Karanci & Aksit, 1999; Maeda & Miyahara, 2003; McIvor, et al., 2009; Paton, 2008; Paton, Bajek, et al., 2010; Rüstemli & Karanci, 1999). Arlikatti et al. (2007) found that while respondents in their survey rated authorities and the news media as being the most knowledgeable and trusted, ratings of hazard knowledge and trustworthiness in families, peers and employers were more closely correlated with actual hazard adjustment adoption, highlighting the need to build trust within communities.

Perceived responsibility has been found to have a significant influence on adjustment adoption, with people who feel a personal responsibility to prepare for earthquakes more likely to undertake adjustment adoption (Garcia, 1989; Jackson, 1977, 1981; Mulilis & Duval, 1995, 1997; Perry & Lindell, 2008). Mulilis and Duval (2001) suggest that freedom of choice and commitment are both required to generate a feeling of personal responsibility. Lack of preparedness can arise when residents ascribe control of a problem to other institutions, such as local or central government (Ballantyne, Paton, Johnston, Kozuch, & Daly, 2000; Jackson, 1981; Lindell & Whitney, 2000; Paton, Smith, & Johnston, 2000).

Researchers have identified that people who feel of a sense of social responsibility for others may be more motivated to prepare for disasters (McIvor, et al., 2009), or may be more supportive of earthquake mitigation programmes (Flynn, Slovic, Mertz, & Carlisle, 1999). The importance of sense of responsibility for others is confirmed by other studies that have found adjustment adoption linked to having children or dependents in a household (Barata et al., 2004; Dooley, et al., 1992; Edwards, 1993; Russell, et al., 1995; Turner, et al., 1986).

Cultural factors in general (including cultural values and religious values) have been found to have an influence on earthquake preparedness. Studies undertaken in countries such as Turkey, Japan, China (including Hong Kong), Iran and Morocco have found subtle differences in how individuals interact within the preparedness process compared

with people living in countries such as the United States and New Zealand (Asgary & Willis, 1997; Kasapoğlu & Ecevit, 2004a, 2004b; Lai & Tao, 2003; Palm, 1998; Palm & Carroll, 1998; Paton, Bajek, et al., 2010).

### **2.2.6 Demographic characteristics**

Demographic characteristics (such as gender, income, education, length of time in neighbourhood, marital status, family make-up, ethnic make-up) seem to have variable impacts on adjustment adoption, with some particular demographics correlating with adjustment adoption depending on the study (e.g. Armaş, 2006; Dooley, et al., 1992; Edwards, 1993; Endo & Nielsen, 1979; Farley, et al., 1993; Karanci, et al., 2005; Lindell, et al., 2009; Lindell & Prater, 2000; Mileti & Darlington, 1997; Mileti & O'Brien, 1992; Ozdemir & Yilmaz, 2011; Paradise, 2005, 2006; Russell, et al., 1995; Tanaka, 2005). Other studies show no influence of measured demographics at all (Asgary & Willis, 1997; Nguyen, et al., 2006; Palm, 1995; Palm, Hodgson, Blanchard, & Lyons., 1990).

In some studies, home-owners have been found more likely to undertake seismic adjustment adoption (Russell, et al., 1995; Spittal, et al., 2008; Tekeli-Yeşil, et al., 2010). However, the definition of 'home-ownership' and its links with preparedness depends on the cultural context, for example, in a Turkish study, Karanci et al. (2005) found that living in a rental property was a predictor of preparedness.

A number of studies have found that education (both earthquake specific and education in general) has a positive impact on people getting prepared (Karanci, et al., 2005; Rüstemli & Karanci, 1999; Tanaka, 2005; Tekeli-Yeşil, et al., 2010). This aspect is discussed further in section 2.2.10.

### **2.2.7 Coping style**

Problem-focused coping, rather than emotion-focused coping, has been found to predict resilient responses during a disaster (Duval & Mulilis, 1999; Lindell & Prater, 2003; Lindell & Whitney, 2000; Paton, 2003; Paton, Millar, et al., 2001). Action coping in particular has an influence on intending to prepare (McIvor & Paton, 2007; Paton, Kelly, et al., 2006; Paton, Smith, et al., 2003).

### **2.2.8 Risk takers**

People who demonstrate a propensity to take risks have been found less likely to prepare, while low risk takers or the risk-adverse are more likely to prepare for earthquakes (McClure, et al., 1999; Ozdemir & Yilmaz, 2011; Spittal, et al., 2008).

### **2.2.9 Resource issues**

Individual resource factors such as cost of preparedness measures (Blessman et al., 2007; Kunreuther, et al., 1978; Mileti & Darlington, 1995; Palm, et al., 1990) have an impact on getting prepared. A lack of time available to undertake preparedness has been identified as hindering action, especially with respect to undertaking more complex actions like making a plan (Blessman, et al., 2007; Carter-Pokras, Zambrana, Mora, & Aaby, 2007). At a wider community level, a lack of resources may also limit the effectiveness of getting prepared for a disaster (Johnston, Karanci, et al., 2006; Lindell & Whitney, 2000; Palm & Hodgson, 1992; Paton, 2006). Lindell et al. (2009) explored a range of hazard and resource-related attributes to see which had the most impact on adjustment adoption. They found that the influence of the attribute varied depending on the action being undertaken, for example, purchasing insurance was seen as costly, while belonging to a community organisation was perceived to require a lot of effort and cooperation, both perceptions contributing to lower levels of adjustment adoption.

### **2.2.10 Earthquake education**

Education about earthquake hazards and preparedness can have an influence on whether people undertake adjustment adoption. Tanaka (2005) undertook a survey in Japan and the San Francisco Bay area in the US and found that the more educational sources people had accessed, the more ready individuals were for earthquakes. Several researchers also report that the receipt of frequent amounts of information is directly correlated with adjustment adoption (Lindell & Prater, 2002; Mileti & Fitzpatrick, 1992).

Rüstemli and Karanci (1999, p. 100) found that education is an important factor that can influence personal, community, control, and cognitive variables of preparedness. They state that, “education equips people with the abilities and the means to sense and deal

with the environment more effectively. People with higher levels of education reported less fear, more personal control and more frequent access to social support”.

As discussed in Chapter 1, many earthquake education strategies in the past have focused on disseminating hazard and preparedness information to the public, in the hope that people will prepare in response to what they see or hear. This ‘traditional’ information dissemination approach is reflected in current campaigns run by emergency management and earthquake agencies in New Zealand. Information is often distributed through channels such as the print media (e.g. newspapers, magazines, brochures); telephone information lines; video, film or computer products; the radio, television, and internet; presentations at public hearings, meetings and workshops; and warning systems (Rohrman, 2000). Despite the prevalence of information dissemination, a number of studies have pointed out that there is no direct link between providing information on hazards and making preparations for hazardous events (e.g. Ballantyne, et al., 2000; Lindell & Whitney, 2000; McClure, et al., 1999; McIvor & Paton, 2007; Mileti & Fitzpatrick, 1992; Mulilis & Lippa, 1990; Paton, Kelly, et al., 2006; Paton, McClure, et al., 2006; Paton, et al., 2005; Paton, et al., 2000; Ronan, Johnston, & Hull, 1998). Several studies also suggest that providing hazard information without any other supporting strategies may even serve to decrease community preparedness, as individuals may transfer responsibility for dealing with hazards on to other agencies (Ballantyne, et al., 2000; Johnston, et al., 1999).

Community-based educational approaches, in combination with information provision, are advocated by a number of researchers as a way to effectively develop preparedness for hazards in communities (e.g. Carter-Pokras, et al., 2007; Eisenman et al., 2009; Finnis, 2007; Finnis, Johnston, Becker, Ronan, & Paton, 2007; Frandsen, Paton, & Sakariassen, 2011; Paton, 2005; Rohrman, 1999; Ronan & Johnston, 2005).

Community-based educational activities may occur in a variety of formats, and may be directed at the individual, household or community level. Examples of different types of community-based education include: engaging people at an individual level (e.g. though door-knocking); inviting individuals along to group forums to discuss hazard and preparedness issues; engaging with community groups to up-skill members about hazards and preparedness issues; holding exercises or drills (Becker, 2009; Simpson, 2002); or empowering community members to help them develop preparedness within

their own communities (Frandsen, et al., 2011; Paton, et al., 2011). Despite evidence that community-based educational programmes can enhance preparedness, few programmes have been comprehensively evaluated and reported in the published literature. One earthquake example comes from Karanci et al. (2005), who evaluated an eight-hour community training programme run in Turkey and found that participating in a training programme was a predictor of preparedness. While overall preparedness levels were still relatively low following the intervention, the researchers surmised that if the training programme had been run for longer and addressed other earthquake-related concerns that may be barriers to action, there may have been more success.

While community-based programmes can achieve success, the short-term nature of many programmes prevents longer term gains. This was evident with the US Disaster Resistant Communities Initiative (Project Impact) launched in 1995, which was designed to establish a wide variety of community-based initiatives to address hazard mitigation and encourage the development of innovative solutions to hazard-related problems (Finnis, 2004; Witt, 1998). Despite the initial successes made by Project Impact (Armstrong, 2000; Holdeman & Patton, 2008; Nigg, Riad, Wachtendorf, Tweedy, & Reshaur, 1998; Wachtendorf, 2000), this programme was disbanded by the Federal Emergency Management Agency after several years and long-term traction has been lost (Finnis, 2004).

Finnis (2007) reviewed a number of community education initiatives from both New Zealand and the United States and came up with a list of key recommendations for developing successful community-based programmes. The recommendations include: understand the community; work with established groups; target vulnerable populations; appoint a programme facilitator; ensure dependable funding; develop simple, achievable projects; consider project diversification; ensure continual exposure within communities, and undertake an evaluation to measure the success of the programme (Finnis, 2007; Finnis, et al., 2007). Consideration should be given to involving a range of community groups within a programme, including schools (Finnis, et al., 2007; Ronan & Johnston, 2005).

### **2.2.11 Types of adjustment**

People are most likely to do things that are deemed easier to undertake (Farley, et al., 1993; Russell, et al., 1995), have been recommended for a long time (Mileti & Darlington, 1995), or are associated with general emergency preparedness (Heller, et al., 2005). In general these actions tend to be more directed toward storing survival items such as food and water (as discussed in Chapter 1). Russell et al. (1995) found that perceived earthquake preparedness was most strongly correlated with actual preparedness of survival items, indicating that most individuals perceive that being prepared for earthquakes means gathering together survival items. People are less likely to undertake mitigation actions such as retrofit their houses, or ensure that they make a family emergency plan (Heller, et al., 2005; Ronan, Crellin, & Johnston, 2010; Russell, et al., 1995).

### **2.2.12 Areas where no strong linkages exist**

A number of studies have found no strong correlation of adjustment adoption with respect to location (e.g. Mileti & O'Brien, 1992; Palm, 1995; Palm, et al., 1990). Lindell and Prater (2000) studied household seismic adoption in the two locations of California (high risk) and Washington (moderate risk) and found that residents in California had higher levels of hazard experience, risk perception, hazard intrusiveness (critical awareness) and hazard adjustment than those in Washington. However they could not determine whether differences in risk perception were due to the experience of being in a high-risk location or whether it had been due to the risk communication efforts of the emergency managers in those locations. Additionally, there is no clear evidence for correlation of preparedness with fault proximity (Farley, et al., 1993; Mileti & Darlington, 1997; Palm, et al., 1990).

United States work also shows that the correlation of past adjustments with current seismic adjustment is inconsistent (Mileti & Fitzpatrick, 1992; Mileti & O'Brien, 1992). With respect to intentions, some purport that an 'intention to prepare' can predict whether people will actually prepare (Lindell & Whitney, 2000; Paton, et al., 2005; Paton, Smith, et al., 2003) while others consider that it overestimates actual seismic adjustments (Farley, et al., 1993).

Several researchers have found a direct relationship between information seeking and adjustment adoption (e.g. Mileti & Fitzpatrick, 1992; Mileti, Fitzpatrick, & Farhar, 1992; Perry & Lindell, 2008; Turner, et al., 1986), however others have found that information seeking is actually a separate process that does not necessarily directly link with adjustment adoption (Paton, et al., 2005; Paton, Smith, et al., 2003).

### **2.2.13 Regulation**

As discussed in Chapter 1, it is possible to employ legislation, regulation and building codes to ensure the construction of safe buildings (Spence, 2004). However, many countries with sound building codes (e.g. Turkey, India) have experienced earthquakes where large-scale failures of buildings have occurred. These failures have been not due to the codes themselves, but rather because the application and enforcement of the codes were not adequate when the building was constructed (Spence, 2004).

In terms of legislation, research has also looked into the effectiveness of the Alquist-Priolo Special Studies Zone Act (1973) in California. The Act was amended in 1975 to ensure that anyone selling a house located in the “special studies” earthquake hazard zone had to disclose the earthquake risk to a potential buyer. Overall the legislation was found to have negligible effect on the purchase of property in hazardous areas, i.e. people still bought property in the area despite the risk (Davis, 1989; Palm, 1981). There were a variety of reasons for this ineffectiveness, including confusion over meaning and importance of the disclosure statement, credibility issues with real estate agents, and individuals finding other more important reasons to buy the house (e.g. thinking the house had good resale value).

Spence (2004) reviewed a number of international earthquake insurance schemes (which have varying amounts of regulation depending on the scheme) and found that while insurance has considerable potential to stimulate a range of mitigation activities, it is not always effective in doing so. For insurance and other regulations to be effective, he suggests they need to be designed to fit the society they are intended for, in combination with the development of a wider safety culture.

The examples of legislation and regulation presented here illustrate that due to contextual influences, legislation alone may not always be effective in achieving its

intended aim, but must be implemented with society in mind (Anbarci, Escaleras, & Register, 2005).

### **2.3 Models of preparedness and resilience**

A wide variety of models have been developed to try to describe what motivates individuals to take action in response to hazard threats. Some are more generic models applied in a hazards context, while others have been developed specifically to attempt to describe the process of seismic adjustment adoption.

One generic model is Lazarus and Folkman's (1984) stress appraisal and coping model, which suggests that when faced with a threat, people may cope in one of two ways: using problem-focused coping or emotion-focused coping. The ways of coping mediate the emotional outcome, either creating positive emotion or leading to distress. The quality of the emotional response then determines what type of coping strategy (e.g. continual thought about a problem; practical adjustment adoption, etc.) is chosen (Nilsson, 2007). Folkman (1997) revised the model to include meaning-based coping as a part of the model, highlighting the importance of meaning-making in emotional outcomes, and subsequent actions.

Hobfoll (1989) devised the Conservation of Resources (COR) stress model; a generic model also applied in natural disaster situations (e.g. Kaiser, Sattler, Bellack, & Dersin, 1996; Sattler, Kaiser, & Hittner, 2000; Siegel, et al., 2003). The COR model suggests that people build and retain resources to maximise positive reinforcement and enhance the self. Four types of resources are identified as part of the model:

1. objects (e.g. physical possessions)
2. conditions (e.g. social roles, marriage, employment)
3. personal characteristics (e.g. age, locus of control, self-esteem, knowledge, skills)
4. energy (e.g. money, insurance).

If an event causes a threat of resource loss, loss of resources, or lack of resource gain following investment of resources, then stress occurs. Conversely, if resource gains occur as the result of an event (e.g. an individual gains knowledge about a hazard or

how to prepare; develops an enhanced sense of self-efficacy; or develops new skills) then this can have a positive effect. Research in a natural hazards context confirms that resource loss has caused psychological distress (Kaiser, et al., 1996; Sattler et al., 2006; Sattler et al., 2002), however few studies have investigated the impact of resource gains following an event in the context of the Hobfoll model (Sattler, et al., 2000). One limitation of the model when applied to 'preparedness' is that it does not consider situational factors that influence preparation factors, e.g. risk communication, environmental cues, behavioural factors (Sattler, et al., 2000).

Some models have focused on risk communication and its influence on aspects such as risk perception and preparedness. Much research has been undertaken on risk perception and communication (e.g. Bostrom, Atman, Fischhoff, & Morgan, 1994; Bostrom, Fischhoff, & Morgan, 1992; Fischhoff, 1995, 2009; Frewer, 2004; Griffin, Dunwoody, & Neuwirth, 1999; Morgan, Fischhoff, Bostrom, & Atman, 2002; Renn, 2004; Rohrman, 1999, 2000; Sjöberg, 2000; Slovic, 1987, 1993; Slovic, 2000; Slovic, Finucane, Peters, & MacGregor, 2004; Slovic, Fischhoff, & Lichtenstein, 1981; Slovic, Peters, Finucane, & MacGregor, 2005), and as it is such a wide field this chapter will not evaluate all of the literature available on this subject. Instead it will highlight three examples.

Slovic (2000), for example, discusses various factors that influence the risk communication process, including information, perceptions, beliefs, risk measures (e.g. statistics), psychometric factors, and external factors such as the media or society in general. He states that, "risk perceptions and risk-taking behaviours appear to be determined not only by accident probabilities, annual mortality rates or mean losses of life-expectancy, but also by numerous other characteristics of hazards such as uncertainty, controllability, catastrophic potential, equity and threat to future generations" (Slovic, 2000, p. 190). To avoid failure of risk communications, he advocates a two-way process of interaction between the risk communication expert and the public.

Rohrman (1999, 2000) has undertaken work related to models of risk communication for hazards. In Rohrman (2000) he produced a socio-psychological model for the risk communication process. He outlines the influence of message features, personal characteristics, social influences and context factors on risk communication, assessment

and management. Rohrman (2000) acknowledges that gaps appear in his models of risk communication and that further research is required with respect to the interaction of previous beliefs in people's appraisal of risk, and the role of 'significant others' in influencing knowledge, attitudes and decisions about risk.

Renn, Burns, Kasperson, Kasperson, and Slovic (1992) discuss how hazard information interacts with a variety of different contextual factors (including psychological, social, institutional, and cultural processes) to influence people's perceptions of risk and behaviour toward risk. They outline the steps in the individual perception of information to be:

1. Passing through attention filters
2. De-coding of signals
3. Drawing of inferences
4. Comparing the de-coded messages with other messages
5. Evaluating messages
6. Forming specific beliefs
7. Rationalising belief system
8. Forming a propensity to take corresponding actions.

In an earthquake context, Mileti and Fitzpatrick (1992) developed a model of risk perception and preparedness based on existing research. They theorised that the process of "public response to risk communication is the consequence of perceived risk, the perceptions which the public has of the risk information, and public perception of the risk information received" (Mileti & Fitzpatrick, 1992, p. 394). The authors acknowledge that contextual and social factors are among important aspects of the model, but do not describe the exact influences that such factors have on the process.

A number of researchers have developed models from simple causal path analyses of tested variables. For example, Turner et al. (1986), Dooley et al. (1992) and Farley (1998) undertook modelling to put together causal path analyses for personal and

household earthquake preparedness. They were able to identify both cause and effect variables of preparedness, as well as mediating variables, many of which have been described in the prior discussion on predictors of preparedness for earthquakes.

Many researchers have developed models in the context of expectancy-valence (EV) theory. EV theory proposes that “people’s behaviour can be predicted from their valences for different outcomes, the instrumentalities of the performance of actions leading to these outcomes, and the expectancies about their relationship between their effort and successful performance” (Lindell & Hwang, 2008, p. 540). The Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) are two such EV models. The Theory of Reasoned Action (Fishbein & Ajzen, 1975) is focused on three important aspects of behaviour including: (1) behavioural intentions; (2) attitudes toward behaviours; and (3) subjective norms. In particular, the theory maintains that attitudes toward behaviours and subjective norms will predict people’s behavioural intentions. In an earthquake context, the Theory of Reasoned Action, “...posits that one’s attitude toward an object (e.g. seismic hazard) is less predictive of behaviour than one’s attitude toward an act (seismic hazard adjustments) relevant to that object” (Fishbein & Ajzen, 1975; in Lindell, et al., 2009, p. 1073). TRA assumes that individuals are rational actors and that cognitions play a major part in motivating behaviours, rather than emotion (Breinbauer, Maddaleno, & Maddaleno, 2005). The Theory of Planned Behaviour (Ajzen, 1985, 1991) is similar to TRA in that it includes the three aforementioned aspects of behaviour. However, its difference is that it also adds perceived behavioural control to the mix, whereby an individual who believes that factors exist that can facilitate behaviour will have a sense of control, and be more likely to undertake the behaviour (Breinbauer, et al., 2005). A down-side to such EV theories is acknowledged by Ajzen (1991) who, in reference to TPB, states that while there is plenty of evidence that relationships exist between the different constituents in the model, the exact form of these relations is uncertain.

A number of natural hazard-specific models have been developed that are based around EV theories such as TRA and TPB. In general, results show that these models support the EV theory they are based upon, however, Lindell and Hwang (2008) argue that because the EV-based models are very general, they are limited in identifying many variables related to hazard adjustment adoption.

Protection Motivation Theory (PMT) (Rogers, 1983) is an EV model, often applied in a health context, but also used as a model for other threats as well (Neuwirth, Dunwoody, & Griffin, 2000). It is based on the premise that when people are exposed to a negative threat, a cognitive appraisal process is initiated, consisting of two main aspects: threat appraisal and coping appraisal. In particular people will assess the likelihood and severity of the consequences of the threatening event, self-efficacy, and the response or outcome efficacy of protective actions (Lindell & Hwang, 2008). This in turn arouses protection motivation (a mediator), which then influences attitudes and intentions to adopt any protective actions (Mulilis & Lippa, 1990).

Mulilis and Lippa (1990) applied the PMT to earthquake preparedness and investigated the behavioural effects of communication about an earthquake threat on household preparedness in California. They found that while some aspects of PMT did hold true (i.e. the cognitive variables of likelihood, severity, self-efficacy and response efficacy did appear to have an effect on preparedness behaviour), that the mediating variable of protection motivation had complex effects on behaviour not explained by the theory (i.e. interaction between the cognitive appraisal processes and protection motivation was highly non-linear). Such results indicate the complex nature of people's interactive and decision-making processes, and highlight the limitations that some models can have if they do not encompass all aspects of a process.

Person relative to Event theory (PrE) (Duval & Mulilis, 1999; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, Duval, & Bovalino, 2000; Mulilis, et al., 2003) is also an EV model, and is derived from Lazarus and colleagues' work on stress (Lazarus & Folkman, 1984). PrE has been tested in a number of hazard contexts, including for earthquake preparedness. It includes similar variables to the PMT (e.g. consideration of the likelihood and severity of the consequences, people's self-efficacy, and response or outcome efficacy) and suggests that in making decisions about whether or not to prepare, people will appraise their personal resources relative to the level of threat (Mulilis & Duval, 1995). Mulilis and Duval (1995, p. 1321) give the example, "Specifically, a person who appraises his or her resources as sufficient in quality and quantity, relative to the magnitude of a particular threat will engage in more problem-focused coping activities than will a person who appraises resources as being insufficient". Mulilis and Duval (1997) suggest that while Lazarus and Folkman's

stress appraisal and coping model indicate that problem-focused coping can occur as a consequence of threat appraisal, it does not specify exactly how the process works, and that PrE theory captures this process better. Research undertaken in the context of PrE theory also suggests that personal responsibility for protection is an essential element to undertaking protective action and moderates the influence of appraisal processes on coping (Mulilis & Duval, 1995, 1997).

The Protective Action Decision Model (PADM) is another model developed by researchers to describe human behaviour to hazard threats (Lindell & Perry, 1992, 2000, 2011). It was originally developed for describing how people behave in emergencies (thus it is also described as the ‘warning and response’ model), but is also applicable to longer-term hazard response such as preparedness. The Protective Action Decision Model adopts aspects of expectancy-valence (EV) models, but can also be distinguished from these because it considers the wider situational context and the influence this context may have on the adoption of protective actions. The model suggests that a number of factors influence perceptions of threat and protective action. These factors include situational factors (e.g. physical cues, social behaviour, risk communication); personal characteristics (e.g. age, education, disaster experience, locus of control); and social contextual variables (e.g. family context, kin relations, community involvement). The model suggests that people take protective actions if: (a) they believe that the disaster threat exists and poses significant risk; (b) taking protective actions is feasible; and (c) they have the traits (e.g. self-efficacy, locus of control), skills and access to resources to effectively implement protective actions (Dooley, et al., 1992). Lindell and Perry (2000) describe the process according to PADM as following:

1. *Information Receipt:* Environmental cues (sights or sounds), observations of others, messages from informal, news media or official sources. Perception of expertise and trustworthiness important.
2. *Raised awareness of threat/increased threat perception*
3. *Motivation of a search for an appropriate response* to protect persons or property with minimum disruption.
4. *Clarification of threat’s significance and selection of appropriate response:* Undertaken by searching memory for knowledge. Observing friends, relatives,

neighbours, and co-workers. Seeking information from informal, news media or official sources.

Lindell and Prater (2000) acknowledge that while the PADM is both consistent with and extends the PrE model by including aspects of the wider situational context, it still has limitations. For example, while the model does incorporate some demographic and social variables, it still does not fully explain the mediating mechanisms by which the variables' effects are achieved. Thus gaps remain in understanding about how these variables interact within the adjustment adoption process.

When considering the PMT, PrE and PADM models it is interesting to note that while all are considered EV models that share similarities with TRA and TPB, they do not specifically address subjective norms (Lindell & Perry, 2011). The TRA and TPB explicitly maintain that attitudes toward subjective norms are influential on people's behavioural intentions. The omission of such a central concept in these models thus presents a significant gap in understanding about how attitudes toward social norms influence the preparedness process.

### **2.3.1 Models using a resilience framework**

While past models have focused primarily on the preparedness process as a way of reducing risk, many researchers are now framing much of their work in a wider 'resilience' perspective. The term 'resilience' is broad and has been used in a wide variety of contexts including physical, psychological, ecological, social, city, community and individual resilience (Gallopín, 2006; Klein, Nicholls, & Thomalla, 2003; Manyena, 2006; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Zhou, Wang, Wan, & Jia, 2009).

The influence of resilience can be found in a variety of disaster-related studies. For example, Cutter et al. (Cutter et al., 2008; Cutter, Burton, & Emrich, 2010) have attempted to model resilience and develop resilient indicators using their Disaster Resilience of Place (DROP) model. They note that preparedness is part of the wider scheme that makes up resilience, but not the sole focus. Ronan and Johnston (2005) advocate a holistic resilience model based around the '4Rs' of Readiness, Reduction, Response and Recovery, which takes account of social and psychological factors. Norris et al. (2008) propose a model of disaster resilience focused on a set of 'adaptive

capacities'. They consider that four primary networked resources are required to achieve resilience, including economic development, social capital, information and communication, and community competence. De Terte, Becker and Stephens (2009) present a 5-part model of psychological resilience that could be used in a disaster context which suggests that to achieve resilience; consideration should be given to cognitions, emotions, behaviours, physical activities and the environment (including family, community and societal support).

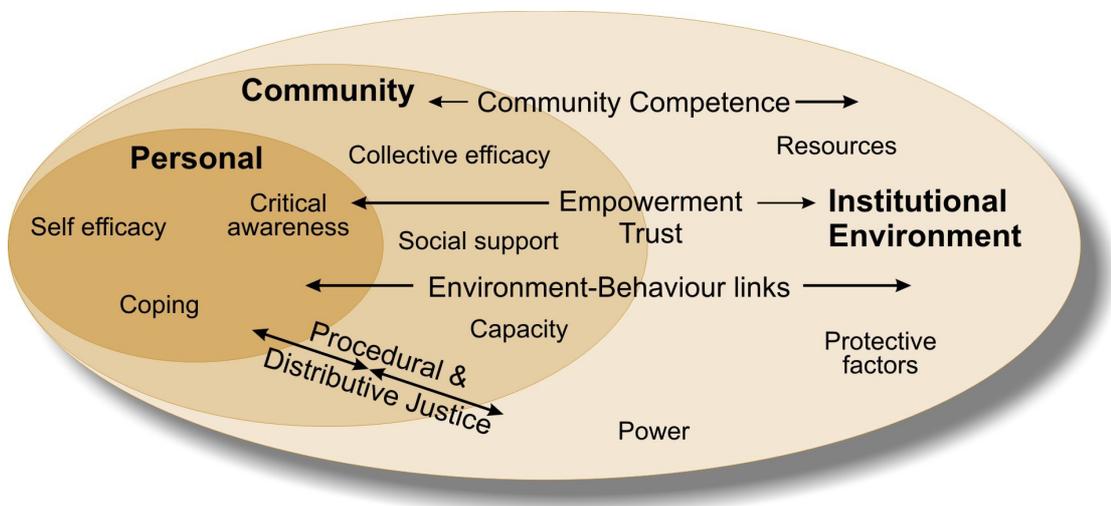
Within the hazards literature, community resilience has often been described as the ability to 'bounce back' after a disaster (Manyena, 2006; Mileti & Peek, 2002; Paton, Violanti, & Smith, 2003). It implies a capability to return to a previous state (Paton, 2007a). However, a 'previous state' is neither necessarily practically achievable after a disaster, nor desirable by the community as they are often interested in achieving a 'better state' from the recovery process. Because of the evolving nature of disasters, a number of researchers consider resilience as an 'adaptive capacity' held by individuals or communities (De Terte, et al., 2009; Klein, et al., 2003; Norris, et al., 2008; Paton, 2007a). Paton (2007a, p. 7) describes 'adaptive capacity' as society's "capability to draw upon its individual, collective and institutional resources and competencies to [anticipate,] cope with, adapt to, [recover from] and develop from the demands, challenges and changes encountered during and after disaster". Berkes (2007, p. 283) also describes resilience as a form of adaptive capacity and states that it relates to "the capacity of a system to absorb current disturbances", with natural disasters being one such disturbance.

Paton and colleagues (e.g. Paton, 2005, 2006, 2007a; Paton, Bajek, et al., 2010; Paton, Johnston, Smith, & Millar, 2001; Paton, McClure, et al., 2006; Paton, Millar, et al., 2001; Paton, Parkes, et al., 2008; Paton, et al., 2000) have framed much of their earthquake and general hazard adjustment adoption work within a resilience framework. Research has been undertaken to develop a model of community resilience focused on enhancing adaptive capacity, with adjustment adoption being one aspect of this adaptive capacity (Paton, 2006). Research for the model has shown that a number of individual, community and institutional attributes can be used as indicators of resilience. These indicators include outcome expectancy, action coping, articulation of problems, community participation, empowerment, trust and self-efficacy (Paton, 2006, 2007a;

Paton, McClure, et al., 2006). The model seeks to outline the relationships between the different influences, and to make suggestions for increasing community preparedness (Figure 2.1). The model includes (Paton, 2006, p. 309):

“(a) individual (e.g. self-efficacy, sense of community, sense of place), community (e.g. reciprocal social support, collective efficacy) and societal/institutional resources (e.g. business continuity planning) required to support adaptation; and

(b) the mechanisms that facilitate interaction within and between levels (e.g. social justice, community competence, trust, empowerment) in ways that promote cohesive action to enhance adaptive capacity, minimise disruption and facilitate growth”.



**Figure 2.1** A model of community resilience, showing selected resources at each level and selected transactional resources (Paton, 2006, p. 311).

Paton and colleagues’ community resilience model has been tested on a variety of hazards (e.g. earthquakes, volcanic hazards, bushfire, flooding) and in a variety of locations (e.g. New Zealand, Australia, United States, Portugal, Japan, Indonesia) and has been found to have many consistencies regardless of the context (Paton, Sagala, et al., 2010). For example, comparative research on earthquakes was undertaken in Japan, New Zealand and Indonesia (Paton, Bajek, et al., 2010; Paton, Sagala, et al., 2010) and a number of variables were found to be relevant across all these countries in influencing the preparedness process, including negative outcome expectancy, positive outcome expectancy, community participation, collective efficacy, empowerment and trust.

## 2.4 Limitations of previous research

Despite years of research, and a better understanding of what influences earthquake preparedness, a challenge still remains about how to improve individual household preparedness. It is evident that we still have much to learn about the preparedness process and how to influence it. Tierney, Lindell and Perry (2001) note that there are significant gaps in our knowledge about socio-psychological processes related to preparing. This is in part due to the independent and ad-hoc nature of previous studies, which have focused on different hazards and contexts, and have not tended to follow participants in a longitudinal sense. Such studies have identified only limited aspects of adjustment adoption and developed models that explain only part of the process. In particular, previous research has focused primarily on a restricted number of cognitive, demographic and emotive aspects of earthquake preparedness; but has failed to investigate the full breadth of influences, including social processes and interactions. This is noted in a review undertaken by Solberg et al. (2010, p. 1673), who state that many social psychology studies have had a narrow focus: “inter-individual influences on intra-individual cognitive processes”, with less focus on understanding the wider social processes that affect preparedness. Additionally most studies have been quantitative in nature, with very few qualitative studies, meaning that details about ‘why’ people prepare, or do not prepare, have not been captured. As Tierney et al. (2001, p. 45) put it, “we know quite a bit about *who* prepares, but not *why* they do so”.

In terms of earthquake information, research to date has focused mainly on people’s use and interpretation of traditional formats of ‘hazard information’. Much of this work has been undertaken in a linear risk communication context. There has been little work undertaken to explore the interactions that occur between the individual and cognitions, emotions, environment and society, in their interpretation of earthquake hazard and preparedness information. Future research needs to focus on exploring and identifying such interactions. As well as accounting for traditional information formats, informal information sources also need to be considered, including conversation and interaction between people, visual cues (e.g. the presence of earthquake-related landscapes) and sources that may not be obviously directed at hazards (e.g. information related to keeping other aspects of the environment safe). A broad definition of ‘hazard information’ is wise, as Paton (2005, p. 11) states, “...facilitating preparedness is less

about giving people information per se and more about interacting with community members in ways that address their needs and assists them to make preparedness decisions”.

## **2.5 Summary of research gaps and future directions**

In summary, there has been very little in-depth study of the processes that influence specifically how individual, community and societal factors interact to determine how people render hazard information meaningful, and how this interactive process translates into preparedness actions. This information has become increasingly important in light of numerous studies over many years that have concluded that even in high hazard areas people tend not to make preparations for hazardous events. Knowledge of the processes that underpin household preparedness may then be translated into preparedness campaigns designed to increase the chances of households taking part in the preparedness process. Consequently this study attempts to investigate how people interpret and make meaning of earthquake hazard and preparedness information, and how this relates to getting prepared. For the purpose of the study ‘preparedness’ is defined as a person having done any of the following activities including: having collected survival items; undertaken mitigation actions; made an emergency plan; undertaken relevant training to gain survival skills; or participated in social preparedness actions (as discussed in section 1.4.1). Chapter 3 (Methodology) discusses how the project was designed and carried out.



# Chapter 3 Methodology

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## 3.1 Introduction

Chapter 2 outlined the factors that have previously been identified as influencing earthquake preparedness. It also described gaps in our understanding about the information meaning-making and preparedness process. Specifically, there has been very little in-depth study of the processes that influence how individual, community and societal factors interact to determine how people render hazard information meaningful, and how this interactive process translates into preparedness actions. Chapter 3 discusses the research approach undertaken for this dissertation to address this gap.

## 3.2 Research question and aims

Given that there are gaps in knowledge about how individuals make meaning of earthquake hazard and preparedness information, the primary question for this research is:

*How do individuals interpret and make meaning of earthquake hazard and preparedness information, and what influence (if any) does this process have on individual household preparedness for earthquakes?*

To help answer the overall research question a set of more specific questions are also posed:

- What types of earthquake hazard and preparedness information are people exposed to?
- What are the processes that people go through to make meaning of this information, and how does this affect people's decisions about whether to prepare or not for earthquakes?

- What key individual, community and societal factors interact to influence meaning-making of information? (e.g. Are individual emotions and feelings important to the process? Is people's prior experience relevant? Do new or existing beliefs have an influence on meaning-making? Are interactions with other people in society important to the process?).
- How can a better understanding of the meaning-making process assist with developing more effective earthquake education strategies that encourage people to prepare?

### **3.3 Research method**

To answer the main research question, and associated sub-questions, it was decided that a qualitative research approach would be followed. Section 3.3 outlines the reasoning for undertaking a qualitative approach.

As discussed in Chapter 2, upon reviewing the literature it became obvious that most previous studies about use of earthquake information and resulting preparedness action have been quantitative in nature. Such studies have focussed predominantly around testing particular hypotheses and as a consequence the findings from such research projects have been limited to the area of study related to the specific hypotheses. Because these previous studies have been narrowly focused, not all elements of the information interpretation and preparedness process have been identified.

Given the number of quantitative studies that have already been undertaken, and the gaps in understanding that remain, it was considered that a unique contribution to the literature could be made by undertaking a qualitative research approach. Qualitative research collects detailed and comprehensive data through use of techniques such as interviews, focus groups, analysis of documentation, and more. Having a comprehensive set of data allows the researcher to investigate key themes and concepts in detail, and to define processes. Use of qualitative data also allows a better understanding of how human beings operate within the context of the wider world, and can assist with understanding the meanings that people ascribe to their experiences (Berg, 2007; Corbin & Strauss, 2008; Flick, 2006). As a consequence, it was considered that a qualitative study would provide a new and unique approach that could address

many of the gaps in understanding that remain. In particular it would aid with defining a broader picture of the earthquake information meaning-making and preparedness process, and help identify the diversity of individual, community and societal influences that affect the process.

In terms of a specific research methodology, grounded theory methodology was chosen for use to guide collection and analysis of the qualitative data. Grounded theory was developed by Glaser and Strauss during their studies of the dying in hospitals, and published as an official method (Glaser and Strauss, 1967). They observed people's experiences of dying (including both patients and staff), and following analysis of the data, developed theories about the social organisation and temporal order of dying (Charmaz, 2006). Their approach to this particular piece of research caused them to advocate developing theories from research grounded in data, rather than creating testable hypotheses from existing theories and then collecting data (Charmaz, 2006). According to Glaser and Strauss (1967; in Charmaz, 2006, pp. 5-6), the defining components of grounded theory include:

- "Simultaneous involvement in data collection and analysis;
- Constructing analytic codes and categories from data, not from pre-conceived logically deduced hypotheses;
- Using the constant comparative method, which involves making comparisons during each stage of the analysis;
- Advancing theory development during each step of data collection and analysis;
- Memo-writing to elaborate categories, specify their properties, define relationships between categories and identify gaps;
- Sampling aimed toward theory construction, not for population representativeness;
- Conducting the literature review *after* developing an independent analysis".

Since the 1967 Glaser and Strauss publication, the original conceptualisations of grounded theory have diverged somewhat, with two versions being developed. Glaser has remained mostly consistent with the original version, with an emphasis on

discovering theory as it emerges from the data (Glaser, 1992). In contrast, Strauss and his colleague Corbin have moved the direction toward verification, which allows some prior reference to be made to existing literature, while still aiming to develop theory from the data alone (Corbin & Strauss, 2008; Strauss & Corbin, 1990). Strauss and Corbin (1990) also suggest that several core categories may emerge from the analysis, rather than just one as advocated by Glaser and Strauss (1967).

Researchers have tended to apply grounded theory methodology in a variety of ways. Some have stayed true to the approach of Glaser (1992) and have coded around one core category. Others have followed the approach of Strauss and Corbin and been more flexible in determining core categories, often opting for several core categories. Some have identified many categories and opted instead to map processes, such as Richardson's (2005) mapping of the phases of individuals' meaning-making following an explosion in Texas City in 1947.

In undertaking this research, it was decided to follow the grounded theory approach advocated by Strauss and Corbin (1990). This meant that a review of the literature was undertaken before data collection to guide the focus of the research. For the data collection itself, it was decided that a series of interviews would be undertaken with household residents in three urban locations in New Zealand to explore how individuals make meaning of earthquake hazard and preparedness information, and how this relates to household earthquake adjustment adoption. It was anticipated that the interviews would be as loosely structured as possible, to allow participants to talk freely about their thoughts and experiences, and to allow theory to 'emerge' from the data during the analysis, consistent with the predominant focus of grounded theory. During the analysis, key themes would be coded, core categories defined (with allowance for a number of core categories if necessary), and theory developed. If possible, it was anticipated that a representative diagram would also be developed, displaying the core categories that had been identified, and defining how these contribute to the overall process of information meaning-making and preparedness.

Section 3.4 describes the nature of the research in more detail, including how the interview locations were selected, how the interviews were carried out and analysed, and the limitations of the project.

## 3.4 Research details

### 3.4.1 Selection of location

A number of earthquake-prone locations throughout New Zealand were investigated to use as case study areas for the research and eventually three urban areas were chosen—Napier, Timaru and Wanganui<sup>3</sup>. In terms of emergency management structure, Napier is currently situated within the jurisdiction of the Hawke’s Bay CDEM Group, Timaru within the Canterbury CDEM Group, and Wanganui within the Manawatu-Wanganui CDEM Group. Figure 1.1 (Chapter 1) shows the location of the three urban areas within New Zealand’s hazardscape, while Figures 3.1, 3.2, 3.3 and 3.4 show images of Napier, Timaru and Wanganui.



**Figure 3.1** View of Napier City as seen from Sugar Loaf Hill (Photograph: Christiaan Briggs).

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<sup>3</sup> The New Zealand Geographic Board, with endorsement from the Minister for Land Information, made a decision in December 2009 that Wanganui now also has the alternative place name of Whanganui. It is anticipated that the use of Whanganui will become more prevalent over time (Land Information New Zealand, 2009). As this research was started before 2009, the prior name of Wanganui will be used throughout the dissertation and associated papers.



**Figure 3.2** The shopping district in Napier City, reflecting the Art Deco style used in the reconstruction of Napier following the 1931 Hawke’s Bay earthquake (Photograph: Margaret Low, GNS Science).



**Figure 3.3** Oblique aerial view of Timaru (Photograph: Timaru Herald).



**Figure 3.4** Aerial view of Wanganui, showing the Whanganui River, which runs through the urban area, and the active volcanic peak of Mount Taranaki in the distance (Photograph: Lloyd Homer, GNS Science).

When selecting the areas for study it was considered important to control for aspects that might inadvertently influence preparedness. Therefore it was decided that:

- Even though preparedness can be undertaken for a range of perils, earthquake would be used as the focus for the interviews in each location. This was to ensure that all participants consider the same context when talking about preparedness. Additionally, high impact earthquakes are typically infrequent. Therefore because they rarely occur they do not provide a constant reminder of the threat, and thus should not have an influence on the variation of preparedness over time.
- The urban areas selected should be similar in nature. This includes aspects such as population size, type of facilities present (e.g. port, airport, hospital), civic institutions and legislative environment, so that preparedness cannot be influenced by major environmental and institutional differences.

- Communities should have an even geographic distribution of earthquake risk, or be mapped in detail so that sampling can take place to ensure all participants are situated in the same area of risk. This will ensure that preparedness is not affected by variation in risk.
- With respect to location, communities should be reasonably geographically isolated, to ensure that reliance on their own resources in a disaster is necessary and that resources cannot be procured from other large urban centres nearby (thus potentially reducing the perceived need for preparedness).

Table 3.1 outlines these aspects in more detail with respect to each of the case study locations.

**Table 3.1** Details of the locations chosen for the proposed research<sup>4</sup>

	<b>Napier City</b>	<b>Timaru</b>	<b>Wanganui</b>
CDEM Group represented	Hawke’s Bay	Canterbury	Manawatu-Wanganui
Population of urban area (based on census data)	53,658 (Statistics New Zealand, 2001) 55,339 (Statistics New Zealand, 2006).	26,745 within the Timaru Urban Area (Statistics New Zealand, 2001).	39,423 within the Wanganui Urban Area (Statistics New Zealand, 2001).
Nearest city or large urban area (giving an indication of resources available in a disaster)	Palmerston North (176 km) Gisborne (214 km) Taupo (139 km)  Note: Hastings is also very close (19 km) but would not be regarded as big enough to have extra resources available in a disaster.	Christchurch (162 km) Dunedin (199 km)	Palmerston North (75 km) New Plymouth (161 km)
Hazard type	Earthquake	Earthquake	Earthquake
Nature of hazard	Effects from ground shaking consistent across most of city – interviews should avoid the hill area which may have a lessened hazard. Return period of a large (MM8) earthquake – 190 years (Johnston, Becker, & Smith, 2001).	Likely to experience a MM 7-8 earthquake at a return period of 150 years, MM 7-8 every 1,000 years (Stirling et al., 2008). Most areas in Timaru sit upon the same geology and soil type (aside from some of the coastal area and deep gulleys), so earthquake ground shaking should be felt similarly across the city (Forsyth, 2001).	Depending on the ground conditions, Wanganui could experience a MM7-9 earthquake at a return period of 150 years or a MM8-10 at a return period of 1,000 years. (Berryman, Taber, Townsend, & Cousins, 1995). Some variation in felt intensity does occur due to differing ground conditions, and these areas are well mapped (Berryman, et al., 1995).

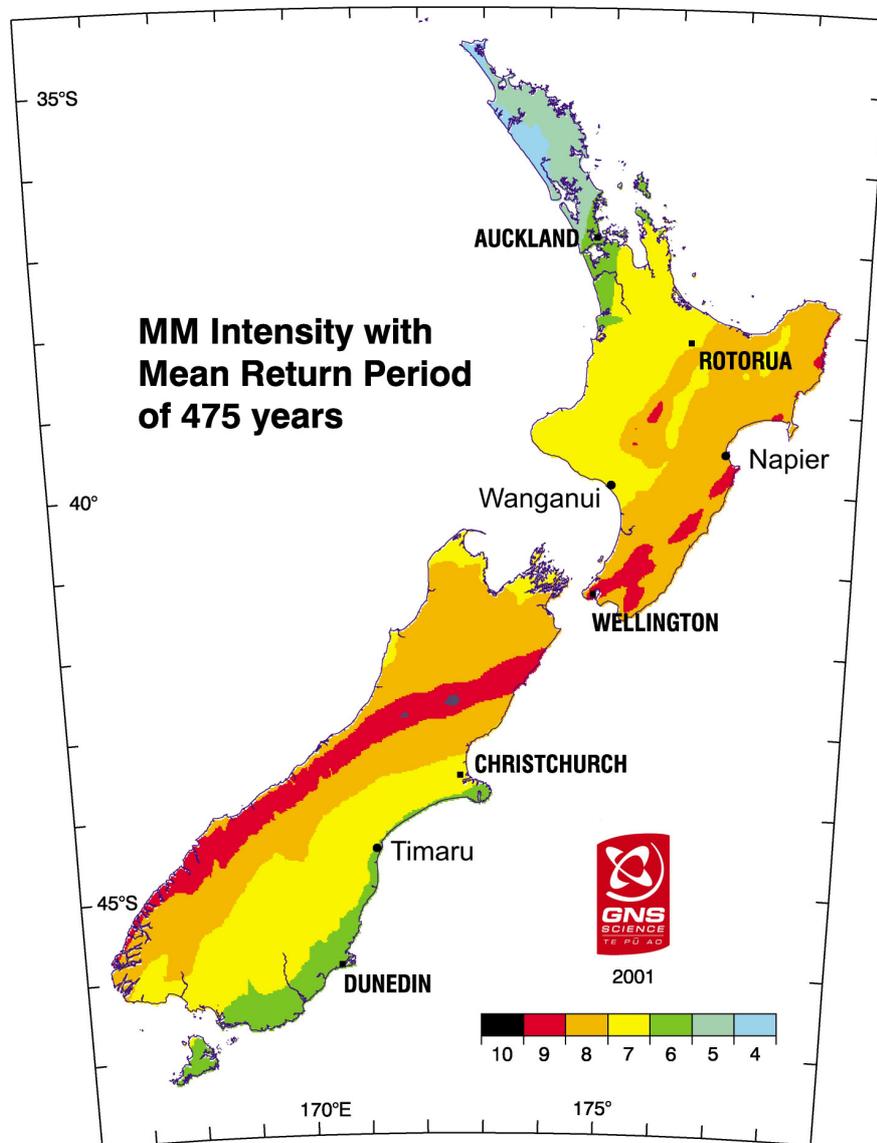
<sup>4</sup> While the 2006 census data had been collected, it was not generally available for use at the time of designing the study, therefore 2001 census data was used instead to make decisions on the study locations.

	<b>Napier City</b>	<b>Timaru</b>	<b>Wanganui</b>
Historic activity	Large destructive earthquake in 1931 (magnitude 7.8). This earthquake killed and injured many people and caused significant building and infrastructural damage.	No large historic earthquakes experienced during people's lifetime in Wanganui. Notable events include the magnitude 7.5 earthquake in 1843 and the moderately damaging magnitude 6.5 earthquake in 1991.	No large historic earthquakes have been experienced in Timaru, only small earthquakes.
Warning time	No warning time available for earthquake events.	No warning time available for earthquake events.	No warning time available for earthquake events.
Consequences of a future earthquake	Building damage, damage to household/business items, injury, death, damage to transport links, lifelines, etc.	Building damage, damage to household/business items, injury, death, damage to transport links, lifelines, etc.	Building damage, damage to household/business items, injury, death, damage to transport links, lifelines, etc.
Possible to avoid hazard?	Cannot avoid hazard.	Cannot avoid hazard.	Cannot avoid hazard.
Potential preparedness measures	Secure items, emergency 'kit', family emergency plan, etc.	Secure items, emergency 'kit', family emergency plan, etc.	Secure items, emergency 'kit', family emergency plan, etc.
Territorial authority	Napier City Council	Timaru District Council	Wanganui District Council
Regional authority	Hawke's Bay Regional Council (HBRC). HBRC's main office is located in Napier City.	Canterbury Regional Council (Environment Canterbury) located in Christchurch.	Horizons Regional Council. The head office is located in Palmerston North.
Central government	New Zealand – Ministry for the Environment, Ministry of Civil Defence and Emergency Management.	New Zealand – Ministry for the Environment, Ministry of Civil Defence and Emergency Management.	New Zealand – Ministry for the Environment, Ministry of Civil Defence and Emergency Management.
Relevant legislation	Civil Defence Emergency Management Act 2002, Resource Management Act 1991, Building Act 2004, Local Government Act, etc.	Civil Defence Emergency Management Act 2002, Resource Management Act 1991, Building Act 2004, Local Government Act, etc.	Civil Defence Emergency Management Act 2002, Resource Management Act 1991, Building Act 2004, Local Government Act, etc.
Education/engagement programmes	Region and district-wide education initiatives.	Region and district-wide education initiatives.	Region and district-wide education initiatives.
Port	Yes	Yes	Yes
Airport	Yes, small regional	Yes, small regional	Yes, small regional
High schools	Yes	Yes	Yes
Primary schools	Yes	Yes	Yes
Tertiary education	Polytechnic	Polytechnic	Polytechnic
Hospital	Yes	Yes	Yes
Growth	Since the 2001 Census, the population usually resident in the city has increased by 1,698 people or 3.2 % (2006 census data) (c.f. a rise of 7.8 % for NZ).	Since the 2001 Census, the population usually resident in the district has decreased by 630 people or 1.5 % (c.f. a rise of 7.8 % for NZ).	Since the 2001 Census, the population usually resident in the district has increased by 900 people or 2.1 % (c.f. a rise of 7.8 % for NZ).

	<b>Napier City</b>	<b>Timaru</b>	<b>Wanganui</b>
Growth ctd.	The estimated population of Napier City was 56,600 at 30 June 2006, an increase of 200 people since 30 June 2005. This represents an increase of 0.4 %, (c.f. a national increase of 1.0 % over the same period) (Statistics New Zealand, 2007a).	The estimated population of Wanganui District was 43,200 at 30 June 2006, a decrease of 100 people since 30 June 2005. This represents a decrease of 0.2 %, (c.f. a national increase of 1.0 % over the same period) (Statistics New Zealand, 2007b).	The estimated population of Timaru District was 42,900 at 30 June 2006, a decrease of 100 people since 30 June 2005. This represents a decrease of 0.2 %, (c.f. a national increase of 1.0 % over the same period) (Statistics New Zealand, 2007c).
Dominant industries	-16.5 % of employees are in the retail trade -13.1 % are employed in manufacturing - 11.3 % are employed in property and business services -9.4 % of employees are in health and community services - 8.6 % are employed in the construction industry - 8.4 % are in accommodation, cafes and restaurants (Statistics New Zealand, 2007a).	- 16.9 % of employees are in the manufacturing industry - 15.7 % are in health and community services - 14.3 % are in retail trade - 8.7 % are employed in the construction industry - 8.7 % are in education - 7.6 % are employed in property and business services (Statistics New Zealand, 2007b).	- 3.8 % of employees are in the manufacturing industry - 15.2 % are employed in retail trade - 12.5 % are in health and community services - 7.1 % are in the construction industry - 6.6 % are in property and business services - 5.7 % are in the transport and storage industry (Statistics New Zealand, 2007c).
Demographics (based on city/district profiles for the 2006 census, Statistics New Zealand, 2006)	Demographics are similar for Napier, Timaru and Wanganui (e.g. ethnic make-up, education, household make-up, income, etc.). The slight differences are: Wanganui has a slightly higher Maori population; Napier has higher proportions of residents in the 15-40 age bracket while Timaru and Wanganui have higher proportions of over 40s; Napier has a slightly higher proportion of professional workers; incomes in Napier are slightly higher than in Timaru or Wanganui; and a slightly higher degree of home ownership is evident in Timaru.		

In addition, when selecting the case study locations some consideration was also given to whether research had already been undertaken in those areas, both from a physical and social science perspective. The Hawke's Bay, Manawatu-Wanganui and Canterbury regions have all had research undertaken from an earthquake hazard and risk perspective (e.g. Begg, Hull, & Downes, 1994; Begg, Hull, & Robinson, 1996; Berryman, 1995; Berryman & Cowan, 1993; Berryman, McVerry, & Villamor, 1997; Berryman, et al., 1995; Johnston, et al., 2001; Stirling, et al., 2008; Stirling, et al., 2000; Stirling, Pettinga, Berryman, & Yetton, 2001; Stirling, et al., 1998; Stirling, Yetton, Pettinga, Berryman, & Downes, 1999). Return periods of various sizes of earthquakes (based on probabilistic seismic hazard modelling) have all been delineated for these regions. Napier City and Wanganui both have maps which delineate the earthquake risk at a basic city level (Berryman, et al., 1995; Hawke's Bay Engineering Lifelines, 2001). No earthquake hazard maps have been developed for Timaru, but geological maps (i.e.

Forsyth, 2001) can provide some indication of earthquake risk within Timaru. Table 3.1 and Figure 3.5 provide more specific details on earthquake risk in each location.



**Figure 3.5** Location of the study areas within areas of earthquake risk. The map shows the distribution of MM intensity with a current Annual Exceedance Probability of 1/475, derived from the National Probabilistic Seismic Hazard Model. Timaru is situated within MM6 (i.e. falling items, slight damage, e.g. cracked plaster), Wanganui within MM7 (i.e. buildings cracked, bricks and chimneys falling), and Napier within MM8 (i.e. damaged and partially or fully collapsed buildings) (personal communication, W. Smith, 2001; based on data from Stirling, et al., 2000)<sup>5</sup>.

<sup>5</sup> Intensity (MM) values may vary between Table 3.1 and Figure 3.6, depending on a) the study cited; b) the return period used; and c) generalisations associated with the scale of the map. Some regional revisions to the National Probabilistic Seismic Hazard Model have been undertaken since 2001 (e.g. Stirling, et al., 2008) and a new model is currently being developed for all of New Zealand (Stirling, et al., in prep).

The uniform nature of the earthquake risk environment in Napier makes it ideal for this study, as people living on the flat areas of the city should experience similar ground shaking effects in a future earthquake (Johnston, et al., 2001). Like Napier, earthquake ground shaking in Timaru should be fairly consistent across the city because most areas in Timaru sit upon the same geology and soil type (Forsyth, 2001). In Wanganui, some variation in felt intensity does occur because of the differing soil types, but these areas are well mapped and identifiable for sampling purposes (Berryman, et al., 1995).

Since 1995, five quantitative studies have been undertaken in the Hawke's Bay region to explore community awareness and understanding of a range of hazards (i.e. volcanic, earthquake and tsunami) with three studies specifically focussing on earthquakes in Napier City (McIvor & Paton, 2007; McIvor, et al., 2009; Paton, 2008; Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Smith, et al., 2003; Ronan, Johnston, & Paton, 2001).

Awareness and preparedness levels in Hawke's Bay are generally higher than in many other centres of New Zealand. The November 1999 survey undertaken by Ronan et al. (2001) revealed that over three-quarters (77%) of people in the Hawke's Bay thought that earthquakes were the 'most threatening' natural hazard for the area, and 58% thought that it was possible they could be personally affected by an earthquake sometime in future. Most earthquake information was reported as being received from traditional sources such as the telephone book yellow pages (62%), television and radio (58%), newspapers or magazines (50%), local councils (48%), and the Earthquake Commission (48%). A fair proportion of people (39%) had not seen any information about the next large earthquake in the Hawke's Bay, and low to moderate levels of information searching took place. People were more likely to seek information from informal sources such as friends or family (46%) than other sources. Actual adjustment adoption was at low to moderate levels (based on actions taken in the previous year), with 55% of residents reporting that they had stored emergency equipment; 48% stockpiling food and water; 7% or less making changes to furniture to make it safer; 2% bolting their house to the foundations; and 17% developing an emergency plan.

Much of Paton and colleagues' preparedness and resilience modelling work has been undertaken in an earthquake context in Napier and has led to the identification of key predictors of earthquake resilience such as self-efficacy, critical awareness, outcome

expectancy, action coping, articulation of problems, community participation, empowerment and trust (Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Smith, et al., 2003).

To date only limited work has been undertaken in Timaru with respect to understanding disaster preparedness. In 2004 a small number of Timaru residents were involved with answering a survey about emergency management awareness and preparedness for the Canterbury region (Leonard & Johnston, 2004; Leonard, Paton, & Johnston, 2004), however to date there has been no comprehensive programme of social science research regarding preparedness or emergency management in Timaru itself.

In the Canterbury-wide survey, Leonard (& Johnston 2004; et al. 2004) found that there was generally a high level of awareness of the types of hazard that present a risk to the Canterbury region and that earthquake was clearly the most commonly perceived hazard. There was reported high outcome expectancy about hazards, but only low intentions to convert to action and low to moderate levels of actual preparedness. In terms of household preparedness, 66% had stored food for an emergency, while 56% had stored water. Earthquake mitigation actions and emergency planning had been undertaken at much lower levels (e.g. restrained furniture (13%); earthquake strengthened the building (13%); developed an emergency response plan (24%)). There were also low levels of engagement with emergency management organisations and community groups.

Additional hazard-related social research in Timaru includes research on domestic violence following the 12 June 2006 South Island/Canterbury snowstorm (Houghton, 2010; Houghton, Wilson, Smith, & Johnston, 2010), and a survey by Wilson, Johnston, Paton and Houghton (2009) on impacts and emergency response to the snowstorm.

In Wanganui a small amount of quantitative research has been undertaken. A survey was undertaken in May 1998 to investigate levels of risk perception, preparedness and other human factors related to a large magnitude earthquake (Ronan, et al., 1998; Ronan, et al., 2001). The overall findings of this study indicated that while just over half (54%) of Manawatu-Wanganui residents thought that earthquakes were the 'most threatening' natural hazard, most residents had not heard any specific information about future large magnitude earthquakes, less than half (42%) of residents thought they could

be personally affected by an earthquake in future, levels of information searching were low, and levels of preparedness also low (for example in the year prior to the survey, only 22% had stored emergency equipment; 18% had stockpiled food and water; 2% had made changes to furniture to make it more safe; 1% had bolted their house to the foundations; and 7% had developed an emergency plan). Most information was reported as being received from traditional sources such as the telephone book yellow pages (55%), television and radio (30%), and newspapers or magazines (22%).

In addition, research was also undertaken in Wanganui as part of a wider Earthquake Commission research project (Paton, Smith, et al., 2003). This research sought to identify resilient indicators and their relationship with motivation and intention to prepare. Findings from the research indicated differences between the processes of 'intention to seek information' and 'intention to prepare', with consequences for risk reduction and communication strategies.

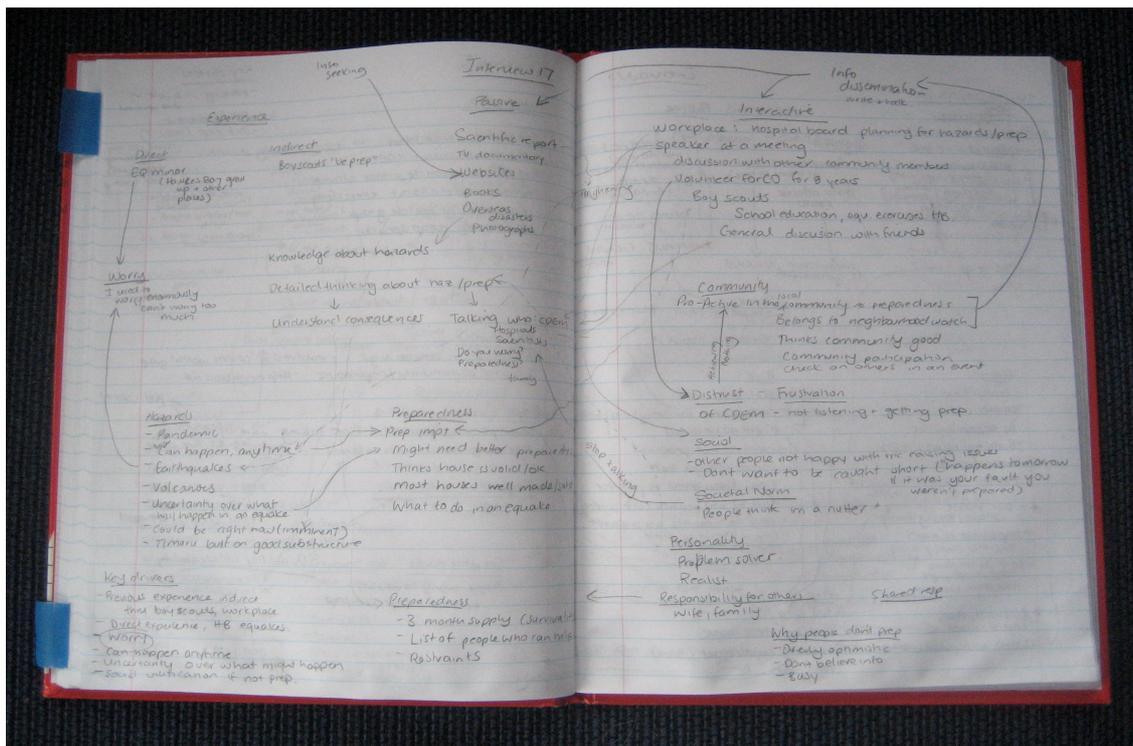
### **3.4.2 Interview details**

For this project, a total of 16 interviews were undertaken in Napier, 18 in Timaru, and 14 in Wanganui during April to June 2008. This equated to 48 interviews in total. Interviewees were volunteers, recruited by advertising in local newsletters and by sending invitations to participate to local community groups. The research was judged to be 'low risk' under Massey University human ethics guidelines, and a low risk notification was lodged with the Human Ethics Committee (Appendix 3). Interviewees were provided with an information sheet about the research project and their rights as participants, and were asked to sign a sheet consenting to participate. Interviews were a combination of face-to-face and telephone interviews, depending on the preference of the participant. As per the grounded theory methodology approach, participants were asked to talk as freely as possible about their thoughts on natural hazards (with a particular emphasis on earthquakes), preparedness for disasters, and hazards and preparedness information. On occasions the researcher would prompt the interviewee from a set of pre-prepared themes in order to ensure that the topic area was saturated during the interview. A list of the pre-prepared themes is attached in Appendix 4.

The interviews were taped with the interviewee's consent, and transcribed into the word-processing package "Word". Transcribed interviews were sent to the interviewees

for consent. Once the transcripts had received consent from interviewee, they were uploaded into the qualitative analysis software package “Atlas.Ti”, whereby an initial analysis was performed. “Atlas.Ti” was used because testing of this software has shown it to be the most useful program available for dealing with complex interview data such as the data collected for this study, and assists in theoretical coding (Barry, 1998). The analysis began with line-by-line coding of the transcripts, transforming into axial coding (Appendix 5), and finally theoretical coding. Memos were regularly written throughout the analysis to describe the emerging themes and categories. Once the initial coding stage was completed, one last overview analysis of the interviews was undertaken to sort the memos, solidify the core categories, and develop theory. It was found that no single core category could be identified, but instead a number of core categories emerged similar to what is seen in the work undertaken by Richardson (2005). It was considered important to make use of the variety of core categories that emerged, so that the entire meaning-making process could be mapped, without trying to condense and potentially force the data into what might be inappropriate category groupings.

The core categories were used as a basis for developing process diagrams (Figure 3.6). Process diagrams were developed for each interview, with 48 diagrams assembled in total. Core categories mentioned by the interviewee were depicted on the diagram. If one category was seen to link with another category then an arrow was drawn between the concepts, with the arrow showing the direction of the association. Once all 48 diagrams had been developed, these were then generalised into an overall model representing the information meaning-making and preparedness process.



**Figure 3.6** An example of the process diagrams constructed during analysis of the research and contributing to development of the model.

### 3.4.3 Limitations

As this study was qualitative in nature, it collected details of the preparedness process for individuals, rather than trends across entire populations. Thus the interviews are not representative of entire populations in Napier, Timaru and Wanganui. Further quantitative research is required to test if the findings from the interviews are representative across the population as a whole. Additionally, some bias may be present in the interview sample. The sample is likely to be biased in the following ways:

- There is an over-representation of ‘community-minded’ people, as many of the participants were recruited by invitations sent to community group organisations.
- There is an over-representation of older people in the sample, with over half of the sample (26 interviewees) being 60 years or over. Other breakdowns include: 50-60 years, 11 interviewees; 40-50 years, 5 interviewees; 30-40 years, 4 interviewees; 20-30 years, 2 interviewees.

- While invitations were sent out, the people who responded to those invitations were self-selected volunteers, and are thus likely to be more interested in hazards and preparedness issues. Therefore there is possibly a bias of people who are more aware of and interested in hazards and preparedness, or who are more prepared for disasters.

The split between male and female interviewees was fairly even, with 27 males and 21 females participating. There was also an even split between those who preferred to undertake their interview by telephone (24) or face-to-face (24). No other demographic data was collected from participants.

### **3.5 Results**

Results of the research are reported in a series of papers, attached as separate chapters within this thesis (Chapters 4-8). It should be noted that all of the papers address both earthquakes and other types of hazards (e.g. floods, snowstorms, windstorms, cyclones), as the interviewees tended to naturally discuss a range of hazards during the course of the interviews.

### **3.6 Link to Chapter 4 - Paper 1**

The following chapter (Chapter 4 - Paper 1, Becker, Johnston, et al., submitted-b) outlines the different types of hazard and preparedness information that interviewees identified, discusses how people interpret and make sense of that information, and considers what relationship this process has with actual adjustment adoption for earthquakes. It also discusses the implications of this process for future information provision and earthquake education.



# Chapter 4 Paper 1: Re-conceptualising hazards and preparedness information: types, use and effectiveness

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## Abstract

Much time and money is spent on educational campaigns designed to encourage householders to prepare for earthquakes. Educational campaigns often focus on disseminating information about hazards and preparedness in the hope that people will accept the information and act on it by undertaking adjustment adoption.

Unfortunately, levels of preparedness remain universally low, indicating that an information dissemination approach alone is not effective in motivating people to prepare. Rather, a complex process exists. When people are exposed to hazards and preparedness information, they must interpret and make meaning of it, before making decisions about whether or not to prepare. To investigate this process a qualitative research project was initiated in New Zealand to study the information meaning-making process. It found that when considering earthquake hazards and preparedness issues, people draw upon three main types of information: passive information; interactive information; and experiential information. Each type of information provides a unique contribution to the meaning-making and preparedness process. Information has an

influence on, and is influenced by a range of factors including: awareness and knowledge of earthquakes and preparedness, understanding of the consequences of earthquakes, thought and discussion, skills, information seeking, salient beliefs, emotions and feelings, societal influences, intentions to prepare, and actual preparedness. Passive information influences only a few of these factors, whereas interactive and experiential information have a wider-ranging effect. People tend to draw upon all of these types of information when interpreting and making meaning of hazard and preparedness issues, and therefore future earthquake education programmes should account for all types in their design.

## **4.1 Introduction**

There has been a great deal of research undertaken on the adoption of household adjustments for earthquakes. Many studies have been quantitative in nature, with only a few qualitative studies undertaken. While these quantitative studies have identified predictor variables and contributed to the development of preparedness theories, the lack of insights they afford into the specific factors that affect the levels of these variables limits the conversion of theory to practice and precludes the inductive development of theories. This is particularly important with regard to understanding the in-depth relationship between information received by householders and identifying the diverse ways and contexts in which people interpret and use this information to make decisions and guide their actions. The research reported here attempts to rectify this and reports on an in-depth exploration of the processes that describe how people impose meaning on hazard and preparedness information, and how this relates to how they make decisions about how to prepare for disasters. Using a grounded theory approach, 48 interviews were undertaken with residents in three urban locations in New Zealand characterised as having a degree of seismic risk. Residents were asked to discuss their thoughts about natural hazards (with a particular focus on earthquake hazards), preparedness for disasters, and hazards and preparedness information. This paper outlines the results of those interviews, and provides new insight into how people interpret and make sense of hazards and preparedness information.

## 4.2 Background

For reasons that relate more to cost-effectiveness than understanding of people's interpretive processes, hazard and preparedness information is usually disseminated by earthquake educators via the mass media (e.g., pamphlets, television advertising, internet). With regard to hazards, this usually includes information on the potential risk people are exposed to and the nature of that risk (e.g. informational text outlining the risk, maps showing risk, return periods). With regard to preparedness, the focus is often on providing generic preparedness information, with an emphasis on having 3 days supply of survival items for use after a disaster (e.g. food, water, medication, flashlight, essential items) or making an emergency plan (Ministry of Civil Defence & Emergency Management, 2011a). Sometimes information is also provided describing actions householders can take to mitigate the effects of earthquakes (e.g. securing your house and securing furniture or other items that may fall during an earthquake) (Earthquake Commission, 2010). Other activities less advocated as preparedness tasks by earthquake educators, but recognised in the literature as preparedness, include the development of survival skills in individuals (Kirschenbaum, 2004) and social actions concerned with earthquake adjustment adoption (Lindell, et al., 2009).

A number of studies have focused on information dissemination and its influence on the preparedness process (Crozier, McClure, Vercoe, & Wilson, 2006; Garcia, 1989; McClure, et al., 2001; McClure, Sutton, & Sibley, 2007; McClure, Sutton, & Wilson, 2007; McClure, White, & Sibley, 2009; Mileti & Darlington, 1995, 1997; Mileti & Fitzpatrick, 1992; Mileti & O'Brien, 1992; Mulilis & Lippa, 1990; Palm, 1981; Tanaka, 2005; Turner, et al., 1986; Whitney, Lindell, & Nguyen, 2004; Zhu, Xie, & Gan, 2011). Such studies have occurred in three main contexts: (1) in the context of earthquake warnings or predictions; (2) following a significant earthquake and (3) in the context of no recent or warned events. Some studies have included elements of all three contexts (e.g. Mileti & Darlington, 1995). Many of these studies have found that information provision can prompt changes in people's risk perception, personal beliefs and actual preparedness, but these changes are usually minor and often do not last in the long term (Mileti & Darlington, 1995; Mulilis & Lippa, 1990; Turner, et al., 1986).

The general assumption that underpins the information dissemination approach is that people accept the information they receive at face value and will act on it in the manner anticipated by risk management agencies that produce it. This is not an accurate assumption. Several studies point out that there is no direct link between providing information about hazards and people making preparations for hazardous events (e.g. Ballantyne, et al., 2000; Lindell & Whitney, 2000; McClure, et al., 1999; McIvor & Paton, 2007; Mileti & Fitzpatrick, 1992; Mulilis & Lippa, 1990; Paton, Kelly, et al., 2006; Paton, McClure, et al., 2006; Paton, et al., 2005; Paton, et al., 2000; Ronan, et al., 1998). In fact, in some cases, providing hazard information without acknowledging and accounting for social and contextual influences on interpretation may even serve to decrease community preparedness. For example, in one study, researchers discovered that when some individuals received volcanic hazard information, they made an erroneous judgement that the agency that provided the information was taking care of the problem, and consequently didn't prepare (Ballantyne, et al., 2000; Johnston, et al., 1999). This example demonstrates that it is important to acknowledge wider social and contextual influences on people's interpretation of information to be able to understand how people reach their decisions about whether or not to prepare for disasters.

Communication of hazard and preparedness information is a complex process, and individuals' interpretation of that information relies heavily on the context in which the information is available, including the physical environment, social environment and psychological characteristics (Mileti & Fitzpatrick, 1992). A number of models have been developed over the years to explain how information is used by people in the preparedness process. Mileti and Fitzpatrick (1992) developed a model which suggests that perceived risk of earthquakes, perception of risk information and social contextual factors are important contributors to the preparedness process. Models such as Protection Motivation Theory (PMT) (Mulilis & Lippa, 1990) and the Person relative to Event Model (PrE) (Mulilis & Duval, 1995) suggest that, when people are presented with information about a potential hazard, beliefs about the likelihood and severity of an event, self-efficacy and response efficacy are influential on adjustment adoption. PrE also maintains that belief about having personal responsibility for protection is an important contributor to the preparedness process. The Protective Action Decision Model (PADM) (Lindell & Perry, 1992, 2000, 2011) posits that people must believe a threat exists and poses a risk, must believe that taking protective actions is feasible, and

must have the traits and access to resources to undertake adjustment adoption. The PADM also emphasises that social contextual variables are important, but does not specify exactly how these operate within the preparedness process.

Even though previous research has contributed to a better understanding of the information provision and preparedness process (e.g. by identifying a number of beliefs that influence adjustment adoption), significant gaps still exist in our understanding of this process (e.g. little is known about the influence of social and contextual factors). More study is required to better understand the relative influence of different types of information (Lindell & Perry, 2000), and the interactions that take place between information and other individual, community and societal factors. Key questions which need addressing include:

- What types of earthquake hazard and preparedness information are people exposed to, or make reference to?
- How do people render this information meaningful?
- What are the individual (including cognitive and affective), community and societal influences on the meaning-making process?
- How does the meaning-making process relate to decisions about whether or not to prepare for earthquakes?

To address the gaps outlined above, a research project was initiated. The project aimed to investigate how people make meaning of earthquake hazard and preparedness information, and how this relates to undertaking preparedness for earthquakes.

### **4.3 Outline of research**

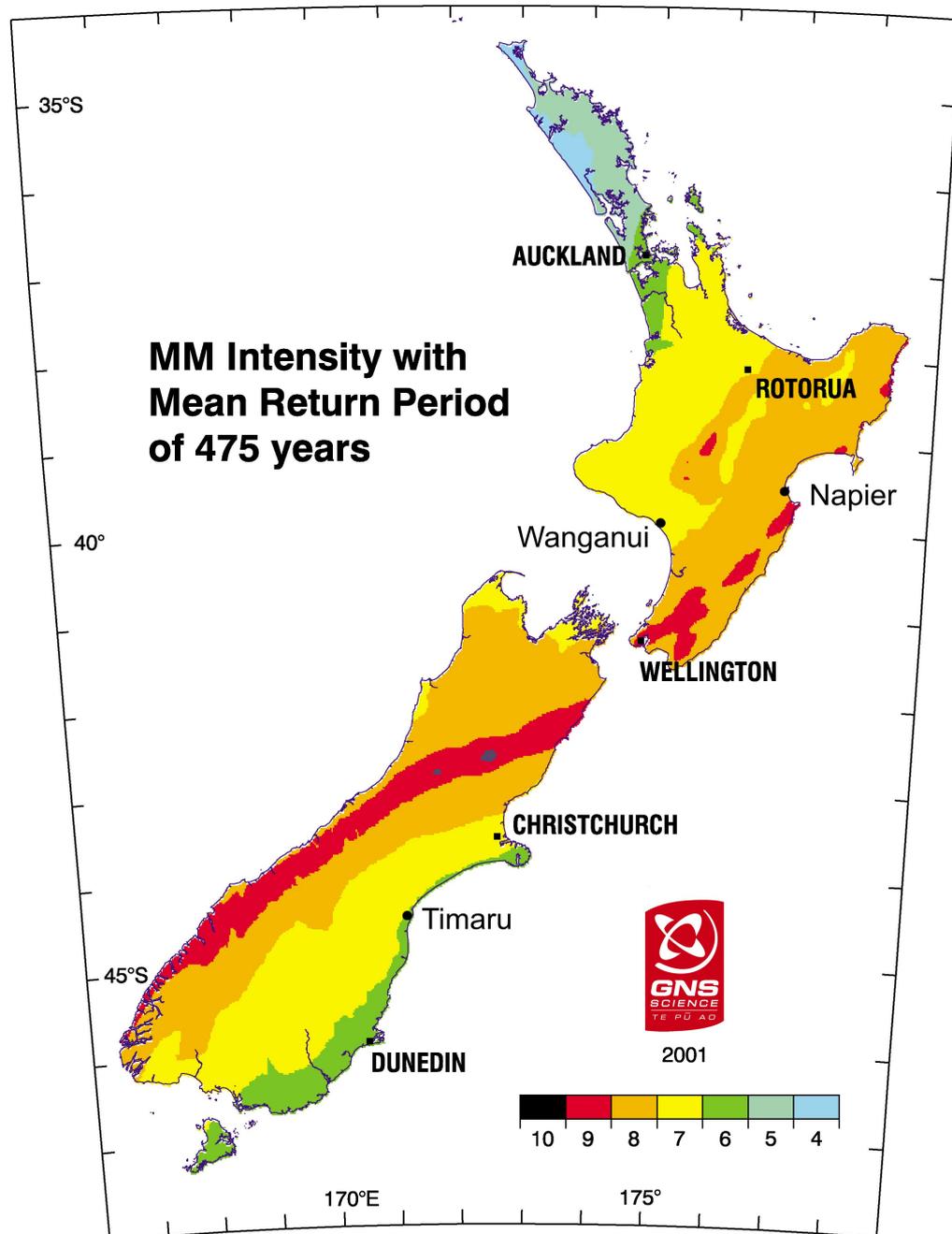
To answer the research questions, the study collected qualitative data using grounded theory methodology (Glaser & Strauss, 1967; Strauss and Corbin, 1990). A series of interviews was undertaken during April-June of 2008 in three urban locations in New Zealand: Napier, Wanganui and Timaru (Figure 4.1). The locations were selected to ensure that they were similar in nature so that preparedness could not be influenced by major environmental and institutional differences. This included aspects such as

population size (e.g. between 25,000 and 55,000 based on the 2001 census data) (Statistics New Zealand, 2001), type of facilities present (e.g. port, airport, hospital), civic institutions and legislative environment. In addition, while each urban area had a slightly different level of risk to earthquakes, interviewees were selected to ensure as even a spatial distribution of earthquake risk across the urban area as possible. Finally, the urban areas selected for the study were reasonably geographically isolated, to ensure that they needed to rely on their own resources in a disaster rather than expect to procure resources from other large urban centres nearby.

None of the three locations studied had experienced a significant earthquake in recent years, with the most recent historic damaging earthquake affecting Hawke's Bay, including Napier, in 1931 (magnitude 7.8). Therefore the interviews were conducted in the context of no recent significant or forecast earthquake events. The September 2010 Darfield (magnitude 7.1) and February 2011 Christchurch (magnitude 6.3) earthquakes occurred after data collection had taken place. Timaru had experienced a large snowstorm in 2006 (Hendrikx, 2007), while Wanganui's most frequently occurring event was flooding (last major event causing property damage in 1990).

Interviewees were recruited by advertising in local newsletters and by sending invitations to participate to local community groups. A total of 48 interviews were undertaken across the three urban areas, with 16 interviews completed in Napier; 14 in Wanganui; and 18 in Timaru. Interviewees were asked to talk freely about their thoughts on natural hazards (with a particular emphasis on earthquakes), preparedness for disasters, and hazards and preparedness information. The researcher would on occasion prompt the interviewee if necessary, drawing from a set of pre-prepared themes that the researcher wished to address during the interview. The interviews were taped with the interviewee's consent, and transcribed into a word processing program. Once the transcripts had been approved by the interviewee, transcripts were uploaded into the qualitative software package "Atlas.Ti". Content analysis based on grounded theory methodology was then undertaken, and themes were extracted to develop theory and create a model. A full outline of the model can be found in Chapter 5 (Becker, Paton, et al., submitted-a). This paper describes the concepts that arose relating to people's perception and use of hazards and preparedness information. Other types of

hazard information (e.g. floods, snowstorm) were also discussed by interviewees, so this paper also refers to those hazards where relevant.



**Figure 4.1** Location of the study areas within areas of earthquake risk. Map shows the distribution of Modified Mercalli (MM) intensity with a current Annual Exceedance Probability of 1/475, derived from the National Probabilistic Seismic Hazard Model. Timaru is situated within MM6 (i.e. falling items, slight damage, e.g. cracked plaster), Wanganui within MM7 (i.e. buildings cracked, bricks and chimneys falling), and Napier within MM8 (i.e. damaged and partially or fully collapsed buildings) (personal communication, W. Smith, 2001; based on data from Stirling, et al., 2000).

## **4.4 Results**

### **4.4.1 Concepts of hazards and preparedness information**

This study found that information can be grouped into three main types: passive; interactive; and experiential. The following sections discuss the findings as they relate to the specific types of information identified.

### **4.4.2 Passive information**

Passive information includes more traditional types of information such as brochures, advertisements, the internet, email, news media (television and print), displays (e.g. museum displays), books or booklets, films, fridge magnets, signage, warning sirens, photographs and environmental cues. Essentially passive information is information people are exposed to that requires very little or no interaction with other people.

People's recall of most passive forms of information was generally poor (e.g. brochures or booklets), with most not remembering the details of the information they had seen. They often remembered it raising their awareness and knowledge of hazards or awareness of the need to prepare (encouraging thoughts about hazards and preparedness), and for some it prompted conversations with others. Only a few stated that passive information had actually motivated them to get prepared. Some felt that passive information could be too vague and did not give practical advice on how people should respond or prepare (for example, Interviewee 10 stated that information in the telephone book was too vague and did not explicitly tell people how exactly they should respond to an event; simply that they should turn the radio on). Prior studies have highlighted that for preparedness to take place, people should not only be exposed to information about hazard and risk, but be provided with information about how to deal with that risk (Mileti & Darlington, 1995, 1997).

Interviewees had better recall of information they had seen in the media, for example, there were regular mentions of the 2004 Indian Ocean tsunami or recent events that had taken place in the early part of 2008 (i.e. Sichuan earthquake in China, a typhoon and flooding in Myanmar, flash flooding in the Mangatepopo Valley, cool-store explosion in Hamilton). The media were more likely than other forms of passive information to

trigger conversations with other people about hazards and preparedness, as people tended to discuss current events as part of normal conversation.

In terms of the media, people had most frequently been exposed to large overseas disasters, while others mentioned local examples. Participants' thoughts about overseas disasters varied. Some felt removed from the situations presented, and formed a belief that a disaster of the scale seen overseas "couldn't happen here". Another common reaction was that of fatalism, in that the disasters reported overseas were so big that people felt you couldn't do anything about a big disaster like that if it were to happen locally. Research by McClure and colleagues (McClure, et al., 2001; McClure, Sutton, & Sibley, 2007; McClure, Sutton, & Wilson, 2007) note that many initial media reports of disasters are very 'instance based', focussing on damage and destruction and contributing to the formation of fatalistic beliefs.

Other people reacted very differently to media information, in that it appeared to raise their awareness about certain disasters and made them feel that something like that could happen where they live. In order to form those beliefs people needed to relate in some way to the information, for example, feel that they were threatened by a similar hazard, or relate in some way to the people who were affected (e.g. the people affected were from a similar type of society; or were "our Pacific neighbours").

The media also had an impact on feelings about disasters. In particular one strong feeling that was frequently triggered on seeing overseas or local disasters was concern or anxiety. Interviewees were uncomfortable watching or hearing some of the information, and in some cases this anxiety seemed enough to cause denial, whereby people would "switch off" from the information or not want to hear about it anymore.

Visual information, such as camera footage seen on television, or photographs of disasters in a museum had a greater impact on people than written or verbal information alone. The impact and influence of visual media such as television has been noted in other studies (e.g. Turner et al., 1986). A number of interviewees stated that they couldn't imagine what an event might be like, because they had never experienced one, and visual information helped with that "imagination". People were more likely to state that they "understood the consequences" of a potential event after seeing the images. People's statements suggest that understanding the actual consequences of an event can

help people understand what an event might mean to them, and can help with motivation in getting prepared. As interviewee 46 states:

“...if you go back to that big tsunami event that happened in Bali, around in those islands [...] within two days you've got photographs taken by these people [...] that were there standing on the balcony of a hotel, and you could actually see a wave come in, hit - knock over things and go zooming back. Now, the only way that you ever could talk to anybody about it was to say, “Oh, it’s like a big wave, it will come in and it might come further up the shore”. Now, you could only, you could verbalise that but it’s not until you actually see visually what its impact is and how in actual fact it’s so destructive as it comes back. In fact you have an understanding of what a tsunami is really like.”

When people were asked, “What do you think will happen in an earthquake?”, they frequently described collapsing buildings and serious building damage. These ideas were often generated by seeing overseas images of collapsing buildings in earthquakes. Despite seeing disturbing images, some participants seemed to be able to rationalise that New Zealand had better building standards and that building collapse was less likely in an earthquake in New Zealand. It was evident that people held a continuum of beliefs based on media images of building collapse interacting with other cognitive, emotive or societal factors. Interviewee 20 provides an interesting perspective on the range of thoughts that enter his mind after seeing collapsed buildings on television:

“Judging by the amount of damage that is done in major earthquakes, ours is a fairly, it’s a modern home, yes, but okay it’s a fairly lightweight construction. The chances of survival under extreme earth movement would probably be pretty remote. Much and all as it may meet earthquake standards. So I wouldn’t, I wouldn’t consider that we would be without some effect. But what that effect would be and how one would safeguard it, other than relying on the fact that those who set those standards for current construction and being under 20 years old, here’s hoping it’s met that.”

Later on he also states, “You are reliant on a whole lot of things that have happened that have been guided or been controlled by others with far more knowledge or involvement

than the occupiers currently. And they don't always - it doesn't always work to do the protection that it was probably designed to."

Essentially Interviewee 20 hopes that New Zealand's building standards will ensure his house does not collapse in an earthquake. But overseas images of collapsing buildings have caused him to have doubts about his house's performance, and he thinks that it may experience severe damage regardless. The other problem is that he doesn't know where and how he would start to investigate and retrofit his house, so he just avoids that issue and hopes that the building standards have it covered. Additionally later on in the conversation he also says that it is "out of his control" as you are reliant on trusting others to ensure the job has been done properly.

Historic information is often predominantly presented in passive format but may also take a more interactive form (e.g. discussion group about local history). Historic information is frequently used as an information source by people, often to assess risk from a particular hazard in relation to future activities. However, if an event hasn't happened in the historic past then people may think it is unlikely to happen in the future. Conversely if an event has happened recently, then the other line of reasoning is that an event has occurred in the recent past and therefore will not happen again in the near future.

Historic information not just used rationally as discussed above—it also contributes to people's understanding of and attachment to the community, and interacts with their perception of risk in this way. This concept was best reflected in the interviews with Napier residents who believed that since the Hawke's Bay earthquake there has been an 'earthquake culture' (Moore, 1964; Turner, et al., 1986) in Napier (with several participants explicitly using that term). People tended to draw upon the experience of the Hawke's Bay earthquake, and thought that if it happened once it could happen again. The Hawke's Bay earthquake is so embedded in the local history that is a core and central piece of information about hazards in the area. It is related as stories by family and friends, taught at school, on display in the local museum and is the reason why many of the buildings in Napier are constructed in Art Deco style. The earthquake is celebrated each year on its anniversary, and tourists are encouraged to come and visit Napier for its earthquake heritage. The Hawke's Bay earthquake has become a part of the history and culture of the area and is a central focus around which residents

contextualise other information. Information about the Hawke's Bay earthquake is supported by other types of information such as brochures, websites, and interactive activities (e.g. workplace, school, community). Because people already have a frame of reference (i.e. the Hawke's Bay earthquake) around which other information can sit, they tend to take more notice of this information and apply it more readily. As a consequence, it appears that there is a better conversion rate of awareness through to intentions and actions. A full discussion of 'earthquake culture' in relation to Napier is beyond the scope of this paper, but future work might consist of identifying exactly what constitutes Napier's 'earthquake culture' and how this facilitates enhanced preparedness.

Return period information (e.g. a 1-in-100 year flood) can suffer distortion issues with members of the public. Scientists and emergency managers have long struggled with how to represent the likelihood and frequency of hazardous events. Return periods (e.g. 1-in-100 years) have been used in the past to represent likelihood and frequency, and more recently probabilities also have been used in an attempt to portray risk (e.g. 0.01). The interviews revealed that people still do not understand either representation well. With return periods many still believe that an event either is unlikely to occur in their lifetime; or that because they had an event recently it will not happen again in the near future. This is a concept often referred to as the 'gambler's fallacy' and has previously been noted as an effect in people's consideration of earthquake risk (Jackson, 1981; Lindell, 1997; McClure, 1998).

Previous research (e.g. Gregg, et al., 2004; Paton, et al., 2005; Paton, Smith, et al., 2003; Ronan & Johnston, 2005), confirmed by these interviews, shows that if individuals believe an event is imminent they will be more likely to be motivated to prepare. Return periods appear to reduce this concept of imminence, and thus reduce people's desire to prepare. For some people, disaster experience may assist with remedying this problem by reinstating the belief that an event "can happen anytime". Interviewee 45 describes the problems associated with return periods and how his experience has influenced his beliefs about return periods:

"... A lot of people here plan on the 30 year rule, on the basis that it won't happen for 30 years and therefore it probably won't happen while they're around and they don't need to worry about it. But we've had instances where people

have told us that things won't go wrong and they do go wrong. You know, getting two 100-year floods in six months..."

Another type of passive information that was discussed widely by participants was that of environmental cues. People use environmental cues as an information source to assess hazard and risk, and to think about solutions for addressing the risk (Lindell & Perry, 2011). For example, with respect to flooding a number of interviewees across all three interview locations used the physical presence of rivers as an opportunity to assess the risk, discuss the risk with others, and think about how they might respond to a potential flood. Others raised the merit of doing 'tours' where you could be shown the physical aspects of a hazard in a community, and this would provide an opportunity to better understand and deal with the risk. Use of environmental cues links with the concept raised above that visual information helps people 'imagine' what the impacts of an event might be like, leading to a motivation to be better prepared for those consequences. Problems with visual cues arise when people want to see a cue before they actually respond to an event. For example Interviewee 31 suggests that he needs to see the river start to flood before he will think about responding, which may be too late in some instances.

There was some discussion about warnings during the interviews. Some felt that if you could receive a warning for a potential event then you might not need to prepare. As a consequence some people are using information about warnings as a justification for not needing to prepare.

#### **4.4.3 Interactive information**

Interactive information is described in this study as hazards and preparedness information that people connect with that requires them to interact with others. Sources of interactive information may include: general discussions with others (e.g. family, friends, and workmates); training for emergencies; community activities; school activities; and workplace activities.

Like passive information, interactive information plays a role in raising awareness and knowledge about hazards and the need to prepare. Interactive information is more likely than passive information, however, to enable conversations to start about hazards and preparedness. These conversations are valuable in helping individuals make

meaning of hazards and preparedness, because as people discuss things they begin to comprehend the problems and solutions, and evolve their thinking on topics.

Discussions with other people (particularly with family, friends and workmates) played a strong part in forming beliefs about hazards and preparedness. Interactive information was also better at helping people understand the potential consequences of an event because people can think and talk through potential scenarios and their impacts.

Interviewee 48 describes how being involved in an interactive workshop (hui) for pandemic preparedness helped her understand the consequences of an event—in particular that she could be on her own—and thus needed to make plans to prepare:

“Well, I actually do a bit of emergency management at work and I actually did some hui last year and we had civil defence there, so that was really what brought it home. We conducted the hui for pandemic [...] and that's when I discovered, I mean, there was only two people in civil defence. As I said, people don't realise.”

*Did they discuss that at...?*

“Well, they said you have to look after yourselves because there's two of us and, you know, you've got to have your plans in place.”

*Did you say that was the first time you sort of heard that type of information?*

“Yeah. I think we all think that we have civil defence there, and when someone actually said it, that was when it brought it home.”

The interviews also revealed that school education is a particularly valuable source of interactive information. All of the interviewees that raised school education as an information source said that it helped raise awareness and knowledge of the potential impacts of a disaster and how to prepare, both in school-aged children receiving the education as well as their family members. School children would often hear the information about hazards and preparing at school, and talk about what they had done at school at home with their family. They were often also likely to encourage their families to prepare, based on what they had learnt at school. Homework assignments related to preparing could also be brought home as activities, which the family would then help the child undertake. For example, Interviewee 45 describes how his children

learned about fire preparedness at school, came home and discussed it with the family, suggested the family should make a fire plan, and then actually went ahead and created one.

A number of interviewees credited their school education with what they know about how to immediately respond to an earthquake. Most interviewees stated that you should, “get under a table or a doorway” when an earthquake occurs, and said that they had been taught this action at school, or had known it, “as long as they could remember”, implying that they had learnt this response sometime as a child. No interviewees referred to the more current advice of “drop, cover and hold on”, advocated by the New Zealand Ministry of Civil Defence & Emergency Management (Ministry of Civil Defence & Emergency Management, 2010a), and many international organisations (Earthquake Country Alliance, 2011). That people still remember the training they received at school, and the messages that go with it, demonstrates the effectiveness of interactive information in the form of exercises and training. A number of interviewees also referred to the immediate response of getting under a table or doorway as “common” or “general” knowledge, implying that such actions have become a social norm, and that getting under a table or doorway is an expected normal response to an earthquake.

Workplace activities also had an influence on people’s understanding of hazards and actual preparedness. Workplace activities could be broken into two main themes. The first relates to training received in the workplace, while the second relates to disaster experience. People who received training for emergencies were more likely to understand the consequences of a hazardous event and how to prepare for and respond to an event. Those who had some experience of hazards in the past were more likely to understand the risks present, have some comprehension of the consequences, and be practiced at preparing for and responding to events. As a consequence, those who had been involved in workplace activities related to hazards (whether these be natural or human-induced) seemed more likely to carry this knowledge into the home environment and ‘be prepared’ both from a mental and practical viewpoint.

Community activities were also noted as good sources of interactive information, whether it be a speaker invited to a community group, a neighbourhood group discussion about hazards and preparedness, or a training session about how to deal with

emergencies. They provided a good avenue to disseminate information, discuss issues and solutions, provide up-skilling and empower community members to prepare for future hazardous events.

Interactive information (e.g. in the form of activities or training) helps build self-efficacy and positive outcome expectancy, is a form of empowerment, and assists in building trust, all of which have been shown in previous studies to be key drivers of forming intentions to prepare (Cowan, et al., 2002; Duval & Mulilis, 1999; Lindell & Whitney, 2000; McIvor, et al., 2009; Mulilis & Duval, 1995; Paton, 2008; Paton, Bajek, et al., 2010; Paton, Houghton, et al., 2008; Paton, et al., 2009; Paton, Parkes, et al., 2008; Paton, Sagala, et al., 2010; Paton, Smith, et al., 2008; Rüstemli & Karanci, 1999). As an example, those who had been exposed to interactive information (particularly training) were more likely to believe that they could respond to an event when it occurred. Thus the interviews revealed that interactive information has a significant role to play in building people's self-efficacy belief that they can respond in an event. Interviewee 3 describes how workplace training built his self-efficacy and positive outcome expectancy for disaster preparedness:

“In my time as manager of the Deka [department] store here in Napier, we often went through scenarios. We had a monthly fire drill, but we also had an address once by the emergency people and they said, “You have a look around your shop and if we had a major emergency it might be two or three days before we could get to you and have a look at what you can do yourself”. Then I looked around and I said - yes, I've got a fridge full of Coca Cola, I'm selling blankets, duvets and pillows, sheets - food wise, you'd probably get sick of eating chocolate (laughter) - we sold sweets and confectionery and all that - we probably could survive for quite a while on our own without having outside assistance, because of what we carried in our shop.”

Coupled with the development of self-efficacy and outcome expectancy is that people felt that training reduced the level of worry, as people knew what they could practically do to reduce risk before and after an event. People also acknowledged that training was more likely to stay sitting in the backs of their minds (subconscious), and 'pop up' when people needed to use it most. Interviewee 18 articulates this phenomenon, “I suppose I've done, you know, first aid courses here and there. Girl Guides and whatever. All

that sort of stuff, and you don't know what you know until you need to use it. And then it just pops up when you need it most.”

#### **4.4.4 Disaster experience**

A third source of information is experience of disasters or hazardous events. Disaster experience is not generally regarded as a type of ‘information’, and has only been specifically mentioned by Tanaka (2005) as a potential type of educational information. In this study the interviews confirmed that people use previous experience to inform their beliefs and actions about earthquake hazards. While no research has explored experience as a specific ‘information type’ to be used in earthquake education, research by Mileti and Darlington (1995) indirectly revealed that people used their experience of the Loma Prieta earthquake to help make sense of subsequent information disseminated in the form of a newspaper insert. Additionally Weinstein (1989) makes reference to types of experience as ‘information’. Interviewee 47 sums it up in the quote, “...experience is knowledge and everything else is information. So once you take the information and actually turn it into experience and put the thing together and actually have a think about it, I think that makes it more real.”

Disaster experience may be related to natural hazards, or other types of hazards or emergencies. Disaster experience may also be direct or indirect. Thus three main types of experience are discussed here: direct disaster experience; indirect disaster experience and indirect event experience. A few of the interviewees reported having had some direct experience with natural disasters, the most common being flooding, rain and windstorms, or snowstorms. People’s direct flood and storm experiences for the most part revolved around experiencing damage to property during an event. A number of interviewees also had some indirect experience of disasters, mostly through either being inconvenienced (e.g. having travel disrupted because of flooding or snow) or by providing assistance during disasters, often through the workplace or a community organisation. However, the majority of participants had not experienced a disaster event at all. In terms of earthquakes, interviewees had generally only experienced minor earthquakes, with these occurring more frequently in Napier and Wanganui. A couple of interviewees had experienced what they described as “moderate earthquakes”, but none had experienced a major earthquake.

The dearth of direct experience by interviewees led many to think about hazards in more salient contexts. Participants would often refer to indirect hazard events such as anthropogenic hazards (for example, traffic accidents; personal hazards; workplace hazards; or recreational hazards) when assessing risk and devising methods of preparedness. Given the lack of experience with major natural disasters, such indirect hazard events provide a relevant context around which discussions about hazards and preparedness can be framed in future. The only qualifier is that people may not be able to directly scale-up the consequences of a minor hazard or emergency to a major disaster without additional assistance, or may suffer from normalisation (Mileti & O'Brien, 1992) or optimistic bias (Burger & Palmer, 1992; Helweg-Larsen, 1999) and think that having experienced these other hazards they are well resourced for future events. For example, Interviewee 16 from Timaru thinks his indirect event experience (i.e. background and training) will allow him to cope in a future earthquake. He has not made specific preparations for an earthquake or other major disaster. He states, "I guess I'd be smug enough to think with my background and training that I'd be as good as anybody else for getting by."

Normalisation was also evident in those that experienced frequent minor earthquakes, with many feeling that they had become blasé about earthquake hazards because of the frequent small earthquakes they experienced. Interviewee 46 describes this process:

"To some degree I guess there becomes a bit of a blasé-ness about it. Bit like people who sort of worked and lived in - we went to visit Northern Ireland, you know, they had their kids going off to school and there's a blinkin' shooting two blocks over. Kids were just wandering along, oh yeah. And over a period of years and time they'd been conditioned to that. And I guess to some degree in New Zealand because we've had these sort of smaller, or a range of earthquakes, it becomes a conditioning process as far as that's concerned."

The quote by interviewee 46 shows that normalisation reduces worry about hazards. The interviews revealed (see section 4.4.5), worry or anxiety can be a key driver for seeking further information about hazards and preparing, and actually being motivated to prepare. Any reduction in worry through normalisation may inhibit this process.

Despite the complications of normalisation arising from disaster experience, experience still plays a significant role as an information source. Like interactive information, interviewees reported that disaster experience is more likely to raise awareness and prompt thinking and talking about hazards and preparedness. It also plays a critical role in assisting people to understand the consequences of a future event, and once they have an understanding of the consequences they are motivated to get prepared. Disaster experience can inform future actions, as if someone has had practice in responding to an event (e.g. Interviewee 31's experience of falling objects in a moderate earthquake); they can apply this to a future situation. In some instances, disaster experience also acts as validation for any information that an individual may have seen previously. In particular Interviewee 45 notes that disaster experience "...reinforces previous thoughts and actions and says 'these are valid'."

While passive and interactive information can contribute to the formation of attitudes, and beliefs, disaster experience appears to play a very strong role in forming key beliefs that motivate preparedness. In particular, key beliefs formed by previous experience include:

- A disaster can happen anytime;
- You could be on your own;
- Safety is important;
- Survival is important;
- I can do something to respond to a disaster (self-efficacy);
- It is important to prepare;
- Preparedness should be considered a 'way of life'.

Previous experience also contributed to people's understanding of risk. This was particularly evident in Wanganui, where flooding had been a problem in the recent past. People considered flooding to be the hazard that Wanganui was most at risk of, because that was the type of event residents had been most exposed to. In comparison, in Napier

past experience of the Hawke's Bay earthquake led to residents believing that earthquake was one of the predominant risks for their area.

Disaster experience can also contribute to forming feelings about disasters. For example a number of people who had directly or indirectly experienced flooding around Wanganui felt that flooding was "horrible" or "horrific", while another interviewee from Napier found heavy rain to be "frightening". Such feelings can assist with understanding the consequences of disasters, and assist with motivating preparedness. For example, many who observed the impacts of a flood knew that it would be horrible to be impacted (or impacted again) and seemed more motivated to prepare.

Interviewees reported that a lack of disaster experience would sometimes raise concern or anxiety about the potential effects of hazards and this concern prompted them to seek information. Such an effect was particularly pronounced in immigrants who had little experience of New Zealand's natural hazards, but was also evident in some born in New Zealand as well. Interviewee 5 spoke about how his lack of experience of earthquakes led to concern and motivated him to seek information about earthquake hazards:

"When I first came to NZ [...] the thought of earthquakes freaked me out a bit. I had a few concerns, I wanted to find out what the procedure was and that's why I became involved with civil defence. I wanted to know more about what an earthquake was like and what it could do."

Not all interviewees who had no disaster experience were concerned or anxious, however. Some simply formed other beliefs on their basis of lack of experience, e.g. "A disaster hasn't happened to me in the past, so it won't happen to me in future."

The experience of others can provide valuable insight into the potential impacts of a disaster. Friends and family will often discuss experiences they have had, and provide a narrative account of a disaster they experienced. For example, a number of interviewees from Napier described how family members had talked to them about their experience with the 1931 Hawke's Bay earthquake. Interviewee 36 also described how videos in the Napier Museum showed people talking about their experiences of the Hawke's Bay earthquake, and how he found the direct telling of these stories very "powerful", "human" and that they were the "plain truth" (linking with the concept of people finding information "real"). Narratives that were discussed however related

mainly to the immediate impact of the earthquake and subsequent response. There was little discussion about the need for preparedness in light of having experienced an earthquake, possibly as a consequence of normalisation bias. So while other people's experience, particularly expressed in the form of narrative, can be useful in helping understand the consequences of an event, it tends not to often link with or advocate the concept of preparedness.

#### **4.4.5 Information seeking**

Information seeking has been the focus of a number of studies. Some researchers have found a direct relationship between information seeking and adjustment adoption (Mileti & Fitzpatrick, 1992; Mileti, et al., 1992; Perry & Lindell, 2008; Turner, et al., 1986). The interviews suggest that information seeking forms a part of the overall preparedness process, and contributes to forming beliefs and feelings, rather than being directly linked to preparedness. Information seeking on hazards and preparedness can be prompted by a variety of reasons. First anxiety or concern about hazards may lead an individual to seek more information. As described in the preceding section, this may or may not be prompted by a lack of experience. People's information seeking in this context generally relates to concern about one of two things: (1) uncertainty about a hazard (e.g. Am I subject to a hazard? What is the risk? What are the potential impacts or consequences?); or (2) uncertainty about how they can mitigate the effects of a hazardous event (e.g. How can I prepare?). Conversely, in some instances, Paton et al. (2005) note that anxiety may have an opposite effect, causing denial of the earthquake problem, and preventing people from seeking information.

Interviewees also reported that they sought information because they had an interest in, or were fascinated by the topic area. This included individual householders seeking out information in a variety of formats, or community groups requesting information (e.g. asking a speaker to come and talk at a meeting or function). Information seeking was also undertaken for verification purposes, with participants looking to verify information they had come into contact with previously, or to verify actions they had undertaken pre- or post- disaster. There were some reports of information seeking by people who were considered to be leaders in the community (e.g. to procure a speaker on hazards and preparedness for a community group; or to gather information about hazards and preparedness to pass on to other community members).

#### 4.4.6 Variety and frequency of information

The notion that people make reference to multiple information sources when interpreting hazards and preparedness information (Lee, 1999; Mileti & Darlington, 1995, 1997) was evident in the interviewees. Interviewee 7, for example, sought out multiple information sources when making decisions about whether to prepare or not for hazards. The process appears not always to be deliberate, however, as people will often not go out of their way to seek multiple information sources, but will draw upon information they have seen or heard over their lifetimes. They may not attribute any particular credence to the information they have collated until a particular moment in time when it makes sense. For example, Interviewee 48 from Wanganui shows how multiple information sources are required to reach an understanding that you could be "on your own" in a disaster. First she draws from indirect experience of the 2004 flooding and recognises that many people during that event were "on their own". At a later stage she uses information provided by civil defence (from an interactive workshop she is participating in) to add to her knowledge. Civil defence tells her that there will be no civil defence people to help in a disaster, so she could be on her own in a disaster. She admits that at this workshop it "brought it home" to her that she could be isolated and without help. This example shows that a variety of information sources are needed to enable people to build up true comprehension of what the consequences will be like in a disaster.

Frequent information has been identified in previous studies as having an influence on preparedness (Lindell & Prater, 2002; Mileti & Fitzpatrick, 1992). Results from this current study showed that frequent information tended to act as a reminder to people about the hazards that they were exposed to, and the need for preparing. People admitted they did not think about hazards or preparedness very much, so the information acted as a trigger to think about the issues, and in some cases it prompted people to actually undertake or update preparedness measures (e.g. Interviewee 30). There was also one suggestion by an interviewee that frequent information about the nature of hazards could also have an unintended effect of desensitising people to hazards and making people blasé about the risk.

#### **4.4.7 Thinking and talking about information**

Most people stated that they didn't often think or talk about hazards, only when it was prompted by an informational trigger, as mentioned previously. Interviewees who thought frequently about hazards and preparedness often commented that it was in either the "front" or the "back of their minds". This indicates that it may not be something that they were always thinking about, but would draw upon from time to time as needed. People tended to talk about hazards and preparedness with people they already knew, such as family members, friends, workmates and other community acquaintances (e.g. neighbours). Conversations were mostly held in informal contexts (e.g. at home, at a friend's house), although some were initiated in more formal contexts (e.g. conversations during an organised community event; workplace training). Topics of thought and conversation tended to revolve around specific hazards or hazard events, leading on to discussions about, "What would happen if a disaster were to happen here?", or "What should we do if a disaster happens here?" Some discussions also occurred about preparedness, but were not as common as discussions about hazards or hazard events that had occurred.

The focus of thoughts and discussion on hazards rather than preparing has implications for promoting preparedness. It cannot be assumed that if people are prompted to think and talk about hazard issues then they will automatically prepare. Conversations need to be actively directed towards discussing and advocating preparedness. To achieve this, use of interactive information is beneficial to get individuals engaged in discussions that explore the full range of issues and options related to risk and preparedness.

#### **4.4.8 Other important aspects of information**

An important aspect of information is the need for people to be able to relate to what is presented. People will tend to take more notice of information if they think it is of relevance to them somehow. This point was raised when discussing passive information, but also relates to interactive information and disaster experience. So, for example, if a place that experiences a disaster is similar to an interviewee's location (e.g. it occurs in a Western country or another location within New Zealand; or if it occurs to New Zealand citizens) then the interviewee may be able to relate to that

experience and apply it to their own circumstances. Many interviewees used the expression, “It makes it more real”. Some people did not relate to disasters overseas at all, but related more readily to local people affected by disasters, or disasters that were more within the realms of their experience (e.g. the gas explosion in a cool-store in Hamilton in 2008). In terms of preparedness information, a similar theme arose from the interviews, with some people (e.g. Interviewee 45) admitting they couldn’t see the relevance of hazards and preparedness information until it was specifically applied to their location and context.

While every person’s way of relating is different, the importance of the point discussed here is that people will only start trying to apply the concepts presented in the information if they relate to it in the first place. Previous literature does discuss this notion, and talks about the need to personalise information so that people can understand how the information applies to each individual or community (Mileti, Drabek, & Haas, 1975; Mileti & Fitzpatrick, 1993; Tierney, et al., 2001; Turner, et al., 1986; Weinstein, 1989).

Interviewees also made reference to the importance of trust, in particular trust in the source of information and trust in the information itself. It was clear from many of the quotations that if interviewees did not trust the information source or content, they were unlikely to undertake the advice presented in the information. For example, Interviewee 32, who hasn’t restrained his hot water cylinder, discusses his mistrust of information presented by the Earthquake Commission (EQC):

“The hot water cylinder is in that cupboard so it can’t move much anyway. And anyway that’s an illusion because the Earthquake and War guide [EQC] say you have got 200 litres of water there... but that’s an illusion because if the water’s not running how do you get the water out? So I think that’s false - I don’t think they should be telling us that because you can’t get it out - unless you take the bung off the bottom and that requires tools and a bit of knowledge which a lot of people wouldn’t have...Some of the stuff is put out by people haven’t actually thought about it, or I don’t think they have anyway...The guys sitting on the seats in the office never thought about how you get water out of the hot water cylinder.”

A few of the respondents identified difficulties with conflicting information, an issue that is known to be detrimental to the preparedness process (Mileti & Fitzpatrick, 1992; Mileti & O'Brien, 1992). An example that was raised several times was with respect to advice about what to do when an earthquake occurs. Some had heard to get under a table or doorway when an earthquake occurs, while others had seen information about needing to run outside. This conflicting information created uncertainty about how to respond in an event. People also discussed the issue of conflicting information with respect to understanding risk. In particular, people's experience of risk did not match the information presented by official sources, leading to disbelief of the official information, and mistrust in the source. This was particularly evident in the location of Wanganui, where flooding is an issue and respondents sometimes felt the Horizons Regional Council was overstating the flood risk in comparison with their previous experience. Interviewee 46 outlines the issues associated with conflicting information:

“And a number of people sort of get to the stage where like for instance, and I think this is happening a little bit at the moment, in our area here, where Horizons are sort of saying oh well, now we've got to look at flood protection, we're looking at a 200 year event and people say, “What? 200 years. We've been here, the town's been here for nearly 150 and it's had these two floods, but this was the worst of it, based on actual record and so forth but it's not ever going to do that, so what's the idea of doing this?” And so basically by being, how do I - by an organisation such as Horizons overstating the situation it creates a negative response more than a positive response.”

One respondent (Interviewee 5) referred to the concept that information about hazards and preparedness could be considered “inside knowledge”. He joined a civil defence volunteer group so that he could get this “inside knowledge”. This belief really highlights the barrier that hazard and preparedness information is not considered part of common knowledge, or easily accessible to the public, and that this information is held only by those “in the know”.

## **4.5 Discussion**

The research undertaken for this study highlights that the relationship between hazard and preparedness information and actual preparedness is complex, and suggests there is

no direct link between being exposed to information and actually getting prepared. On exposure to information people will go through a number of processes, including thinking about the information, talking about it with others, forming beliefs and emotions about the information and seeking further information. They will often draw from multiple sources of information and also consider the environmental and social context in which they exist before making decisions about preparedness. This interactive process is how individuals interpret and make meaning of hazard and preparedness information. Lee's (1999) study on children after Hurricane Andrew perhaps best reflects this idea in previous research. In Lee's study, it was found that "students constructed the meaning of the hurricane based on multiple information sources, including their personal experiences, family members and neighbours, scientifically sanctioned versions from school and news media, and social organizations such as churches" (Lee, 1999, p. 214). Lee found that students with less knowledge of hurricanes tended to draw primarily from their experience; conversely those with more knowledge of hurricanes provided scientific knowledge-based explanations as they were describing personal experience of Hurricane Andrew. Such research demonstrates the interactions that occur between different types of information, one's self and the social environment.

The interviews for this study revealed that individuals make use of three predominant types of information: passive; interactive; and experiential information. Each information type provides a unique contribution to the meaning-making and preparedness process. As a consequence a major recommendation of this research is that the concept of 'information' should be reconceptualised and earthquake education programmes adjusted accordingly to take account of the influence of all three different types of information.

Passive information comes in a variety of formats including brochures, advertisements, the internet, email, news media (television and print), displays (e.g. museum displays), books or booklets, films, fridge magnets, signage, warning sirens, photographs and environmental cues. Information offered through these avenues can be good for providing a detailed outline of hazard risks and preparedness actions. Passive information appears to primarily raise awareness and knowledge, and may trigger conversations with others depending on the source and content. As a result, such

information can be used for developing critical awareness in community members (Lindell & Perry, 2011; Lindell & Prater, 2000; McIvor & Paton, 2007; Mileti & Darlington, 1995, 1997; Mileti & Fitzpatrick, 1992, 1993; Paton, 2003, 2007a; Paton, Kelly, et al., 2006; Paton, McClure, et al., 2006; Paton, et al., 2005; Paton, Smith, et al., 2003).

While passive information raised the awareness of the interviewees, however, it was not as useful for assisting people to develop a full comprehension of the consequences of a disaster. The only passive information that appeared to assist with this was media information, as the visual images projected in the media were found to be useful for understanding the consequences of an event. That the majority of passive information was unlikely to contribute to understanding consequences is evident in other studies, for example, Anderson-Berry (2003) found that traditional passive educational material used for cyclones tended to raise 'awareness' but did not actually improve 'understanding' of the hazard. Passive information contributed to the formation of both helpful and unhelpful beliefs relative to hazards and preparing, and sometimes stimulated emotions predominantly related to fear. The interviews revealed that some people used passive information to make both rational and cognitive assessments of risk (e.g. through assessing return period information) while others made assessments based on emotional significance (e.g. though considering historic information which was of cultural and social importance to the community). Passive information was found to be useful for those seeking information or wanting to verify information they had seen elsewhere.

One of the issues with the sole use of passive information is that it is often not supported by other types of information (e.g. conversations with experts). As a result, it may be inaccurately interpreted and there may be a lack of verification of information if no information seeking is carried out. People may consequently develop unhelpful beliefs, attitudes and feelings that are not conducive to motivating preparedness, for example people may think: "A disaster won't happen here", "A disaster won't happen imminently", "A disaster will be very destructive and I can't do anything about it" or "There will be warning for a disaster so I don't need to prepare". If no additional information is available to counter these beliefs, these may be the predominant beliefs that remain. In addition, passive information may not mean very much to people if they

don't already have some kind of understanding about the nature of disasters, or hold any core beliefs that support the reason why they should take notice of the information (e.g. "I want to survive", or "Safety is important"). As a consequence, passive information should be supported by interactive or experiential information.

Interactive information includes any type of information that generates interaction such as general discussions with others (e.g. family, friends, and workmates), training for emergencies, community activities, school activities, and workplace activities.

Interactive information raises awareness and knowledge, but also contributes to understanding the consequences of an event better. This is because it is more likely to stimulate thought and discussion, and provides the opportunity for people to explore the consequences of such events in more detail. Interactive information has the added benefit in that because it is more 'hands-on' it can assist with building skills to help people prepare for or respond to a disaster. This in turn contributes to developing people's self-efficacy and promoting positive outcome expectancy, both attributes which have been found in previous studies to be predictors of people's preparedness for disasters (Cowan, et al., 2002; Duval & Mulilis, 1999; Lindell & Whitney, 2000; McIvor, et al., 2009; Mulilis & Duval, 1995; Paton, 2008; Paton, Bajek, et al., 2010; Paton, Houghton, et al., 2008; Paton, et al., 2009; Paton, Parkes, et al., 2008; Paton, Sagala, et al., 2010; Paton, Smith, et al., 2008; Rüstemli & Karanci, 1999). Interactive information can assist with developing helpful beliefs, and reducing unhelpful ones.

Few interviewees made reference to emotions such as fear in the context of interactive information, implying that such information may help reduce negative emotions associated with hazards and preparing. However, this study did not investigate such an association in detail, and could be the subject of further research. School activities were discussed by many as being particularly useful, as they fostered information circulation between school children and the wider community. School children would often take information home and encourage preparedness action within their families.

Additionally school education appeared to encourage good recall of information, with individuals remembering and applying what they had learnt at school long into their adult lives. The interviews show that interactive information is an important contributor to the interpretation and preparedness process. Other studies support the use of interactive techniques, suggesting they are more personal and more effective at engendering community participation in hazard and preparedness issues (Bajek,

Matsuda, & Okada, 2008; Stevens, Berke, & Song, 2010). Unfortunately current disaster education programmes are rarely interactive (Anderson-Berry, 2003), but such interactive information should be considered for future use.

Experiential information was identified as a third key information type that people often made reference to. Experiential information included direct disaster experience, indirect disaster experience and indirect event experience. People drew upon their experiences in forming their beliefs, in thinking about how they feel about disasters, and in deciding whether they should prepare or not. Only a few interviewees had experienced a disaster either directly or indirectly. As most people had only limited disaster experience, many made reference instead to more salient indirect events they had experienced, such as traffic accidents, personal hazards, workplace hazards or recreational hazards. Having some kind of disaster or event experience was useful, as it helped people understand what the consequences of an adverse event could be, and made them more motivated to prepare. In addition, preparedness and response skills learned during past events could be applied to future events. Experience also interacted with other types of information. For example after experiencing an event the rationale for preparing would be reinforced, and any passive information that was received about preparing made more sense. Experience could have a down-side, however, as at times it could contribute to the formation of both normalisation (Mileti & O'Brien, 1992) and optimistic biases (Burger & Palmer, 1992; Helweg-Larsen, 1999) which could reduce the desire for individuals to prepare. The identification of experiential information as a core information type suggests that consideration should be given to incorporating this into future earthquake education strategies.

In considering the results of this study, a number of recommendations arise for future education programmes designed to promote earthquake preparedness:

1. Ensure that a range of information types (passive; interactive; and experiential) are factored into earthquake education programmes.
2. Ensure that both realistic information about hazards and risk is provided, as well as ways of how to deal with that risk (i.e. preparedness).

3. Begin with interactions as a core focus, as the interactive part of the process is a primary way that people make meaning of risks and consequences, and are motivated to take action for preparedness.
4. Make use of passive information within the context of interactions. Provide passive information, but also provide forums where people can discuss and interact with others about this information. Ensure that there is enough expert input into the process so people have knowledgeable contacts they can discuss their issues with and receive accurate information. Also consider incorporating alternative types of passive information that people make use of, such as historic information and environmental cues.
5. Make better use of disaster experience as an information source. Accept that people will draw upon past experiences (possibly not even related to natural disasters) and decide how to best incorporate that into educational initiatives. For example, can preparedness for natural disasters be incorporated into occupational health and safety training in the workplace?
6. People will need to refer to multiple sources of information, so ensure that information is consistent as possible, or that there are avenues available to help people eliminate the inconsistencies they come across (e.g. through interactive sources).
7. Ensure people can relate to the information—what does it mean for them, and in their location?
8. Think not only about raising awareness and knowledge about hazards and preparedness, but how information can really assist people with understanding the consequences of an event such as an earthquake.
9. Be aware that simply stimulating thought and conversation about hazard issues will not necessarily lead to people getting prepared; thought and discussion needs also to be directed towards the desired outcome of getting prepared.
10. Build trust. If individuals trust the information they are exposed to and the source of that information, they will be more willing to take hazard and preparedness messages on board.

## **4.6 Limitations**

Several limitations have been identified in the research undertaken for this project. Because the nature of this study was qualitative and intended to collect details about the preparedness process, the sample size was small (48). A quantitative study in future would help to determine if the results are representative across the wider population. Additionally, due to the self-selection of interviewees, some biases may be present in the interview sample. In particular there may be an over-representation of ‘community-minded people’ (as the majority of invitations were sent to community groups); an over-representation of people interested in earthquakes and preparedness; and an over-representation of older people in the sample (i.e. over half the sample were 60 years or over).

## **4.7 Link to Chapter 5 - Paper 2**

The following chapter (Chapter 5 - Paper 2, Becker, Paton, et al., submitted-a) describes a model of household preparedness for earthquakes that has been developed from analysis of the interviews. It describes the influence that different types of information have on the meaning-making and preparedness process and the interactions that occur as part of that process (e.g. with beliefs, with emotions and feelings and within the wider social context).



# Chapter 5 Paper 2: A model of household preparedness for earthquakes

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## Abstract

One way to reduce the risk from earthquakes is for individuals to undertake preparations for earthquakes at home. Common preparation measures include gathering together survival items, undertaking mitigation actions, developing a household emergency plan, gaining survival skills or participating in wider social preparedness actions. While current earthquake education programmes advocate that people undertake a variety of these activities, actual household preparedness remains at modest levels. Effective earthquake education is inhibited by an incomplete understanding of how the preparedness process works. Previous research has focused on understanding the influence individual cognitive processes have on the earthquake preparedness process, but has been limited in identifying other influences posed by the wider social contextual environment. This project explored the earthquake preparedness process through a series of qualitative interviews with householders in three New Zealand urban locations. It investigated earthquake information that individuals are exposed to, how people make meaning of this information, and how this relates to undertaking actual preparedness measures. During the study the relative influence of cognitive, emotive and societal factors on the preparedness process were explored and the interactions between these

identified. A model of the preparedness process based on the interviews was developed, and is presented in this paper.

## 5.1 Introduction

Around the world earthquakes continue to be a significant cause of death, injury and disruption. Contributions to death and injury include rising populations, poverty, building collapse, poor construction methods, collateral hazards such as landslides or tsunami, individual demographics, people's behaviour at the time of the earthquake, and the effectiveness of emergency response (Petal, 2011; Spence, et al., 2011). In developing countries, death from earthquake can be extremely high, with 220,000 reported dead in the 2010 Haiti earthquake and 88,289 in the Wenchuan earthquake in China (Spence, et al., 2011). In developed countries death and injury from earthquakes is often less, primarily due to better construction methods, however, people can still be seriously affected. For example, the recent magnitude 6.3 earthquake in Christchurch, New Zealand, caused 181 deaths on 22 February 2011 (Brown, 2011; McSaveney, 2011; New Zealand Police, 2011; The Press, 2011)<sup>6</sup>, mostly related to the collapse of two multi-storey office buildings, many unreinforced masonry buildings, and being hit by other falling objects. As well as death and injury, damage and disruption after an earthquake can be widespread, with important services cut off. For example, water and food may be difficult to obtain for days to months afterwards, and sewerage and transport systems may be disrupted for years. An earthquake can also have a significant impact on people's lives, potentially affecting where people live and work, causing financial hardship, and disrupting normal social processes within the wider community.

There are many ways to reduce the risks posed by earthquakes, including land-use planning to avoid earthquake-prone areas (Kerr, et al., 2004); engineering solutions (e.g. building earthquake-resilient buildings; engineering soils to reduce risk); warning systems that can give a number of seconds of warning before ground shaking is felt (Gasparini, et al., 2011; Satriano, et al., 2011); and earthquake preparedness. In terms of preparedness, solutions may be administered at a societal, community or individual

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<sup>6</sup> 172 names had been officially released on the New Zealand Police website as of 7 April 2011, with a further 9 individuals whose bodies had not been formally identified. The Press (2011) also reports that while 181 people died on the day of the earthquake (22 February 2011), another person died from injuries several days later, and four other potentially earthquake-related deaths have been referred to the coroner.

level. At an individual level, household preparedness is often advocated, particularly in developed countries, as one component of risk management for earthquakes. For many decades earthquake-prone countries such as the United States, Japan, New Zealand and Turkey have promoted the idea that individual households should be prepared for earthquakes so as to reduce the risk to life and property. Preparedness actions that have been encouraged include collecting together essential survival items (e.g. food, water, torch, radio, medication, etc.), creating a plan for what householders will do if an earthquake occurs, undertaking earthquake mitigation actions (e.g. retrofitting buildings; securing objects within a residence), developing survival skills in individuals, and undertaking social action related to earthquake preparedness (Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Mulilis, et al., 1990; Russell, et al., 1995; Spittal, et al., 2008).

Despite many years of information dissemination and education about the importance of preparing for earthquakes, household preparedness remains at only modest levels. Ronan and Johnston (2005) analysed the outcomes of a number of international studies and found that overall levels of preparation are universally low, including in risk prone areas. There have been some modest improvements in certain geographic areas over time (e.g. earthquakes in California, Lindell & Perry, 2000) but not to exceedingly high standards. In New Zealand, for example, despite many preparedness campaigns being run over the past decade, over half of residents report not having done a single thing to prepare for earthquakes (Earthquake Commission, 2011).

Given the difficulties of encouraging householders to prepare for earthquakes, a great deal of research has been undertaken to understand what motivates individuals to get prepared. The large body of social research undertaken began to appear in the 1970s and has continued through to the present. Research during the last 40 years has identified a range of factors that influence adjustment adoption for earthquakes, including individual perceptions, beliefs and attitudes; emotions and feelings; previous experience of earthquakes; demographics; resource constraints; and social influences. The emphasis of most previous studies has clearly been on the individual, however, and a review by Solberg et al. (2010, p. 1673) notes that many social psychology studies have had a narrow focus: “inter-individual influences on intra-individual cognitive processes”. While studies of intra-individual cognitive processes provide valuable

insight into particular influences of preparedness, such an emphasis has meant that researchers have fallen prey to a fundamental attribution error (Ross, 1977) called context minimisation error (Shinn & Toohey, 2003). This occurs when casual influences are attributed primarily to individuals and less regard is given to contextual factors such as the influence of wider society (e.g. neighbourhoods and communities). Shinn and Toohey (2003) maintain that contextual factors are important, as these factors interact with individual and sociocultural characteristics and may cause psychological processes to play out differently in different contexts. From an earthquake preparedness perspective, this suggests that people's deliberations about whether or not to prepare cannot be solely attributed to individual cognitive processes, but are likely also influenced by their interactions within wider society. In addition, the eventual outcome of people's deliberations may play out in a diversity of ways, depending on the wider social context in which they are situated. That the earthquake preparedness process is subject to such complexity sheds some light on why existing 'one size fits all' earthquake education programmes fail to motivate large numbers of people to prepare.

The current emphasis on intra-individual cognitive processes is evident in the models that have been constructed so far. For example, early models by researchers such as Turner et al. (1986), Dooley et al. (1992) and Farley (1998) have focused on using quantitative survey data to undertake causal path analyses of earthquake preparedness. A number of models are based on the Theories of Reasoned Action (TRA) and Planned Behaviour (TPB) (Ajzen, 1985; Fishbein & Ajzen, 1975). These include Protection Motivation Theory (PMT) (Rogers, 1983) and Person relative to Event theory (PrE) (Duval & Mulilis, 1999; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2000; Mulilis, et al., 2003), both primarily cognitive models that focus on aspects such as likelihood, severity, self-efficacy, outcome expectancy and responsibility for protection. Some studies have explored wider aspects of context, including the influence that social interactions have on preparedness, but have not done so in any detail. For example, Mileti and Darlington (1997) identified that societal interaction was an important part of earthquake information use in a risk communication context, but did not explore this further. Work by Lindell and Perry (1992, 2000, 2011) introduces the importance of the social context in their Protective Action Decision Model (PADM) but again does not talk in explicit detail about the nature of its influence. Paton and colleagues (e.g. Paton, 2005, 2006, 2007a; Paton, Bajek, et al.,

2010; Paton, Johnston, Smith, et al., 2001; Paton, McClure, et al., 2006; Paton, Millar, et al., 2001; Paton, Parkes, et al., 2008; Paton, et al., 2000) have developed a more comprehensive model that incorporates social influences into the preparedness process, in particular identifying important societal attributes that an individual must be exposed to, such as trust, community participation, articulation of problems and empowerment. Again, however, the model does not explain how the individual interacts within their wider context; it simply identifies that such social contextual elements are important to the process.

Consequently there remains a gap in understanding the influence that the wider societal context has on the preparedness process. This is acknowledged by many earthquake researchers, and has resulted in recommendations to explore this area further (e.g. Lindell & Perry, 2000; Mileti & Darlington, 1997; Rohrmann, 2000; Solberg, et al., 2010; Tierney, et al., 2001). As a result, a new research project was developed to identify and describe the personal, social and contextual interactions that take place with respect to earthquake information meaning-making and adjustment adoption, and devise a model to explain the process.

## **5.2 Outline, design and methodology of research**

Qualitative research was deemed to be most useful for this research project as it is more exploratory, allows detail to be collected, and provides more flexibility for elucidation of processes. In contrast, quantitative survey data tends to be more general and constrained around particular hypotheses, providing less opportunity to explore processes in a detailed way. To allow for the greatest possible flexibility in data collection and analysis, grounded theory methodology was used (Glaser & Strauss, 1967; Strauss & Corbin, 1990). Grounded theory is an often used qualitative approach which allows core categories and theory to emerge from the data, rather than forcing data into preconceived categories.

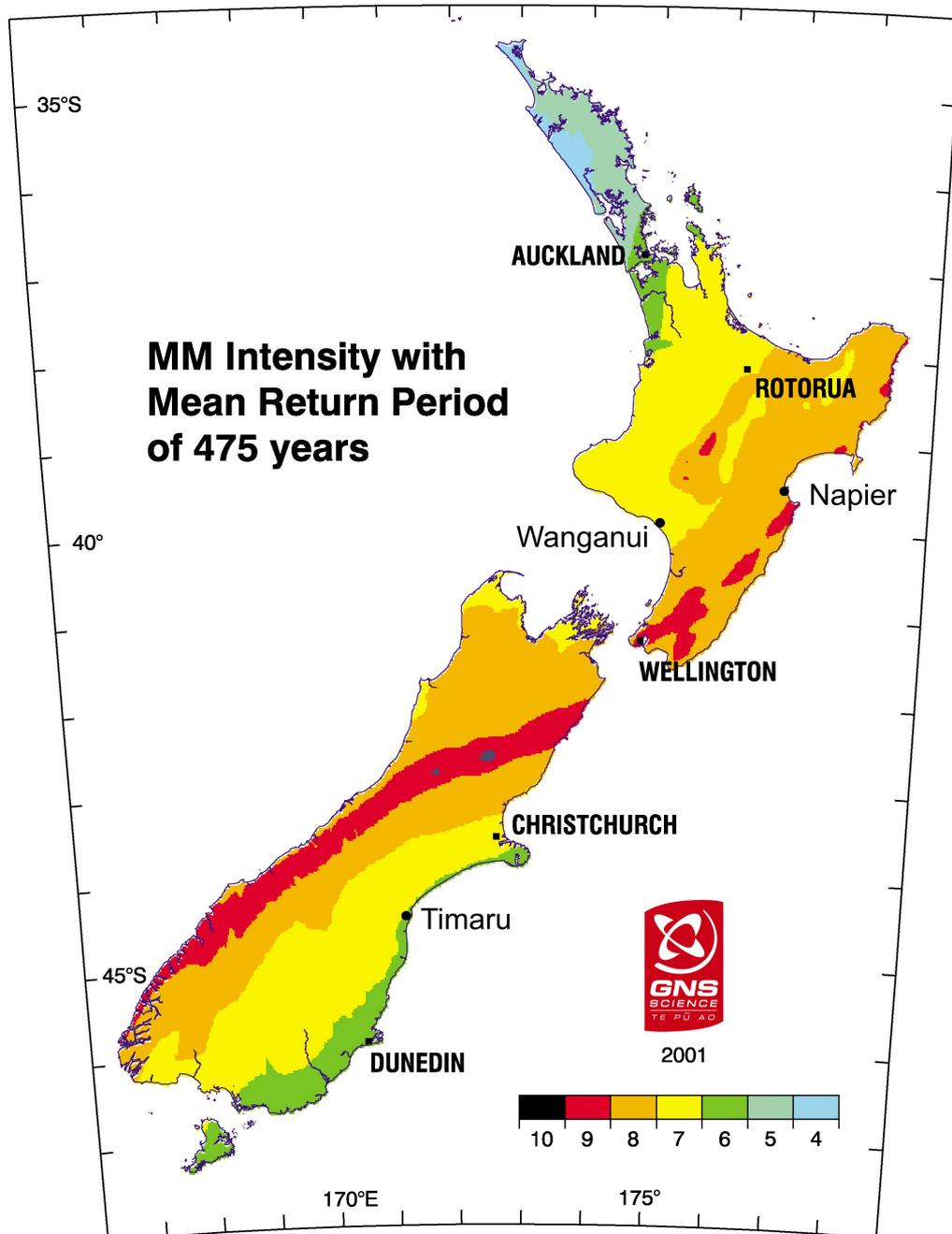
To investigate how people make meaning of earthquake information and how this related to preparedness, research was conducted in three communities in New Zealand: Napier, Wanganui and Timaru. The towns were selected based on their similarities with respect to population size, relative potential geographic isolation, types of facilities present, civic institutions and legislative environment, so that preparedness could not be

influenced by major environmental and institutional differences. Earthquake risk varies between the three locations, with Napier located in the highest area of risk, followed by Wanganui and Timaru (Figure 5.1).

The research focused on asking household residents about their perspectives on earthquake hazards, earthquake information and preparedness for earthquakes. Data was collected by means of semi-structured interviews with residents. Forty-eight interviews were undertaken during April to June 2008, with 16 interviews in Napier, 14 in Wanganui and 18 in Timaru. Participants were self-selected volunteers, recruited by sending invitations to community groups and advertising in local publications.

At the time of the study, the last major earthquake disaster that had occurred was the magnitude 7.8 Hawke's Bay earthquake near Napier in 1931; with the September 2010 Darfield earthquake (magnitude 7.1) and February 2011 Christchurch earthquake (magnitude 6.3) occurring after data collection had taken place. Therefore the study was undertaken during a relative period of earthquake quiescence. Timaru had experienced a major snowstorm in 2006 (Hendrikx, 2007), which many interviewees referred to in their interviews. Wanganui's most frequently occurring hazard is flooding, with the last major flood causing property damage occurring in 1990.

Interviews were taped and transcribed into a word processing package with the interviewees' consent. The interview data was then entered into the qualitative research software package "Atlas.Ti", and codes identified and memos written. The codes then became assembled into core categories. Analysis followed the approach of Strauss and Corbin (1990), who suggest that several core categories may emerge from the analysis, rather than just one (Glaser & Strauss, 1967). In fact, a range of core categories were eventually identified, in a similar manner to work undertaken by Richardson (2005) in mapping the phases of individuals' meaning-making following an explosion in Texas City in 1947. It was felt important not to condense the codes into too few categories, as to do so would prevent accurate identification of the range of factors that influence the earthquake information meaning-making process (Corbin & Strauss, 2008). Theory was then developed from the identified codes and categories, and a process of earthquake information meaning-making and action identified.



**Figure 5.1** Location of the study areas within areas of earthquake risk. The map shows the distribution of Modified Mercalli (MM) intensity with a current Annual Exceedance Probability of 1/475, derived from the National Probabilistic Seismic Hazard Model. Timaru is situated within MM6 (i.e. falling items, slight damage, e.g. cracked plaster), Wanganui within MM7 (i.e. buildings cracked, bricks and chimneys falling), and Napier within MM8 (i.e. damaged and partially or fully collapsed buildings) (personal communication, W. Smith, 2001; based on data from Stirling, et al., 2000).

### 5.3 Results

Figure 5.2 shows the process model that was derived from the interviews. The model describes cognitive, affective and social influences on the information meaning-making process. The model represents a linear process, with people starting from receiving information, interpreting it and making decisions about whether to prepare or not. While a linear process may accurately describe the journey for some individuals, this is not the case for all, as the data revealed. Some may start from a different point in the diagram, for example, those with strong existing beliefs about personal safety may start from the “Beliefs” point in the diagram and interpret hazards and preparedness information in the context of this belief. In addition, feedback loops also exist, but are not all are documented or described in this diagram. There is also a time element to the process, but it is not captured on Figure 5.2. For example, awareness of hazards or preparedness may be triggered by certain information, but as time passes this awareness may dissipate. Likewise, people’s actual preparedness may also wax and wane over time. For example, Interviewee 28 suggested that after she arrived in New Zealand to live she got highly prepared; however this preparedness had waned over time. She attributed the change in her physical preparedness to an evolution in her beliefs that reflect New Zealand’s social norms more (i.e. from thinking preparedness is very important to being blasé about preparing for disasters). Therefore while the diagram presents an accurate as possible picture of the information meaning-making and preparedness process, it should be interpreted within the limitations noted here.

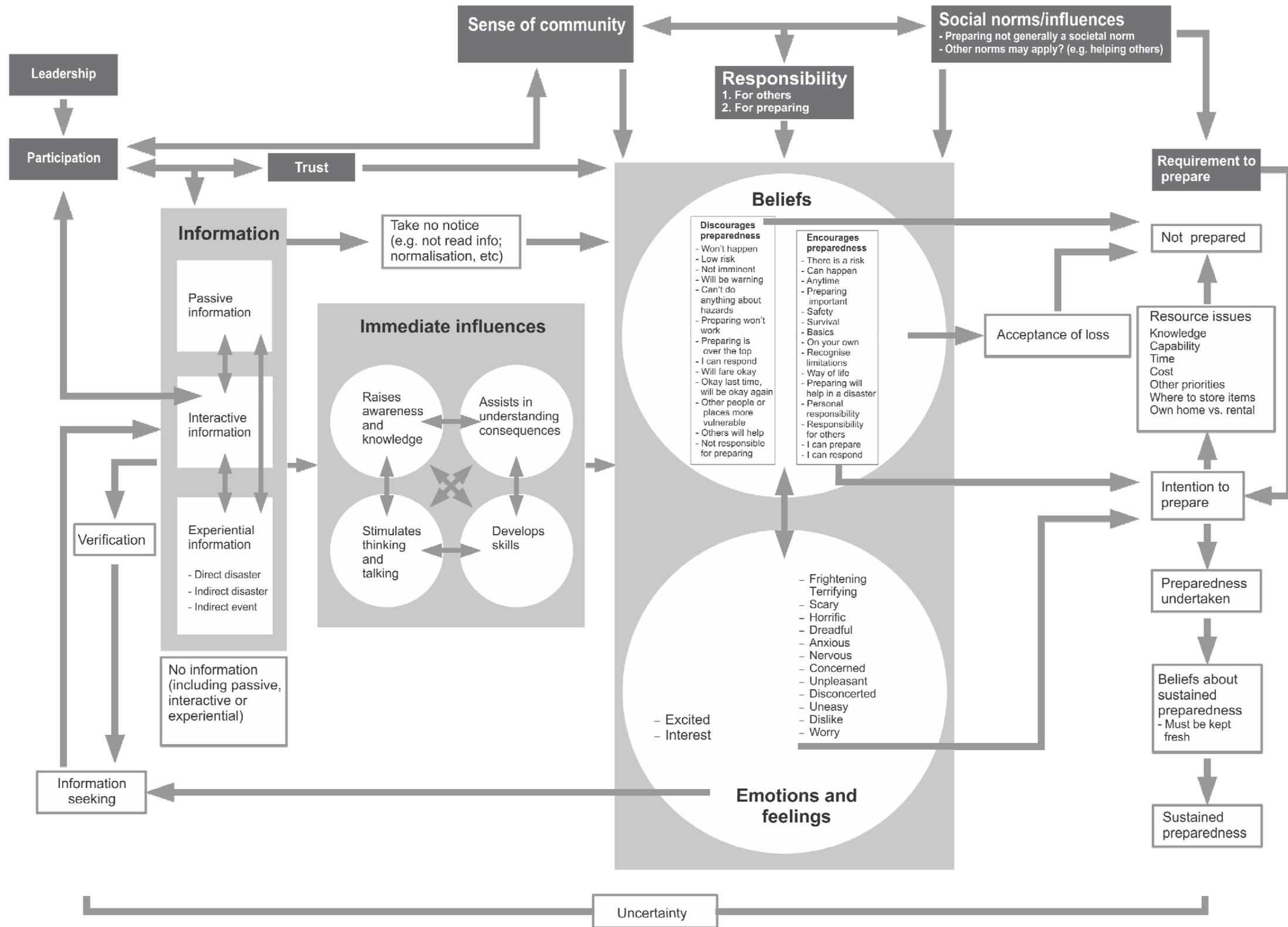


Figure 5.2 Model of information meaning-making and preparedness for earthquakes and other disasters.



### 5.3.1 Types of information

The interviews revealed that people are exposed to three main types of information: passive information; interactive information; and experiential information (see Figure 5.2 - “Information” box). Passive information reflects the type of information that is traditionally used for hazards and preparedness education such as brochures, television, or websites. Interactive information pertains to information that involves interactions with other people, such as school activities, community activities, workplace activities and training. Experiential information is information that individuals glean from their own life experiences. Such experiences can be directly related (e.g. a person directly experiences a disaster) or indirect. Indirect experience can be broken into two main types: indirect disaster experience whereby a person observes or is involved in responding to a disaster event; or indirect event experience with other hazards (e.g. experiencing an accident, personal health issues, being engaged in an occupation that involves elements of hazards or preparedness). The analysis revealed that both interactive and experiential information are important sources of information, proving that interaction within social and worldly contexts is important for how people make meaning of hazard information. Interviewee 42 provided a good overview of the three types of information that people use, including the media, magazines and videos (passive), workplace influences and discussion with others (interactive) and local hazard events (experience, or in this case reference to lack of experience).

*Where have you picked up that sort of [information]?*

“Probably just, I mean, if we have for example a flood and you’ll hear someone say that was a one in a 100 year event or a one in 50 year event. So just nothing formal. Just what you’ve heard [...] So heard through other people, or the media [...] Probably magazines, things like that. And we don’t have a lot of things happening in our area so I don’t hear anything specific really about events in Hawke’s Bay. We have, at work here we get, obviously we’re involved in emergency management so we do see a fair few videos and things like that.”

Each type of information has a different influence on people’s understanding, interpretation and actions (Figure 5.2 – “Immediate influences”). Passive information was more likely to raise awareness and knowledge about hazards or preparing, and

would sometimes prompt people to think about hazard issues, or talk about them with others. Passive information, particularly media-based information, also contributed to forming people's beliefs. Some beliefs were useful to understanding and personalising disasters (e.g. "A disaster like the one overseas could happen here"), and some were unhelpful, as they contributed to aspects such as fatalism (e.g. "The disaster overseas was so destructive; there's nothing I could do if it happened here"). Because media information is often visual, it also provided a good way for people to understand what the impacts of disaster events were really like, even if it did contribute to some unhelpful beliefs. In addition, passive information could influence people's feelings. For example, a common feeling was horror and fear at seeing information and images about overseas disasters. As Interviewee 9 describes, "...having seen the highways collapsing in the States when there was that last big earthquake in Los Angeles, San Francisco or wherever it was, it was (pause) - the pictures were just horrifying - you know people disappearing off the ends of bridges and getting crushed and those sorts of things - absolutely horrifying." Thus passive information could induce anxiety in individuals.

Interactive information raised awareness and was an essential type of information for stimulating thought and discussion. Such information was useful, as it took people a step beyond just 'raising awareness' about hazards and actually helped people understand the consequences of a potential event through interactive discussion. Interactive information helped build people's skills for preparing and responding (e.g. show what practical tasks need to be done to prepare; or train people how to respond to earthquakes). Beliefs could also be shaped and formed by interactive information, and important beliefs such as "I can prepare" and "I can respond" were often shaped by such information. In many cases, where experts were involved in the interactions, there was a higher likelihood of beliefs being accurate, as people could discuss, evolve and correct assumptions during the course of the interaction. People didn't really discuss their feelings at length with respect to interactive information, but passive information did appear to have some impact on feelings, particularly as people built knowledge and skills around preparedness and response, then their worry was reduced.

Experiential information had a significant impact on the process. First it raised awareness and stimulated thought and discussion. It was also essential in helping

people understand the consequences of disasters, as experience often provided first-hand information about the types of conditions that could be experienced in a disaster, and what might be needed to overcome any adverse impacts. Related to the previous concept, is that direct experience in particular helped build skills for preparedness and response, through practicing a real event. Experiential information was a key contributor to developing beliefs about a disaster, in particular beliefs related to: people's understandings of hazard and risk; that preparing is important; a disaster can happen anytime; you could be on your own; safety and survival are important; and preparedness is a 'way of life'. Like the other types of information, disaster experience also had an impact on people's feelings, with most feelings being related to feeling shocked or scared by an event they had experienced. Some were directly motivated as a result of their experience to prepare for future disasters, while others were normalised and felt because that they had got through the event they would survive a future one okay. Another common related belief was that such an event wouldn't happen again. Amongst the interviewees, very few participants had had direct experience of a disaster, and none had experienced a large earthquake within their lifetime. Most people's experiential information was based on small events (e.g. minor earthquakes), indirect disaster experience and experience of other types of hazardous events.

The interviews revealed that people tend to draw upon multiple types and sources of information in forming beliefs and making decisions about preparedness. Some people may also be motivated to seek further information in order to verify what they have seen or heard. The findings reinforce the fact that no single information format will encourage individuals to prepare, and that a variety of resources must be used.

Some people may take no notice of information at all or are not influenced by it, meaning that they will rely on their existing beliefs in deciding whether hazards are an issue and whether they need to prepare for them. Others may not come into contact with any information at all, and again rely on existing hazards and preparedness beliefs.

A realisation that an individual had a lack of information (whether it be passive, interactive, or experiential) often led to worry or concern, which then might prompt a search for further information about hazards or preparedness in an effort to reduce that concern. This aspect was most evident in new immigrants to New Zealand who, on arrival, became aware of the hazards posed by New Zealand's environment, were

concerned by their lack of knowledge about them, and went about seeking further information in an effort to reduce their worry.

### **5.3.2 Immediate influences**

#### **5.3.2.1 Raising awareness and knowledge**

One of the first impacts of information is that it can raise people's awareness and knowledge (Figure 5.2 – "Immediate influences: Raises awareness and knowledge"). As outlined previously, awareness was raised by all types of information—passive, interactive and experiential. Two main types of awareness were described by interviewees, including a raised awareness of hazards, and awareness of the need for preparedness. Raised knowledge was closely linked with awareness, so is considered as one category for this model.

Awareness seemed to be quite a superficial concept, relating mostly to the idea that the existence of hazards, and importance of preparedness, had been highlighted to individuals by certain sources of information. People mentioned specifically that people should be aware of the possibility that hazards can occur; the risk posed by hazards; the impacts or consequences such hazards might have; and how they might need to prepare or respond. For example, Interviewee 6 stated, "I think you just have to be aware that [an event is] a possibility and to know what you're going to do if it does happen", while Interviewee 10 said, "[People] should just be aware of what the consequences of a major event can be, and the best way to prepare themselves and their immediate family". When asked by the researcher what Interviewee 26 thought "awareness" meant, he related a similar theme, "Awareness of the possibility [of hazard events]. People living here should be aware that this is always a possibility. There's always a risk".

Awareness did not imply any detailed thinking around the topic – this was more accurately represented by another category entitled, "Understanding consequences". Being 'aware' simply meant that people realised there was a risk or danger, and they understood that having a degree of either mental or physical preparedness was advisable. Awareness alone was unlikely to motivate people into action, as many felt that simply being aware of the potential issues was enough to enable them to be mentally prepared for, or respond appropriately to a disaster. For example, Interviewee

33 reflects on the need to be aware of hazards but not necessarily go to the extreme of physically preparing by saying, “I think whatever dangers you have, whether its tsunami, I think one has to be aware of tsunami, but you don’t leave a car with its engine going polluting the atmosphere just so you can make a quick dash for the hills.”

### **5.3.2.2 Thinking and talking**

Once information had raised people’s awareness, it could also prompt people to begin thinking and talking about hazards and preparedness (Figure 5.2 – “Immediate influences: Stimulates thinking and talking). Thoughts and discussions generally began after information of some sort had acted as a trigger. People who had undergone an experience, or who had been exposed to interactive information were more likely to talk about hazards and preparedness with others. In some instances, passive information also triggered conversations as well, but this was in most cases related to something individuals had seen about a particular event in the media, rather than other traditional types of passive information such as receiving a brochure or looking at a website.

Individuals predominantly talked about hazards and preparedness with people they already knew, such as family members, friends, workmates and other community acquaintances (e.g. neighbours) in informal contexts (e.g. at home, at a friend’s house). Some discussions were initiated in more formal contexts and sometimes with strangers as well (e.g. conversations during an organised community event; workplace training). Opinions about hazards and preparing were more readily listened to from those who were trusted or respected, with family and friends predominantly falling into those categories.

Common topics of thought and conversation were related to:-

- Specific hazards (e.g. earthquakes, snowstorms, flooding, etc.);
- Specific events that had occurred in local, national or overseas locations, with discussion around what happened in the event;
- What would happen if a disaster were to happen ‘here’? (impacts and consequences of a potential event);
- What should we do if a disaster happens ‘here’? (preparedness and response);

- Preparedness already undertaken, or preparedness that should be undertaken in future.

While people had an interest in discussing hazards and specific events, action was most likely to be initially prompted by conversations that were focused on understanding the impacts and consequences of an event (i.e. “What would happen if a disaster were to happen here?”). Following these conversations, thought and discussion would then naturally lead on to what one might do to prepare for a disaster and how they might go about doing it. The evolution of people’s thoughts was highlighted by Interviewee 40, who called the researcher back several times after the initial interview to talk about how discussion during the interview had prompted him to think a little more about hazards and his preparedness, and helped him realise that he wasn’t as prepared as he originally stated. Thus, while this particular instance relates specifically to the evolution of thought as a result of the interview process, it also is applicable to discussions held about hazards and preparedness within communities.

People’s interactions (reflected in thinking and talking) also contributed to the formation of social norms regarding hazards and preparedness. Informal networks, such as family and friends, would share ideas and come to an agreement on aspects of hazards and preparedness. This was also evident in more formal contexts, where groups of people followed a similar, if not more managed, process. For example, Interviewee 35 provided a forum at a dinner club to discuss hazards and preparedness and found following those discussions that a norm of ‘preparedness is important’ had evolved amongst the attendees and that people had actually got prepared.

While people prefer to interact with friends and family, such informal networks may not necessarily provide accurate opinions about hazard and preparedness issues, resulting in unhelpful social norms developing. Formal group structures, mediated appropriately, can be useful for developing appropriate social norms and securing commitment for action. Ideas generated within these groups can then be taken back to family and friends in an attempt to influence the wider community.

### **5.3.2.3 Understanding consequences**

An important part of the process was that people actually understood the consequences of an event occurring and the consequences of preparing or not (Figure 5.2 –

“Immediate influences: Assists in understanding consequences”). This appeared to be a trigger for people forming important beliefs around hazards and preparedness, and in motivating preparedness. For example, Interviewee 24 directly links thinking about outcomes or consequences with preparedness:

“...there was one other bloke who was well prepared [during the Canterbury snowstorm], and when I think about it I'm sure he would be in every other respect as well be well prepared because he's that sort of person.”

*So when you say he's 'that sort of a person', what do you sort of mean by that?*

“Well, he (pause)... thinks about outcomes and that sort of thing.”

Awareness and understanding consequences were identified as quite different concepts, with awareness being more of a ‘flag’ of the presence of hazards or preparedness, and understanding the consequences implying that people had undertaken some serious and detailed thought about issues. Understanding the consequences implied a realisation of what the impacts would be, a reflection on their own vulnerability, and a realisation of “why” individuals needed to prepare. People often used the term “making it real”. Understanding of consequences was reflected in detailed descriptions of what people thought the consequences might be. For example raised awareness of the impacts of an earthquake might be “power failure”. Understanding the consequences, included thinking through aspects such as, “If there is power failure there will be no lighting available. If it's winter it will be cold and there will be no heating. I won't be able to cook and feed my family.” Understanding of consequences best occurred from exposure to experiential information, whether it was direct or indirect experience. While providing slightly less impact, interactive information was also better than passive information at helping people to understand consequences. This was often due to the fact that interactive information enables discussion with others, and allows people to explore potential scenarios surrounding an event, thus expanding people's understanding of the potential impacts.

#### **5.3.2.4 Developing skills**

Information provides as an opportunity to build skills related to hazards and preparedness within individuals (Figure 5.2 – “Immediate influences: Develops skills”).

Information that is more likely to do this includes interactive and experiential information. Interactive activities can directly assist people to up-skill with respect to practically preparing for and responding to an event, through group discussion, physical demonstrations, or training. Encouraging the development of such skills can be a form of empowerment for people. Interviewee 45 from Wanganui describes how interactive information from school, combined with interaction in the home helped empower his children to develop a fire escape plan themselves.

*And why did you decide to [develop a fire escape plan with your children]? I guess what was the prompt for that?*

“The prompt came more from them, because they knew I was doing this work on disaster recovery and they had the fire - ‘drop, roll’ and that - lessons at school, and they were saying, “Well, what’s our evacuation plan? They didn’t call it evacuation plan, they said, “How do we get out?” (laughter).”

*So then when you developed your plan I guess, how did you go about doing that?*

“Well, we just [...] asked them to do it for themselves, and tell us what they thought was the best way to do it. That was the most logical way - they made it ...”

Experience provides a similar type of up-skilling as people are able to practice how to respond during an event, and consequently will have a better an idea of what items and skills they will need for future events.

### **5.3.3 Formation of beliefs**

People’s beliefs are an important part in the preparedness process (Figure 5.2 – Beliefs). People may hold existing beliefs (often related to prior experience) around which they interpret information, or may form completely new beliefs through being exposed to information. For example, people may believe that safety is important, and interpret any hazards and preparedness information they are exposed to in the context of this belief. Alternatively, people’s experiential information about disasters would often prompt them to form the belief that disasters “Can happen anytime”.

Three main types of belief were found: hazard beliefs (most of which relate to risk perception), preparedness beliefs and personal beliefs. Table 5.1 shows the different important beliefs that were identified and whether these beliefs were more likely to encourage or discourage preparedness.

**Table 5.1** Key beliefs important to encouraging and discouraging preparedness (Becker, Johnston, Paton, & Ronan, submitted-a)

	<b>Encourages Preparedness</b>	<b>Discourages Preparedness</b>
<b>Hazard Beliefs</b>	<ul style="list-style-type: none"> <li>- There is a risk</li> <li>- Can/will/does happen (inevitability)</li> <li>- Anytime (imminence)</li> </ul>	<ul style="list-style-type: none"> <li>- Won't happen at all</li> <li>- Won't happen to me (lack of personalisation)</li> <li>- Low risk</li> <li>- Not imminent</li> <li>- There will be warning</li> <li>- Can't do anything about hazards (lack of control, external locus of control)</li> </ul>
<b>Preparedness Beliefs</b>	<ul style="list-style-type: none"> <li>- Preparing is important</li> <li>- Safety</li> <li>- Survival</li> <li>- Basics</li> <li>- On your own</li> <li>- Recognise limitations of preparing</li> <li>- Preparing is a 'way of life'</li> <li>- Preparing will help me in a disaster (positive outcome expectancy)</li> </ul>	<ul style="list-style-type: none"> <li>- Preparing won't work/make a difference (negative outcome expectancy)</li> <li>- Preparing is 'over the top'</li> </ul>
<b>Personal Beliefs</b>	<ul style="list-style-type: none"> <li>- I can prepare (self-efficacy)</li> <li>- I can respond/resourcefulness (only if this is linked with the "I can prepare" belief)</li> <li>- I have a personal responsibility to prepare</li> <li>- I have a responsibility for others (e.g. children, family, the community)</li> </ul>	<ul style="list-style-type: none"> <li>- I can respond/resourcefulness (when not linked with the "I can prepare" belief)</li> <li>- I will fare okay</li> <li>- I was okay in a previous event, therefore I will be okay in future (normalisation bias)</li> <li>- Other people or places are more vulnerable than me (optimistic bias)</li> <li>- Others will help in a disaster (e.g. agencies, other community members)</li> <li>- It's not my responsibility to prepare</li> </ul>

Various studies have identified select beliefs that influence preparedness (as discussed in the literature review at the beginning of this paper), many of which have also been identified as part of this study. However, while many of the previous studies have touched on only a limited number of important beliefs, this study, being qualitative in nature, has enabled an entire cross-section of beliefs to be identified, as well as the relationship between those beliefs. As this paper cannot discuss the relationships in detail, more information about the nature and relationships between beliefs can be found in Chapter 7 (Becker, Paton, et al., submitted-b).

### 5.3.4 Emotions and feelings

In a hazards and preparedness context, emotion is important, as individuals have feelings about hazards themselves, as well as feelings about the information they come into contact with (Figure 5.2 – Emotions and feelings). Several key emotions and feelings were noted during the course of the interviews (Table 5.2), mostly related to hazards themselves.

**Table 5.2** Emotions and feelings about hazards as expressed by interviewees

<p><b>Excitement</b> Excited by the thought of hazards or a hazardous event occurring</p>
<p><b>Interest</b> Two aspects of interest:</p> <ul style="list-style-type: none"> <li>- General interest in hazards</li> <li>- Fascination with hazards</li> </ul>
<p><b>‘Negative’ emotions and feelings toward hazards</b></p> <ul style="list-style-type: none"> <li>- Frightening</li> <li>- Terrifying</li> <li>- Scary</li> <li>- Horrific</li> <li>- Dreadful</li> <li>- Fearful</li> <li>- Anxious</li> <li>- Nervous</li> <li>- Concerned</li> <li>- Unpleasant</li> <li>- Disconcerted</li> <li>- Uneasy</li> <li>- Dislike</li> <li>- Worry</li> </ul>

There were a few people who found hazards exciting. These people were more likely to become involved in volunteering in the community with the intention of helping with emergency response if a disaster were to occur (e.g. become civil defence volunteers). There were others who expressed that they were interested in or fascinated by disasters, and some of these were also the people who thought hazards were exciting. Such an interest in hazards often led individuals to seek information about hazards and preparedness.

People expressed a number of ‘negative’ emotions and feelings about hazards and earthquakes. At one end of the scale people thought earthquakes were frightening, terrifying, scary, horrific, dreadful or fearful. Such feelings were often prompted by seeing an earthquake disaster in the media. Sometimes these emotions may also be prompted by other earthquake information they had come into contact with. People who had experienced serious floods often described the experience as ‘horrific’. In contrast to flood events, the 2006 snowstorm in Timaru was not described as a ‘horrific’ event, likely due to its fairly benign impacts. Flooding was often described as horrific because it caused so much devastation to property and had a traumatic impact on people. If people had experienced a moderate earthquake (rather than a minor one) they might describe the earthquake they had experienced as scary, or describe a potentially large future earthquake as scary.

The frightening nature of potential future events often caused people to worry. Perceived risk from a hazard could also cause people to worry, as articulated by Interviewee 47 who said, “I don’t think I’m as concerned about earthquakes in my head as I am about flooding. Maybe because I perceive the danger of flooding [to be] higher than the danger of an earthquake.” People also admitted to worrying because they felt that hazards were out of their control, although conversely there were some individuals who stated that because they felt hazards were uncontrollable they had made a conscious decision not to worry about them. Worry might also arise if people had limited knowledge of what an event might be like, either because they had not been exposed to passive or interactive information or had no experience of such an event. A lack of information could also act to reduce some people’s worry, as people said that if they hadn’t seen any information about a hazard then it was possible there was no risk to their community from that hazard (and thus no point worrying about it). People also stated a number of other reasons why they might not worry about hazards, including not perceiving they were at risk, surviving a previous event, thinking an event was unlikely to happen again, not being responsible for others’ safety, and a belief in their ability to respond should an event occur. People generally didn’t seem to express worry about not being prepared—most worry was directed toward hazard events.

Worry manifested itself in four main ways: it could prompt individuals to seek further information about hazards and preparedness; it could directly motivate people to get

prepared for a disaster to reduce their worry; it could indirectly contribute to helping form people's beliefs that 'preparing is important'; or it could cause people to deny the problem. Interviewee 28 describes how her worry prompted her to seek information, contributed to belief formation, and was a motivator to getting prepared:

“...when I came to New Zealand, I was gathering together water and canned food and candles. [My husband] didn't have the slightest idea what I was doing and why I [was] worried about this stuff. And I said, “Well, you have earthquakes and things here”, and at the time he had never heard of or even thought of doing anything just in case there was a problem. We lived in Auckland at that time and of course they don't think about earthquakes up there, but that is where I felt my first one. But I did study about, you know, what was around me and I knew there were volcanoes, and if there were volcanoes there could be earthquakes, and so I wanted to prepare for that...”

In terms of the latter issue of denial, if people were very worried or anxious they often would try not to think or talk about disasters or preparedness (thus denying the issue), or they might form denial-related beliefs, such as, “A disaster won't happen here” or “A disaster won't happen to me”. Interestingly, there was at least one person (Interviewee 19) who had been concerned and got prepared to avert her anxiety, but did not talk about it with anyone else because of the anxiety it caused if she raised the subject. So there may be very prepared people in the community who do not interact with or 'recruit' new people into preparedness because they do not wish to talk about it with others because of the anxiety it causes.

Overall, when analysing the interviews it was found that those with higher levels of worry (expressed in ways such as calling earthquakes “frightening”, “terrifying”, “scary”, “horrific” or “dreadful”) were more likely follow a process toward getting prepared, than those who were simply concerned or uneasy.

### **5.3.5 Societal factors**

A number of societal factors were highlighted as important influences on the information meaning-making and preparedness process (Figure 5.2 – various dark coloured boxes). Community participation helped the preparedness process in a number of ways. First, it could act as a form of interactive information. For example, several

interviewees spoke about their involvement with Neighbourhood Watch (a crime prevention group) and how they had used meetings of this group as a forum for discussing hazard and preparedness issues. If people participated in their community in a general sense they were also more likely to feel a sense of community, and a sense of responsibility for other community members. This often led to an awareness of the need to prepare, as they felt a social responsibility to look after themselves in a disaster, and be available to help others in the community.

Community groups often had a role of assisting with preparedness and relief. In particular, a Rotary Group scheme was mentioned whereby the group put together disaster kits, primarily to be sent overseas to assist in disaster situations. Community groups also often helped with raising funds to send to disaster-stricken areas both within New Zealand and overseas. People within the community groups felt a sense of responsibility to help other people less fortunate than themselves, but had not considered undertaking disaster-related activities to assist their own communities, perhaps due to optimistic bias. Interviewee 37 gave another reason for why groups were more likely to help others affected by a disaster, but less likely to encourage preparedness within their own communities. He suggested that funding was available to groups to carry out preparedness and relief activities in other locations, whereas this funding was not available within local communities for preparedness activities. Linked with the issue of lack of funding is the strong perception that in New Zealand getting prepared is seen primarily as an individual responsibility rather than a collective responsibility, and therefore collective action is rarely undertaken to boost preparedness.

Linked with participation was the concept of leadership. A number of interviewees were very proactive in their communities and showed leadership in trying to disseminate information and encourage others to prepare. For example Interviewee 17 in Timaru delivered information to his neighbourhood in an effort to raise awareness about hazards and preparedness and encourage others to prepare. Another interviewee, from Napier, took the initiative of raising the topic of hazards and preparedness at a singles dinner she had organised. So the interviews showed that key leaders in the community can be proactive in providing information, raising the subject of hazards and preparedness for discussion, and promoting preparedness within their communities.

Trust emerged as a theme during the interviews. The relationship between trust and other factors appeared to be complex. If people trusted the information they were exposed to (usually also related to trust in the information source), then they were more likely to believe or take the advice presented in the information and be motivated to prepare. However too much trust in a particular agency may mean that a person might think that the agency will look after them in a disaster, and therefore they don't need to prepare (also known as 'transfer of responsibility'). Distrust in information (or the information source) could lead people to not believing the information was credible, and therefore they might not take any notice of it or prepare. However distrust in an agency could aid preparedness, because if a person does not think that an agency will be able to look after them in a disaster, then they need to make sure they can look after themselves, and as a consequence may prepare. Therefore the interviews revealed that there is a difficulty in managing trust relationships. It is critical that people trust information, and the source (agency) it comes from; however too much trust in the agency may prevent some people from preparing. A delicate balance needs to be struck, with people being able to trust an agency, but having a realistic belief that they will be "On their own" in a disaster and the agency will not be there to help them. Community participation can help build trust, as Interviewee 32 articulated when he suggested that if the community had been involved more in making decisions about flood risk in Wanganui, then the local authority might have had greater support for their flood mitigation proposals.

Trust can be difficult to build, and damaged fairly easily (Slovic, 1993). The interviews revealed that people's experiences of disaster can have a profound impact on how they view authorities. If an agency performed well in a disaster then individuals may be more likely to trust an agency; if not then trust may be lost. For example Interviewee 32 from Wanganui describes his feelings about the council who he believes did not perform adequately in a disaster:

"Now some places should have a portable generator - and the council is one of them. The council lost power in that flood [in 2004] and their cell phones ran flat, so they had no bloody communication. For a council that is just bloody stupid! I don't know why they didn't have a donkey down in the basement to

keep their computers running and their phones running. That is just negligence, I reckon.”

Given that disasters are fairly infrequent, many gains and losses in trust also happen during times of quiescence, and over fairly everyday matters. For example, Interviewee 18 calls the police to try and help them apprehend some local hooligans but they don't take any notice of her, leading her to think she won't bother calling the police again in future. Interviewees mentioned that financial matters could be a key issue over which trust is gained or lost. For example, councils who chose to spend large amounts of money on hazard mitigation that was not perceived as necessary often lost the trust of their citizens. Several participants from Timaru mentioned that the local council had spent a large amount of money earthquake-proofing the council buildings. To the participants the buildings looked new and structurally sound already, and they could not understand why so much money had been spent on earthquake improvements. In a similar vein, when people's own experiences of hazards do not match the information an agency is purveying, distrust can arise. For example, in Wanganui people had experienced only moderate floods, and distrust arose when they could not understand why the Regional Council was insisting that it spend a large amount of money upgrading flood protection to a height that they had never seen a flood occur at before.

There were two main themes that arose with respect to responsibility. First, if individuals felt that they had personal responsibility to deal with hazards (rather than it be the responsibility of others such as the local council), then they were more likely to get prepared. Second, if individuals felt some sort of responsibility for others, such as children, older adults, other dependents, the community or animals, then they were more likely to prepare. Interviewee 46 reflects on the reasoning for this and suggests that having a responsibility for others raises worry or anxiety, and prompts a desire to prepare: “I mean when you've got children, and young children, or even well, put it this way, dependent children, your fear factor or your consciousness of looking after other people is raised or heightened.”

Evidence could be found in the interviews that preparing for disasters was not generally considered a social norm. Some participants directly stated this fact, while others alluded to it. Interviewee 34 provided the most direct statement that described how preparedness was not considered a social norm.

*And so why for example, like you mentioned buying [...] life insurance or house insurance, why would you go ahead and do that?*

“Because everybody does it, whereas not everybody prepares for hazards. If you tell somebody you didn’t have any life insurance or you didn’t have any house insurance, then you would be up to, shall we say, social vilification. Because if your house actually burned down and you had no insurance, and you had to start again, then people would say, “What an idiot”. You would lose a lot of friends, even, on that basis. But if you lost your house in, say, a flood or an earthquake you’d have plenty of company, and so you’re not really acting against the social norm; whereas having life insurance and house insurance is a social norm, where you tend to respond to social norms. Maybe in the future proper natural hazards preparation will become a norm but I don’t think it’s a norm yet.”

The concept that preparing is not a social norm was reflected in people’s beliefs, particularly the suggestion that many people thought, “Preparing is over the top”. Such norms hindered people’s desire to prepare for earthquakes. Other norms were at play, however, for example the norm that you should help other people in your community motivated some interviewees to prepare. The influence of social norms are discussed more fully in Chapter 8 (Becker, Paton, et al., submitted-c).

Finally, there were a few references to the fact that if people are required to prepare because of regulation, then they will do so. One interviewee stated that in order to get insurance for certain items (i.e. Interviewee 12 mentioned getting insurance for a set of stamps), a degree of preparedness was required by her insurance company (i.e. a storage unit which was anchored to the floor). The requirements of certain legislation also prompted a degree of preparedness, for example, the Building Act (2004) and associated Building Code require that buildings are constructed or brought up to certain standards to protect life safety for earthquakes; the Health and Safety in Employment Act (1992) requires that certain safety and emergency preparations are undertaken in the workplace. Unfortunately there is little regulation in New Zealand that specifically targets household earthquake preparedness (e.g. the Building Act does not legislate for the retrofitting of residential buildings less than two storeys high and containing less than three household units), so evidence of the effectiveness of regulation on preparedness was only seen anecdotally though the parallel examples presented here.

### 5.3.6 Uncertainty

In the model, uncertainty is placed across all aspects of the process, as uncertainty is a major player in terms of information itself, people's interpretation of that information, their beliefs and feelings, societal influences and even to the point where they create an intention to prepare (Figure 5.2 – "Uncertainty"). Some aspects of the influence of uncertainty have already been discussed previously in this paper.

Individuals discussed a range of uncertainties they had, most of which were related either to uncertainty about hazards, or uncertainty about how to prepare. In particular, people often described how the outcome of a hazard event was very uncertain: no-one knows exactly what will happen in an event, what the impacts will be, and what you might need to do to mitigate those impacts (either before or after the event). The timing of the next big event, particularly in relation to earthquakes, also provided an element of uncertainty for most. People were not likely to prepare if they were uncertain about whether an event might actually happen or not. Interviewee 31 summed this up by saying, "...there's no point in planning for something that may not happen. You know, you've got all your plans in place, and it's something else. You can do all your planning for fire, and you've left earthquake out of it." Interviewee 22 described how uncertainty about the nature of an event itself could hinder preparedness: "Well a disaster is something that strikes suddenly and without warning. And how can you prepare for it, because you don't really know what form it will take, or what you will have to do to overcome things." A complex task like making a family plan for what to do after an earthquake, was complicated by uncertainty surrounding what effects could be expected during a potential event, and as consequence was often a task not tackled by the interviewees. People often stated they didn't know what scenario to make a plan for. The interviews reflect that uncertainty has an impact on preparedness through influencing beliefs such as negative outcome expectancy, fatalism, denial, and enhancing the belief that people will simply be able to respond at the time when they find out exactly what the disaster is. Uncertainty can reduce worry and concern about hazards, and reduces short-term motivation to act and get prepared.

Uncertainty can also lead to anticipatory anxiety, whereby people are anxious about facing something they have feared in the past such as earthquakes. Interviewee 13 describes how uncertainty about the timing and impacts of earthquakes leads to fear and

anticipatory anxiety about how she could deal with and respond to an earthquake. This then prevents her from thinking about how to practically prepare for an earthquake, and as a consequence she is not prepared.

“Well, the thought of an earthquake scares me. In fact I suppose that some of the - you don’t need to think about it. Yeah, no, an earthquake I think earthquake kind of thing like that really scares me if I think about it. I think about how we would all cope. And the likes of the tsunami. Because they come so quickly those things, whereas snow I have dealt with a lot more, that doesn’t frighten me quite the same. I’ve dealt with that a lot. Just, yeah, and the other thing is too I think because at this particular time, I suppose Timaru is quite well populated all the same, isn’t it, but you’re not in such a big populated area that you don’t see great big two storey buildings falling down on top of you. Like you would if you were in a bigger city. I mean, I know you still see your buildings falling down on top of you and whatever, but, you know, I think an earthquake here wouldn’t be the same as a big earthquake in Christchurch. So I guess in that respect I haven’t really let myself consider it. Other than yes, it would scare me. How you deal with it and how you fare.”

Other interviewees reported that uncertainty was a motivator of preparedness. For the most part, despite their uncertainty about the nature of a future earthquake event, these individuals still thought that an event “Can happen anytime”. These people tended to have positive outcome expectancy and believe that preparedness would be useful in an event. They also seemed to have a realistic understanding of the limitations of preparedness, in that preparedness might not address every problem they encountered during a disaster, but would go a fair way toward helping them survive and prosper after an event. Some people were worried by the uncertainty surrounding the potential impacts of a hazard event and so were motivated to directly get prepared because of this worry. For these people such preparedness reduced the worry and the uncertainty of how to respond.

Uncertainty about hazards or preparedness could also motivate an individual to seek further information in an attempt to become better informed. Uncertainty about information itself could also encourage information seeking in an attempt to verify the information through different sources. Individuals were more likely to seek information

due to uncertainty because of lack of experience, uncertainty regarding hazards and preparedness from what they saw (e.g. information seen from passive sources) or heard (e.g. a speaker at a community group), or from uncertainty about how to respond in an event. Information sought tended to be interactive (for example, people would talk to civil defence, join a group, talk to their local school) or they may draw upon limited passive information sources (for example, the Internet and telephone book were the most often cited sources of passive information).

Links between uncertainty and trust were evident. People's uncertainty about information could lead to reduced trust. For example, as discussed in the section on societal factors (5.3.5), where information was contradictory, uncertainty and distrust arose (e.g. if people's perceived understanding of risk differed to an organisation's perception of risk and ways of dealing with it). In addition, trust issues arose when people had uncertainty over whether mitigation measures advocated or managed by an organisation would actually reduce risk in an event (e.g. whether stopbanks or pumps would actually reduce flood risk in an event).

### **5.3.7 Acceptance of loss**

Some individuals appear to undertake a 'rational' assessment of the information available to them about hazards and preparedness in making a decision whether to prepare or not (Figure 5.2 – "Acceptance of loss"), similar to the process suggested by Kunreuther (1992). In doing so, they also draw upon their existing beliefs and feelings (and the influence that societal factors have on these beliefs). As a consequence, some may choose to make an 'informed decision' about whether to accept a potential loss or not. If they choose to accept the loss, they may decide that it is not worth preparing. A decision may be based on what the individual believes to be good or adequate information, or may be based on only limited information. Most decisions about acceptance of loss are related to accepting loss of money or property, rather than loss of more social aspects such as loss of life or community. For example, Interviewee 1 discusses monetary costs versus consequences in making decisions about whether to accept loss or not: "...you are always going to be balancing the cost, if you like, against the consequences. You can accept some losses, in some cases you accept them, whereas rather than pay the price of eliminating the risks..."

### **5.3.8 Formation of intentions to prepare**

The interviews revealed that a distinct category of “Intention to prepare” could be identified (Figure 5.2 – “Intention to prepare”). People drew upon information, societal influences, beliefs and feelings before deciding whether to prepare or not.

### **5.3.9 Resource issues**

Many of the interviewees that had identified that preparing was important, and that they should prepare, were impeded by a variety of what is termed in this paper as “Resource issues” (Figure 5.2 – “Resource issues”). People identified a lack of knowledge as a barrier to getting prepared, particularly a lack of knowledge about what preparedness items to gather, how this should be done, and how to make their buildings safer. (Lack of knowledge about hazards was important at earlier stages of the process, in particular with respect to assisting with the formation of beliefs and feelings). Linked with this lack of knowledge was that fact that people often did not feel capable of preparing, usually because they lacked the knowledge, skills or tools to undertake preparedness.

A major barrier to preparing was the time factor, with interviewees suggesting that they just did not have time to undertake preparedness, as their lives were already full with undertaking other daily tasks. People suggested that they had other priorities that were far more pressing, such as work, looking after families, or just living their lives.

Getting prepared was seen as a costly business by a number of participants, and consequently many had not undertaken preparedness for this reason. Of those that had prepared, often the cheapest and easiest measures had been undertaken, such as storing food or water. More costly measures such as retrofitting buildings had only been undertaken by a very few participants in the study, and often had been done as a part of general house maintenance or renovation, rather than specific retrofitting.

A major issue for many interviewees was that they had a problem of knowing where to store preparedness items. Some simply suggested they had no storage space in which they could store any items, and therefore had not prepared because of this. Others were confused about where the best place was to store items. People had a myriad of questions on this topic: Should they store items together in one place, or should they be scattered around the house? Should they store items inside the house, or outside in a

separate space such as the garage? Where was the safest place? What if they could not get to the items in an emergency, for example, if the garage collapsed in an earthquake?

Another issue that emerged was that sometimes people did not prepare because they didn't want to see items go unused during times of quiescence (either because they thought it was a waste, or because they thought that the item wouldn't work in an emergency if it hadn't been kept updated or in regular use).

Finally, although most people interviewed were home-owners, there were a few that did not own their own home (e.g. they rented). These people admitted that they were either less willing or unable to make changes to their residences due to the fact that they did not have jurisdiction over the building they lived in.

### **5.3.10 Preparedness**

In general, participants were more likely to have undertaken simple preparedness actions related to collecting survival items (Figure 5.2 – “Preparedness undertaken”). Water and food were the two most often mentioned collated preparedness items. Other common items included alternative cooking and heating devices, torches, radios, candles, batteries, and smoke alarms. People's understanding of preparedness reflected their belief that they thought preparing was primarily related to having the “basics” required for safety or survival. While many admitted to having prepared survival items specifically for an emergency, there was an equal number of others who were using “just what they had in the house already” for an emergency. Undertaking exercises, drills and training for emergencies were also mentioned as important aspects of preparedness that interviewees had participated in.

Few had actually undertaken more complex tasks, such as preparing an emergency plan or retrofitting their home for earthquakes. That few had undertaken such complex tasks appeared to be related to a number of factors, such as their focus on basics and survival, a lack of knowledge of the consequences of a catastrophic event (also related to hazard uncertainty), a lack of knowledge about how to undertake more complex tasks (also related to preparedness uncertainty), fatalism, being overly optimistic about the outcome of a large event, and resource difficulties in carrying out complex preparedness actions.

While survival items were most commonly mentioned in relation to the concept of preparedness, participants did discuss other aspects that they considered preparedness to be. For example, interviewees noted that preparedness was also necessary for wider society—for example, workplaces should be prepared for disasters, local authorities should ensure that community mitigation measures are in place, and buildings should be safely constructed. Also many people referred to preparedness more philosophically, saying it was about “forward thinking” or that preparedness should be “a way of life”.

Few people discussed the additional benefits of preparing. Of those that did, most referred to the fact that being prepared meant they had additional items in the house they could use if they need to (e.g. could break into food supplies, or use a gas cooker); that preparedness increased general safety (e.g. items were secured so small children wouldn't be injured, acquired first aid or fire safety skills through training); and two people mentioned that freezing bottled water in their freezer made the freezer more efficient. People didn't really connect preparing with broader benefits, such as that it would save money in the long run.

### **5.3.11 Sustained preparedness**

Once people have got prepared for a disaster, a difficulty is getting those people to continue to update their preparedness over time (e.g. replenish food and water, ensure that fresh batteries are available) (Figure 5.2 – “Sustained preparedness”). There were a number of interviewees who did undertake sustained preparedness, while many others thought it was important but just didn't get around to it.

People suggested they kept their preparedness items updated for two main reasons. The first was related to personality, whereby “organised” people admitted to ensuring that they kept their supplies updated. They used a variety of methods to organise this. One interviewee wrote in her diary to update her supplies every 6 months. Others used the change from ‘normal’ time to ‘daylight savings’ time (and vice versa) as a cue to replenish or update their supplies. This approach is advocated in some passive information preparedness campaigns (e.g. by the Fire Service regarding changing batteries in smoke alarms), so it is clear that some individuals have taken these messages on board in this context.

A second reason for undertaking sustained preparedness was that people desired to keep their supplies fresh and/or in working order in case they had to use them. In particular people wanted to ensure they had safe drinking water and food, and this desire for safety encouraged people to turn these items over as part of sustained preparedness. Many beliefs about the necessity for safe water in particular were formed by exposure to passive information (i.e. seeing water issues occurring in a disaster elsewhere) or by experience (e.g. visiting a country with poor water quality, needing to ensure drinking water is safe for outdoor recreation).

Respondents also noted that constant informational reminders were needed to ensure that they remembered to undertake sustained preparedness.

## **5.4 Discussion**

This research has allowed the process of information use, interpretation and the relationship with household preparedness to be identified and mapped into a model (Figure 5.2). The developed model has been depicted in a linear sense; however the process itself is not strictly linear as feedback also occurs during the process. This is supported by other models such as the Person relative to Event theory, which suggests that people's appraisal of a threat, coping and evaluation of responsibility for the threat does not occur in a linear fashion (i.e. primary appraisal followed by a secondary appraisal) but rather can happen as part of a parallel simultaneous process (Mulilis & Duval, 1997, 2003). Important aspects identified for the newly developed model are summarised as follows.

### **5.4.1 Type of information (passive; interactive; and experiential)**

It was evident from the interviews that several types of information are utilised by individuals, including passive, interactive and experiential information, all of which serve different functions from raising awareness through to directly motivating preparedness. Traditional education programmes about hazards and preparedness tend to focus on providing passive information. However, when devising education programmes more lateral thought should be given to including a wide variety of types of information that will support the interpretation and preparedness process undertaken by individuals. For example, having school children go home with interactive

homework assignments around household preparedness would just be one straightforward way to move beyond more passive forms of preparedness education.

### **5.4.2 Immediate influences**

A number of immediate influences of hazard and preparedness information were identified as part of the model. Information raised awareness and knowledge and prompted thinking and talking about hazard issues, consistent with previous research that identifies that critical awareness is a key part of the preparedness process (Lindell & Perry, 2011; Lindell & Prater, 2000; McIvor & Paton, 2007; Mileti & Darlington, 1995, 1997; Mileti & Fitzpatrick, 1992, 1993; Paton, 2003, 2007a; Paton, Kelly, et al., 2006; Paton, McClure, et al., 2006; Paton, et al., 2005; Paton, Smith, et al., 2003). Information can also help build skills, depending on the format used, with interactive and experiential information being more beneficial in assisting with this. A new category of influence was also identified as “Understanding consequences”, which appeared to reflect more detailed thinking and comprehension about the impacts of hazards. People with a better understanding of consequences seemed more likely to be motivated to get prepared. McClure et al. (1999) and Hurnen and McClure (1997) have highlighted in previous research that people with more complex causal models of earthquakes have a better understanding of the effects of earthquakes and how to prepare. Having an understanding of the consequences, as found in this research, reflects the importance of having a complex causal model. Education strategies should ensure that a range of activities are included that stimulate critical awareness, build skills and help people truly understand the consequences of what an earthquake event might be like.

### **5.4.3 Formation of beliefs**

The model identifies a range of beliefs that influence the preparedness process—they can be divided into hazard beliefs, preparedness beliefs, and personal beliefs. With respect to hazard beliefs, previous literature identifies two main issues regarding risk perception. The first is that risk perception appears to be only weakly correlated with household seismic adjustment adoption (Solberg, et al., 2010). The second is that prior studies have identified only a few important aspects of risk perception and other salient beliefs, but not the full range that exist and how these interact within the preparedness

process (Lindell, et al., 2009; Lindell & Perry, 2000). This research has been able to map the most important perceptions and beliefs that influence preparedness and the interactions between these. As there is not space in this paper to discuss these in detail, these are discussed in Chapter 7 (Becker, Paton, et al., submitted-b).

Some of the preparedness and personal beliefs identified in this study have already been highlighted as important in previous studies, e.g. beliefs related to self-efficacy (Cowan, et al., 2002; Duval & Mulilis, 1999; Lindell & Prater, 2002; Lindell & Whitney, 2000; McClure, et al., 2001; McClure, Sutton, & Sibley, 2007; McClure, Sutton, & Wilson, 2007; McClure, et al., 1999; Mulilis & Duval, 1995; Rüstemli & Karanci, 1999; Şakioroğlu & Karanci, 2008); outcome expectancy (Davis, 1989; Farley, et al., 1993; Garcia, 1989; Lindell & Whitney, 2000; McIvor & Paton, 2007; McIvor, et al., 2009; Mulilis & Duval, 1995; Mulilis & Lippa, 1990; Paton, 2003; Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Sagala, et al., 2010; Paton, et al., 2005; Paton, Smith, et al., 2003; Şakioroğlu & Karanci, 2008); personal responsibility (Garcia, 1989; Jackson, 1977, 1981; Mulilis & Duval, 1995, 1997; Perry & Lindell, 2008); normalisation bias (Johnston, et al., 1999; Mileti & O'Brien, 1992; Nguyen, et al., 2006; Russell, et al., 1995) and optimistic bias (Burger & Palmer, 1992; Helweg-Larsen, 1999; McClure, 1998; Spittal, et al., 2005). Others appear to be newly identified beliefs (e.g. people's consideration that "Preparedness is a way of life" or the belief that "Preparing is over the top"). Emergency managers undertaking earthquake education should ensure that any educational programmes attempt to develop the helpful beliefs identified in this paper, and work to reduce negative beliefs through more interactive programmes.

#### **5.4.4 Emotion and feelings**

Emotion and feelings form a core component of the meaning-making process for people. Important emotions and feelings of note included excitement, interest and those related to anxiety, fear and worry. Such emotions and feelings instigated a variety of interactions, including information seeking, belief formation and direct preparedness. Overall, when analysing the interviews it was found that those with higher levels of anxiety or worry (expressed in ways such as earthquakes are "frightening", "terrifying", "scary", "horrific" or "dreadful") were more likely follow a process toward getting prepared, than those who were simply concerned or uneasy. This is at odds with some previous earthquake research, which has found that higher levels of anxiety can inhibit

aspects of the preparedness process such as reduce outcome expectancy (Paton, et al., 2005; Paton, Smith, et al., 2003), and contrary to theories such as the Yerkes-Dodson law which suggests that high levels of emotional arousal can inhibit performance (as well as very low levels). However, other research does support the concept of high arousal leading to action (Dooley, et al., 1992; Hanoch & Vitouch, 2004). It is likely that other contextual factors, such as experience or exposure to other specific types of information, or self-efficacy, play a part in determining whether anxiety will lead to action (Dutton & Carroll, 2001). For example, Hanoch and Vitouch (2004) suggest that restricting information (i.e. focussing on essential or goal-relevant information rather than providing too much information) can lead to an improvement in performance during states of high arousal. This may well be the case with the interviewees, as many who got prepared as a consequence of feeling worried did so after either being exposed to or seeking specific goal-relevant information on how to prepare. Thus, despite the interviews showing that emotions such as “fear” are important in motivating preparedness, it is not just fear that gets people prepared; specific information about preparedness is also required to ensure people develop positive outcome expectancy. This supports previous findings that earthquake education programmes should provide a realistic perspective of the impacts of earthquakes to help people acquire a level of hazard concern that promotes action (versus fear; e.g. Mileti, 1999), as well as practical advice about the effectiveness of preparedness measures (McClure, et al., 1999; Paton, 2006).

#### **5.4.5 Societal factors**

Several key societal factors were identified as interacting with the information and preparedness process, including sense of community; community participation; leadership; trust; responsibility; social norms; and a requirement to prepare. While many of these attributes have been highlighted from prior quantitative work (e.g. Paton and colleagues highlight many of these aspects in their resilience model, Paton, 2005, 2006, 2007a; Paton, Bajek, et al., 2010; Paton, Johnston, Smith, et al., 2001; Paton, McClure, et al., 2006; Paton, Millar, et al., 2001; Paton, Parkes, et al., 2008; Paton, et al., 2000), the benefit of this project was that a better understanding was gained of how these elements interact. For example, it was found that trust can be difficult to build, and damaged fairly easily, in line with Slovic’s (1993) findings regarding trust

asymmetry. The interviews revealed that experiential information, both in times of quiescence and disaster, play a key role in influencing trust relationships, and in forming beliefs about whether preparedness was important or not, or whether it would be effective (outcome expectancy). Societal norms had a strong influence on formation of beliefs such as “Preparing is over the top”, or that it was important to help other people in your community during a disaster. It is evident that the influence of society has diverse influences on the preparedness process and cannot be ignored when developing earthquake education programmes.

#### **5.4.6 Uncertainty**

Uncertainty was found to be influential across many aspects of the model: individuals were uncertain about information, about the hazard itself, about the outcome of a hazard event or about how they could deal with a hazard. Uncertainty could act to derail the preparedness process (e.g. through the formation of unhelpful beliefs or reducing worry) or could be a motivator of preparedness (e.g. by increasing worry). Uncertainty could also lead to a person seeking further information. Uncertainty can be difficult to address, as many aspects of earthquake hazard in particular are not easily quantified or communicated to the lay public. Some elements of uncertainty can be tackled, for example, people’s uncertainty about the presence of an earthquake hazard due to a lack of knowledge. In this case the use of interactive information in combination with passive information is potentially the best way to raise knowledge. Other aspects will likely always be unknown (e.g. when the next earthquake will occur) and will need to be addressed slightly differently. For example, the focus of the information might need to be on assisting people to believe that it “Can happen anytime” and letting them know how to deal with it. Information needs to be tailored to the specific type of uncertainty that is intended to be addressed.

#### **5.4.7 Other aspects of preparedness**

After forming core beliefs, some (but not all) people undertook a rational cognitive assessment of whether they could accept the losses imposed by an earthquake or not, and if they were willing to accept the loss, often did not prepare (similar to the process suggested by Kunreuther, 1992).

Resource issues such as lack of knowledge, lack of time, lack of capability, other priorities, cost, knowing where to store items, and renting a property (rather than owning a home) were barriers to getting prepared. Such resource issues have also been highlighted in previous research (e.g. Blessman, et al., 2007; Carter-Pokras, et al., 2007; Kunreuther, et al., 1978; Lindell, et al., 2009; Mileti & Darlington, 1995; Palm, et al., 1990), and ways of addressing these issues need to be factored into education and empowerment programmes.

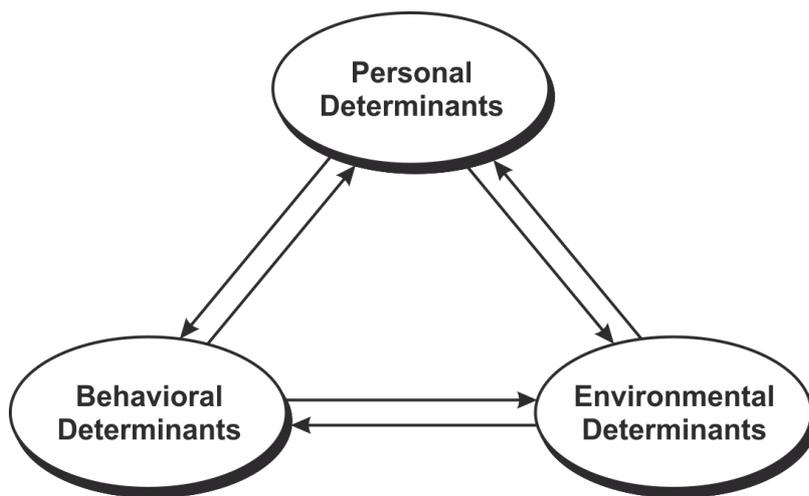
The interviews revealed that people did develop distinct intentions to prepare similar to what is promoted in the TRA and TPB-type models. Actual preparedness tended to be focused on gathering together simple survival items, rather than undertaking more complex tasks such as developing an earthquake response plan or undertaking mitigation actions. In addition, people are not likely to sustain their preparedness for any length of time. That people tend to focus on survival items concurs with current literature, which suggests that people are most likely to do things that are deemed easier to undertake (Farley, et al., 1993; Russell, et al., 1995), have been recommended for a long time (Mileti & Darlington, 1995), or are associated with general emergency preparedness (Heller, et al., 2005). It is obvious there still remains a problem with people focussing on survival items for preparedness, and this needs to be a focus of on-going educational efforts.

#### **5.4.8 Fit with previous models of earthquake adjustment adoption**

When reflecting on previous models it can be said that the model developed for this research fits aspects of previous work. For example it fits with previous TRA and TPB models in that attitudes toward behaviours, subjective norms and control are influential on behavioural intentions. Consistent with the PMT seen in Mulilis and Lippa's research (1990) and the PrE model (Duval & Mulilis, 1999; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2000; Mulilis, et al., 2003), people do assess the likelihood and severity of the consequences of the threatening event, their self-efficacy, and the response efficacy of protective actions in coming to decisions about whether to prepare or not. Personal responsibility for protection is also another important aspect, as identified in the PrE model. The model fits more closely with Lindell and Perry's (1992, 2000, 2011) Protective Action Decision Model as it maps out a variety of situational, personal and social characteristics that influence the

preparedness process. Paton's (2006) model also provides a good fit, as many of the community and societal indicators found in Paton and colleagues' research are also confirmed by this research (e.g. that self-efficacy, outcome expectancy, critical awareness, community participation, empowerment and trust) are important in motivating preparedness. The new model however advances thought by identifying additional predictors of preparedness (whether they be directly influential of preparedness or mediating factors) and helping to understand the interactions between different variables.

In attempting to place it in context with other current theories, it perhaps best resembles a model developed according to Bandura's (1986) Social Cognitive Theory (Figure 5.3). As well as identifying that cognition plays an important role, the theory also considers the importance of context, interaction and meaning-making in people's decisions about behaviour. In his model, Bandura suggests that human behaviour is influenced by three main factors: personal determinants (also described as cognitive factors, e.g. knowledge, expectations, attitudes); behavioural determinants (e.g. skills, practice, self-efficacy); and environmental determinants (e.g. social norms, access in the community, influence on others). Some of these factors have a direct influence on behaviour, while others interact with other factors or serve as mediators (for example, the influence of socio-environmental factors is mediated by cognitions). The three main factors are certainly seen in the model developed from this research (Figure 5.2), with the cognitive factors represented by "Beliefs" and "Uncertainty"; the behavioural determinants primarily represented by "Immediate influences", "Intention to prepare" and "Preparedness"; and environmental determinants represented by "Information" and a variety of societal influences. Perhaps the theory's one weakness is a lack of focus on emotions as an influence on behaviour (Breinbauer, et al., 2005), as in the earthquake preparedness context "Emotion and feelings" are seen as a key factor in developing beliefs and directly driving behaviour. Bandura's model has not been applied in an earthquake preparedness context before, and with some adaptation could well be a better fit than previous models.



**Figure 5.3** Bandura's model of Social Cognitive Theory representing the triangular relationship between the three main factors of human behaviour (Bandura, 2001, p. 266).

In analysing interviews from the three different locations, there appeared to be few differences between the communities in terms of the overall process of information meaning-making and how this contributes to preparedness. The only major differences noted were with respect to perceptions of earthquake risk in the three different communities (with Timaru interviewees thinking they were exposed to the least earthquake risk and Napier interviewees the most risk). The variation in risk perceptions had an effect on levels of awareness and understanding, but did not significantly alter the overall process itself. As a consequence the model held true for all the three locations of Napier, Wanganui and Timaru and is likely to be applicable in a wider New Zealand context. Further research could confirm whether it is also applicable in an international context.

#### **5.4.9 Limitations**

This research undertaken for this project has several limitations. First, as the study was qualitative in nature it does not measure representativeness of the model across the wider population. A quantitative study is required to test and confirm the model findings for the general population as a whole. Second, due to the self-selection of interviewees there is likely some bias present in the interview sample, namely: an over-representation of 'community-minded people' (as the majority of invitations were sent to community groups); an over-representation of people interested in earthquakes and

preparedness; and an over-representation of older people in the sample (i.e. over half the sample were 60 years or over). Third, this model did not consider the influence of personality on preparedness, as the primary focus of the research was to identify aspects that could be useful for developing new directions for earthquake education and resilience strategies, rather than focus on something that is impossible to change such as personality. Future research could focus on identifying aspects of personality that contribute to getting prepared, and how this relates to the overall model.

## **5.5 Link to Chapter 6 - Paper 3**

The following chapter (Chapter 6 - Paper 3, Becker, Johnston, et al., submitted-c) discusses people's prior experiences and how these relate to the earthquake preparedness process. People's experience was found to have a profound influence on how people make meaning of earthquake and preparedness information, and in motivating them to prepare. The findings suggest that earthquake education programmes should be developed and administered within the context of individuals' prior experiences.



# Chapter 6 Paper 3: The role of prior experience in informing and motivating earthquake preparedness

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## Abstract

A number of researchers have investigated the influence of previous earthquake and disaster experience on household preparedness for earthquakes. Experience of an earthquake can, in some circumstances, influence people's risk perceptions and other beliefs about earthquakes and preparedness (including the formation of both optimistic and normalisation biases); influence anxiety, fear and concern about earthquakes; and prompt changes in actual physical preparedness. In the absence of direct earthquake experience, people may instead be influenced by experience of other hazards or events in their lives, which in turn can have a bearing on preparedness. Whether experience is effective in prompting changes in preparedness appears to be highly dependent on the nature and context of people's experience. It is this nature and context that little is known about, along with how this relates to people's decisions about preparing. It is likely that in making decisions about earthquake preparedness, people go through a meaning-making process, whereby they draw upon prior experience in interaction with a range of other cognitive, emotive, social and environmental factors. This New

Zealand-based study aimed to identify such interactions and provide recommendations for emergency managers on how they can better factor the influence of disaster and adverse event experience into earthquake education programmes.

## 6.1 Introduction

One of the ways of reducing the risk from earthquakes is for individuals to undertake household earthquake preparedness. Preparedness activities can include collecting together survival items (e.g. food, water, other essential items); undertaking mitigation actions (e.g. retrofitting buildings, securing household items); making a household emergency plan; learning survival skills; or participating in social activities related to earthquake preparedness (Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Mulilis, et al., 1990; Russell, et al., 1995; Spittal, et al., 2008).

Despite many years of educational campaigns advocating household preparedness, preparedness levels remain low (Ronan & Johnston, 2005). One issue that prevents the development of more effective educational campaigns is a lack of understanding of the process of how people interpret and make-meaning of earthquake information, and how this influences preparedness. Many quantitative studies have been undertaken that have identified aspects of this process, but none have been able to comprehensively investigate the full range of cognitive, emotive, social and environmental factors that influence preparedness. This is primarily due to the constraints of quantitative research whereby the focus is generally limited to several key research questions or hypotheses. Qualitative research allows more in-depth exploration of ideas and processes.

To address gaps in understanding about how to motivate people to prepare for earthquakes, a qualitative study was instigated to define the process better. The project focused on exposure to earthquake information, how people make meaning of this information (i.e. through interaction with cognitive, emotive, social and environmental factors), and how this relates to undertaking actual adjustment adoption. This paper reports the findings related to experience of disasters and other adverse events, and how a person's prior experience plays a role in the information meaning-making and preparedness process.

## **6.2 Literature review**

### **6.2.1 The influence of previous earthquake experience**

A number of researchers have investigated whether having previous earthquake experience has directly prompted preparedness. Results of the various studies have been mixed, with some researchers finding only small or non-significant correlations between earthquake experience and preparedness (e.g. Kiecolt & Nigg, 1982; Lehman & Taylor, 1987; Mileti & Darlington, 1997; Mileti & Fitzpatrick, 1992; Tanaka, 2005), while others finding that experience can motivate preparedness (e.g. Farley, 1998; Lindell & Prater, 2002; Mulilis, et al., 1990).

Whether people prepare or not appears to be dependent on the nature of the experience. For example, people have undertaken additional preparedness actions depending on the number of earthquakes experienced (Russell, et al., 1995); after feeling shaking (Nguyen, et al., 2006); experience of damage (Davis, 1989; Palm & Hodgson, 1992; Perry & Lindell, 2008); the amount of earthquake damage and losses (Heller, et al., 2005; Jackson, 1977, 1981; Russell, et al., 1995); whether a person was more directly impacted (Palm & Hodgson, 1992); proximity to the epicentre (Nguyen, et al., 2006; Russell, et al., 1995); experience of personal loss by a family member (Turner, et al., 1986); being physically, financially or emotionally injured (Nguyen, et al., 2006); being evacuated (Russell, et al., 1995); knowledge of and contact with recovery agencies (Russell, et al., 1995); participating in rescue and solidarity activities in previous earthquakes (Tekeli-Yeşil, et al., 2010); thinking about the earthquake after the event (Russell, et al., 1995); hearing a prediction of a larger earthquake event (Russell, et al., 1995); and experiencing an earthquake that scared an individual (Dooley, et al., 1992; Russell, et al., 1995). Researchers have also found that people who undertake household preparations following disaster experience tend to implement measures that are easy or not costly (McGee, McFarlane, & Varghese, 2009; Palm & Hodgson, 1992; Russell, et al., 1995).

Researchers have noted that previous earthquake experience can have an influence on the formation of risk perceptions (e.g. Clark, et al., 1993; Dooley, et al., 1992; Karanci & Aksit, 1999; Lindell & Prater, 2000; Palm & Hodgson, 1992), but again this is dependent on the type of experience people have had. For example, risk perception may

be altered depending on whether individuals experienced loss or not (Davis, 1989; Helweg-Larsen, 1999; Mileti & O'Brien, 1992; Solberg, et al., 2010; Weinstein, 1989); and whether they experienced injury, or whether they knew of someone who had experienced an injury (Helweg-Larsen, 1999). An increase in perceived vulnerability may motivate people to become more prepared (Russell, et al., 1995). Experience of only relatively moderate earthquakes (e.g. magnitude 5.5, Modified Mercalli Intensity VI) can raise awareness about earthquakes, but can lead people to form the opinion that they are not a problem or to think that a 'big one' is not likely or imminent (Simpson-Housley & Curtis, 1983). Also people's experience of earthquake events, and their comparison with magnitude calculations, can lead them to underestimate the effects of a potential future earthquake (e.g. because the earthquake might be located far away from their location), and be less likely to prepare (Celsi, et al., 2005).

Normalisation bias has been reported by a number of researchers (Johnston, et al., 1999; Mileti & O'Brien, 1992; Nguyen, et al., 2006; Russell, et al., 1995) and may be one reason that people do not undertake adjustment adoption. With normalisation bias, people assume that they fared adequately in a previous event, and therefore do not need to do anything different (e.g. prepare) to survive a future event.

Optimism bias has also been found to be affected by earthquake experience. Optimism bias is people's optimism that they will be not harmed or impacted in an event when compared with others. Burger and Palmer (1992) found that shortly after the 1989 Loma Prieta earthquake in California optimism bias was non-existent, with people more likely to see themselves as more vulnerable than the average person. After three months had passed, optimism bias was again evident. They speculate that, "...such changes in unrealistic optimism over time may be a function of attention to and cognitive accessibility of information concerning one's vulnerability to an event" (Burger & Palmer, 1992, p. 43). As time passed, such information dwindled and people started to pay less attention to vulnerability information.

In subsequent years, Helweg-Larsen (1999) conducted her own study on optimistic bias following the 1994 Northridge, California earthquake. She found that while students did not show optimistic bias in the three months after the earthquake, they also did not show any up to five months afterwards, consistent with studies on other hazards (personal communication, Weinstein, 1996; in Helweg-Larsen, 1999) which

consequently suggests that disaster experience can have a longer term effect on optimistic bias. In Helweg-Larsen's (1999) study, those who had experienced no personal loss were found to be more optimistic, as were those who had not sustained personal injury or did not know others who had been injured.

In terms of affective domains, disaster experience has been shown to influence concern and anxiety, and this in turn can prompt preparedness (Dooley, et al., 1992; Heller, et al., 2005; Karanci & Aksit, 2000; Rüstemli & Karanci, 1999; Siegel, et al., 2003). As mentioned previously, experiencing a 'scary' earthquake (or an earthquake that induced fear) has in some studies been directly linked to people getting better prepared (Dooley, et al., 1992; Russell, et al., 1995). A similar link between fear and preparedness has also been found in a flood experience context, with Takao et al. (2004, p. 784) suggesting that "emotional response has a stronger effect on preparedness for floods than a cognitive response". Rüstemli and Karanci (1999) suggest that fear actually shapes cognitions and motivates adaptive responses.

Siegel et al. (2003) investigated whether experience of 'emotional injury' during the Northridge earthquake influenced response to a slow-onset El Niño disaster. They found that the earthquake experience increased people's perception of the likelihood of receiving property damage during an El Niño event, increased worry, and increased reporting of emotional injury during the subsequent event. They also discovered a direct relationship between prior perceived 'emotional injury' and application of preparedness for the El Niño.

Conversely, Palm and Hodgson (1992) found that while experience of the Loma Prieta earthquake increased concern about future earthquakes, this did not translate into high rates of adjustment adoption for most mitigation measures. This may be possibly due to the level of concern experienced, with lower levels or too high levels of concern being less likely to motivate preparedness (Paton, et al., 2005; Paton, Smith, et al., 2003).

A number of researchers, when undertaking research into people's disaster experience, have found that belief in personal control (associated with locus of control) has an impact on whether people prepare for subsequent events. In a survey of earthquake survivors in Erzincan, Turkey, Rüstemli and Karanci (1999) found that fear and belief

in personal control were the two most important indicators of whether people would prepare for future events.

Direct experience of a disaster has an impact on memory of an event. Neisser (1996) undertook a study following the Loma Prieta earthquake and found that individuals who had direct experience of the event (as participants) had better recall of the event a year and a half later, when compared with those who had only heard about the event through the news. While unconfirmed, they suspect that this was likely due to those with direct experience talking about the event afterwards in the form of narratives. It was unclear as to whether the repetition of the narratives made the earthquake more memorable, or because it increased the distinctiveness of the experience. Lee's (1999) study with children after Hurricane Andrew found that a year and a half after the hurricane, children expressed vivid memories of their experiences, as did people questioned by Norris and Kaniasty (1992) when asked about what they remembered of their experience with Hurricane Hugo. Norris and Kaniasty (1992) suggest that people remember disastrous events because they cause great change in people's lives, and their vividness distinguishes them from other life events.

### **6.2.2 The influence of vicarious experience**

As discussed above, Neisser (1996) notes that people who have vicarious experience in terms of media exposure tend not to recall experiences as well as those who have a direct experience. Paton, Johnston, Bebbington, Lai, and Houghton (2001) also looked at the effects of direct and vicarious media experience of a volcanic eruption from Mt Ruapehu in New Zealand in 1995, and the influence it had on risk perception and adjustment adoption. They found that only individuals who had directly experienced the effects of the eruption (i.e. ash fall) had changes in risk perception, while those that had vicarious experience did not. The risk perception variables measured included threat knowledge (local eruption history, including ash thickness), and perceived threat to safety and daily life. As only a limited number of risk perception variables were measured, it is possible that the vicarious experience changed other perceptions but these changes were not captured by the survey undertaken.

It has been suggested by other authors that vicarious experience can influence risk perception (Flynn, et al., 1999; Sjöberg, 2000) and protective action (Lindell & Perry,

2011). Karanci and Aksit (2000) found that vicarious media experience of the Marmara earthquake in Turkey raised people's awareness of the consequences of an earthquake, and developed important beliefs that people would have to rely on their own resources in a future event. McClure, Wills, Johnston, and Recker (submitted) found changes in risk perception following vicarious experience of the 2010 Darfield earthquake in Canterbury region, New Zealand. Following the Darfield earthquake, people living in two cities outside Canterbury (Palmerston North and Wellington) felt that an earthquake was more likely to occur somewhere in New Zealand. When asked specifically about their own cities, however, only the Palmerston North residents rated the likelihood of an earthquake in their own city as being significantly higher than before the Darfield earthquake. The difference between Palmerston North and Wellington is that Wellington had higher levels of risk perception before the Darfield earthquake, indicating that vicarious experience may only be influential on risk perceptions if baseline levels of risk perception are low to start with.

Vicarious experience in the form of other people's experience may have an effect on people's perceptions and preparedness. Studies have reported that knowing someone who has experienced personal loss or injury (such as a family member) may alter risk perception or motivate an individual to get prepared (Helweg-Larsen, 1999; Turner, et al., 1986). Conversely, McClure et al. (submitted) found no significant difference in earthquake risk perception between those who knew people in Christchurch who had experienced the Darfield earthquake, versus those who did not. However, their study did not identify the types of experience the people in Christchurch had been through, or the relationship between the participant and the Christchurch resident, making it difficult to ascertain whether the vicarious experience of others really did have an impact.

### **6.2.3 The influence of other types of experience**

Paton et al. (2000) highlight that other types of 'hazard-related' experience, such as crime, accidents, economic adversity or unemployment, may be more salient to community members, than natural hazards. Norris (1997) found in her study across different domains of precautionary behaviour (hazards preparedness, crime prevention, vehicular safety and health maintenance) that people tend to take a general stance to a range of environmental threats. She states that, "'Be prepared' is a motto that many

people seem to have taken to heart. In contrast to a view of the public as unconcerned with the management of risk, precautionary behaviours appear to be a common element of life” (Norris 1997, p. 574). Her findings suggest that because people already have precautionary beliefs and behaviours across different aspects of life, a multi-hazard approach to encouraging self-protective behaviour is valid. Spittal et al. (2008, p. 811) have also found that people’s propensity for risk precaution predicts earthquake preparedness, indicating that “people who take precautions about potentially adverse life events are more likely to prepare for earthquakes”.

A note of caution is required however; differences do occur when comparing the uptake of different precautionary measures (for example, more people wear seatbelts than collect survival items for a disaster). Therefore it is important to note that while taking a multi-hazard approach may be generally relevant, the mechanisms for motivating preparedness for life-related hazard experiences are unlikely to be exactly the same as for earthquake preparedness, and that specific actions may be required to target certain aspects of earthquake adjustment adoption.

#### **6.2.4 The ‘window of opportunity’**

McGee et al. (2009) reviewed a number of papers related to disasters, health and policy issues and point out that individuals are often prompted to adopt risk-reducing behaviour following direct experience of a significant event, thus a ‘window of opportunity’ may exist after an disaster whereby people may be more likely to undertake adjustment adoption. However their research on wildfire indicates that the ‘window of opportunity’ may exist only for those that have been more directly affected by the experience (i.e. in their study this relates to those that had to stay in their homes during the fire or were officially evacuated), as this direct experience makes them more receptive to future preparedness information.

In an earthquake context, a number of researchers also refer to a ‘window of opportunity’ following a damaging earthquake in which emotion, awareness and preparedness activity may be enhanced (Dooley, et al., 1992; Russell, et al., 1995). Pennebaker and Harber (1993) found that experiencing the Loma Prieta, California earthquake prompted increased thinking and talking about the earthquake event for 2 weeks, followed by increased thought for 6 weeks, after which time people no longer

thought or talked about the event. They suggest that in this brief period of time social norms changed and it became acceptable to think and talk about earthquakes. Karanci and Aksit (2000) found that the window of opportunity of raised anxiety following the Marmara Earthquake was useful for initiating participatory projects on earthquake preparedness. Tanaka (2005, p. 220) notes, however, that the opportunities may be short-lived and that “lessons from earthquake experiences are soon forgotten”.

In a hurricane context, Sattler et al. (2000) also surmise that the passing of time may explain why one sample of hurricane survivors did not get prepared compared with another sample who did get prepared. They suggest that over time, as distress diminishes or becomes less readily activated, it may limit the usefulness of experience in motivating preparedness. An increase in optimistic bias, as noted previously, is also likely to play a role.

Anecdotal evidence from the 2010-11 Canterbury earthquakes in New Zealand suggests that vicarious experience may also result in a ‘window of opportunity’ whereby adjustment adoption increases following an event, but this is still currently being documented in terms of research.

### **6.2.5 Models of disaster experience and preparedness**

Several researchers (e.g. Lindell & Perry, 2000; Mulilis, et al., 2003; Weinstein, 1989) acknowledge that while much research has been undertaken in attempt to understand the effect of experience, there still appears to be limited understanding about why experience can prompt preparedness. Mulilis et al. (2003) attempt to explain a basic process behind experience as a preparedness prompt in their study following a swarm of tornadoes in Western Pennsylvania in 1998. Using the Person relative to Event (PrE) theory as a context, they suggest that experience of a tornado increases people’s level of threat appraisal, which directly leads to people becoming prepared (assuming they have the resources to undertake preparedness). Increased levels of threat appraisal also lead to increased salience, a belief in people that preparing is important, more commitment to preparing (increased personal responsibility), and finally individuals actually taking action to become prepared. In the tornado context, actually practicing getting ready for a real tornado event seems to also increase people’s self-efficacy and engenders the belief that getting prepared for tornadoes isn’t difficult. While the Mulilis et al. study

attempted to describe the possible influence of experience on preparedness, it only identified a limited number of factors and presents the process as being predominantly linear.

### **6.2.6 Gaps in research**

From the literature it is evident that experience of adverse events can in some circumstances influence risk perceptions and other beliefs (including the formation of both optimistic and normalisation biases); influence anxiety, fear and concern; and prompt changes in actual preparedness. The exact influence of disaster experience, however, appears to be heavily related to the nature and context of the experience. It is this nature and context that little is known about, along with how this relates to people's decisions about preparing. For example, given the ad hoc nature of previous studies, it is impossible to definitively say what type of experience is required for people to change their risk perceptions and other beliefs, and prompt motivation to prepare. In terms of anxiety, little is known about the effect of disaster experience on the exact nature and level of anxiety, and its influence on the preparedness process. It is also currently impossible to say how people's experience with other hazards related to daily-life has a bearing on their approach towards natural hazards. In addition, while direct experience has been shown to have a definite impact in certain instances, the impact and nature of vicarious experience is still unclear.

Other contextual factors might also have an influence on the process, but have not been studied in detail. For example, community and societal factors may play an important part in forming experience, as Weinstein (1989) points out: several studies have found that individual experience was greater in communities that had more hazard experience (e.g. Perry & Lindell, 1981; Perry & Lindell, 1986; Smith & Tobin, 1979). Likewise he speculates that the interactions between individuals play an important part in forming disaster experience (Weinstein, 1989).

The true interactive nature of disaster experience on the preparedness process has not been explored in prior research. It is likely that in making decisions about earthquake preparedness, people go through a meaning-making process, whereby they draw upon prior experience in interaction with a range of cognitive, emotive, social and environmental factors. This study aimed to identify such interactions and provide

recommendations for emergency managers on how they can better factor the influence of disaster experience into earthquake education programmes.

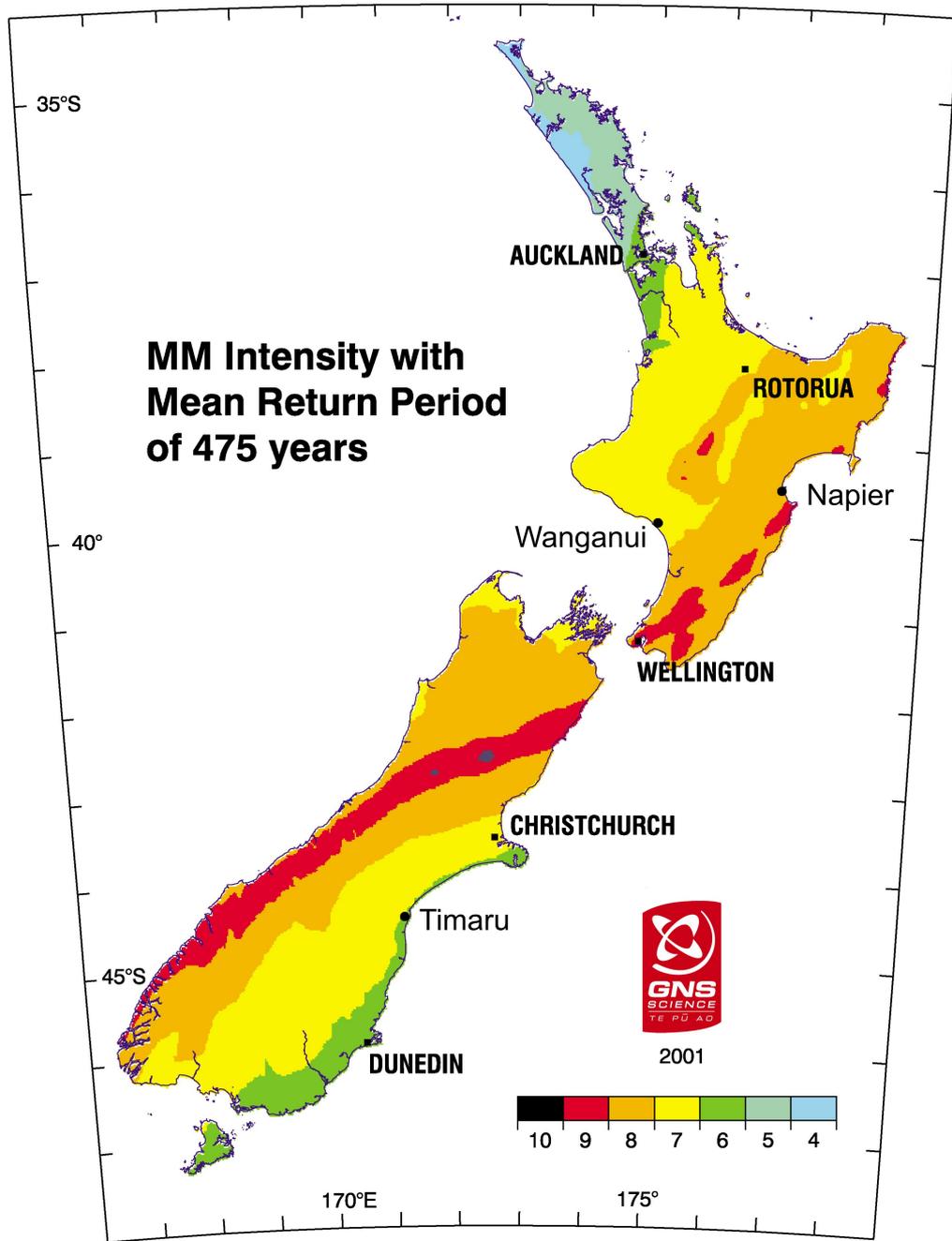
### **6.3 Research outline**

Forty-eight interviews were conducted with residents from three towns in New Zealand to investigate how people make meaning of earthquake hazard and preparedness information and how this relates to preparing for earthquakes. Interviews took place from April to June 2008. Interview breakdowns included 18 interviews in Timaru, 16 in Napier and 14 in Wanganui (Figure 6.1). The interview locations were selected to ensure that the towns being studied had a degree of earthquake risk (albeit slightly differing levels), were similar in terms of population size (between 25,000 and 55,000 based on the 2001 census data) (Statistics New Zealand, 2001), facilities available, institutional representation and legislative environment, and in their propensity for relative geographic isolation in a disaster.

The most recent earthquake disaster that had occurred at the time of the interviews was the 1931 Hawke's Bay earthquake (magnitude 7.8). The Hawke's Bay earthquake affected Napier at the time. Since then Napier has experienced earthquakes of moderate size and other events such as floods. The most recent hazard event for Timaru was a large snowstorm in 2006 (Hendriks, 2007). Wanganui had been most recently affected by flooding and storms, with the worst flood event occurring in 1990 causing damage to property, and several other floods since then threatening property and causing evacuations. While Timaru had not experienced any significant damaging earthquakes in recent history, Wanganui has experienced several, including a magnitude 7.5 earthquake in 1843 and a magnitude 6.5 earthquake in 1991 (Wanganui District Council, 2011). The 4 September 2010 Darfield earthquake (magnitude 7.1) and 22 February 2011 Christchurch earthquake (magnitude 6.3) occurred after data collection had taken place. Therefore interviews were conducted in a period of relative earthquake quiescence.

Invitations to participate in the study were sent to local community groups, and advertised in local publications. Participants were volunteers who had received or seen the invitations. A grounded theory approach (Strauss & Corbin, 1990) was used to conduct and analyse the interviews. Participants were asked to talk freely about

hazards, earthquakes, and preparedness and discuss any information they had seen on the aforementioned topics. Interviews were taped with the interviewees' consent and transcribed into a word processing program. The files were then loaded into the qualitative software analysis package "Atlas.Ti" and coding and analysis undertaken according to grounded theory. During the analysis a number of core categories were identified. One of the core categories that emerged was disaster and event experience as a type of information. This paper describes the role that experience provides as an information source and how this relates to getting prepared for earthquakes.



**Figure 6.1** Location of the study areas within areas of earthquake risk. The map shows the distribution of Modified Mercalli (MM) intensity with a current Annual Exceedance Probability of 1/475, derived from the National Probabilistic Seismic Hazard Model. Timaru is situated within MM6 (i.e. falling items, slight damage, e.g. cracked plaster), Wanganui within MM7 (i.e. buildings cracked, bricks and chimneys falling), and Napier within MM8 (i.e. damaged and partially or fully collapsed buildings) (personal communication, W. Smith, 2001; based on data from Stirling, et al., 2000).

## **6.4 Results**

### **6.4.1 What does 'experience' mean?**

People's experiences of hazards varied considerably. There tended to be three main types of experience mentioned during the interviews: direct disaster experience (i.e. being impacted by a disaster); indirect disaster experience (i.e. observing the impacts of a disaster from a distance, but not being personally affected); and indirect event experience (i.e. applying experience of another event or situation to a disaster context). A fourth type of experience is also identified here, that of vicarious experience. In the context of this study, vicarious experience relates mainly to individuals interacting with others who have had disaster experience, as opposed to individuals tapping into experience via the media or other avenues. Becker, Johnston, Paton, and Ronan (submitted-b, Chapter 4) include vicarious experience as a subset of indirect disaster experience, but it is discussed separately in this paper, as it has a slightly different influence than true indirect disaster experience.

Few of the interviewees had experienced a large disaster directly, and none had experienced a major earthquake. Most direct experience related to storms or flooding, and the majority of participants had experienced minor earthquakes. People's direct experience for the most part was related to experiencing damage to property during a disaster event. In terms of location, interviewees in Timaru mentioned they had experienced a significant snowstorm in 2006 and a windstorm in the 1970s. Some mention was also made of flooding. In Wanganui, flooding was the most common type of event that participants had experienced, followed by minor earthquakes. In Napier, flooding and moderate to minor earthquakes were most commonly experienced by interviewees. A few interviewees in Napier and Wanganui also spoke about volcanic eruptions from Mt. Ruapehu and minor ash effects experienced as a result of those eruptions.

A number of participants reported that they had had some indirect experience of disasters. People reported being involved in responding to an event (e.g. as a civil defence volunteer); being involved in preparing, planning or responding as part of a particular role (e.g. a workplace role); being indirectly impacted by an event (e.g. not being able to travel to work because of transport disruptions); observing the effects of a

local event but not being impacted in any way; and assisting with relief efforts.

Flooding was the most common type of disaster that people had indirect experience of.

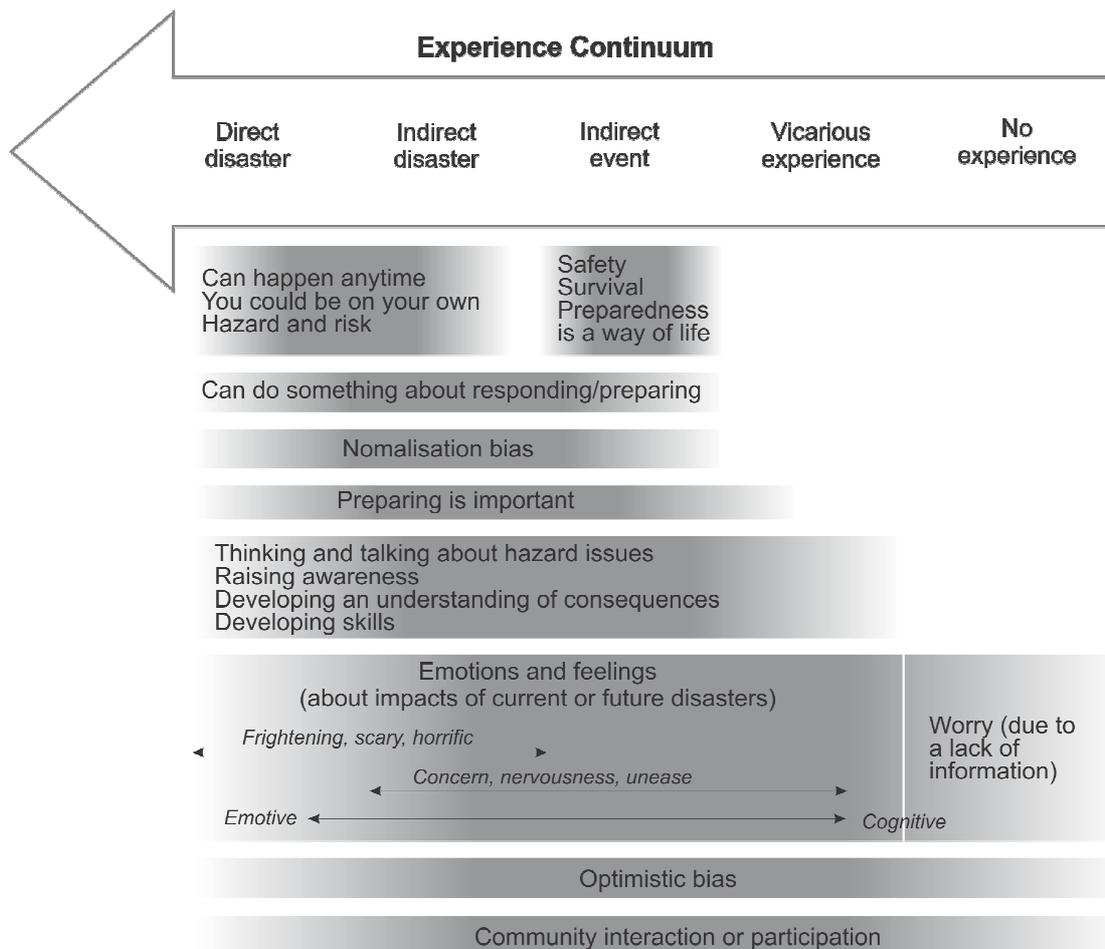
Interviewees discussed a variety of other types of experience they had, related to other events. Such experiences included accidents (e.g. vehicle accidents, personal accidents), personal health events, industrial hazards, and infrastructure failure.

Discussion of these events in a hazards context reflected issues that were salient to people, particularly in the absence of having any direct or indirect disaster experience.

The fourth type of experience is vicarious experience. Interviewees often discussed how the experience of other people influenced them, or how they had seen information about disasters through other sources.

#### **6.4.2 Effects of experience**

Becker, Johnston, et al. (submitted-b, Chapter 4) suggest that disaster experience is used as a form of information by people. People's experiences of disaster and other hazardous events had a range of influences on perceptions and preparedness for disasters. Figure 6.2 depicts such influences in what is termed an 'experience continuum'.



**Figure 6.2** An ‘experience continuum’ showing the relative influences of different types of experience on: awareness and understanding of hazard consequences; thinking and talking; beliefs (including biases); and emotions. Note: This diagram applies in the context of a relative period of earthquake quiescence; it may look different in the context of the occurrence of a large earthquake.

In the first instance, experience had an influence on thinking and talking about hazards and preparedness. Being either directly or indirectly involved in a disaster or some kind of other event would commonly trigger thoughts and conversations. Interviewee 41 directly noted that for conversations to begin, the “conversation needs to be stimulated by something [such as] an event...” Interviewee 29 from Timaru describes how experiencing an event can trigger conversations, “... after things like the snow or the floods - yes, you are talking, that’s your conversation all the time. How prepared were you? How did you manage?” Both interviewees 41 and 29 made reference to the snowstorm event which they had experienced, however people did not necessarily have to have experience of a disaster per se for conversation to occur. Discussions could also take place as a result of indirect event experiences or vicarious experience. For example, interviewees commonly discussed how they would talk about experiences such as vehicle accidents or personal accidents. With respect to vicarious experience,

even though Napier interviewees had not directly experienced the Hawke's Bay earthquake, they often mentioned that they would ask other family members or friends to discuss their experiences in the 1931 Hawke's Bay earthquake with them. With vicarious experience people most often talked about what happened in the event and what they had gone through. They did not tend to link their experience with other topics, such as preparedness for disasters.

Interviewees who had directly or indirectly experienced disasters felt that the experience had raised their awareness and knowledge. The types of awareness raised included both awareness of hazards and awareness of preparedness. Interviewee 26 sums up how experience can raise awareness by saying, "The way I see it, if... when people have experienced something, have experienced some disruption, then they are likely to be aware of what can happen and what they can do about it beforehand for themselves. You think afterwards, well, I should have done this, that and the other thing."

More importantly, however, having some disaster experience also had a strong influence on assisting people with understanding the consequences of an event. People suggested that an experience can make an event seem more "real". Those that had had direct or indirect disaster experience spoke of a disaster or event leading them to the realisation that disasters can actually happen, the impact disasters can have, and the preparedness that needs to be undertaken to counter the impacts of those disasters. People also described experiencing a disaster event as a "wake-up call". Such an understanding of the consequences prompted a number of people to get more prepared. This was most evident in participants from Timaru who had experienced the 2006 snowfall event. A major issue during the event was that electricity went off, so following the event many interviewees went out and purchased items (e.g. transistor radio, batteries, candles, gas cookers, a phone that doesn't run off power, a generator) to ensure they could deal with future electricity outages. Interviewee 29 describes the experience of the snowstorm, how it assisted people's understanding of consequences, and how it became a prompt for preparedness:

"...after the snow situation here we were quite - there was no power, we didn't have power for what was it - 5 days, we didn't have telephone, so there was just no power. Some of the homes had it longer than that - I think it was a couple of

weeks with no power. So it really brought it home to people how prepared they should be ...”

Indirect event experience also helped with understanding the consequences of something adverse happening, but in a more generic way, as the nature of the experience was usually different to that experienced during a disaster. Indirect experience assisted with understanding the impacts of an adverse event in general, and helped individuals understand how being prepared for adverse events might make your life easier or lessen the impact. For example, individuals discussed how being prepared for accidents or adverse health events by having a first aid kit or first aid training could lessen the impact of such an event. Interviewee 3 describes how experience of vehicle accidents has helped him become more conscious of hazards in general, understand the consequences of having an accident, and alter his behaviour to ensure his safety:

“Riding a motorbike you tend to be quite conscious of hazards. A truck going around the corner spilling some shingle - on a motorbike it would be like ball-bearings and you would be flying. When it is wet, and diesel spills and things like that. My speed goes down by 20%-30% when I’m riding in the wet, because of that - I don’t like it. I have come off a few times and yeah, you are conscious of that then.”

Vicarious experience also helped with understanding the consequences of disasters, but because these experiences did not happen to the individual themselves, tended to be less personalised and did not necessarily lead to any direct behaviour change. Interviewees described how their understanding of certain elements of disasters increased after talking with family or friends about experiences they had been exposed to. For example, after the 2006 snowstorm, Interviewee 35 from Napier spoke with friends in Canterbury who explained to her that access to electricity was a significant problem following the event. Interviewee 28 spoke to friends living in rural Wanganui, and during this conversation became aware of the isolation and problems that floods could cause:

“During the last flood in Wanganui I had friends calling me up that knew [my husband] was with the emergency services, asking if [my husband] could please get someone out to them. They had babies, had no food, they had no milk, they

couldn't get out, the water was up to their front door, sort of thing. So even they weren't always prepared."

Having a true understanding of the consequences (i.e. a realisation of what the impacts would be, a reflection on their own vulnerability, and a realisation "why" individuals needed to prepare) helped develop and cement beliefs about hazards and preparedness. For example, some people had never thought about the impacts and consequences of disasters before, and this was the first time they developed beliefs based on what they had experienced. Others had heard key messages through information sources, but had not really taken these messages on board until the experience had "brought it home" or made it seem "real". One of the examples that emerged was that related to an understanding of being "on your own". Ministry of Civil Defence & Emergency Management information promotes the idea that people might be on their own in the "Get Ready, Get Thru" campaign. On the "Emergency Services" television advertisement, for example, they state that it is necessary to prepare because, "...you and your family will be on your own for up to three days or more..." (Ministry of Civil Defence & Emergency Management, 2011b). While a number of interviewees were aware of the message promoted in the advertising, it wasn't often until people had actually experienced a hazard event in some way that they really understood why the message was important, and began to cement it as an actual belief worthy of attention. Interviewee 48 summed up how experience can bring home such messages, "... we had floods here - as a lot of people did in - in 2004, about February, but people were cut off. [...] You know, and it really brought it home that people can be isolated." The aforementioned findings by Karanci and Aksit (2000) support the concept that disaster experience helps people understand that they need to rely on their own resources in a disaster.

In the analysis it was evident that the type of experience a person had undergone had an influence on the beliefs that were formed. Both direct and indirect experiences were valuable for helping form beliefs. After directly or indirectly experiencing a disaster, people were more likely to believe that a disaster "Can happen anytime", that you "Could be on your own" in an event, and that "Preparing is important". People also developed more comprehensive views about the risk posed by natural hazards. Some of these views could be accurate, for example, people in Wanganui had a good

understanding of the potential impacts of flooding (i.e. the damage it could cause to property and the impact it could have on people) from the direct and indirect experiences they had been through. Other risk perception beliefs formed could be inaccurate, however; for example, several people suggested that the hazards they were most at risk from were the same as those experienced in the past, rather than undertaking a rational assessment of all of the risks posed by hazards in the local area. When Interviewee 11 was asked why she chose wind as the event most likely to affect her in future she said, “Because that’s what has affected us [in the past].”

As disaster experience often involved physically dealing with the impacts of an event, individuals were able to develop useful skills that they could apply in future both with respect to responding to a future event and preparing. The practice gained during this experience helped develop people’s self-efficacy belief that that they would be able to do something to respond to a future event, or that they could do something to prepare.

Indirect event experience appeared to promote a slightly different set of beliefs in individuals. As with disaster experience, indirect event experience inspired a belief in many individuals that preparing was important. However it was more likely to encourage beliefs related to general safety issues. For example, this type of experience led people to believe that “Safety is important”, “Survival is important”, and that “Preparedness should be a ‘way of life’” rather than a one-off activity. Interviewee 6 describes how indirect event experience from being in the army helped develop some of her core beliefs around survival and safety which she also applies in a disaster context, “...we were both in the army so we kind of have a little bit of a survival background too. It’s - I think once you’ve done that sort of thing the seeds are well sown, it’s about keeping yourself safe and knowing where to get help.”

Indirect event experience also assisted with developing skills on how to respond and prepare leading to the development of self-efficacy beliefs in these areas. Interviewee 47 describes how growing up in a place with a lot of crime teaches you skills about how to think laterally about how to deal with adverse situations, “I grew up in South Africa. We’re from South Africa and I think that teaches you to, just because of the criminal climate and the way things are there, it teaches you to look broader, or, “How else can I?”.”

While vicarious experience did have some influence on beliefs, this type of experience predominantly assisted raising awareness and understanding consequences (more like a traditional information source), but did not appear to cement beliefs as profoundly as other direct and indirect experiences did. This is possibly due to the fact that the experience did not happen to the individual themselves, and thus was not personalised by the individual.

Despite the positive effect that disaster experience can have on people, it can also prompt several biases. First, experience was found to contribute to normalisation bias (Johnston, et al., 1999; Mileti & O'Brien, 1992; Russell, et al., 1995). This was seen particularly in the context of earthquakes, where people who had experienced many smaller earthquakes had become blasé and not concerned about an earthquake occurring. This led them to a lack of motivation to prepare. In the context of a large earthquake, Interviewee 6 describes how her grandmother and father fell subject to normalisation bias following their experience of the Hawke's Bay earthquake. She states, "... they were never *too* concerned with earthquakes. They thought about them and they'd lived through them and figured that they'd managed to get through one, they'd probably get through the next one (laughter)."

Optimism bias (Burger & Palmer, 1992; Helweg-Larsen, 1999; Spittal, et al., 2005) was also found to be present in some interviewees whereby people who had experienced an event were optimistic that they would not be vulnerable to an event in future. For example, people held a variety of beliefs related to optimism, including that they thought: it wouldn't happen again; it wouldn't happen the same way again; it wouldn't happen for many years; the event would be as benign as last time; or for some other reason they wouldn't be affected in future (e.g. the event wouldn't strike them, or their current state of preparedness would see them through). Interviewee 35 describes how despite her experience, she is optimistic another event won't occur in future, and thus she does not prepare:

"When we lived in Opotiki in the Bay of Plenty that whole township flooded when we lived there... but I didn't learn a lesson from it, if you know what I mean, coming to live here."

*So why do you think it didn't stick with you?*

“Because you think it’s not going to happen again, sort of thing.”

People often described disaster events they had experienced as “unusual”. In particular, the majority of interviewees from Timaru thought that the 2006 snowstorm was an unusual event and thus was unlikely to occur again in future. This type of description of an event highlighted that normalisation and optimistic biases were operating amongst individuals.

Experience had a strong influence on people’s emotions and feelings. In particular direct or indirect disaster experience often made people think an event was frightening, scary or horrific. They might then transfer this emotion to future potential disasters, thinking about the risks that may be posed by those events, how they might feel, and what they might need to do to avert any adverse feelings. For example, Interviewee 35 is “frightened by heavy rain now” after her experience of having her house flooded, and acts to prepare by ensuring her gutters are clear to avert such a disaster happening again. Interviewee 25 discusses how his indirect disaster experience of responding to a flood in Invercargill filled him with horror, and prompted him to think about and check his own preparedness.

“[The] Invercargill flood was a very dirty flood because, if you compare it with a sink, where someone’s put a plug in the sink and filled it up with water over say a period of 24 hours, and while it was there it was like a lake filling and all the debris and rubbish and sewage and everything was all - it was horrible [...] I rang my wife halfway through the week, and I said to her, tomorrow please ring the insurance company and double our contents policy. When I got home, I mean I found that we already had enough, but it just stunned me...”

Emotions such as excitement, concern, nervousness and unease were most often conveyed if an individual had indirect disaster experience, rather than direct disaster experience. Emotions were not connected as strongly with indirect event experience. People tended to talk about indirect event experiences (e.g. personal health issues, accidents) in a much more rational way, with less emotion attached. For example Interviewee 14 states, “I have got one leg which probably - when I was aged 29 I had bone cancer which probably shook me out of [my] comfort zone. That I wasn’t bullet proof, and probably I have thought about personal safety because of that a little more

than others probably would.” While Interviewee 25 says, “I’ve had a lot of personal life disasters which probably prepare you for the next event all the time, you know, serious car crash and those sorts of things. And heart attacks and all those sorts of things. But, you know, I mean, you know, you become a bit wiser by events.”

As with indirect event experience, vicarious experience did not produce the same depth of emotion in an individual as disaster experience did. However it still did have some effect on the meaning-making process, as while the experience was vicarious for the interviewee; it was still direct to the other person who had experienced it. This caused the other person to be persuasive about their experience and have an influence on the interviewee. For example, Interviewee 10 says that his wife’s experience of Cyclone Tracey has made him more sensitive to windstorms, “My wife is petrified of strong winds. She was in Darwin when a cyclone hit in 1974 I think it was - and that gave her one hell of a fright. So whenever we get strong winds she is petrified. That has made me a lot more sensitive to them. Now that she has experienced the destructive nature of a tropical cyclone.”

Finally, all types of experience were seen to prompt community interaction or participation with respect to disaster issues. For example, individuals who had been directly involved in a disaster were seen to interact with other community members during the disaster response and recovery process. The Timaru snowstorm provided the best examples of this, with people checking on family, friends and neighbours during the event to see if they were okay, and offering to help out where possible (e.g. clear snow, deliver essential items such as food and medication). Interviewees who had indirect disaster experience were also often involved in the community in some way. For example, some participants spoke of being involved in the community as part of a civil defence response team during an event. Vicarious experience could also lead to community interaction on hazard and preparedness issues. This was most often seen in the form of a desire by community members to provide disaster assistance either before (i.e. in collating preparedness items) or after a disaster event had occurred (e.g. raising money for disaster relief).

Having either direct or indirect experience of a disaster or event can produce empathy in people, which prompts a desire to assist others in a hazards and preparedness context (Sattler, Adams, & Watts, 1995). Interviewee 13 suggests that seeing the impacts on

her elderly mother isolated by the 2006 Timaru snowstorm has meant that she will make sure she gets to know her neighbours so she can help them in a future event.

Interviewee 2's indirect experience of past flooding has meant he was able to empathise with the flood victims, and has been keen to help the community in future events:

“Back in 1990 we were called out to the floods and we were helping people move out - move all their belongings out - this was on Anzac Parade over there - we were wading in water up to here (points to thigh height) and it was absolutely - it was a real experience but it was just heart-wrenching for those people. And after that we have had some big ones since then and gone out and helped people get their stuff out.”

## **6.5 Discussion**

### **6.5.1 Summary and recommendations**

This paper has gone some way to furthering understanding of the interactions between the experience of individuals in the context of a period of relative earthquake quiescence, and how this relates to the earthquake preparedness process. The interviews confirmed that people's experience does play a significant role in helping people interpret hazards and preparedness information and in making decisions about preparedness for earthquakes. Many theorists have explored the role of experience in learning and have given it the term 'experiential learning' noting that "learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38). Learning via experience is a continuous process, involves adaptation, and interactions between an individual and the environment (Kolb, 1984). It is also argued that experience can be considered an important form of information itself and in the earthquake preparedness paper by Becker, Johnston, et al. (submitted-b, Chapter 4) it is given the term 'experiential information'.

Four main types of experience were considered in this paper, including direct disaster experience, indirect disaster experience, indirect event experience, and vicarious experience (in relation to the experience of other people). This study found that the various types of disaster experience have seven predominant influences on the information interpretation and preparedness process:

1. Prompts thinking and talking about hazard and preparedness issues;
2. Raises awareness and knowledge;
3. Helps individuals understand the consequences of a disaster;
4. Develops beliefs (including helpful beliefs and also unhelpful ones such as biases);
5. Develops skills;
6. Influences emotions and feelings; and
7. Prompts community interaction on disaster issues.

All four different types of experience produce slightly different influences, the natures of which are discussed as follows. Direct disaster experience is known to be more powerful and vivid, which leads to better recall of information that people can use to inform future decisions (Lee, 1999; Neisser, et al., 1996; Norris & Kaniasty, 1992; Sattler, et al., 1995; Weinstein, 1989). Experience of a disaster can improve people's estimation of impacts in a future disaster (Sattler, et al., 1995). Direct experience is also more personal, and as Weinstein (1989) notes there is usually greater correspondence between attitudes and behaviours when personal involvement is high. This study showed that people recall their direct experiences well, and were often motivated to prepare based on their experience. In general, the more direct an experience was, the more likely people were to relate to the experience, have raised awareness and knowledge, engage in thought and discussion, understand the consequences of disasters, think about their experience in the context of future disasters, form or cement relevant beliefs, have an effect on emotions and feelings, and have a motivation to prepare. Helpful beliefs formed from disaster experience included: a disaster "Can happen anytime", "You could be on your own", "Preparing is important" and beliefs about the level and nature of risk. Having direct experience also assisted people to develop skills related to preparing and responding, and enhanced self-efficacy, consistent with what is reported by Mulilis et al. (2003).

Indirect experience (both disaster and event-related), was not as powerful as direct experience, but it was still found to contribute to the meaning-making process and assist with motivation for preparedness. Indirect experience could prompt people to engage in

thought and discussion, raise awareness and knowledge, help people understand the consequences of disasters, think about their experience in the context of future disasters, form relevant beliefs about hazards and preparing, stimulate emotions and feelings, and provide motivation to prepare. The main difference between indirect disaster experience and indirect event experience was in the type of beliefs formed. Indirect disaster experience helped form similar beliefs to those of direct disaster experience, while indirect event experience formed more general beliefs related to safety issues, such as “Safety is important”, “Survival is important” and “Preparedness is a way of life”. Previously, researchers have speculated upon whether indirect event experiences are helpful or not to disaster preparedness (Norris, 1997; Weinstein, 1989), however this research has confirmed that indirect event experiences do help inform people’s interpretations and decisions about hazards and preparedness. To make hazards relevant to the general public, emergency managers could consider reinforcing the idea that “Preparedness is a way of life” in general, and that this philosophy can be applied to a disaster context.

The interviews reinforced the concept that direct and indirect experience can contribute to the formation of two main biases: normalisation bias (Johnston, et al., 1999; Mileti & O'Brien, 1992; Russell, et al., 1995) and optimistic bias (Burger & Palmer, 1992; Helweg-Larsen, 1999). It is essential therefore that any education programmes attempt to address these biases. Optimism bias in particular seems to increase over time following an event, and attention should be paid to minimising its effect within a relevant timeframe (e.g. within the first year after the event) in order to maximise the ‘window of opportunity’ that arises in making use of disaster experience (Dooley, et al., 1992; Karanci & Aksit, 2000; McGee, et al., 2009; Pennebaker & Harber, 1993; Russell, et al., 1995; Sattler, et al., 2000; Tanaka, 2005).

The vicarious experience of others, while not usually a direct motivator of preparedness, does play an important role in people’s interpretation of hazard and preparedness information and eventual decisions about whether to prepare or not. Vicarious experience can trigger thinking and talking about hazard issues, assist with understanding the consequences of future events, and help with the formation and cementation of beliefs about hazards and preparing.

The downside is, however, that there are several limitations with respect to the vicarious experience of others. First, in their thoughts and conversations, people talk about what happened during an event, rather than issues related to future preparedness or response. This is a factor that is sometimes also seen in conversations triggered by direct and indirect experience. The disadvantage of such conversations is that people are focused more on the event itself, rather than thinking about ways of dealing with such an event in future, limiting the undertaking of problem solving-type actions. Education programmes should ensure that conversations about hazard issues are directed to include both discussions about the experience itself, and what can be done to mitigate the adverse effects of future disaster experiences. Vicarious experience also has limitations in that, because an experience has not happened to the individual in question, individuals' understanding of the consequences of disasters or newly formed beliefs are not as personalised. Personalisation of experience has been noted to have an effect on taking action (Jackson & Mukerjee, 1974; Tierney, et al., 2001; Weinstein, 1989) and vicarious experience may not contribute to this process. Finally, the vicarious experience of others did not appear to produce a strong effect on emotions, which again are a key component to the meaning-making and preparedness process (Dooley, et al., 1992; Heller, et al., 2005; Rüstemli & Karanci, 1999; Siegel, et al., 2003), although some minor emotional effect could not be discounted.

Emotions and feelings proved to be powerful contributors to the information meaning-making and preparedness process. Direct disaster experience produced the most profound emotions, with people using terms such as “frightening”, “scary” or “horrific”. The less direct or personal the experience was, the more likely participants were to use less emotive terms. Thus those with indirect disaster or event experience were more likely to use the terms “excitement”, “concern”, “nervousness” and “unease”. Sjöberg (1998) suggests that natural disasters are linked to strong sensory experiences and may be more likely to cause the formation of perceptions related to emotional risk, while more every-day events are more likely to cause cognitive risk. Such emotional risk is more likely to create anxiety about perceived threat, which may then become a motivator of preparedness. Those that expressed experiencing more emotion did appear to have higher levels of anxiety about disasters and often stated they were more motivated to prepare (as discussed in Chapter 5, Becker, Paton, et al., submitted-a).

Literature suggests that emotion experienced as a consequence of a disaster can affect people's performance; for example, high arousal may lead to less efficient information processing and recall, or it may lead to people experiencing difficulty with tasks, particularly complex ones (Tiegan, 1994). In particular, there may be a difference between direct experience and indirect experience, with those with direct experience having high arousal and potential impairment of the recollection of central details; and those with neutral (or indirect) experience having lower arousal and better recollection of central details (Dutton & Carroll, 2001). However, other researchers do suggest that high arousal can lead to improved performance, depending on the context of the experience (Hanoch & Vitouch, 2004). For example, restricting information during states of high arousal can lead to an improvement in performance. In a practical earthquake education sense, this could mean focussing on essential or goal-relevant information to assist with directing individuals to appropriate actions.

Finally, people's experience of disasters or events often provides a prompt for interaction with the community. During the interviews, this was most often seen in terms of directly helping out other community members during an event, or through contributing to relief efforts. Disaster experience makes hazards and preparedness more salient to people, and makes them more willing to engage in a participatory fashion. Consequently, better use could be made of people's willingness to engage after disasters. Earthquake education programmes should make provision to use the 'window of opportunity' post-event to engage communities in participatory risk reduction activities for future events.

In summary, earthquake educators should be aware that experience does have an influence on the way people interpret hazard and preparedness issues with respect to making decisions about preparedness. Therefore it should be considered a relevant and valuable source of information for the general public. Emergency managers should ensure that the aforementioned aspects discussed in this paper are tailored for inclusion in future earthquake education programmes.

### **6.5.2 Challenges for earthquake education**

While direct disaster experience appears to have the greatest influence on behaviour, difficulties arise in that few members of the public are actually exposed to direct

experience. Perry and Lindell (2008) note the fact that emergency managers cannot recreate direct experience for people and that other ways of delivering this experience must be found. They issue a challenge for identifying how we can better use vicarious experience (both from the media and via other individuals) to more closely mirror direct experience, and assist with adjustment adoption. It has been suggested that information could be released well before a disaster occurs that vividly describes the experiences of a past event. This would assist people who experienced a disaster to remember what happened in the past, and to inform those who have not experienced an event what a future event might be like (Sattler, et al., 1995; Sattler, et al., 2000).

Other challenges in making use of experiential information include the evolution of experience. This study was undertaken in a period of relative earthquake quiescence, and thus peoples' reported experiences are distinct to a snapshot in time from 2008. Since data collection took place, two significant earthquakes have occurred in the Canterbury region of New Zealand, altering the landscape of direct, indirect and vicarious experience for people. This may have changed the way in which people interact with and use experiential information, and potentially may affect behavioural outcomes. McClure et al. (submitted) already report that risk perceptions about the likelihood of an earthquake in New Zealand have been raised by the Canterbury earthquakes. In terms of actual preparedness, Russell et al. (1995) found that in comparing preparedness before and after the Sylmar, California earthquake, different predictors of preparedness were found. In their study pre-earthquake, socio-economic factors tended to be dominant drivers of preparedness, while in the post-impact period socio-economic, psychological and situational variables tended to be key influences. Differences between pre-and post-earthquake motivators have been found by other researchers as well, with Heller et al. (2005) noting that before the Northridge earthquake community participation was a key predictor of preparedness, while after the earthquake, household damage, discussion of preparedness, affect and socio-economic variables were predictors. Future research should focus on following individuals' experiences over time to ascertain how experience evolves and the influence this has on interactions between cognitive, emotive, social and environmental factors, and the overall meaning-making and preparedness process.

### **6.5.3 Limitations**

This research has several noted limitations. First the research is qualitative in nature, designed to capture details about the information meaning-making and preparedness process. It is not, therefore, necessarily representative of the wider population, and further quantitative research is required to test the ideas presented here more generally. In addition, interview participants were self-selected volunteers and as a consequence there may be some bias present in the sample. In particular there is an over-representation of older people in the sample (i.e. over half the sample were 60 years or over) and an over-representation of ‘community-minded people’ (as the majority of invitations were sent to community groups). People who were more interested in the topics of earthquake hazards and preparedness were also more likely to have answered the request to participate.

## **6.6 Link to Chapter 7 - Paper 4**

The following chapter (Chapter 7 - Paper 4, Becker, Paton, et al., submitted-b) discusses individuals’ salient beliefs about earthquake hazards and preparedness that were discovered during the interviews. It outlines key beliefs that were found to influence the preparedness process, how those beliefs came to be formed during the meaning-making process, and interactions of those beliefs with personal, social and environmental factors. Recommendations are made on how to account for people’s beliefs in earthquake education programmes.

# Chapter 7 Paper 4: Salient beliefs about earthquake hazards and household preparedness

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## Abstract

The link between beliefs about earthquake hazards and preparedness, and actual household preparedness for earthquakes has long been studied. Research has often found little or no direct link between beliefs about earthquake hazard and risk and getting prepared for earthquakes, indicating earthquake hazard beliefs are either indirectly related to the preparedness process, or not related at all. In addition, there has been only limited study about the range of preparedness behaviour beliefs that people hold and how these beliefs affect the preparedness process. Thus there remains a gap in understanding about the range of salient beliefs people hold regarding earthquake hazards and preparedness, and how these beliefs interact within the preparedness process. This study attempted to address such a gap. Forty eight qualitative interviews were undertaken with residents in three urban locations in New Zealand, to investigate the variety of beliefs that people hold, the influence that earthquake information provided by public education programmes has on those beliefs, and interactions of beliefs within the preparedness process (including interactions with personal, social and

environmental factors). Three main categories of beliefs appeared to influence preparedness, including hazard beliefs; preparedness beliefs; and personal beliefs. A number of salient beliefs found previously to influence the preparedness process were confirmed as influential by this study, including beliefs related to earthquakes being an inevitable and imminent threat, self-efficacy, outcome expectancy, personal responsibility, responsibility for others, and beliefs related to denial, fatalism, normalisation bias and optimistic bias. New salient beliefs were also identified (e.g. preparedness being a 'way of life'), as well as insight into how some of these beliefs interact within the wider informational and societal context.

## 7.1 Introduction

Earthquakes occur with little or no warning, and can pose a significant threat to the physical and social environment. Recent earthquakes around the world have caused death and destruction, as demonstrated by earthquakes in 2010 in Haiti (220,000 reported dead), 2008 in Wenchuan, China (88,289 deaths) (Spence, et al., 2011), and 2011 in Christchurch, New Zealand (181 reported dead on the day of the earthquake) (Brown, 2011; McSaveney, 2011; New Zealand Police, 2011; The Press, 2011). As populations continue to remain vulnerable to earthquakes, there is still a need to work toward reducing risk.

Reduction of risk can occur at societal, community and individual levels. At the individual level, household preparedness for earthquakes is often promoted as a means of reducing the physical impacts of an earthquake, reducing injuries and deaths, and assisting with response and recovery to an event. Being prepared for earthquakes at an individual household level includes undertaking actions such as collecting together survival items, undertaking building mitigation (e.g. retrofitting a building), making a household emergency plan, developing survival skills, and getting involved in social preparedness activities (Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Mulilis, et al., 1990; Russell, et al., 1995; Spittal, et al., 2008).

Despite emergency managers strongly advocating household preparedness for many years, levels of actual household earthquake adjustment adoption are still universally low (Ronan & Johnston, 2005). This, in part, is due to having only a partial understanding of what motivates people to prepare for earthquakes, with the result that

education programmes cannot be comprehensively developed. Research over the years has identified a variety of important factors that contribute to motivating household preparedness, but has failed to capture all of the inputs and interactions that feed into the process (Tierney, et al., 2001).

One area of research that has taken place is with respect to people's beliefs about earthquakes and preparedness. Theoretical models suggest that beliefs play a part in people's decisions about whether or not to prepare for hazards such as earthquakes. At a generic level, models such as the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) suggest that certain beliefs (e.g. about behaviours, subjective norms and controllability) have an influence on actual behaviour (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). Such models have been modified for use in a hazards context. For example Protection Motivation Theory (PMT) (Mulilis & Lippa, 1990; Rogers, 1983), Person relevant to Event Theory (PrE) (Duval & Mulilis, 1999; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2000; Mulilis, et al., 2003), and the Protective Action Decision Model (PADM) (Lindell & Perry, 1992, 2000, 2011) have been developed for use, and have investigated the role of relevant beliefs. According to these models, beliefs found to be important to adjustment adoption include those related to: consideration of the likelihood and severity of consequences of an event, self-efficacy, response or outcome efficacy, and personal responsibility for protection. Adjustment adoption modelling by Paton and colleagues also confirms the importance of aspects such as self-efficacy and outcome efficacy (Paton, 2003; Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Sagala, et al., 2010; Paton, et al., 2005), and suggests additional beliefs related to collective efficacy, positive and negative attitudes, and social norms are also important (McIvor & Paton, 2007; Paton, Bajek, et al., 2010; Paton, Sagala, et al., 2010).

Significant research has taken place on beliefs in the context of risk perception, with an attempt to identify if, and how, risk perception influences the process of adjustment adoption. Some of these studies have been undertaken within the context of the aforementioned models, while other studies have been independent. A number of specific risk perception beliefs have been found to directly influence adjustment adoption, including: understanding of the presence of risk (Turner, et al., 1986); perceived likelihood of an event (Farley, et al., 1993; Rüstemli & Karanci, 1999);

expected property damage (De Man & Simpson-Housley, 1987; Kunreuther, et al., 1978; Palm, et al., 1990); perceived imminence of an event (Gregg, et al., 2004; Paton, et al., 2005; Paton, Smith, et al., 2003; Ronan & Johnston, 2005); and personalisation of risk (Mileti & Fitzpatrick, 1993; Turner, et al., 1986). When all of the studies are analysed, however, it can be concluded that direct links between risk perception and preparedness are only weak, implying that risk perception feeds indirectly into the preparedness process rather than directly (Solberg, et al., 2010). Lindell and Perry (2000) also suggest that it is likely not all aspects of risk perception have been fully explored in relation to earthquakes, and thus not all influences accurately identified.

While much of the discussion in this paper so far has focused on beliefs that have been found to positively influence household earthquake adjustment adoption, Whitney et al. (2004) note that many beliefs also can have a negative impact. For example, a lack of perceived control either about an event itself, or with respect to the preparedness process, can cause people to develop fatalistic beliefs (McClure, 1998, 2006; Turner, et al., 1986). As a consequence, individuals may choose not to prepare because they don't think it will make a difference to their eventual outcome. Incorrect beliefs, such as the belief that a warning may be provided before an earthquake, may also cause people to be less motivated to prepare (Whitney, et al., 2004).

Few researchers have tried to comprehensively identify the range of beliefs that are held by individuals and the influence these beliefs have on the preparedness process. The closest has been Whitney et al. (2004), who developed an Earthquake Belief Inventory (EBI) consisting of 51 statements representing different beliefs (i.e. beliefs about getting a personal warning, earthquake predictability, earthquake damage potential, efficacy of seismic planning, other items related to earthquake risk or consequences). The scale was developed using a free-response procedure recommended by Fishbein and Ajzen (1975) to elicit salient beliefs. Most of the belief statements developed for the EBI, however, relate to beliefs about earthquake hazards rather than preparedness. Testing of the EBI found that earthquake beliefs were not directly related to household earthquake adjustment adoption, suggesting that such beliefs are either indirectly related, or irrelevant to undertaking preparedness activities. Thus while a range of beliefs were identified for the Whitney et al. (2004) study, there remain a number of gaps in knowledge. First, given the lack of a direct link between beliefs and actual adjustment

adoption, there remains a gap in understanding of how beliefs about earthquakes interact with other parts of the preparedness process (i.e. is there an indirect effect of beliefs on the preparedness process, and if so, how does this work?). Second, because beliefs in the Whitney et al. study were focused more on earthquake hazards rather than preparedness, there remains a lack of knowledge about the range of preparedness behaviour beliefs that people hold.

A lack of understanding about how beliefs influence the preparedness process has implications for emergency managers wishing to develop earthquake communication and education strategies. If it is not known what beliefs are influential and how these interact, then it is difficult to target the development of helpful beliefs in community members. This research attempts to address gaps in knowledge about earthquake hazard and preparedness beliefs, by investigating the variety of beliefs that people hold, and the interactions between earthquake information, people's beliefs and the overall preparedness process.

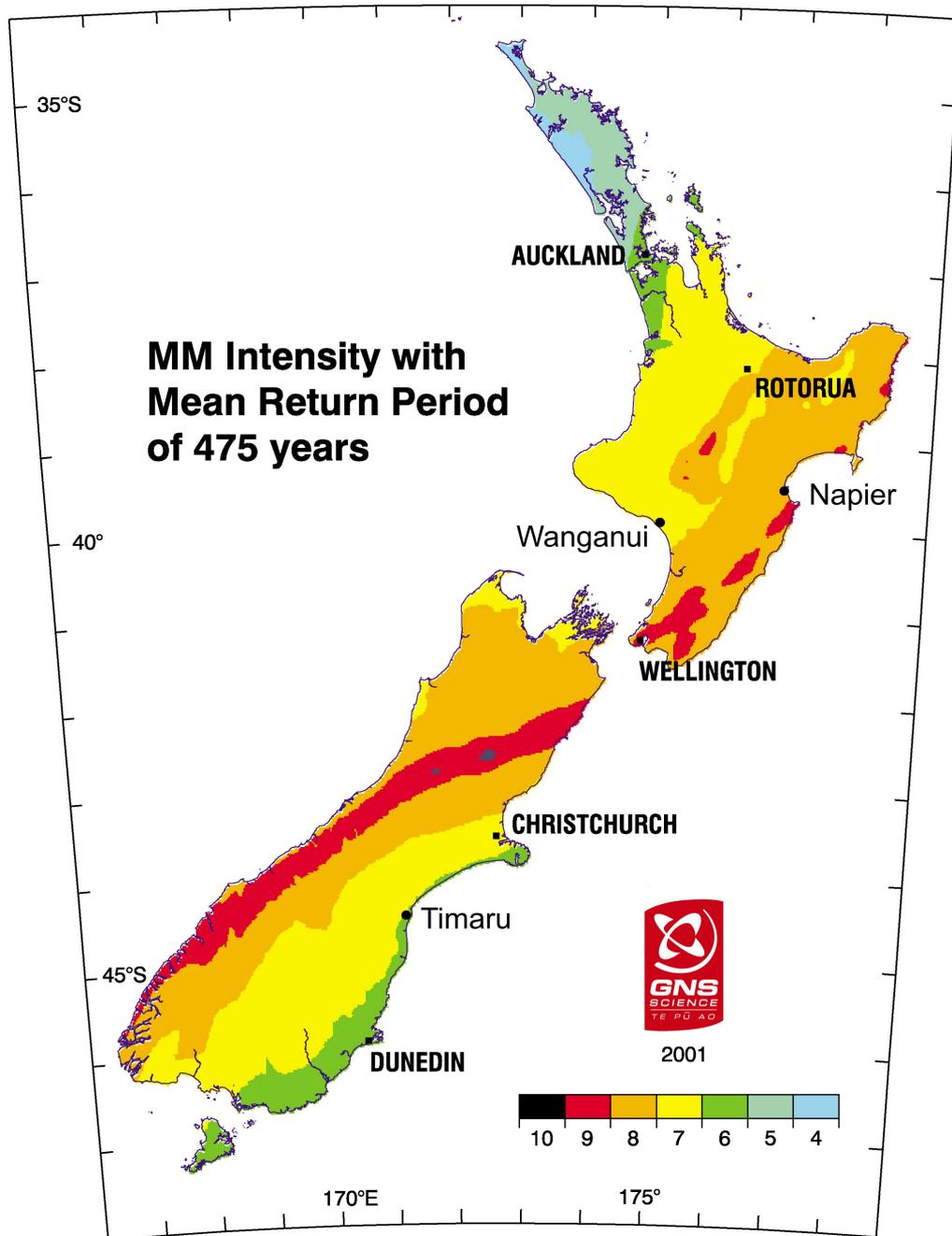
## **7.2 Method**

A qualitative research approach was used to investigate people's salient beliefs. Such an approach was useful as it allowed detail to be collected and ideas to be explored without being constrained by particular hypotheses. In terms of use of a particular research method, grounded theory was used to collect and analyse data (Strauss & Corbin, 1990). Data was collected by undertaking semi-structured interviews with household residents to canvass their views about earthquake information, earthquake hazards and preparedness. The interviews were subsequently typed up into a word processing document, loaded into the qualitative software package "Atlas.Ti", and analysed according to the grounded theory approach. A number of core categories 'emerged' from the data which helped to build an overall theoretical model of how people interpret earthquake information and how this leads to preparedness. The full model is described in Chapter 5 (Becker, Paton, et al., submitted-a). One of the categories that emerged relates to people's beliefs and how they influence the preparedness process. This paper describes those beliefs, and the effect they have.

Interviews were undertaken from April to June 2008 in three urban locations in New Zealand—Napier, Wanganui and Timaru. All three locations have a degree of

earthquake risk, with Napier being exposed to the greatest risk, followed by Wanganui and finally Timaru with the lowest risk (Stirling, et al., 2000) (Figure 7.1). To ensure that people's potential preparedness could not be affected by contextual factors, the interview locations were selected to ensure that the urban areas had a degree of similarity about them, including similar facilities, institutions, and a relative degree of geographic isolation. Participants were volunteers, recruited via invitations to community groups and advertisements in local publications. A total of 48 interviews were conducted with household residents, with 16 undertaken in Napier, 14 in Wanganui and 18 in Timaru.

Interviews were conducted during a period of relative earthquake quiescence. The last major earthquake disaster in New Zealand occurred in 1931 in the Hawke's Bay (magnitude 7.8 near Napier). Since that time both Napier and Wanganui have experienced small to moderate earthquakes, while Timaru has been exposed only to small earthquakes. The 2010 Darfield and 2011 Christchurch earthquakes had not occurred at the time of data collection. Other recent hazards to affect the study communities included repeated floods in Wanganui, and a large snowstorm in Timaru in 2006.



**Figure 7.1** Location of the study areas within areas of earthquake risk. The map shows the distribution of Modified Mercalli (MM) intensity with a current Annual Exceedance Probability of 1/475, derived from the National Probabilistic Seismic Hazard Model. Timaru is situated within MM6 (i.e. falling items, slight damage, e.g. cracked plaster), Wanganui within MM7 (i.e. buildings cracked, bricks and chimneys falling), and Napier within MM8 (i.e. damaged and partially or fully collapsed buildings) (personal communication, W. Smith, 2001; based on data from Stirling, et al., 2000).

## **7.3 Results**

On analysis of the interviews three main belief systems emerged: hazard beliefs; preparedness beliefs; and personal beliefs. The hazard beliefs described in this paper tend to fall under what is predominantly described as ‘risk perception’ in previous literature. Preparedness beliefs are more aligned to people’s understandings about what preparedness means and the effectiveness of that preparedness; and personal beliefs describe a person’s understanding of the impacts of disasters on themselves and how they might deal with a disaster.

It is recognised that the divisions between the beliefs presented here cannot be strictly applied, but are indicative only. Some hazard beliefs identified in this paper do link with preparedness and personal beliefs. Preparedness beliefs and personal beliefs also overlap, for example ‘outcome expectancy’ is usually considered a personal belief in the literature, but is described as a preparedness belief in this paper, because it is a belief about the outcome of preparing.

### **7.3.1 Hazard beliefs**

#### **7.3.1.1 What do people believe natural hazards to be?**

Interviewees had wide-ranging interpretations of what they consider natural hazards to be. Some made immediate mention of geological and meteorological hazards such as earthquakes, tsunami, landslides, coastal erosion, volcanic eruptions, floods, snowstorms, rainstorms and windstorms. Others were swayed more towards hazards related ‘to life’, such as accidents, workplace health and safety, and personal health. Life hazards were perceived as more salient and relevant to people, as they were more common and had been experienced more often than natural hazards. It is these more salient hazards around which people often based their subsequent beliefs.

Some interviewees drew a distinction between what they perceived to be human-generated hazards (e.g. accidents, chemical spills) and natural hazard events. Some tended to pay more attention to human-induced hazards because they thought they were more likely to occur than natural events. In addition, some held thoughts that human-made hazards were easier to do something about, whereas natural hazards were

uncontrollable and not easy to address. For example, Interviewee 33 says he thinks more about human-made hazards because you can do something about the problems associated with those types of hazards. He doesn't believe that you can do anything about natural hazards, therefore doesn't think about them as much.

### **7.3.1.2 Hazard beliefs that encourage preparedness**

Key hazards beliefs that were found to encourage the preparedness process included: believing there is a risk; that an earthquake was inevitable; and that an earthquake could potentially be imminent.

For people to prepare, they first had to believe that some kind of risk did exist. This was most evident when comparing between the three locations. With respect to levels of risk, according to Stirling et al. (2000), Timaru has the lowest physical level of earthquake risk, and participants were quick to note this. Consequently, people in Timaru were less likely to explicitly prepare for earthquakes, and more likely to prepare for other hazards (e.g. snowstorms, fire, general safety). Similarly, in Wanganui, flooding was perceived as the greatest risk (followed by earthquake) and people prepared for a variety of reasons, some of these being earthquake-specific and others not. Earthquakes (along with tsunami) were perceived by individuals to be one of the main risks to Napier, and this was reflected in preparedness, with people making more earthquake-specific preparations than the other locations. Because many interviewees across the three communities were still prepared, despite varying levels of earthquake risk, this suggests that preparedness is not solely related to perceived risk, but that perceived risk is merely a part of the overall process of individuals evaluating whether or not they will prepare, and how they will prepare.

The perceived level of risk appeared to affect the nature (e.g. focus on survival items, rather than earthquake mitigation) and degree of preparedness (e.g. Interviewee 31 thinks the level of risk from hazards is not extremely high, so he suggests that, "...my way of looking at things is you do a *little bit* of forward planning"). Level of risk was also found to affect thinking and talking about hazards, with people less likely to think and talk if they perceived the risk to be low. This was particularly evident in Timaru with respect to earthquakes, and made worse by the fact that people did not often experience minor earthquakes which could trigger such thoughts and conversations.

Interviewee 32 from Wanganui articulated this concept clearly by saying, “No, I don’t [think] people discuss [hazards] very much. I don’t think people actually think it’s a really - very high possibility.” Levels of risk were linked to worry and concern in people, and this was most evident where people had moved into a new residential area they perceived to be at risk, and begun to worry.

An important aspect of risk perception found in this study was that if people believe that an earthquake was inevitable at some point, then they were more likely to be motivated to prepare. This was reflected in people stating that they thought events “Do happen”, “Can happen”, or “Will happen”. Interviewee 8 from Wanganui directly articulates this:

*Why would you give [preparedness] an 8 [out of 10]?*

“Well, because I think [preparing] is important. You don’t know when these things are going to happen and you do need to be prepared for them...”

*Why do you think that [...] being prepared is useful?*

“Well, because natural disasters are things that can happen at anytime.”

There was evidence in the interviews that some individuals thought that earthquakes can happen, but hoped they won’t anyway. Thus people’s denial was found to interact with beliefs about inevitability, which in turn acted toward decreasing actual preparedness. Interviewee 20, for example, realises that disasters can happen, but hopes that there won’t be one, and has consequently not prepared. She states, “[I’m] probably living in hope that there won’t be [a future disaster], but is that realistic? I don’t think it is”.

Linked to the concept that an event was inevitable were thoughts about timing of an event. Those that believed that an earthquake was inevitable also often thought that the event could happen at anytime. This feeling of potential imminence was a motivator of preparedness. As described in the quote above, people often linked the two (“Can happen anytime”) and this linkage appeared to be the most powerful combination of belief in providing a motivation for preparing.

### **7.3.1.3 Hazard beliefs that discourage preparedness**

A number of hazard beliefs were found to discourage preparedness taking place and these included: believing an earthquake won’t happen at all; an earthquake is low risk;

an earthquake is not imminent; there will be warning; it won't happen to the individual; they can't do anything about hazards.

The first three beliefs were primarily related to risk perception. As discussed earlier, people did have to believe that there was some risk posed by earthquakes before wanting to specifically prepare for them. If they didn't think an earthquake was possible, it was low risk, or it wasn't potentially going to happen in the near future, then they were less likely to be motivated to engage in the preparedness process.

Additionally, while some individuals might have held the belief that an earthquake could happen, they also thought that an earthquake would not affect them personally. Such thoughts show reflection of optimism bias (Burger & Palmer, 1992; Helweg-Larsen, 1999; Spittal, et al., 2005) whereby people optimistically believe that they won't be affected by an event because they think it's unlikely to occur, or because they won't be affected. Interviewee 12 from Timaru rates preparedness as being only moderately important because he is, "... optimistic enough to hope it didn't - it wouldn't happen."

Belief that they might receive a warning before an impending disaster led a number of people to not prepare in advance, as they considered they could get prepared or respond once they had received the warning. This did not apply so much in the context of earthquakes, but more to hazards where it was believed warning could be given, such as floods, tsunami, volcanic events or pandemic. Interviewee 32 describes how he would get prepared on hearing a warning about an impending pandemic:

"... you would get a little bit of notice about a pandemic. I would actually make more provisions if they said its coming then I'd probably go down to the supermarket and get quite a fair chunk of stuff, over time, just in case."

*Once you had heard about it.*

"Yes. If there was warning about a pandemic starting in Auckland - you'd throw up your hands in glee and say, "Couldn't be a better place" - and then go and stock the freezer up with bread and buy a few tins of baked beans. Things like that, probably freeze a bit of milk and get some stuff in. So you could actually live for a fortnight or three weeks."

The belief that individuals can't do anything about natural hazards such as earthquakes influenced the preparedness process. This belief linked to feelings of lack of control about disasters, in particular demonstrating that external locus of control was present in some individuals. In particular, people felt that they had no control over what nature can do. This was reflected by some in saying that events such as earthquakes were an "Act of God", "We are in the lap of the gods", are at the whim of "mother nature" or that "We are at the mercy" of hazard events. This belief of lack of control in natural hazards was often in contrast with human-induced hazards, which people did feel they had more control over. As Interviewee 33 states, "... I think you can do something about human failures. You can't do anything about natural failures."

Individuals also made reference to the idea of "luck", with particular reference to the "luck of the draw" of a disaster happening or impacting a location; being lucky to have not been badly affected by a previous event; or being lucky to live in a safe area or have good facilities relevant to preparedness. Such references to luck imply that people perceive a lack of control over hazards and a belief that it is only through luck that they might survive a future event. Interviewee 6 describes how information she has seen influences her thoughts about luck and lack of control:

"And different things come up on TV about what people have done in disasters and some have survived under tables and some have survived outside and you know, again I think it's just luck of the draw. If it's your number and it's up then it's up."

Feelings of lack of control could lead people to believe that because they had no control over disasters, they couldn't do anything about the hazard problem. Certain individuals could become fatalistic about hazards and preparedness, and decide there was nothing they could do about hazards, and therefore not prepare. Interviewee 19 sums up his feelings of a lack of control over nature and his subsequent lack of impetus to prepare by saying, "...what can you do, I mean if an earthquake comes it's going to come, and yeah... (pause). I'm not sure how prepared you can be other than survival. You can't avoid it."

Other individuals accepted that there was nothing they could do about a natural hazard event occurring per se, but recognised that being prepared could help in a disaster situation, and therefore undertook preparedness actions. The data suggest that feeling a hazard event is out of your control does not necessarily mean that a person will automatically not prepare. If a person only believes that they “Can’t do anything about natural hazards” then they might well not undertake adjustment adoption. However, if a person holds the simultaneous beliefs that they “Can’t do anything about hazards” but they “Can do something about the impacts of hazards by preparing”, then they will be more likely to undertake preparedness actions. Interviewee 21 describes how people can believe that there is nothing you can do about hazard events, but still feel that preparedness might help in a disaster:

“But, um (pause) earthquakes (pause), not much you can do about them either if they’re going to flatten your house, but if they don’t flatten your house you should be all right as long as you’ve got food in your cupboard.”

Emotions and feelings were connected with lack of control of disasters. Some worried about disasters such as earthquakes because they felt like such events were out of their control; conversely others suggested that they didn’t worry about earthquakes because they felt there was nothing you could do about them (therefore there was no point worrying). A lack of control could lead to some people developing optimism bias, whereby they felt there was nothing you could do about disasters; therefore you just had to be hopeful you would be okay in an event. Interviewee 12 describes her reasoning:

“I can just imagine all this falling down, everything around me here (looks at books on bookshelves). I just hope I’m not standing underneath it. But it happens, doesn’t it. You cannot protect yourself against everything. You just can’t. So you’ve just got to be optimistic about it.”

## **7.3.2 Preparedness beliefs**

### **7.3.2.1 What do people perceive preparedness to be?**

The interviews unearthed a diversity of viewpoints about what people consider ‘preparedness’ to be. A significant number of participants discussed preparedness in the traditional emergency management sense and made reference to collecting survival

items (e.g. food, water, and other essential items), undertaking mitigation actions (e.g. securing items; retrofitting buildings) or creating an emergency plan. Some people did have broader conceptualisations of preparedness, however. For example, getting to know your neighbours was considered a form of preparedness. Preparedness was also often considered a state of mind, with interviewees advocating that attributes such as “forward thinking” were important for being prepared. Preparedness was also linked with more generic concepts such as “safety”, “survival”, “self-sufficiency” and “resourcefulness”.

There were two main ways of organising preparedness according to interviewees. Some individuals identified undertaking specific preparedness actions in order to get ready for a disaster such as an earthquake, for example putting aside items such as water, food, medication, radios, torches, candles, batteries and alternative cooking devices. Others considered themselves prepared with just what they had in the house already. For example, if their pantry was already well stocked then they might think they had enough food for a disaster, or that they could make use of items such as torches or barbeques that they had already in a disaster. Thus some people’s preparedness may not be able to be linked back to a specific decision-making process concerned with preparing, but to decision processes that have little or nothing to do with earthquake preparedness (Paton, et al., 2005). People’s interpretation of their levels of preparedness varied considerably as well, with some very prepared people considering themselves not prepared enough, and other less prepared people thinking that they were well prepared.

### **7.3.2.2 Preparedness beliefs that encourage preparedness**

On analysis of the interviews, a number of key beliefs about preparedness were found to be influential on the adjustment adoption process. These include beliefs that preparing is important; safety is important; survival is important; that preparedness is about having the ‘basics’; that you could be on your own after an earthquake; that preparing has some limitations; and that preparing is ‘a way of life’.

In the first instance, an important part of the process was that people had to believe that “Preparing is important”. The majority of interviewees did actually think that it was important to undertake a degree of preparedness, but this belief did not necessarily lead directly to adjustment adoption because of interaction with other important beliefs or

contextual factors. Preparing was considered important for a variety of reasons, including the fact that disasters can happen (often without warning), that preparedness will help with response and recovery after a disaster and that it is important to protect personal safety or ensure survival. Safety and survival were both concepts that came through as strongly associated with the ideology of preparedness itself, and as justification of the need for preparedness. Interviewee 27 directly states that preparing is important to ensure safety and survival:

*“How important do you think it is that people should prepare for natural hazards, so 1 is not important at all and 10 is extremely important?”*

“10.”

*And why would you rate it that way?*

“Because if you’re prepared then it’s certainly a less scary thing. But also it’s a higher chance of safety during a natural disaster.”

*Mmm. So when you say there’s a higher chance of safety, what do you mean?*

“Survival I mean.”

While the concepts of safety and survival were often linked (as demonstrated by Interviewee 27’s quote above), safety was also perceived more broadly by interviewees. People valued safety in their day-to-day lives, and were conscious of the importance of keeping themselves and their family safe within their general environment. While some held the importance of safety as an existing core belief, indirect experience of hazards could prompt others to think about safety or undertake safe practices. For example, Interviewee 40 suggests that his recreational and work experiences have prompted him to think more about safety: “So what with my sport being a risk possibility, my work being a high risk possibility and just driving on the roads, I saw the greatest risk there actually. And I had to stay around to support a family. I guess I was pretty tuned into safety aspects.” Because interviewees understood the need for safety in a day-to-day context, they were able to more readily transfer the need for safety to a natural hazard context. As a consequence, safety-conscious people were often more likely to undertake preparedness actions. Interviewee 9 talks about how he routinely makes

emergency plans for escaping fires as a consequence of being more safety conscious overall:

“I am very fire safety conscious. The first thing I do when I go into a hotel is look out and see where all the fire escapes are (laughter) and that sort of thing. And I am very fire safety conscious in the home, so I would check and double check, and security, ummm... security consciousness (pause). Yeah, so all those sorts of aspects of keeping safe I am very conscious of.”

Participants often referred to the idea that being prepared was about having the “basics” or having your basic needs covered (e.g. water, food, shelter and warmth). This was reflected in the most common tasks that people had undertaken, namely storing food and water, and having collected together basic supplies such as torches, radios, candles batteries and alternative cooking devices. More complex tasks such as restraining furniture, retrofitting a building, or making an emergency plan were less often carried out. Interviewee 47 articulates the views of many by saying, “So for me basic preparedness is: can I look after myself and my family or a few people around me for a couple of days? Do I have some first aid stuff, do I have, you know, a change of clothes, do I have food, do I have water? Really, the basic stuff.” “Basics” were also often linked by participants to the aforementioned idea of being able to survive a disaster. As Interviewee 25 says, “... you know, it’s really going back to basics, isn’t it? Survival is about going back to basics in my view.” Interviewee 7 also links the idea of basic preparedness to survival by saying, “In general I think that we do need to be prepared for simple things like storing water and food and emergency supplies, torch, some other things that will help you survive for a few days.”

The belief that an individual could be isolated and “on their own” in a disaster had an influence on preparedness. This embodies an understanding that help might not be available in a disaster, and that people may have to look after themselves for several days using their own personal and physical resources. People who really believed that it was possible they might be left “on their own” were more likely to be motivated to prepare. As Interviewee 47 states:

“There are a lot of natural things that can go wrong, volcanoes and you know, earthquakes and things like that, which I think people need to be aware that in an

emergency situation they may not get the assistance they would expect to get from other areas. They may be on their own, cut off somewhere for quite a while.”

Many of those who were prepared expressed realistic viewpoints about the limitations of preparing. They accepted that while preparedness could help in response and recovery from a disaster, it may not address all of the problems that arise after a disaster. For example, people reported thinking that situations may arise whereby they cannot access their preparedness supplies because their house has been damaged or because they cannot return home. This suggests that recognising the limitations of preparedness may not automatically lead to negative outcome expectancy and a lack of motivation to prepare. However the benefits of preparing must be seen to outweigh the limitations. When presented with the advantages of preparing, people can then recognise the benefits and want to prepare, while keeping a realistic understanding of the limitations in the back of their minds. Additionally, some limitations may be countered by implementing additional preparedness measures, for example, being isolated from the home environment during a disaster could be addressed by creating an emergency plan, as suggested by Interviewee 14.

People who perceived that “Preparing is a way of life” were often more likely to be prepared. Such people thought that you should always be prepared for adverse events that might arise as part of daily living, rather than just being specifically prepared for a natural disaster. Being prepared for daily hazards might include thinking about the potential impacts of adverse events and response to situations in advance, or having specific items ready in case you needed to use them (e.g. first aid kit, extra petrol in the car, a toolkit in your car in case it breaks down). Interviewee 41, for example, suggests that, “It’s always been part of my psyche to have a general preparedness for whatever eventuality may come up”, while Interviewee 48 refers to it as, “...just natural, just normal preparedness [...] that you get prepared for any sort of any emergency that would be most likely”. Some interviewees suggested that if you incorporated physical preparedness into day-to-day living then it was much easier to transfer to a disaster situation. For example, Interviewee 47 says of pandemic hazard:

“Our entire team have hand sanitizers, you know, and it’s not just for the day-to-day stuff. You know, but it’s just little things like that that I think you can do on a daily basis that when it comes to a big bang kind of thing you are already

doing it. It's easier if you're already doing it than to suddenly have to change what you're doing.”

While wanting to be prepared as a ‘way of life’ encouraged a degree of adjustment adoption, the danger was that people could over-estimate their preparedness. For example some thought because they had an overall mind-set about preparedness, or had some existing background preparedness, that they would be prepared for anything. They considered that they could either get through a disaster with the preparedness they already had, or that they were resourceful or self-sufficient enough to respond as needed at the time. They often didn't see the need to undertake further specific preparation measures for earthquakes or other disasters. For example, Interviewee 34 considers “preparedness a way of life or living” but links this to the fact that he is resourceful or self-sufficient and thus will be able to respond in a disaster as needed. Hence he is overly-optimistic about his preparedness and ability to respond. He states:

“... so yes, our general approach to life will help us and in a defensive reaction, I would say that that is perhaps the reason why we haven't gone and created a specific plan and a specific emergency kit. Because we regard ourselves as being able to look after ourselves pretty well.”

### **7.3.2.3 Preparedness beliefs that discourage preparedness**

Two key beliefs were identified that were seen to discourage preparedness. The first related to negative outcome expectancy, whereby people thought that if a disaster were to occur, being prepared wouldn't make a difference to their outcome. Reasons why people thought preparing might not make a difference included: that they might not be able to access their preparedness items during an event; that a preparedness items might not work as expected or be of any practical use; that you can only do so much to prepare and an event might overpower you anyway; that you can prepare for some hazards and not for others; or you can be prepared all you like but it's how you respond at the time that will determine your outcome. Uncertainty around the nature of hazard events and their potential impacts acted on people's negative outcome expectancy. This was particularly seen with respect to developing household emergency plans. People were unsure of what a future event might be like, and given their uncertainty could not see how any amount of emergency planning would make a difference to outcomes.

The second preparedness belief that discouraged people getting prepared was that “Preparing is over the top”. There were some individuals who believed that getting prepared was an extreme reaction to natural hazards, and this belief limited the extent of people’s adjustment adoption. For example, Interviewee 48 thinks that because people worry too much about disasters happening, “...you get people who are in the stage of over-preparedness.” Interviewee 32 thinks that some planning for disaster should take place, but should not be too extreme, “I think you have to make prudent plans but not go to the ‘nth’ degree. In other words you don’t really fill your cupboards with stuff for a disaster because you might never eat them. You keep a reasonable amount, but...” The belief that “Preparing is over the top” is largely linked with predominant social norms, whereby preparedness is not really seen as a ‘normal’ activity by the general public, and consequently is not readily accepted or applied comprehensively (see Chapter 8 for further discussion, Becker, Paton, et al., submitted-c).

### **7.3.3 Personal beliefs**

#### **7.3.3.1 Personal beliefs that encourage preparedness**

Several personal beliefs were found to be influential on the preparedness process, including: belief in the ability to prepare for disasters such as earthquakes; belief in an ability to respond to an event; belief that preparedness is a personal responsibility; and belief that an individual has some responsibility to take care of others.

The first belief relates to self-efficacy, and is described in this paper as, “I can prepare”. People who believed that they could undertake preparedness actions were more likely to be inclined to actually undertake adjustment adoption. Interviewee 37 directly states that she believes that she can undertake preparedness and talks about specific actions she has done:

“I can [prepare] and it’s not actually a huge sacrifice. It takes a little bit of time now and again. [...] I guess the things that we’ve done are things like the food and water. There’s one or two things that I probably should do in terms of, I haven’t got a radio and that sort of stuff that I really ought to have. And I think actually I find it easier to do those things that I can do myself...”

As articulated by Interviewee 37, people's belief that they can undertake preparedness was stronger when faced with undertaking relatively simple tasks like collecting together survival items, but waned as tasks became more complex.

Another personal belief that influences the preparedness process is "I can respond" in a disaster. This belief, while also associated with self-efficacy, is noted as a distinct belief because it creates a slightly different influence depending on the context. Where people believed "I can prepare" and "I can respond" simultaneously, then they were more likely to undertake adjustment adoption. This is because they linked these two concepts and realised that having a degree of preparedness would assist with their response in a disaster. Interviewee 7, for example, understands that he "can prepare" to assist in response to a disaster such as an earthquake, and has undertaken some basic preparedness such as storing food and water. He then links this preparedness to being resourceful in response to an earthquake:

"I think we would survive all right. You know, we're resourceful and as long as we didn't suffer any injuries we can walk places, we can make do with food supplies we have and if we needed to work on our house we could if it was something structurally wrong, you know, we can do some things. So yeah, I think we would survive for a few days until water ran out. And then it would probably be an inconvenience of where to get water."

Where people only believed that, "I can respond" then they were less likely to undertake adjustment adoption. This is because individuals did not link their ability to respond in a disaster with prior preparedness, and instead intended to rely on their own resourcefulness during an event. Such belief in their inherent resourcefulness was often influenced by prior experiences they had been exposed to, for example, they may have been able to respond adequately to past disasters or other adverse situations by using their existing personal and physical resources. A belief in the necessity of resourcefulness also appeared to be linked to uncertainty, whereby people were uncertain about how an event might unfold and therefore preferred to wait and see what kind of response they might need to employ. Participants also talked about the perceived need to maintain flexibility to adapt to circumstances in an event.

Interviewee 25 provides an example of how a belief in personal resourcefulness can have a negative effect on the preparedness process. He states the reason he hasn't made

a household emergency plan, is because he is relying on his own resourcefulness to respond to an earthquake.

“We haven’t actually sat down and [...] prepared a plan. I mean, some people would say that it’s likely, but I’m a pretty fast reactor to things and thinking ahead, you know, I’ve got all the hand tools, I don’t mean electric tools, all the hand tools and I know how to use those things. And you know I could very quickly make or create a situation or alter a situation so it could become more acceptable. You know, I’m just thinking knocking a hole in the floor and propping the floors up and using them for fire if you had to, all those sorts of things that wouldn’t occur to a lot of people.”

Beliefs about responsibility also influenced the preparedness process. Individuals who believed that, “I have a personal responsibility to prepare” were more likely to undertake adjustment adoption. In addition, those who thought, “I have a responsibility for others” (e.g. children, family, the community) often prepared in order to ensure such dependents were safe in the event of a disaster.

### **7.3.3.2 Personal beliefs that discourage preparedness**

The interviews highlighted a number of key personal beliefs that served to discourage preparedness. Such beliefs included that: an individual will be able to respond to a disaster as needed (the details of which are discussed above); they will be okay if an event were to occur; that other people or places are more vulnerable to disasters; that others will help in a disaster; and that it is not a personal responsibility to prepare.

It is clear that optimistic bias plays a predominant role in many of the beliefs listed above. People are overly optimistic that in a disaster they will be able to respond effectively, will not suffer any adverse consequences, that other people will be affected more than themselves, and that others will be available to help them out. While some optimism occurs as a consequence of a lack of understanding and experience with disasters, a number of people are also optimistic because they have had experience of a previous event that has been relatively benign, resulting in normalisation (e.g. the 2006 Timaru snowstorm). Such optimism prevents individuals from recognising that having a degree of preparedness is important for effective disaster response and recovery. As a

consequence these optimistic individuals are less likely to undertake adjustment adoption measures.

If people believed that they did not have a responsibility to prepare for disasters they were less inclined to undertake adjustment option. Such individuals often believed that responsibility for dealing with hazard issues lay with other groups or agencies within society. Thus individuals transferred this responsibility for dealing with hazard issues on to these bodies. Interviewees transferred responsibility for dealing with hazard issues to a variety of agencies, including central and local government, civil defence emergency management, emergency responders (e.g. fire, police), and lifeline and utility companies. Some transferred responsibility to the insurance sector, and did not prepare because they were convinced that it was the insurance sector's job to fix any damage that might befall them in an earthquake. Interviewee 32 thinks that any potential damage of his house would be covered by insurance, and because of this has not bothered to undertake specific building retrofitting actions. Interviewee 34 also discusses how he transfers the responsibility of dealing with hazard impacts on to the insurance industry:

“...we probably all have house insurance and life insurance [...] but that's easier to do because you just write a cheque out to look after that. You pay somebody else to worry about your hazards in the future. But actually physically doing something, we tend to give it a lesser priority.”

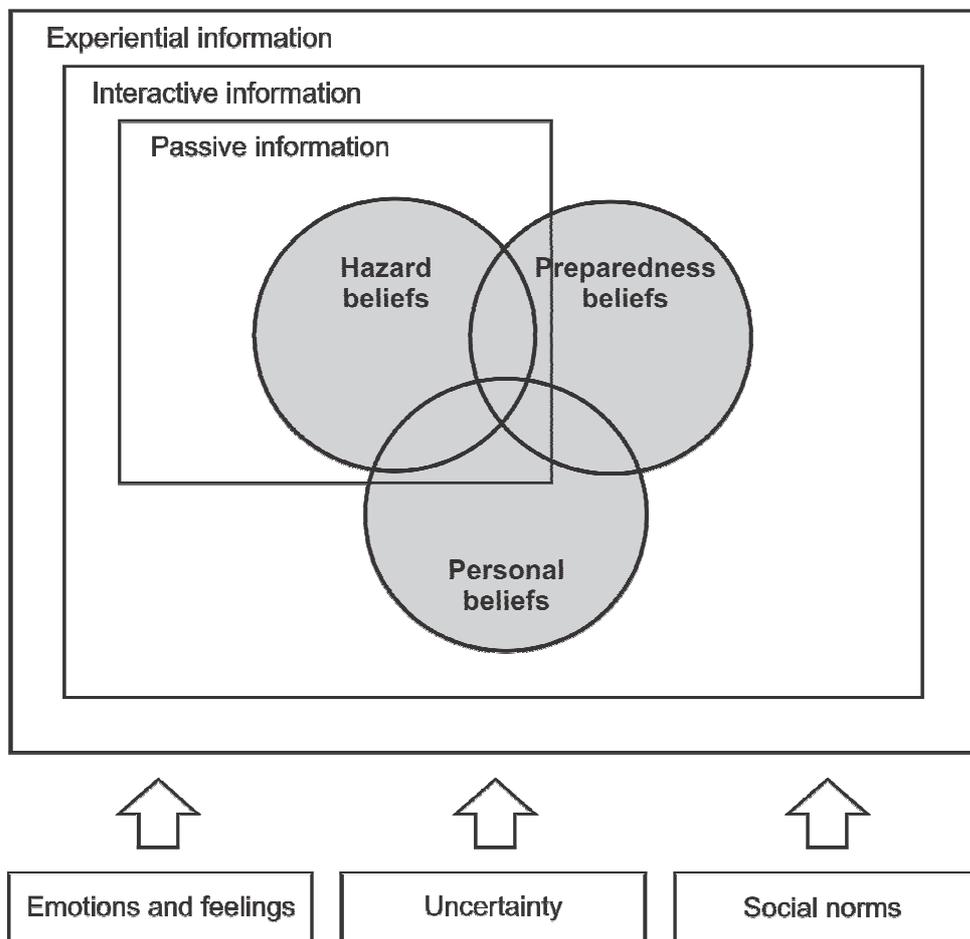
It was notably common for interviewees to transfer the responsibility of safe buildings to the Building Act (2004) and associated building code and standards. Participants assumed because there was legislation in place to address earthquake risk in buildings that most recently constructed residential buildings would comply, and thus would be safe in an earthquake. This belief meant that many did not feel a necessity to undertake household earthquake adjustment measures. Interviewee 26, who has not undertaken any retrofitting, describes how he assumes the safety of his apartment is covered by the Building Act:

“It's a concrete block structure. My flat is the lower storey. Risk-wise I guess that the predominant one is earthquake. How the structure can withstand an

earthquake is probably the outstanding risk. I don't see fire as being a risk at all. It's relatively modern. I take it for granted that it is built to design code."

### 7.3.4 Formation of beliefs

An important question to be asked is: if the aforementioned beliefs are important to the preparedness process, how are they formed? The interviews revealed that formation of beliefs predominantly occurred by exposure to three main information sources: (1) passive information; (2) interactive information; and (3) experiential information. Other significant influences on the formation of beliefs included uncertainty, emotions and feelings, and social norms. Figure 7.2 shows a representation of these key influences on hazard, preparedness and personal beliefs.



**Figure 7.2** Key influences on beliefs as identified in the interviews.

In the first instance, passive information (e.g. brochures, advertisements, the internet, email, news media, displays, books, films, fridge magnets, signage, warning sirens, photographs and environmental cues) was most likely to have an influence on the

formation of hazard beliefs. It tended to predominantly raise awareness of the risk, helping form beliefs such as, “There is a risk”, “Can/will/does happen” and “Anytime”. One passive information type of note was media information about overseas disasters, which while it helped form the beliefs previously mentioned, also could engender fatalistic beliefs such as “I can’t do anything about hazards”, or influenced the personal belief that “Other people or places are more vulnerable than me”. Passive information did not appear to have a strong effect on the majority of other personal and preparedness beliefs, but this of course depended on the person and the context that they were situated within. The one preparedness belief that passive information clearly did influence was recognition of the need to prepare (“Preparing is important”).

Interactive information, primarily garnered through discussion with others in interactive settings (e.g. community groups, workplaces, schools), had a much broader influence on beliefs than passive information alone. Such information helped develop a range of hazard, preparedness and personal beliefs. The most often noted beliefs that were formed through exposure to interactive information included, “There is a risk”, “Can/will/does happen”, “Anytime”, “Preparing is important”, “You could be on your own”, “I can prepare” and “I can respond”. However, while these concepts were most often referred to by interviewees, a range of other beliefs were also noted (e.g. “Safety” and “Survival”). Thus interactive information helped develop accurate risk perceptions about hazards such as earthquakes, emphasised the importance of preparing, helped people understand reasons why they should prepare, helped cultivate people’s understanding of how to prepare or respond, and assisted with developing an individual’s belief in their ability to prepare and respond.

Experiential information had by far the biggest influence on belief formation of all the information types. Experiential information was gleaned from individuals’ previous direct and indirect experiences of disasters, and indirect experiences of other adverse events (e.g. accidents, personal health experiences, workplace hazards, recreational hazards). Experiential information had a strong influence on forming hazard, preparedness and personal beliefs. People’s direct and indirect experience of disasters was more likely to assist with the formation of hazard beliefs such as “There is a risk”, “Can/will/does happen” and “Anytime”. Indirect event experience helped form preparedness beliefs such as “Preparedness is a way of life”, “Safety is important”, and

“Survival is important”. Both disaster experience and indirect event experience contributed to the formation of preparedness beliefs such as “Preparing is important”, and the personal beliefs of, “I can prepare”, and “I can respond”. One downfall of experience was that if people had a good experience of an adverse event, then they might be overly optimistic about experiencing a future event (e.g. “I was okay in a previous event, therefore I will be okay in future”). Another common reaction from interviewees following their experiences was that they felt that, “You can’t do anything about hazards” (or certain hazards). A lack of experience led people to predominantly believe that they were unlikely to be affected by future events, or that they would fare well if a disaster were to occur. It was evident that experiential information had a strong influence on the formation of beliefs in both a positive and negative way. Chapter 6 (Becker, Johnston, et al., submitted-c) discusses the influence of experience on the preparedness process in more detail.

Three other significant influences on the formation of beliefs included uncertainty, emotions and feelings, and social norms. Uncertainty surrounding hazard beliefs, lead to uncertainty surrounding preparedness and personal beliefs. For example, if a person is uncertain about whether a risk exists or not, then they may be uncertain about whether “Preparing is important” or whether preparing can be ultimately useful in a disaster situation. Emotions and feelings also interacted with beliefs. For example, those who had worry or fear about disasters often had strong beliefs about the need for “Safety” and “Survival”. Worry was also often connected to the belief that you “Can’t do anything about hazards”. People would also have worry or concern for family dependents and community members, reflected in the belief that “I have a responsibility for others”. Finally, social norms also influenced beliefs, particularly those related to preparedness and personal beliefs. In particular, social norms influenced the idea that preparing is a personal responsibility, that people should have responsibility for others, and thinking that “Preparing is over the top”. The concept of responsibility also linked directly with preparedness and personal key beliefs such as “Preparing is important”, “Safety”, “Survival”, “Preparing is a ‘way of life’” and “I will fare okay”.

## 7.4 Discussion

### 7.4.1 Salient beliefs in the preparedness process

It is clear from the interviews that people hold a number of salient beliefs about hazards and preparedness, some of which are helpful to motivating preparedness, others of which are unhelpful. These beliefs may directly influence adjustment adoption, or indirectly influence the preparedness process by interacting with other beliefs and existing personal, social and environmental factors.

This research found that three main types of beliefs influence preparedness, including hazard beliefs, preparedness beliefs and personal beliefs (Table 7.1). Hazard beliefs were considered to be beliefs that prominently relate to ‘risk perception’; preparedness beliefs were more aligned with people’s understanding about what preparedness means and the effectiveness of that preparedness; and personal beliefs described a person’s understanding of impacts of disasters on themselves and how they might deal with a disaster.

**Table 7.1** Key beliefs important to encouraging and discouraging preparedness (Becker, Johnston, et al., submitted-a).

	<b>Encourages Preparedness</b>	<b>Discourages Preparedness</b>
<b>Hazard Beliefs</b>	<ul style="list-style-type: none"> <li>- There is a risk</li> <li>- Can/will/does happen (inevitability)</li> <li>- Anytime (imminence)</li> </ul>	<ul style="list-style-type: none"> <li>- Won’t happen at all</li> <li>- Won’t happen to me (lack of personalisation)</li> <li>- Low risk</li> <li>- Not imminent</li> <li>- There will be warning</li> <li>- Can’t do anything about hazards (lack of control, external locus of control)</li> </ul>
<b>Preparedness Beliefs</b>	<ul style="list-style-type: none"> <li>- Preparing is important</li> <li>- Safety</li> <li>- Survival</li> <li>- Basics</li> <li>- On your own</li> <li>- Recognise limitations of preparing</li> <li>- Preparing is a ‘way of life’</li> <li>- Preparing will help me in a disaster (positive outcome expectancy)</li> </ul>	<ul style="list-style-type: none"> <li>- Preparing won’t work/make a difference (negative outcome expectancy)</li> <li>- Preparing is ‘over the top’</li> </ul>
<b>Personal Beliefs</b>	<ul style="list-style-type: none"> <li>- I can prepare (self-efficacy)</li> <li>- I can respond/resourcefulness (only if this is linked with the “I can prepare” belief)</li> <li>- I have a personal responsibility to prepare</li> <li>- I have a responsibility for others (e.g. children, family, the community)</li> </ul>	<ul style="list-style-type: none"> <li>- I can respond/resourcefulness (when not linked with the “I can prepare” belief)</li> <li>- I will fare okay</li> <li>- I was okay in a previous event, therefore I will be okay in future (normalisation bias)</li> <li>- Other people or places are more vulnerable than me (optimistic bias)</li> <li>- Others will help in a disaster (e.g. agencies, other community members)</li> <li>- It’s not my responsibility to prepare</li> </ul>

Certain beliefs already identified in previous studies were also identified in this research as affecting the preparedness process. In particular, beliefs related to there being an inevitable and imminent threat, self-efficacy, positive outcome expectancy, personal responsibility and a belief in responsibility for others (Duval & Mulilis, 1999; Lindell & Perry, 1992, 2000, 2011; McIvor, et al., 2009; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2000; Mulilis, et al., 2003; Mulilis & Lippa, 1990; Paton, 2003; Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Sagala, et al., 2010; Paton, et al., 2005) were helpful in motivating preparedness. Conversely, beliefs that were related to denial, fatalism, normalisation bias and optimistic bias (Burger & Palmer, 1992; Helweg-Larsen, 1999; McClure, 1998, 2006; Mileti & O'Brien, 1992; Spittal, et al., 2005) acted to hinder people's motivations to prepare. The interviews also revealed that people predominantly believe that getting prepared means collecting together survival items (Russell, et al., 1995), as opposed to undertaking mitigation actions, making an emergency plan, learning survival skills, or engaging in social preparedness activities (Heller, et al., 2005; Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Ronan, et al., 2010; Russell, et al., 1995; Spittal, et al., 2008).

New salient beliefs were identified during this study, as well as insight into how some of these beliefs interact within the wider informational and societal context. In particular the study found that the value that people placed on more every-day life aspects such as safety had a strong influence on preparing. Prepared people were also more likely to believe that "Preparedness is a way of life" and to recognise and accept that preparing did have some limitations. While people's approach to every-day risks has been shown to have some influence on the preparedness process (Norris, 1997; Spittal, et al., 2008) this study was able to demonstrate the actual nature of the link between every-day safety beliefs and practices, and disaster adjustment adoption actions.

The interviews suggested that in some cases certain configurations of beliefs were required to be influential on the preparedness process. For example, individuals had to believe that a hazard event was both inevitable and imminent (i.e. "Can happen anytime") before they were likely to be motivated to prepare. In addition, people had to also simultaneously believe that, "I can prepare" and "I can respond" to a disaster. If they only believed that they could respond to an event then they may be overly

optimistic in relying on their current resources in a disaster and not see a need to prepare.

#### **7.4.2 Formation of beliefs**

In attempting to develop helpful beliefs, the provision of passive information alone appears to have only a limited influence. Passive information tends to raise awareness and understanding about hazards such as earthquakes, and emphasise that preparedness is important, but does not seem to have a significant impact on developing other influential beliefs. As an example, the Ministry of Civil Defence & Emergency Management in New Zealand (2011a) frequently provide written, radio and television messages that disasters “Can happen anytime” or that people could be “On their own” in a disaster (i.e. “Disasters such as earthquakes, tsunamis volcanic eruptions, floods and storms can strike at any time, sometimes without warning” and “...you and your family will be on your own for up to three days or more...”). However, despite ongoing communications, people appear not to take all of these messages into their belief systems. While some interviewees credited passive information with helping them understand that a disaster “Can happen anytime”, it was seen to not be particularly effective in helping form the belief that you “Could be on your own”.

Interactive and experiential information had a much more powerful effect on developing beliefs that were influential in the preparedness process. In contrast to passive information, individuals were much more likely to form a range of hazard, preparedness and personal beliefs with interactive and experiential information. For example, the concept of being “on your own” in a disaster, was more likely to be formed by exposure to interactive and experiential information, as opposed to passive information. Evidence from the interviews suggest that passive information has a limited influence on belief formation, so earthquake education strategies should ensure that a variety of types of information are used to develop helpful beliefs, and negate unhelpful ones. In addition, people will draw upon multiple sources of information in forming their beliefs (e.g. compare passive information with previous experiences) so it is important that information is consistent or able to be verified (Chapter 4, Becker, Johnston, et al., submitted-b; Lee, 1999; Mileti & Darlington, 1995, 1997).

Other key influences on the development of beliefs identified in this study included uncertainty, emotions and feelings, and social norms. Emergency managers and other earthquake educators need to ensure that such factors are considered when earthquake education programmes are devised. For example, even if the best communication strategies are able to convince people that “Preparing is important”, individuals are still unlikely to take household earthquake adjustment if the behaviour is not seen to be consistent with the predominant social norm.

### **7.4.3 Other points of note regarding belief formation**

Additionally, a number of other specific suggestions can be made regarding belief formation and earthquake education based on the interview data:

1. Individuals demonstrated a wide range of understanding about what they consider a ‘hazard’ to be, and what ‘preparedness’ means to them. Such a range in viewpoints highlights the need for earthquake educators to be clear in their communications about what perils people should be taking note of, and what people should be doing to prepare.
2. Despite wide ranging views about the overall concept of ‘preparedness’, the interviews revealed a strong focus on having survival items as a way of being prepared. This linked with beliefs about the need for “Basics” and “Survival”. Earthquake education programmes need to continue to build people’s knowledge and behaviour about other forms of earthquake preparedness such as mitigation actions, or preparing a household emergency plan.
3. People that simultaneously believed that a hazard event was both inevitable (“Can/will/does happen”) and imminent (“Anytime”) were more likely to engage in the preparedness process. An understanding of the presence or level of risk was important to the preparedness process, but did not appear to motivate people into taking action as much as thinking an event “Can happen anytime”.
4. Individuals who were prepared often considered preparedness to be a “way of life”. They preferred to be prepared for adverse circumstances likely to be experienced during daily life (e.g. accidents, recreational hazards, workplace hazards), as well as for disasters. Earthquake educators could consider how to link more salient day-to-

day preparedness with disaster preparedness, in their attempts to encourage people to prepare for earthquakes. It is also suggested by some authors that some of these more salient or higher priority issues are just as, if not more, important, and need to be addressed by authorities before people can begin to take on board natural hazard issues (Carter-Pokras, et al., 2007).

5. With respect to self-efficacy, earthquake educators should be conscious of the need to build beliefs both around, “I can prepare” and “I can respond”. If individuals believe both of these statements, then they are more able to link these concepts with the idea that preparedness will help them respond in an earthquake. If they only believe that “I can respond”, then they potentially might rely on their own existing preparedness or resourcefulness to respond, rather than make any specific preparations for a disaster.
6. Finally, while it is important to develop beliefs that can motivate preparedness, it is also important to counteract beliefs that discourage adjustment adoption. Earthquake educators should ensure that earthquake education programmes include ways of addressing unhelpful beliefs.

#### **7.4.4 Limitations**

This study has identified a range of beliefs that people hold about hazards and preparedness, and the interactions that these have with other beliefs and the wider personal, social and environmental context. However, because the research was qualitative in nature, it is unknown whether the findings apply across the general population. Further quantitative research is required to test whether the ideas presented here can be transferred to the wider community. As the overall sample size was small (as per qualitative procedure), some bias may also exist in the sample, including an over representation of older people (i.e. over half the sample was 60 years or over), of people belonging to community groups, and people interested in hazards and preparedness issues.

## **7.5 Link to Chapter 8 - Paper 5**

The following chapter (Chapter 8 - Paper 5, Becker, Paton, et al., submitted-c) discusses how a variety of societal factors can influence people's meaning-making process of earthquake hazard and preparedness information, and actual adjustment adoption. Influential societal factors identified in the interviews include community participation, sense of community, perceiving a personal responsibility for preparing, feeling a responsibility for others, leadership, social norms, trust and societal requirements. Recommendations are made on how to account for societal influences in future earthquake education programmes.



# Chapter 8 Paper 5: Societal factors of earthquake information meaning-making and preparedness

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## Abstract

The adoption of household preparedness for earthquakes has long been studied, and a wide range of factors have been identified as influencing preparedness. Such factors include specific perceptions about earthquake risks, perceptions about the preparedness process, other attitudes and beliefs, emotions and feelings, previous earthquake experience, coping style, resource issues, earthquake education, demographic characteristics and social influences. Most studies, however, have focused on investigating adjustment adoption in an individual sense, looking at intra-individual cognitive processes and their influence on preparedness. Less well studied are social influences on the preparedness process. In particular, there is limited understanding of the impact that wider society has on people's interpretation of earthquake and preparedness information, and how this relates to people's decisions about getting prepared for earthquakes. To address this gap, a New Zealand-based project was initiated to investigate how social factors interact with individuals' meaning-making of earthquake information and how this affects subsequent earthquake preparedness behaviour. A range of social factors were identified as being influential on the

meaning-making and preparedness process, including: community (community participation, sense of community); leadership; responsibility (responsibility for preparing, responsibility for others); social norms; trust; and societal requirements.

## 8.1 Introduction

Undertaking individual household preparedness is advocated as one way of reducing risk of death, injury and damage from large earthquakes, and aiding response and recovery. Preparedness can be undertaken prior to an earthquake by collecting together survival items such as food, water and other essentials; undertaking mitigation actions such as retrofitting a building to prevent earthquake damage; creating a household emergency plan so that family members know how to respond in the event of an earthquake; learning survival skills; or participating in social preparedness activities (Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Mulilis, et al., 1990; Russell, et al., 1995; Spittal, et al., 2008).

Despite years of advertising campaigns advocating that householders undertake preparedness, levels of preparedness are still modest. In New Zealand, for example, less than half (49%) of residents have undertaken any single action to reduce or prevent damage from earthquakes (Earthquake Commission, 2011), and only 24% describe themselves as being fully prepared for any kind of disaster at home (Colmar Brunton, 2010).

In order to raise levels of household preparedness, it is first necessary to understand what motivates people to prepare. Household adjustment adoption for earthquakes is a heavily studied field, and a wide range of factors have been identified as influencing preparedness, including specific perceptions about earthquake risks, perceptions about the preparedness process, other attitudes and beliefs, emotions and feelings, previous earthquake experience, coping style, resource issues, earthquake education, demographic characteristics and social influences (for more detail see review papers by Lindell & Perry, 2000; Solberg, et al., 2010).

Despite the range of research on earthquake adjustment adoption that has taken place, however, such studies have been relatively constrained in their approach. Most have focused on investigating adjustment adoption in an individual sense, looking at intra-

individual cognitive processes (Solberg, et al., 2010). Consequently, while some social influences have been highlighted as influencing preparedness, the impact that wider society has on both people's interpretation of hazard and preparedness information, and how this affects the preparedness process, has not been investigated in any depth. To address this gap, this project attempted to investigate social influences of information interpretation and meaning-making, and how this relates to subsequent earthquake preparedness behaviour.

### **8.1.1 Previous studies**

As mentioned previously, prior studies have identified a number of social aspects that influence earthquake adjustment adoption behaviour. Previous work has tended to adopt a narrow definition of the concept of 'social' and has predominantly measured the direct influence of demographics on individual preparedness (e.g. gender, income, education, length of time in neighbourhood, home-ownership, marital status, family-make-up, ethnic make-up). The results of these studies have been varied, with different demographics noted to influence earthquake adjustment adoption depending on the study (e.g. Armaş, 2006; Dooley, et al., 1992; Edwards, 1993; Endo & Nielsen, 1979; Farley, et al., 1993; Karanci, et al., 2005; Lindell, et al., 2009; Lindell & Prater, 2000; Mileti & Darlington, 1997; Mileti & O'Brien, 1992; Ozdemir & Yilmaz, 2011; Paradise, 2005, 2006; Russell, et al., 1995; Tanaka, 2005).

With respect to risk perception, studies have linked certain demographic groupings, such as being female, being part of a minority and being older, with higher risk perceptions (Solberg, et al., 2010). Socio-economic status appears to have mixed effects on risk perception depending on the location in question. For example, people of higher socio-economic status (e.g. income, education, home ownership) in developed countries such as the United States have been noted to have lower risk perceptions, while those of increasing educational attainment in moderately developed countries have been seen to have higher risk perceptions (Solberg, et al., 2010).

Such variance in the influence of demographics on the risk perception and preparedness process highlights the fact that demographics interact differently depending on the exact social and environmental context.

In looking beyond demographic information, a number of other social influences of earthquake preparedness have been identified. Community participation, for example, has been found by many studies to be essential to the preparedness process.

Participation encourages people to discuss and solve hazard-related issues, acts to give citizens a feeling of empowerment to take action and assists in building trust, all essential elements of the preparedness process (Karanci & Aksit, 1999; McIvor, et al., 2009; Paton, 2007b, 2008; Paton, Bajek, et al., 2010; Paton, Houghton, et al., 2008; Paton, et al., 2009; Paton, Parkes, et al., 2008; Paton, Sagala, et al., 2010; Paton, Smith, et al., 2008). While individual self-efficacy has been found by many studies to be an influencer of preparedness (Cowan, et al., 2002; Duval & Mulilis, 1999; Lindell & Prater, 2002; Lindell & Whitney, 2000; McClure, et al., 2001; McClure, Sutton, & Sibley, 2007; McClure, Sutton, & Wilson, 2007; McClure, et al., 1999; Mulilis & Duval, 1995; Rüstemli & Karanci, 1999; Şakioroğlu & Karanci, 2008), collective efficacy has also been identified as an essential element in the process, both indirectly (e.g. helping assist with empowerment and trust) and through directly motivating intentions to prepare (Paton, Bajek, et al., 2010; Paton, Houghton, et al., 2008; Paton, et al., 2009).

The concept of ‘sense of community’, or feelings of belonging and attachment for people and places, has mixed findings. Paton et al. (Paton, Millar, et al., 2001; Paton, et al., 2005) did not find any strong linkages between sense of community and the preparedness process for disasters such as earthquakes or volcanoes. However, Bishop et al. (2000) found sense of community to be a predictor of action toward salinity issues, and sense of community has also emerged as important in several bushfire studies (Paton, et al., 2011; Paton, Kelly, et al., 2006; Prior & Paton, 2008). In a similar vein to the concept of ‘sense of community’, Russell et al. (1995) suggest that a number of demographic variables such as length of time in a community, home ownership, number of children at home and other variables may enhance a feeling of ‘community bondedness’ and thus encourage a desire to take responsibility for oneself and others by preparing. This is confirmed by other studies that have found adjustment adoption linked to having children or dependents in a household (Dooley, et al., 1992; Edwards, 1993; Russell, et al., 1995; Turner, et al., 1986). Feeling a sense of social responsibility to others has also been directly identified by McIvor et al. (2009) as a motivator for preparing.

Social norms are accepted ideas about appropriate behaviour, and often will restrict individuals' behaviour because people will usually conform to an acceptable norm. People may feel pressure to conform for a range of reasons including: being part of a group (no matter how small); there being agreement between several groups; the individual identifying with those providing an opinion; the status of the person (the higher the status, the more influential a person is); feeling like they are in the public eye; and having no prior commitment to an opinion (Myers, 2002). A person may conform for two major reasons: to be accepted and avoid rejection (normative influence), or to obtain important information about realities they are unsure of (informational influence). People will do the latter if they feel incompetent, if a task is perceived as difficult, and if they care about being right (Myers, 2002). White, Smith, Terry, Greenslade and McKimmie (2009) outline three types of norms that have been found to contribute to normative influence in previous studies related to health and environmental behaviours:

- Social injunctive norms, whereby action is motivated based on the receipt of social rewards or punishment for engaging in a certain behaviour;
- Descriptive norms, whereby action is motivated by the perception of whether other people perform a behaviour; and
- Personal injunctive or moral norms, whereby action is untaken based on a person's internal moral rules.

Previous literature discusses aspects of social norms in relation to hazards and preparedness. McIvor and Paton (2007) looked specifically at subjective norms and found that positive subjective norms had an indirect influence on intentions to prepare, mediated by outcome expectancy. Positive subjective norms also linked with having a positive attitude toward preparing. Other research on earthquake adjustment adoption addresses social norms in a more indirect fashion. For example, several researchers have found that people may be more likely to prepare if they observe or believe that others have prepared (Farley, 1998; Mileti & Darlington, 1997; Mileti & Fitzpatrick, 1992). Other aspects known to influence preparedness, such as thinking and talking about hazards, community participation, the development of a local 'earthquake culture' (Moore, 1964; Turner, et al., 1986), and feeling responsibility for other community

members, also imply that social norms must be a factor in the preparedness process. In an informational context, Solberg et al. (2010, p. 1669) suggest that when “information sources providing explicit norms for adjustment are numerous, consistent and specific” then adjustment adoption has been seen to be higher. Despite an indication that social norms play a part in earthquake adjustment adoption, social norms have not been studied comprehensively. Further research is required to fully understand how social norms interact within the wider preparedness process.

While many of the aforementioned studies have highlighted a number of social influences on the preparedness process, such studies have been limited in nature. In particular it is unlikely that the full range of social influences have been identified. Additionally, it is still relatively unknown how particular social aspects interact with other cognitive, emotive, environmental and social factors relevant to the preparedness process. This study aimed to identify the range and nature of such interactions. In particular the study draws upon social influences in the context of people’s interpretation of earthquake hazard and preparedness information, and linkages with the overall preparedness process.

## **8.2 Method**

To identify the influence of social factors on the earthquake information meaning-making and preparedness process, qualitative interviews were undertaken with 48 household residents from three urban locations in New Zealand. The research used a grounded theory methodological approach (Strauss & Corbin, 1990). The grounded theory approach allowed residents to speak freely about their thoughts on hazard and preparedness information, and preparedness for hazard events such as earthquakes.

The urban locations selected for the study were Napier (16 interviews), Wanganui (14 interviews) and Timaru (18 interviews). These locations were selected as they each have a degree of earthquake risk, are relatively similar in size (populations between 25,000 and 55,000 based on the 2001 census data), would be reasonably geographically isolated in a disaster, and have similar facilities, institutions and legislative environments. Interviews were conducted from April to June 2008.

Napier was the urban centre that had been most recently affected by a large damaging earthquake (magnitude 7.8 Hawke's Bay earthquake in 1931), with Wanganui experiencing a slightly damaging earthquake in 1991 (magnitude 6.5), and Timaru only experiencing small earthquakes. The 4 September 2010 Darfield earthquake (magnitude 7.1) and 22 February 2011 Christchurch earthquake (magnitude 6.3) occurred after data collection had taken place. Consequently, interviews were conducted in a period of relative earthquake quiescence. Other relevant disaster events that had occurred recently included a snowstorm in 2006 that had impacted Timaru (Hendrikx, 2007), and a series of floods in Wanganui, with the last damaging flood event occurring in 1990.

Interviews were taped with the interviewee's permission, and transcribed into a word processing document. They were then loaded into the qualitative analysis software package "Atlas.Ti", and an analysis was undertaken according to grounded theory methodology. During the analysis a number of core categories were identified that reflected a range of influences on the earthquake preparedness process. One core category identified as part of the analysis was 'societal influence on preparedness', with a number of social sub-categories falling underneath this concept. This paper describes how such identified social factors interact with information interpretation and the overall process of getting prepared for earthquakes.

## **8.3 Results**

Key social influences identified in analysis of the interviews included the community (community participation, sense of community), responsibility (responsibility for preparing, responsibility for others), social norms, leadership, trust and societal requirements. The nature of these influences is described under the following sub-headings.

### **8.3.1 Community**

Communities are often considered to be a social network of interacting individuals, located within a specific geographic area (Johnston, Gregory, & Smith, 1994). However, the term 'community' can also refer to groupings of people who share common interests, such as religion, family ties, culture or social activities. A

community essentially exists if there is a social network present whereby people interact with one another in some way. It is argued that some neighbourhood-based communities today are less socially networked than in the past and are less effective in operating as a unit, while groupings that consist of people from widespread geographic locations may in some cases be stronger.

Given that communities can be geographically place-oriented or based on shared interests, people may belong to a number of different communities. The interviewees suggested that they belonged to a range of communities during their conversations. Common communities mentioned included neighbourhoods, wider urban areas (i.e. the whole town or city), workplaces, schools, and community groups (e.g. hobby or interest groups, sports groups, community service groups, and religious groups). The different communities all had varying influences on participants, but in particular neighbourhoods, workplaces, schools, hobby or interest groups, and community service groups proved influential with respect to hazards and preparedness issues.

A number of overall community influences were evident. The first relates to participation in the community with respect to hazard and preparedness issues. If people participated in the wider community they were more likely to think and talk about hazard issues, have a raised awareness of hazards and preparedness, understand the consequences of a potential event better, develop some skills they could use for preparedness and response, be empowered, have trust in organisations involved with hazard issues, and be more likely to be motivated to prepare. A variety of levels and types of participation were noted. At the most basic level, people participated with informal networks to discuss hazards and preparedness issues (e.g. conversations with friends and family about what people have seen in the media). Other types of participation included listening to a speaker talking about hazards and preparedness, attendance at meetings, and involvement in community activities (e.g. school activities, workplace activities and community group activities). In general, the more interactive, structured and frequent the participation was, then the more likely it was to lead to some type of preparedness action.

Some participants were directly involved in activities focused on hazards and preparedness (e.g. they belonged to a volunteer civil defence group) while others participated in the community in a more general sense (e.g. they belonged to a service

group such as Rotary). Those that participated in non-hazard related groups sometimes brought hazards and preparedness into their regular discussions and activities.

Interviewee 35 from Napier talked about how she brought the topic of hazards and preparedness to a community dinner she was running and notes the influence it had on those participating:

“I’m the hostess of the Hawke’s Bay Dinner Club. I have been for five years. [...] I always have three topics of discussion to talk about when people arrive for pre-dinner drinks before the dinners. It’s very hard for new people to walk into a restaurant and not know anybody, so I introduce everybody around and then I say “topics to talk about tonight are...”. And at that time, one of my topics was, “Are You Prepared for a Disaster? Did You See Kerri Woodham’s Programme?” Well, nobody was prepared at that dinner. And then the next dinner I said, “What have you done in the last month to prepare for something like that?” Well a lot of people had done a lot of things. So I felt, oh well it was just a little thing that I’d done but at least I’d done my bit to make all those dinner guests aware.”

Other types of disaster activities that hazard and non-hazard related groups participated in included engaging in voluntary disaster response activities (both at home and overseas), co-ordinating local and overseas post-disaster relief efforts, and putting together preparedness/response kits for people overseas. Several of the Napier interviewees belonged to Rotary groups and discussed how the Rotary was involved with putting together disaster relief kits to send to international disaster sites. However, Interviewee 34 admitted that Rotary had not done this for their own community in a preparedness sense, and that he “[hadn’t] really thought about the contradiction” until his conversation with the researcher. Interviewee 37 suggested a reason that preparedness kits were not made for their own community is that funding is available to undertake group activities such as responding to overseas disasters, whereas “putting food in your own cupboard is your own responsibility.”

Individuals often participated in community activities to help others (both locally and internationally) as they perceived that other people were more vulnerable and needed their assistance. This was also reflected in people believing that other people had experienced worse impacts in a previous event, or other people would be worse off if a

future disaster were to strike. Such beliefs link with the concept of optimistic bias, whereby previous studies have found that often people don't prepare because they perceive themselves to be less vulnerable or better prepared than the rest of the population (Burger & Palmer, 1992; Helweg-Larsen, 1999; Spittal, et al., 2005). Therefore while participation in the community may be positive depending on its nature, it can also serve to uphold unhelpful existing beliefs related to vulnerability.

Another prominent concept that emerged from the interviews was 'sense of community'. Many individuals who had prepared felt a sense of community. Such individuals felt that if they were prepared for a disaster then they would be better placed to help out other community members as needed. They anticipated that this preparedness would be reciprocal, and that other community members would also prepare, so they could help out too if someone was in need. Interviewee 23 described how he wants to make sure he has "done his share", by ensuring he is prepared so he can look after himself and other community members, and they can do likewise if he needs help. Interviewee 47 sums up the idea of having preparedness across a community:

"...if I'm prepared in my house and the neighbour's prepared in their house and we're at home and it goes wrong, we can support each other, or, you know, a quick grab and go. Or if something happens in my house and the neighbour is prepared as well, you've got further sustainability, you know, while you're waiting for assistance. You might be prepared for a day or two, they're prepared for a day or two, between the two of you - you can either, you know, work something out together kind of thing."

Hazard events in Timaru and Wanganui demonstrated how sense of community can make a difference in a disaster. People often described how during the 2006 snowstorm in Timaru and flood events in Wanganui that people shared their resources amongst community members in an attempt to negate the effects of the events. For example, there was pooling of generators to run electricity, particularly on farms where cows required milking. People would also assist by sharing home comforts such as food, showers and accommodation.

Other evidence of the importance of community was seen in people's beliefs that: having a good community network was important to be able to respond adequately to a disaster; feeling that support was available in their community if something adverse occurred; feeling like they knew neighbours or community members well; and feeling that they were living in a good community.

Many of the interviewees held community as an important aspect; however, this was most likely influenced by the selection of the sample, as many interviewees received invitations through community groups. Those that were less community-minded did give some alternative opinions on the role of community. Some did not prepare because they felt that others in the community had prepared already, and that they could rely on these people if a disaster strikes. Thus they saw a role for sharing of resources during an event, but lacked the sense of moral obligation that others had to 'do their share' in an event. In this instance, they transferred their responsibility onto other community members, as they assumed that other people would help them out in a disaster. For example, Interviewee 32 from Wanganui suggested that other farmers didn't prepare for Y2K because they thought that they could share other people's community resources during an event. In addition, Interviewee 17 from Timaru had spoken to people who said that they were not prepared, but that they would come to his place in a disaster because they knew he had prepared.

### **8.3.2 Responsibility**

Leading on from the discussion about sense of community, comes responsibility. As seen in the comments above, responsibility for preparing is not-clear cut. The interviews revealed that many individuals feel a personal responsibility for preparing at a household level, and as a consequence this belief may be more likely to motivate preparedness. Those that thought they had no personal responsibility for preparing were unlikely to prepare. They had a tendency to transfer this activity to others, and hope that others were taking care of the problem, such as other community members, government agencies, or other organisations.

However while individual responsibility appears to be a key driver for household preparedness, people still hold beliefs that preparing is actually a shared responsibility. So a person might think that they have a responsibility for preparing, and also think that

other agencies or organisations also have a responsibility. As discussed above, communities are perceived to play a role in preparedness, particularly through ensuring each community member is prepared and thus able to share resources and provide mutual assistance during an event. Also agencies and organisations are perceived to play a role in preparedness. The public expects that each organisation has particular activities that they must undertake to ensure they are prepared and can respond effectively during a disaster. For example, people expect that local government should educate, undertake physical mitigation works, run an adequate civil defence unit, be prepared for a disaster and be able to respond to local issues effectively. It is expected that service providers, such as power or telephone companies, be prepared for and be able to respond to disasters effectively, with the anticipation that services are up and running quickly. So the public sees preparedness as a shared responsibility, with individuals playing their part to ensure they have adequate household preparedness, and communities and agencies also playing theirs. Interviewee 24 directly states this by saying, “So, yeah, there’s an individual responsibility and a collective responsibility.” Interviewee 34 suggests that while we have devolved some tasks to organisations, it does not completely absolve us of personal responsibility (e.g. just because you pay taxes for hospital care it does not mean you should not take good care of your personal health), again emphasising the need for shared responsibility across individuals, communities and agencies.

While considering that others are more vulnerable than you can lead to optimistic bias, in some cases it can be a motivator of preparedness. If individuals perceive others to be vulnerable, and also feel a sense of responsibility for these people, this can motivate preparedness. Interviewees who stated that they felt a responsibility for others such as children, a spouse, parents, other family members, work colleagues, community members and animals, often were more prepared. Interviewee 6 from Napier suggests that: “... I think you think about it more when you’ve got a family. If there’s just the two of you as adults, well, you think that you’ll get on, have access to water and, you know, basic stuff. But when you’ve got children you perhaps think about it a little bit more deeply because you’ve got that responsibility.” For many, feeling a responsibility for others increased people’s worry and anxiety about them being impacted by a disaster, and preparing alleviated this concern. Likewise, the previous discussion on sense of community also highlights that people do feel responsible for wider community

members (not just family), and will prepare to ensure that the wider community can assist one another in a disaster. Interviewee 32 from Wanganui also discusses his sense of responsibility for the livestock on his farm in motivating him to prepare for anticipated power failures during Y2K.

*You were talking about Y2K before. What made you do something for Y2K and what was the difference for you?*

“I had 150 female [cows] depending on me, didn’t I! (laughter) That would actually make you do something. That was my major focus because that was New Year so the cows would be milking at quite a reasonable rate and they couldn’t say how long the power would be off... so, um. And the losses by not milking the cows for 48 hours would be quite a lot. It would have taken them probably a fortnight to come back to the same amount of milk again, if they did. And you could get diseases - mastitis and all those sort of funny things. So it was worthwhile...”

### **8.3.3 Leadership**

It was evident that individuals who showed leadership in the community were highly influential on preparedness for disasters. Those who showed leadership were more likely to be proactive in promoting preparedness amongst family, friends and their communities in general. Some took leadership upon themselves, while others were thrust into leadership roles and became advocates of preparedness because of the role they were in. For example, Interviewee 17 took it upon himself to make sure that the community of Timaru was prepared for a future disaster. Within his own local neighbourhood he strongly advocated being prepared. He would bring the subject up at Neighbourhood Watch meetings, deliver information to letterboxes and generally talk to other people about how they should get prepared. In a work context, he was also an advocate of preparedness and emergency planning, and would take his concerns to the highest level (e.g. the mayor) if he didn’t think that he was making progress. In terms of leadership being undertaken as a necessity rather than a choice, Interviewee 11 talks about how her daughter had to look after preparedness and emergency management specifically for her role in the workplace. It was not her choice to be an advocate but rather a side-role expected of her by her employers.

Interviewees discussed how trying to convince people to prepare was a difficult task. They described how they would become frustrated when no-one would take their advice. Interviewee 11 said of her daughter, “she said people aren’t the least bit co-operative when it comes to preparations for things. She used to get quite frustrated.” Interviewee 2 says in relation to her frustration, “There is only so much that you can tell people or suggest to people that you do, but if they don’t want to do it, can’t be bothered to do it...well there’s no way they are going to do it...” Frustration that people weren’t taking their advice could cause a sense of helplessness for those trying to advocate preparedness, and could lead to them giving up their efforts. Thus leaders who start out being proactive and passionate about getting prepared can over time be beaten down, and their efforts start to wane. Ensuring support is available for such people would provide validation of their efforts, and hopefully allow them to retain their energy for such pursuits.

#### **8.3.4 Preparedness as a social norm**

This research project explored a diversity of views about social norms in relation to hazards and preparedness. While it found that many people interviewed thought having a degree of preparedness was a good thing, actual specific preparedness for disasters such as earthquakes was not necessarily considered a ‘normal’ activity amongst the wider population. In fact the predominant social norm tended to be a blasé attitude toward natural hazards and preparing.

Interviewee 34 from Napier directly stated that preparedness was not considered a social norm in his conversation with the researcher. Other interviewees made indirect references to the fact that preparing for disasters is not considered a norm by way of the views they expressed. A number of references were made to the fact that people considered preparing for disasters to be “over the top” or that it can become an “obsession”. For example, Interviewee 22, when asked if he had talked about preparedness with anyone said, “Only with [my niece] about the pandemic and I thought she was a bit over the top there with her preparations.” Other evidence that supports preparedness not being a social norm is shown by Interviewee 4, who suggests that people laugh at safety regulations and call them ridiculous.

Even those that are well-prepared are conscious that their actions do not constitute the social norm. Well-prepared interviewees often admitted that they were unusual in undertaking preparedness, or that it was not normal to think or act the way they did. People used words such as “paranoid” or “crazy” in describing how others perceive them. Interviewee 17 sums up what others think of him by saying, “People think I’m a nutter you see, so I don’t talk about it very much now, [...] but I used to try and encourage everyone and I had lots of people, lots of friends who did start putting food in a locker, getting some water in, and feeling happier that they had done it.” As Interview 17 points out, negative reactions from others due to social norms serve to stop prepared people talking about and advocating preparedness widely.

Another barrier to advocating preparedness is the belief that getting prepared is a “personal judgement call”. This links with the focus of many information campaigns that promote preparedness as a personal responsibility. It is widely socially accepted that it is up to individuals to prepare for a disaster. While some community members may attempt to encourage others to prepare, they feel there is only so much they can do. They feel unable to push people too hard on the subject, as at the end of the day it is ultimately a personal decision on whether an individual will prepare or not. Interviewee 14 sums up this wider societal belief by saying, “I think that [preparing is] a personal judgement that [people] need to make for themselves. All you can do is give them the information and then they go ahead and do whatever they need to do.” Interviewee 46 discusses how he talks about hazards and preparedness, with one topic being about what people have and haven’t done for preparedness. His conversation eventually stops because he doesn’t want to get into a situation where he is berating others for not preparing. He considers it a “personal choice” as to whether people prepare or not, and feels it is not his place to be telling others off for not preparing. The “personal judgement call” belief is part of a social norm that hinders discussion and encouragement of preparedness in communities.

The influence of others has a profound effect on preparedness being a social norm. People’s opinions can be influential in both encouraging and discouraging a preparedness ethos. Interviewees were more likely to take notice of other people’s opinions if they considered the others to be ‘like themselves’ or people they could relate to (e.g. family or friends). If another influential person thought preparing was

important, then the interviewee was more likely to agree and take the advice on board; conversely if another person held negative viewpoints about preparing, then the interviewee was more likely to share that viewpoint and be disinclined to prepare. For example, Interviewee 28 relates how she learned from her parents to always have water, flashlights, batteries, lanterns and other preparedness items. Interviewee 40 says that his positive attitude to preparedness and planning has rubbed off on his family members, and consequently they are prepared also. Those who have not prepared often say that they can't think of anyone else they know who has prepared, and like these other people they are under-prepared. The interviews also revealed that an 'embarrassment factor' might serve to encourage preparedness amongst individuals. Several interviewees stated that they did not want to be embarrassed by being 'caught short' in a disaster, therefore they undertook preparations to ensure that this would not happen. They did not want other people to see that they were under-prepared.

One of the key questions to ask is: How does preparedness become a social norm? The interviews threw up a number of examples that give some insight on how this can be developed. The first is from an interview with a Napier resident who discusses preparedness for Y2K. Interviewee 34 considers preparedness for the Y2K event different from general disaster preparedness in that there was more of a social norm to prepare for Y2K. He states:

"My wife was quite keen in Y2K, year 2000, that we store some water under the house, and it's still there. And that's about all we did at that stage."

*Why do you think Y2K was something that your wife decided to do something for?*

"Because it was a social norm - everybody was doing it. There was a lot of advertising, people were saying the telephone must be off, the power stations were going to close down, and therefore the water [stop] pumping, right. We did a few reasonably easy things in order to deal with it but the sceptics were matched by the optimists and so, oh yeah okay - we'll put some water under the house. But we didn't really make up an emergency kit."

From his description it appears that the frequency of advertising and discussion about the Y2K event brought it more into the realm of being 'normal' for people, and thus became an event that many people prepared for. Therefore it appears that critical

awareness, reflected in frequent thought and discussion, is essential for developing preparedness as a norm.

Another example of a type of preparedness that is seen as a social norm is response to earthquakes. When asked what they would do following an earthquake, most interviewees (especially those living in Napier) said they would get under a table or a doorframe. While this is not reflective of current advice (i.e. drop, cover and hold on, Ministry of Civil Defence & Emergency Management, 2010a), it is consistent with what people have been taught in the past. When asked where they had heard this advice, people suggested that they had known it as long as they could remember. This information had become so much a part of what people know, that they could not remember its origins. Responding to an earthquake in such a way was considered a normal and accepted response, and an example of a social norm amongst people. In the case of earthquake response, it is likely that people learned how to respond at school, with this information being supported by earthquake exercises and drills. Learning an activity at an early age, combined with repeated practice, has served to engrain this as a 'normal' response to experiencing an earthquake.

A third way in that preparedness might become a social norm, is by emphasising that "Preparedness is a way of life". Respondents that perceived preparedness to be "a way of life" rather than a one-off set of activities to prepare for a hazard event were more often prepared. In this sense, preparedness was perceived to be useful as it provided benefits for daily living, rather than focussing on a single event that might never happen. It became something people did as a matter of course, a 'normal' part of life. Interviewee 40 describes how preparedness should be accepted as a "way of life":

"...if [preparedness is] used in one place alone it will fall into disrepute, so it needs to - this is my suggestion - so it's going to be more valuable, more likely to continue and be more successful if it's a broad-brand brush that's anticipated, well, no, just expected, just expected, not something fresh and new and exciting or, well, it can be all that too, but not something that gets boring. Or something that's a surprise. It shouldn't be a surprise. It should be a part of daily living. In the same way as you wash your hands. And you keep things clean. You know that if you don't you could get sick because things are dirty. Just as simple as that."

Fourth, direct or indirect experience of a disaster could assist in creating norms in a community. In Napier, for example, experience of the 1931 Hawke's Bay earthquake, combined with active thought and discussion about the event, had led to the development of norms around risk perception beliefs and earthquake-related practices. Because the city had experienced a previous event, interviewees understood the risk from earthquakes was real, and that it was likely a destructive earthquake could happen again in future. Earthquakes had become so much of a social norm that many people actually shared the perspective that Napier had an 'earthquake culture' (Moore, 1964; Turner, et al., 1986). This earthquake culture was regularly discussed, was embedded in local history, and is celebrated every year on the anniversary of the 1931 earthquake. Interviewee 38 discusses the various inputs required to create an earthquake culture in the Hawke's Bay, including how it has influenced beliefs and practices:

“Well, I guess, you know it could be dangerous because it has been. And, you know, the sea disappeared and thousands of acres of land lifted right out of the sea two and a half metres. And lots and lots of people died when [Napier] city fell down. And a lot of Hastings fell down too. So I guess everyone in Napier, and in fact it's quite surprising, [...] there wouldn't be a tourist [...] that comes here that doesn't [...] know that the city suffered a major earthquake. I guess it's so much of the tourism stuff, the Art Deco thing, that the city has very cleverly capitalised on. So people read about that and they must read a couple of lines down to discover that the Art Deco is the building theme of the '20s and '30s, perpetuated here in the 1930s after the city fell down in an earthquake. I mean, you can get people all over the world, and they say “What is there to see?” I say, “Well, you can go and see the gannets or there's 67 wineries or there's the Art Deco”. “Oh, yeah, I know about the Art Deco”. They do. So it's part of the general culture, knowledge, experience. It's dangerous.”

When looking at the data from Timaru it is also possible to see how experience of the 2006 snowstorm caused many activities to become more 'normal' and assisted in creating social norms following the storm. For example it was normal for people to talk about the snowstorm after the event, and it became more acceptable to get prepared.

Finally, vicarious experience of disaster was also noted as having the potential to help create norms. Interviewee 1's wife makes reference to the 2004 Indian Ocean tsunami,

and how after that event everybody seemed interested in disasters and how it was considered the “in thing”. Interviewee 1’s wife says, “It was just after the tsunami in Asia, wasn’t it, we decided that [tsunami] was the “in thing” at that stage, what everybody was interested in.” Her comments suggest that the media coverage and experience of this event raised the profile of tsunami hazards, and as a consequence it was normal to think about and find ways to address this issue for a while.

### **8.3.5 Trust**

The interviews revealed that trust appeared to be an influence on the overall process of getting prepared. Trust worked in diverse ways. If an individual had trust in an individual or organisation giving advice about hazards and preparedness, they were more likely to believe and act upon the advice. However, trust in an organisation could also lead a person to believe that the organisation was taking care of the problem (transfer of responsibility), and therefore think they did not need to prepare. This effect was especially evident with respect to building safety, as many people stated that they trusted the building legislation to ensure that their homes were built to withstand an earthquake. As a consequence, few had undertaken any specific preparedness measures with respect to mitigating earthquake impacts on buildings.

Distrust in an organisation also had an interesting effect. In some instances people did not trust that an organisation had a hazard problem covered, and therefore they undertook preparations to ensure their safety and wellbeing. For example, Interviewee 39 from Napier, who was well prepared, stated that some of this preparedness was related to the fact that he didn’t trust the Government to look after the provinces during times of quiescence, and therefore didn’t trust the government to provide in an emergency situation either. When Interviewee 16 is asked why he thinks people don’t prepare, he notes that transfer of responsibility due to trust is certainly an issue:

“... I think particularly in a place like Timaru there’s that acceptance that there’s an organisation to look after you if things go wrong. Which I suppose is pretty comforting really. And whether that adds to complacency or not I don’t know but it certainly, for those that think about it, they do know that that service is there.”

A lack of trust may also encourage people to undertake inappropriate actions. For example, Interviewee 18 doesn’t trust that large shopping centres have prepared for

earthquakes by restraining items and so as a consequence thinks she will run out of such a place in an earthquake (rather than drop, cover, and hold on). She says, “You walk through a shop like the Warehouse or something or a supermarket, those high stands, they are higher than you can reach. You can’t get anything off the top shelf as a rule. And they’re just standing there. I wouldn’t want to be in one of those buildings if there was an earthquake. I’d be outside fast (laughter)!” The interviews show that trust is an important societal factor to consider in the preparedness process.

### **8.3.6 Societal requirements**

The requirements that institutions impose on people can have an influence on whether people undertake adjustment adoption or not. In the interviews some mentioned that they undertook preparedness measures if they were required to do so, for example, because of insurance company requirements, or requirements by legislation.

Interviewee 12 outlines how her husband’s insurance company required a degree of preparedness before they would provide insurance: “You mention things tied down on the floor. [My husband’s] insurance company has asked him to have the more valuable items in his stamp collection in something that is anchored to the floor. Which is something he now has to do. But that’s the first time that anchor[ing furniture] to the floor has sort of come into our conscious level very much at all.” Occupational Health and Safety or OSH (as per the Health and Safety in Employment Act, 1992) was mentioned by a number of interviewees as being the driver for undertaking disaster preparedness activities in the workplace. Interviewee 6 describes how OSH contributed to preparing for disasters in the workplace:

“At work we talk about OSH. We have an OSH representative who they obviously go to for things like this during the OSH planning. And issues are raised from around the country about various disaster things, you know, what we can do locally and being prepared and that’s when our disaster packs came into the clinic, about two or three years ago. At the family centres they have a proper disaster pack that they brought in with the blankets and all that sort of thing. In our little clinic, because you wouldn’t expect many people to be there, we’ve just got a basic container that each nurse put together. Some clinics are better prepared than others. [...] It’s part of the OSH requirements. It’s part of that

quality stuff, if you're running a quality accreditation programme you've got to contribute all those things."

The Building Act (2004) requires that all new buildings are constructed according to the Building Code to protect life safety in an earthquake, and that certain older buildings (e.g. public buildings, multi storey and multi-unit residential buildings) are retrofitted to bring them up to the code. Such a requirement means that some earthquake mitigation does take place for new and larger buildings; however the majority of New Zealand's typical older residential buildings are not covered by legislative requirements and the retrofitting of these buildings is entirely voluntary. Coupled with this is the belief by many individuals that the Building Act has widely addressed the safety of residential housing, often regardless of building type or age. As a consequence, little retrofitting of earthquake-prone residential buildings takes place.

## **8.4 Discussion**

### **8.4.1 Summary of key social influences and implications for earthquake education**

The interviews revealed that a number of key social influences have a bearing on the preparedness process. The themes that emerged from the analysis include: community (community participation, sense of community); leadership; responsibility (responsibility for preparing, responsibility for others); social norms; trust; and societal requirements.

First the interviews confirmed that community participation plays a significant role in the preparedness process, as suggested by previous researchers (Heller, et al., 2005; McIvor, et al., 2009; Paton, 2008; Paton, Bajek, et al., 2010; Paton, et al., 2011; Paton, Houghton, et al., 2008; Paton, et al., 2009; Paton, Parkes, et al., 2008; Paton, Sagala, et al., 2010; Paton, Smith, et al., 2008). Participation helps initiate thought and discussion about hazards and preparedness. Such discussions raise people's awareness of the consequences of disasters and the need to prepare. Certain types of participation can also help build individuals' practical ability to undertake preparedness tasks. Consequently, participation can assist with empowering people to develop solutions to hazard-related issues. Leadership from an individual can help encourage community participation to occur. Group dynamics in a participatory setting can assist with

developing social norms. For example, community participation can help develop normative beliefs that preparing is important and motivate people to undertake preparedness actions as part of 'normal' behaviour, as demonstrated in the example of the Napier dinner group.

In summary, it was apparent from the interviews that community participation plays an important role in the information interpretation and preparedness process and should be factored into future earthquake education programmes. Leadership should also be fostered as part of the community participation process. Leaders should be identified and empowered to participate in hazards and preparedness issues, so that their passion and drive does not wane, or so they do not experience problems inspiring action because of limited access to resources.

In this study, the concept of sense of community was suggested to link with community participation, whereby individuals who felt a sense of community were more likely to participate with respect to hazard-related issues. In a disaster context this was often reflected in community members assisting with response to a disaster, contributing relief, or helping develop preparedness in communities that they considered to be vulnerable.

As discussed previously, sense of community has found to be of mixed influence in previous studies, with some studies reporting sense of community to be influential on the preparedness process (Bishop, et al., 2000; Paton, et al., 2011; Paton, Kelly, et al., 2006; Prior & Paton, 2008) and others finding no obvious link (Paton, Millar, et al., 2001; Paton, et al., 2005). A difference in influence may occur because studies have been undertaken in differing contexts (e.g. different hazards, different geographic locations, urban versus rural situations, quantitative versus qualitative investigation), and therefore the complex nature of sense of community has not yet been fully explored. This remains an area for future research.

The research also suggested that the concept of sense of community links with responsibility. Those individuals who identified that they felt a sense of community also often said that they felt a responsibility to their fellow community members to either be prepared themselves (so they can be available to respond on a personal and community level to a disaster) or assist others to prepare. Feeling a responsibility for

others appeared to be a key motivator to getting prepared in general. Interviewees stated that they were more likely to be prepared so they could ensure the safety of others they were responsible for (such as children, a spouse, parents, other family members, work colleagues, community members and animals). Researchers (Carter-Pokras, et al., 2007; McIvor, et al., 2009) have previously noted the importance of a sense of social responsibility for others as a motivator in the preparedness process. This is also reflected in previous earthquake preparedness studies, where people who have dependents such as children state that they are more likely to be prepared (Dooley, et al., 1992; Edwards, 1993; Russell, et al., 1995; Turner, et al., 1986).

Sense of community and feeling a responsibility for others was also linked with social injunctive or personal injunctive norms regarding people's feelings of moral obligation to look after other people in general. Earthquake education initiatives should work with community development programmes to build an overall sense of community, and emphasise the responsibilities that individuals have to protect both those they are close to, and the wider community.

Consistent with previous research (Garcia, 1989; Jackson, 1977, 1981; Mulilis & Duval, 1995, 1997; Perry & Lindell, 2008) the interviews confirmed that individuals who feel that preparing for earthquakes is a personal responsibility are more likely to undertake adjustment adoption. However, the interviews also revealed that most people perceive that collective responsibility (for example, institutional or community responsibility) similarly exists for preparing, the nature of which is different from individual household responsibility. Previous research confirms that despite personal responsibility being important, individuals often see preparedness as a shared commitment (Mulilis & Duval, 2001).

Current educational campaigns have a strong focus on individual responsibility for preparing; however such programmes fail to capture any collective responsibilities that people perceive there to be. The interviews show that members of the public perceive a role for the 'wider community' in preparedness, but this is often not focused on as part of educational campaigns. The research also revealed an appetite amongst those involved in community groups to take part in preparedness and response activities, but people were unsure of how such groups could become practically involved. Important questions to be asked include: What is the role of wider society in earthquake

adjustment adoption? What tasks are solely the roles of individuals, and what tasks should communities be engaging in? How can this be achieved? Gruev-Vintila and Rouquette (2007) found that for collective mitigation actions to take place, individuals must already be personally involved in a degree of risk-related practice, so one suggestion might be to begin with empowering individuals to prepare, and evolve toward undertaking collective action.

Social norms were identified as having an influence on the preparedness process. As discussed earlier, norms regarding the importance of caring for community members often influenced people's desire to prepare. In terms of beliefs, the predominant normative belief among interviewees was that, while preparedness was important in general, earthquake preparedness was not normal or a widespread activity. Few knew of, or had observed, other people undertaking earthquake preparedness measures. Others went as far to say that they believed preparing was "over the top"; that those who prepared were "paranoid" or "crazy"; or that getting prepared was a "personal judgement call". Such beliefs hindered people's motivation to prepare. Solberg et al. (2010) suggest that norms can have either a positive or a negative effect on seismic hazard adjustment adoption. Helpful norms may steer people toward undertaking preparedness, but as seen above, unhelpful norms can serve to stifle positive adjustments. The development of helpful attitudinal and behavioural norms for preparing was found in the interviews to be influenced by:

- Participating in a group situation or activity, particularly in which interaction took place;
- Being exposed to frequent information which acted to stimulate thought and discussion about hazards and preparedness;
- Repeated practice of activities related to hazards and preparedness;
- Learning from an early age about earthquakes and preparedness;
- Framing preparedness in a broader sense, making it more applicable to people's daily lives and current normative beliefs, e.g. "Preparedness is a way of life"; and

- Experience of disaster or event, particularly where the experience was shared by others. This assisted with the development of widespread risk perceptions and a realisation of the importance of preparing.

Given that communities can be geographically-based or linked by wider social networks, and that individuals may be members of many different communities, challenges exist in developing social norms. Earthquake educators need to think laterally about how to interact with a diverse range of communities in developing such norms, and account for their different ways of interacting and learning.

As seen in previous research (Karanci & Aksit, 1999; McIvor, et al., 2009; Paton, 2007b, 2008; Paton, Bajek, et al., 2010; Paton, Houghton, et al., 2008; Paton, et al., 2009; Paton, Parkes, et al., 2008; Paton, Sagala, et al., 2010; Paton, Smith, et al., 2008), trust and distrust were identified in the interviews as a distinct influence in the preparedness process. Trust in information types and sources, and in institutions themselves, often lead to people being more likely to undertake earthquake adjustment adoption. Conversely, trust sometimes had the opposite effect, as too much trust in an institution could lead to people believing that the institution was taking care of the hazard issue and thus they didn't need to prepare. Distrust had a similar multi-dimensional effect, whereby some individuals who distrusted information or an agency would not prepare, while others' distrust motivated them to undertake preparedness. As was evident with Interviewee 18, the distrust of individuals in institutions can also lead people to taking inappropriate actions. In a complementary Turkish example, Green (2008) found that perceived distrust in the building practices of professional builders and contractors led people to undertake inappropriate actions by building their own, often sub-standard homes, in the hope that they would be safer in an earthquake than those built by the professionals.

Information should be delivered by sources that people can trust and relate to. In some cases this could be an institution that people trust, or a relevant individual (e.g. family and friends, trusted community members, trusted leaders). Information should be of good quality, and consistent between different sources.

Individuals' trust in information is not the only important facet of trust, however, and building elements of wider 'social trust' should also be considered (Drottz-Sjöberg,

2002). Educational strategies should aim to build trust in populations and reduce distrust, while at the same time emphasising the fact that people have a responsibility to prepare. Other suggestions for emergency managers wishing to build trust in populations include: ensuring provision of adequate knowledge and expertise; taking events seriously when the situation requires; dealing with uncertainty; being honest and open; showing concern and care; ensuring adequate performance over decisions that are made; and counteracting negative stereotypes (Maeda & Miyahara, 2003; Peters, Covello, & McCallum, 1997; Petts, 2008; White & Johnson, 2010).

Finally there was some indication that imposing requirements on community members (such as legislative or insurance requirements) could serve to ensure that disaster preparedness measures were undertaken. Unfortunately, few requirements currently exist in New Zealand to undertake earthquake mitigation actions in a residential household setting, so the examples presented in this paper were indirect and a only potential indication of the influence that imposing requirements might have. Social contextual factors have been shown to have an influence on the effectiveness of legislation for earthquake preparedness (Anbarci, et al., 2005; Davis, 1989; Palm, 1981; Spence, 2004) and must be accounted for when imposing formal requirements.

#### **8.4.2 Models for understanding social influences on information interpretation and earthquake preparedness**

Primarily due to a previous focus on intra-individual studies, rather than a holistic approach to understanding preparedness, understanding of the social influences on the interpretation of earthquake information and adjustment adoption has been incomplete. This has limited the ability of emergency managers and other earthquake educators to design earthquake education strategies that incorporate and account for societal influences. To develop a better model which incorporates the social influences of the information interpretation and preparedness process, it may be necessary to draw from wider resilience models rather than earthquake-specific research.

Paton and colleagues (e.g. Paton, 2005, 2006, 2007a; Paton, Bajek, et al., 2010; Paton, Johnston, Smith, et al., 2001; Paton, McClure, et al., 2006; Paton, Millar, et al., 2001; Paton, Parkes, et al., 2008; Paton, et al., 2000) provide a good starting point for understanding many of the social influences on hazard preparedness. Previous research

using structural equation modelling has identified a number of key factors that influence hazard adjustment adoption, including collective efficacy, community participation, articulation of problems, trust and empowerment. Their model of resilience also describes a number of other social influences on preparedness such as social support, capacity, power and resources (Paton, 2006). They also acknowledge that preparedness is but one aspect, and that response and recovery are also important considerations within the overall scheme of resilience. Norris et al. (2008) present another model, which provides a good example of how social aspects may influence resilience. Their model of disaster resilience focuses on a set of ‘adaptive capacities’ and considers that four primary networked resources are required to achieve resilience, including economic development; social capital; information and communication; and community competence.

Resilience-based models, such those discussed above, are more effective at incorporating a range of cognitive, emotive, environmental and social influences of earthquake preparedness. The continued formulation and evolution of such models in an earthquake context will allow a better understanding of the full range of influences of preparedness, and will allow the development of more effective earthquake education strategies.

### **8.4.3 Research limitations**

While a range of social influences on the information interpretation and preparedness process were identified in this paper, it is likely that some gaps still exist that have not been addressed. For example, while no mention has been made of resource issues, interview participants did state that lack of resources (such as money or time) were barriers to getting prepared (see Chapter 5, Becker, Paton, et al., submitted-a).

According to work by Norris et al. (2008), economics constitute a part of resilience, and thus should be considered a core societal consideration in the context of encouraging preparedness for disasters. A full outline of all the influences of earthquake information meaning-making and preparedness identified as part of this broader project is discussed in Chapter 5 (Becker, Paton, et al., submitted-a).

A second limitation of this study is that community participation was only referred to by interviewees in a limited sense. Participants discussed a few examples of people getting

prepared as a consequence of undertaking hazard-related community activities, but such activities were not particularly common, as they do not form a core part of current earthquake education initiatives. Future work might involve undertaking more participatory community activities directed at earthquake preparedness, and analysing the influence these have on the preparedness process. Evaluation is important in determining whether earthquake education initiatives are effective or not, and what subsequent changes need to be made to programmes (Finnis, et al., 2007).

According to Myers (2002) people are less influenced if they are asked their opinions privately, rather than in public. Therefore, one limitation of the interviews is that while people may have been happy to say that preparing is, or is not, important in a private setting; it may not be truly representative of their public viewpoint. Further research should involve investigating people's beliefs in a social rather than just an individual context (e.g. by use of focus groups or observation). Such research will allow the influence of social aspects to be identified as people interact with others in real time.

Finally, the data collected for the research has several limitations. Data collected was qualitative rather than quantitative, so while details related to the information meaning-making and preparedness process have been identified, representativeness across the wider population has not been measured. Future quantitative work is required to test whether findings are applicable more generally across the wider population. In addition, some bias may be present in the sample of interviewees, including an over-representation of 'community-minded people'; an over-representation of people interested in earthquakes and preparedness; and an over-representation of older people in the sample (i.e. over half the sample were 60 years or over).

## **8.5 Link to Chapter 9 - Discussion**

While Chapters 4 to 8 have presented the detailed findings of this research in a series of submitted journal papers, many of the key results are also outlined in the following discussion section of this thesis (Chapter 9).

# Chapter 9 Discussion

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## 9.1 Introduction

Motivating people to prepare for earthquakes and other natural hazards remains a challenge for emergency managers. Despite considerable expenditure and many years of running education campaigns encouraging individuals to prepare for earthquakes at a household level, levels of overall preparedness remain low in New Zealand. In a nationwide survey undertaken by the Ministry of Civil Defence & Emergency Management in 2010 (Colmar Brunton, 2010) only 24% of New Zealanders reported that they were fully prepared for a disaster at home and only 11% were prepared both at home and work. Over half (51%) of New Zealanders have done nothing to reduce or prevent damage from earthquakes (Earthquake Commission, 2011). In addition the types of preparedness measures people do undertake tend to be directed at gathering together basic survival items (consistent with international research, e.g. Heller, et al., 2005; Russell, et al., 1995), rather than undertaking mitigation actions, making an emergency plan, learning survival skills, or engaging in preparedness activities socially.

For emergency managers to effectively motivate people to prepare, an understanding of the reasons why people prepare is necessary. Past research has succeeded in helping understand certain facets of the preparedness process. It is well known that risk perception, disaster experience and critical awareness have variable influences on the preparedness process depending on the context (Solberg, et al., 2010). Personal beliefs such as self-efficacy, collective-efficacy, positive outcome expectancy and a perceived responsibility for preparing are influential in motivating preparedness (Duval & Mulilis, 1999; Lindell & Perry, 1992, 2000, 2011; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2000; Mulilis, et al., 2003; Mulilis & Lippa, 1990; Paton, 2003; Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, McClure, et al., 2006; Paton, Sagala, et al., 2010; Paton, et al., 2005), while fatalism, denial and certain cognitive biases (such as normalisation or optimistic bias) can be detrimental (Burger & Palmer, 1992; Helweg-Larsen, 1999; McClure, 1998, 2006; Mileti & O'Brien, 1992; Spittal, et al., 2005). Emotions and feelings such as anxiety, fear, and worry can have

both positive and negative effects on the preparedness process (Paton, et al., 2005; Paton, Smith, et al., 2003). The characteristics of people's social contexts, including sense of community, community participation, empowerment, trust, subjective norms, sense of responsibility for others and availability of resources also have a bearing on whether people decide to prepare or not (Karanci & Askit, 1999; McIvor & Paton, 2007; McIvor, et al., 2009; Paton, 2007b, 2008; Paton, et al., 2011; Paton, Kelly, et al., 2006; Paton, McClure, et al., 2006; Rüstemli & Karanci, 1999).

While previous research has identified a number of key influences on the preparedness process, it has not been able to explain the entire process of adjustment adoption, and the role that information plays in getting to a state of preparedness. This is due to research being largely quantitative in nature and primarily focused on intra-individual cognitive processes (Solberg, et al., 2010). Contextual influences on the adjustment adoption process (e.g. social and environmental influences) have been less well studied. Consequently, gaps in understanding exist about how people make meaning of hazards and preparedness information provided by earthquake educators within their social and environmental context, and how this affects preparedness actions. Understanding is also limited about how various individual, community, and societal factors interact with each other, and affect the interpretation and meaning-making process. To address these gaps, a PhD research project was undertaken to investigate how people make meaning of earthquake hazard and preparedness information and how this relates to getting prepared. The key research question for this project was:

*How do individuals interpret and make meaning of earthquake hazard and preparedness information, and what influence (if any) does this process have on individual household preparedness for earthquakes?*

To answer the overall research question a set of more specific questions were posed:

- What types of earthquake hazard and preparedness information are people exposed to?
- What are the processes that people go through to make meaning of this information, and how does this affect people's decisions about whether to prepare or not for earthquakes?

- What key individual, community and societal factors interact to influence meaning-making of information? (e.g. Are individual emotions and feelings important to the process? Is people's prior experience relevant? Do new or existing beliefs have an influence on meaning-making? Are interactions with other people in society important to the process?).
- How can a better understanding of the meaning-making process assist with developing more effective earthquake education strategies that encourage people to prepare?

## 9.2 Summary of research undertaken

In order to answer the research questions, a qualitative methodological approach was employed. As discussed previously, a review of the literature revealed that most past earthquake preparedness studies have been quantitative in design and consequently limited in their testing and findings. It was considered that a qualitative study would add a unique contribution to the literature as this different approach could define a broader picture of the earthquake information meaning-making and preparedness process, and address gaps in knowledge. In particular, a qualitative approach would yield new information about the diversity of influences on earthquake information meaning-making and assist with developing a more comprehensive understanding of the subsequent preparedness process. From a practical perspective, a qualitative approach was also deemed appropriate for the proposed study, as it was considered the best format for investigating the detail required to answer the research questions, and describing processes.

Grounded theory methodology was chosen for use as a basis for data collection and analysis (Strauss & Corbin, 1990). Grounded theory methodology was an ideal approach to use, as it allowed participants to freely discuss their thoughts and feelings about earthquake hazards, earthquake information and preparedness for earthquakes, from which thematic codes, core categories, processes and theory could be subsequently identified during analysis.

In total, 48 semi-structured interviews were undertaken in 2008 in three urban areas in New Zealand subject to earthquake risk (Napier, Timaru and Wanganui). Household

residents were asked about their perspectives on earthquake hazard and preparedness information, the meaning-making process, and actual preparedness actions taken. Research was undertaken during a period of relative earthquake quiescence, with the largest previous earthquake disaster occurring in 1931 in the Hawke's Bay. The 2010 Darfield and 2011 Christchurch earthquakes had not yet occurred at the time of data collection. Undertaking the interviews during a period of relative quiescence had the benefit of being able to capture people's thought processes without the influence of an actual event, reflecting the most common and challenging period of time for earthquake education.

Interviews were digitally recorded with the interviewees' consent, transcribed into a word processing document, and entered into the qualitative software analysis package "Atlas.Ti". Thematic codes were identified, followed by core categories, and the development of a model of the information meaning-making and preparedness process.

### **9.3 Results of research question and aim**

In answering the overall research question, the set of more detailed questions will be addressed in this discussion.

#### **9.3.1 Types of earthquake hazard and preparedness information**

The first detailed research question asked, "What types of earthquake hazard and preparedness information are people exposed to?" It is well known in the literature that individuals are exposed to and draw upon a variety of information sources in informing their decisions about preparing for earthquakes (Lee, 1999; Mileti & Darlington, 1995, 1997). This study has suggested such previous findings are valid, and also assisted with identifying exactly what types of information people draw upon (Chapter 4, Becker, Johnston, et al., submitted-b). Three main types of information are used by individuals in their assessment of whether to prepare for earthquakes, or not. These include:

1. Passive information (e.g. brochures, advertisements, the internet, email, news media (television and print), displays (e.g. museum displays), books or booklets, films, fridge magnets, signage, warning sirens, photographs and environmental cues);

2. Interactive information (e.g. discussions with others, training for emergencies, community activities, school activities, workplace activities); and
3. Experiential information (e.g. direct disaster experience, indirect disaster experience, indirect event experience, vicarious experience).

Each information type provides a unique contribution to the meaning-making and preparedness process. Passive information provides an important contribution in that it primarily raises awareness and knowledge about hazards and preparedness, and stimulates conversations amongst community members. Interactive and experiential information also provide similar functions, however these information types also assist people in developing an understanding of the actual consequences of an event and building skills in community members. All types of information have an influence on the formation of beliefs, and emotions and feelings; however, interactive information provides the best avenue for directing those aspects in a helpful way that assists with motivating preparedness, rather than leading to fatalism and denial. A number of societal factors influence access to information, interpretation of that information as part of the preparedness process, and actual adjustment adoption.

It is evident from this research that earthquake information should cease to be thought of in a traditional sense (e.g. predominantly providing information through formats such as written material or television advertisements). While passive information is important, providing passive information alone is unlikely to be solely effective in assisting people to prepare. Interactive and experiential information also form important information sources that people draw upon when deciding whether to prepare or not. The different types of information also have differing influences on the meaning-making and preparedness process. Therefore ways of utilising all three types of information should be factored into future earthquake education programmes.

### **9.3.2 The process of information meaning-making**

The second detailed research question was, “What are the processes that people go through to make meaning of this information, and how does this affect people’s decisions about whether to prepare or not for earthquakes?” For this research a model was constructed to describe the information meaning-making and preparedness process. The model is presented in Chapter 5 (Becker, Paton, et al., submitted-a), but is also

replicated in this concluding chapter for reference (Figure 9.1). The model shows that a number of aspects are important to the information meaning-making and preparedness process, as discussed in the following sections.

### **9.3.2.1 Critical awareness**

Critical awareness was found to be an important influence on the preparedness process. In the model this was encompassed by two facets—“Awareness and knowledge” and “Thinking and talking”. As with previous research (e.g. Lindell & Perry, 2011; Mileti & Darlington, 1995, 1997; Mileti & Fitzpatrick, 1992, 1993; Paton, McClure, et al., 2006; Paton, et al., 2005), critical awareness was shown to both assist and hinder the preparedness process. For example, helpful frequent thought and discussion about hazards and preparedness was more likely to motivate people move toward preparedness. However if the thoughts and discussions were unhelpful (e.g. individuals only talked about what happened during a disaster rather than how to prepare; or they shared a conversation about preparing being “over the top”), then this could prove detrimental to the preparedness process.

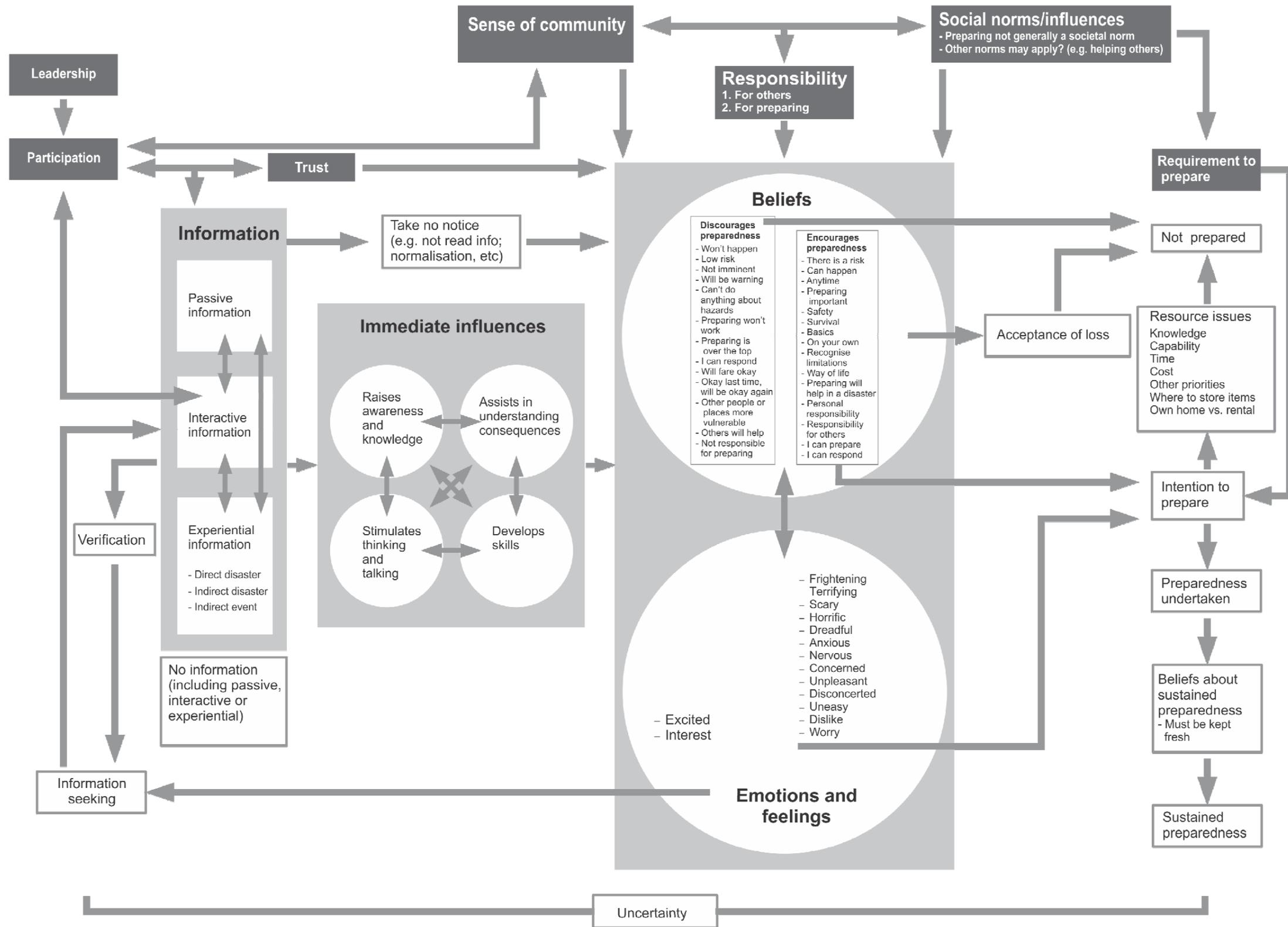


Figure 9.1 Model of information meaning-making and preparedness for earthquakes and other disasters (as seen in Chapter 5, Figure 5.2).



### **9.3.2.2 Understanding consequences**

While earthquake information could raise awareness about earthquake hazards and preparedness, it was evident from this research that simply raising awareness is not enough to motivate actual preparedness actions. Instead the research suggests that people have to really understand what the consequences of an event might be like before being motivated to prepare. Understanding the consequences implied a realisation of what the impacts from an earthquake might be like, a reflection on people's own vulnerability, and a realisation of 'why' individuals needed to prepare. An understanding of the consequences was reflected in more detailed thought about the impacts of hazards. McClure et al. (1999) and Hurnen and McClure (1997) have found in previous research that people with more complex causal models of earthquakes have a better understanding of the effects of earthquakes and how to prepare, and this was highlighted by this research, with the development of a better understanding of how this is reflected in people's thoughts.

Being able to understand the consequences of an event requires a variety of informational inputs, as well as a capacity to understand and make meaning of such information. Passive information can provide detailed rational information about earthquake impacts and preparedness measures. Interactive information provides a forum for discussion whereby people can talk through scenarios about what might happen in an event and what they might need to do to avert any adverse impacts. Emotionally, people need to understand what it might feel like to experience an event, and how they can negate any adverse feelings by being prepared. Individuals also need to consider the social implications of a disaster, for example: What are the implications for other community members? What are the implications for people I am responsible for?

### **9.3.2.3 Developing skills**

The research found that different types of information could provide an opportunity to build skills within individuals that assist them with practically preparing for, or responding to, an event. Information that was found to be more likely to do this included interactive and experiential information. Interactive activities can assist with building skills through group discussion, physical demonstrations, or training. Real-life

experiences also build skills by the fact that people gain practice by being actively engaged in preparing for, or responding to, an event. Earthquake education strategies should acknowledge that building skills in people is an important part of enhancing preparedness, and use should be made of interactive and experiential information that aids this facet.

#### **9.3.2.4 Other interactions in the meaning-making process**

A variety of other interactions are influential in the process of people's meaning-making of earthquake information and resulting preparedness. Other important factors identified in the model include beliefs, emotions and feelings and societal influences. As there is some cross-over between the research questions these factors are noted and not discussed in detail here, but are discussed further under section 9.3.3.

#### **9.3.2.5 Resource issues**

Interviewees identified a number of resource issues (Blessman, et al., 2007; Carter-Pokras, et al., 2007; Kunreuther, et al., 1978; Lindell, et al., 2009; Lindell & Whitney, 2000; Mileti & Darlington, 1995; Palm, et al., 1990; Paton, 2006) as being a barrier to undertaking adjustment adoption, including lack of knowledge, lack of capability, lack of time, cost, other priorities, lack of space to store items, and not owning your own home. While at a first glance such resource issues may not seem directly related to meaning-making, they do have a bearing on the process. For example, if individuals perceive that preparing for earthquakes is important but they do not have the financial resources to prepare, they may make alterations to their belief systems to justify not spending the money on preparedness (e.g. they may rely on the thought that an earthquake might not happen to justify the decision not to prepare). Thus, resource issues do have an influence on the meaning-making and preparedness process and ways of addressing resource issues should be considered by earthquake educators.

#### **9.3.2.6 Fit with other models**

The findings for this study and the model that has been developed support elements of previous models that have been developed. Consistent with both the Protection Motivation Theory (PMT) and Person relative to Event (PrE) theory, people do assess the likelihood and severity of the consequences of a threatening event, their self-

efficacy, and the response efficacy of protective actions in their decisions about preparing (Duval & Mulilis, 1999; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2003; Mulilis & Lipa, 1990). The model developed for this study also reflects findings from the Protective Action Decision Model (PADM), whereby people must believe a threat exists and poses a risk, must believe that taking protective actions are feasible, and must have the traits and access to resources to undertake adjustment adoption (Lindell & Perry, 1992, 2000, 2011). The PADM emphasises that social contextual variables are important to this process, and this was also confirmed in the model developed for this study. Many of the factors identified as important to the preparedness process for this study are also present in the model of community resilience developed by Paton and colleagues (Paton, 2005, 2006, 2007a; Paton, Bajek, et al., 2010; Paton, Johnston, Smith, et al., 2001; Paton, McClure, et al., 2006; Paton, Millar, et al., 2001; Paton, Parkes, et al., 2008; Paton, et al., 2000). For example, self-efficacy, outcome expectancy, community participation, sense of community and trust all strongly emerged as themes throughout the interviews, consistent with the community resilience model.

The research undertaken for this project is unique in that in developing a model it has started with detailed qualitative interview data, and from such detail been able to map out the entire individual meaning-making and preparedness process. This is in contrast to other quantitative research that has chosen to measure only limited aspects of the information and preparedness process, and attempted to develop models from the restricted data that has been captured. As a consequence, the model developed for this study incorporates a number of components that are not present or strongly emphasised in other information and preparedness models. First, this model recognises that not all information is equal and that different types of information (i.e. passive, interactive and experiential) have different influences. It also includes a specific focus on emotions and feelings as part of the meaning-making and preparedness process. The model accounts for the fact that uncertainty about earthquakes issues or preparedness information can have a bearing on people's decision-making processes. Finally, it includes a strong societal component and recognises that a number of societal influences have a bearing on the meaning-making process. Chapter 5 (Becker, Paton, et al., submitted-a) suggested that the model developed for this research closely resembles a model developed according to Bandura's (1986) Social Cognitive Theory. Most aspects of the

model fit well with Bandura's model aside from the fact that Bandura has a lack of focus on emotions as an influence on behaviour. Future quantitative attempts to model people's interpretation and use of information and how this links with preparedness should consider including some of the additional aspects identified by this research in any testing.

### **9.3.3 Factors influencing the meaning-making process**

A third question posed as part of the research was, "What key individual, community, and societal factors interact to influence meaning-making of information? The following sections focus on four key factors that were found to influence the meaning-making process: emotion and feelings; people's experiences (also known as experiential information); salient beliefs; and societal factors.

#### **9.3.3.1 The role of emotion and feelings in meaning-making**

Emotion and feelings were found to have an interactive effect with hazards and preparedness information and an effect on the preparedness process, in line with previous studies (Dooley, et al., 1992; Karanci, et al., 2005; Paton, et al., 2005; Paton, Smith, et al., 2003; Rüstemli & Karanci, 1999). While exposure to all types of information could affect individuals' feelings and emotions about hazards and preparedness, experiential information had the strongest influence. If people had been directly or indirectly exposed to a disaster they often expressed that this experience had caused them to be horrified, fearful, anxious and worried about future disasters. Indirect event experience did not produce the same degree of emotion, but prompted people to think about risks in a more rational way. Individuals also suggested that passive information could be frightening and cause them to be anxious and worried about disasters. Respondents reported less emotion when discussing information that they had been exposed to in an interactive context.

People's worry manifested itself in four main ways: it could prompt individuals to seek further information about hazards and preparedness; it could directly motivate people to get prepared for a disaster to reduce their worry; it could indirectly contribute to helping form people's beliefs that "Preparing is important"; or it could cause people to deny the problem. Overall, when analysing the interviews, it was found that those with higher levels of worry (expressed in ways such as earthquakes are "frightening", "terrifying",

“scary”, “horrific” or “dreadful”) were more likely follow a process toward getting prepared than those who were simply “concerned” or “uneasy”.

Some previous research supports the concept of high arousal leading to action (Dooley, et al., 1992; Hanoch & Vitouch, 2004), while other research suggests that high levels of emotional arousal can inhibit aspects of the preparedness process (Paton, et al., 2005; Paton, Smith, et al., 2003). A lack of anxiety or concern can also be detrimental to the preparedness process. The findings for this study should be interpreted with caution, as the sample used for the study may have biased the results. Most participants were volunteers who were naturally more interested in preparedness (and thus might have already had a certain type or level of anxiety), so opportunities were limited to test how and why anxiety might hinder other people from preparing. Further qualitative study is needed to fully explore the role that anxiety has on adjustment adoption, including the exact nature and levels of anxiety that influence the preparedness process.

### **9.3.3.2 The importance of experiential information**

Experiential information proved to be a powerful influence on the meaning-making and preparedness process, as people tend to draw upon past experience when considering hazards and preparedness issues (Chapter 6, Becker, Johnston, et al., submitted-c). They might draw upon this experience alone when making decisions about whether to prepare, or draw upon it when considering other types of information they come into contact with. Several types of experience were identified in the analysis, including direct disaster experience (i.e. being impacted by a disaster); indirect disaster experience (i.e. observing or being involved in addressing the impacts of a disaster from a distance, but not personally impacted); indirect event experience (i.e. applying the experience of another event or situation to a disaster context); and the vicarious experience of others (e.g. a family member experiences an event). All types of experience could stimulate critical awareness and help individuals understand the consequences of adverse events. Direct and indirect experiences could assist with developing useful skills that individuals could use in preparing for, or responding to a disaster (including both practical and personal skills, such as that related to self-efficacy). People’s experience helped form unique beliefs, but the beliefs developed depended on the context of the experience. Helpful beliefs formed from direct and indirect disaster experience included: a disaster “Can happen anytime”, “You could be on your own”, “Preparing is

important” and beliefs about the level and nature of risk. Indirect event experience assisted with forming beliefs related to safety issues such as “Safety is important”, “Survival is important” and “Preparedness is a way of life”. The vicarious experience of others also had some influence on forming individuals’ beliefs, but appeared not to be as powerful as direct or indirect experience, due to it being less personalised. Even though disaster experience provided many positive influences on the meaning-making process, it also could have some negative effects as well. For example, people could also develop unhelpful beliefs related to optimistic and normalisation biases (e.g. “I managed in the last event, therefore I will be okay in the next”) that might hinder them from thinking it important to undertake preparations.

As this research was undertaken during a period of relative earthquake quiescence, people’s discussion of their experiences should be taken within this context. Since data was collected for this study, the 2010 Darfield and 2011 Christchurch earthquakes have occurred in the Canterbury region of New Zealand, altering the landscape of direct, indirect and vicarious experience for people. This may have changed the way in which people interact with and use experiential information, and potentially may affect behavioural outcomes. Future research should focus on following individuals’ experiences over time to ascertain how experience evolves and the influence this has on the overall meaning-making and preparedness process. This thesis provides useful baseline information on views and perceptions that could be used to assess change in the Canterbury region.

### **9.3.3.3 Salient beliefs**

From this study a number of key beliefs were identified as being influential on the preparedness process, and these were divided into three main categories: hazard beliefs; preparedness beliefs; and personal beliefs (Chapter 7, Becker, Paton, et al., submitted-b). Hazard beliefs were considered to be beliefs that prominently relate to ‘risk perception’; preparedness beliefs were more aligned with people’s understandings about what preparedness means and the effectiveness of that preparedness; and personal beliefs described a person’s understanding of the impacts of disasters on themselves and how they might deal with a disaster.

The interviews suggest that perception of risk does not solely motivate people to prepare for disasters (Kirschenbaum, 2005; Solberg, et al., 2010), but is still an important part of the preparedness process. People had to believe that a risk of some sort did exist (whether it concerned earthquake risk, another type of risk from a natural event, or a risk related to 'life') before they would contemplate preparing. However, this research also showed many other contextual factors influence the preparedness process, so perceiving there was a risk alone was often not enough to lead directly to preparedness. For example, people might perceive an earthquake was possible and be anxious about it, which may in turn lead to denial of the problem and no adjustment adoption. The level of perceived risk also influenced the preparedness process, with lower perceived levels of risk influencing the type of preparedness undertaken (e.g. if earthquakes were perceived as low risk, then only survival items might be organised and earthquake-specific actions ignored). Consistent with the literature (Mileti & Fitzpatrick, 1993; Turner, et al., 1986), it was evident that those who were able to personalise risk were more likely to be motivated to prepare for earthquakes. This was reflected in people's comments that if they could "relate" to information they had seen or heard they were able to better understand the consequences of a disaster, and were thus more likely to prepare.

Certain beliefs identified in previous studies were also identified in the model as affecting the preparedness process. In particular, beliefs related to there being an inevitable and imminent threat, self-efficacy, positive outcome expectancy, personal responsibility and a belief in responsibility for others (Duval & Mulilis, 1999; Lindell & Perry, 1992, 2000, 2011; McIvor, et al., 2009; Mulilis, 1996; Mulilis & Duval, 1995, 1997, 2003; Mulilis, et al., 2000; Mulilis, et al., 2003; Mulilis & Lippa, 1990; Paton, 2003; Paton, Bajek, et al., 2010; Paton & Johnston, 2008; Paton, Sagala, et al., 2010; Paton, et al., 2005) were helpful in motivating preparedness. Conversely, beliefs that were related to denial, fatalism, normalisation bias and optimistic bias (Burger & Palmer, 1992; Helweg-Larsen, 1999; McClure, 1998, 2006; Mileti & O'Brien, 1992; Spittal, et al., 2005) acted to hinder people's motivations to prepare. The interviews also revealed that people continue to believe that getting prepared means collecting together survival items, as opposed to undertaking mitigation actions, making an emergency plan, learning survival skills, or engaging in social preparedness activities (Heller, et al.,

2005; Kirschenbaum, 2002, 2004; Lindell, et al., 2009; Ronan, et al., 2010; Russell, et al., 1995; Spittal, et al., 2008).

However, new salient beliefs were also identified during this study, as well as insight into how some of these beliefs interact within the wider informational and societal context. In particular the study found that the value that people placed on more every-day life aspects such as safety had a strong influence on preparing. Prepared people were also more likely to believe that “Preparedness is a way of life” and to recognise and accept that preparing did have some limitations. While people’s approach to every-day risks has been shown to have some influence on the preparedness process (Norris, 1997; Spittal, et al., 2008) this study was able to demonstrate the actual nature of the link between every-day safety beliefs and practices, and disaster adjustment adoption actions.

The interviews revealed that in some cases certain configurations of beliefs were required to be influential on the preparedness process. For example, individuals had to believe that a hazard event was both inevitable and imminent (i.e. “Can happen anytime”) before they were likely to be motivated to prepare. Additionally people had to also simultaneously believe that, “I can prepare” and “I can respond” to a disaster, whereas if they only believed that they could respond to an event, then they may be overly optimistic in relying on their current resources in a disaster and not see a need to prepare.

In terms of information type, passive information was most likely to have an influence on the formation of hazard beliefs (e.g. “There is a risk”, “Can/will/does happen” and “Anytime”). Interactive information helped develop a range of hazard, preparedness and personal beliefs (e.g. “There is a risk”, “Can/will/does happen”, “Anytime”, “Preparing is important”, “You could be on your own”, “I can prepare” and “I can respond”), while experiential information had by far the strongest and widest influence on belief formation for hazard, preparedness and personal beliefs (see section 9.3.3.2 for details). As people tend to draw from a variety of informational sources when forming beliefs about hazards and preparedness (Lee, 1999; Mileti & Darlington, 1995, 1997) it was noted that information from various sources needs to be consistent or verifiable.

Three other significant influences on belief formation included uncertainty, emotions and feelings, and social norms, all of which could have positive or negative effects depending on the context.

The research suggests that beliefs play a significant part in the information meaning-making and preparedness process. Beliefs may be formed by information, or may inform people's interpretation of information. Earthquake education strategies need to focus on fostering beliefs that are helpful to the meaning-making and preparedness process, and countering those that are incorrect or unhelpful.

#### **9.3.3.4 Societal factors**

Analysis of the interviews revealed that a number of societal factors influence the information meaning-making and preparedness process (Chapter 8, Becker, Paton, et al., submitted-c). These factors included community participation, sense of community, leadership, responsibility for others, social norms, trust and societal requirements. Many of these factors have been highlighted as important in previous studies (e.g. Karanci & Askit, 1999; McIvor & Paton, 2007; McIvor, et al., 2009; Paton, 2007b, 2008; Paton, et al., 2011; Paton, Kelly, et al., 2006; Paton, McClure, et al., 2006; Rüstemli & Karanci, 1999), but the value of this research project was that a more detailed understanding of the nature of how they influence the preparedness process could be gleaned.

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Community participation was found to have many benefits, including stimulating critical awareness, building skills in individuals and developing helpful beliefs and

social norms with respect to hazards and preparing. Feeling a sense of community was important for the preparedness process, as people often wanted to be prepared so they could assist other community members in a disaster. Those who generally felt some kind of responsibility for others (e.g. dependents, family, friends, and community) were more likely to get prepared to ensure the safety of those people.

Leadership from an individual can help encourage community participation, and thus should be fostered as part of the community participation process. Leaders should be identified and empowered to participate in hazards and preparedness issues.

Social norms had both positive and negative effects on adjustment adoption. The predominant social norm was found to be that while people considered preparedness was important in general, earthquake preparedness was not seen as a normal or widespread activity. Such beliefs hindered people's desire to prepare. Other social norms proved more useful, for example, norms surrounding the moral obligation to look after your community in general helped contribute to a feeling of sense of community and provided a reason to prepare for disasters. The development of helpful attitudinal and behavioural norms appeared to be assisted by community participation, exposure to frequent information, practice of preparedness activities, ensuring that preparedness was applicable to people's daily lives (i.e. "Preparedness is a way of life"), and experience of an adverse event particularly when the experience was shared by others.

The complex role of trust in the information meaning-making and preparedness process was elucidated. Trust in information types and sources, and in institutions themselves, often lead to people being more likely to undertake earthquake adjustment adoption. Conversely, trust could also have an opposite effect, as too much trust in an institution could lead to people believing that the institution was taking care of the hazard issue and thus they didn't need to prepare. Distrust had a similar multi-dimensional effect, whereby some individuals who distrusted information or an agency would not prepare, while others' distrust motivated them to undertake preparedness because they believed that no-one else would take care of them in a disaster.

Finally, there was indication that imposing societal requirements on individuals to prepare at a household level (e.g. through insurance or legislative requirements) could assist the undertaking of preparedness. However, while the Building Act (2004)

legislates for earthquake safety of all new and older multi-unit residential buildings, few other formal earthquake requirements exist in New Zealand for household preparedness, and thus this suggestion could not be effectively tested.

Given the influence of social factors on the meaning-making and preparedness process, those involved in earthquake education need to give more consideration to the social environment in developing programmes, and ensure that influential aspects are accounted for.

### **9.3.4 The development of effective earthquake education strategies**

The final important question for the research was, “How can a better understanding of the meaning-making process assist with developing more effective earthquake education strategies that encourage people to prepare?” The previous sections have touched on aspects of how this might occur, however this section will discuss it in more detail.

Traditional methods of earthquake education have been based on the premise that if people are given passive information about earthquakes or preparing, they will directly act on the information and get prepared. However people do not usually directly act on information they receive; they first will make meaning of the information, before they make decisions about acting. This meaning-making process involves a complex set of interactions within themselves (e.g. cognitions, emotions, and experience), other people, and the wider social and physical environment. Given the complexity of the earthquake information meaning-making process as described previously, it is clear that current methods of earthquake education need to evolve.

The first way to start this evolution is to recognise that information comes in a variety of types including passive, interactive and experiential, and that provision should be made for using all of these types of information. As an example, an earthquake education programme might begin with holding or supporting a number of interactive activities including school activities (including homework assignments), community activities (e.g. basic earthquake education with existing groups; preparedness and response training; supporting preparedness activities in communities; door knocking and face to face interactions with householders), workplace activities (e.g. preparedness and response training) and activities related to social networking (e.g. making use of

interactions on online networks). Such interactions would be supported by the provision of passive information including website material, written material (e.g. pamphlets, newspaper articles), visual material (e.g. DVD, photographs, signage), advertisements (e.g. radio, television), and museum displays. Experiential information should also be utilised during the interactive activities, for example, asking people to think about prior experiences they have had that may be relevant to earthquakes and preparedness, or asking people to think about experience-based concepts that are of importance to them such as general safety. Other people's experience could also be utilised where possible. For example, people's experience of the Canterbury earthquakes could be related to those who have not experienced an earthquake, to show those individuals what a large earthquake might be like, what impacts they might anticipate, and what they might need to do to be prepared for a future earthquake in their location.

Understanding of the interactions that occur as part of the meaning-making process can also assist with creating better messaging. Information relayed during interactive activities, or information contained in passive formats, might include some of the following messages that have been shown to be important in this research (Table 9.1).

**Table 9.1** Important messages that could be relayed during information provision.

<ul style="list-style-type: none"> <li>- There is risk of a large earthquake occurring (with details about the earthquake hazard)</li> <li>- Earthquakes can happen anytime</li> <li>- There won't be warning of an earthquake</li> <li>- An earthquake can happen to you</li> <li>- Other people have experienced a large earthquake before, therefore it could happen to you too (linking with past earthquake experiences, e.g. Canterbury or Hawke's Bay earthquakes).</li> <li>- A large earthquake will cause a number of serious impacts (with a list of potential impacts)</li> <li>- You will be affected by a large earthquake (with a list of ways a person/family/community might be affected)</li> <li>- Preparing is important (with reasons <i>why</i> it is important, e.g. reference to the impacts listed above, the need for safety and survival, etc.)</li> <li>- Preparing requires a range of activities e.g. collecting survival items, mitigation actions, emergency planning, training and community preparedness activities (with details on how to undertake these activities)</li> <li>- Others may not be available to help in a disaster, and therefore you could be on your own</li> <li>- Being prepared will help in a disaster (e.g. with response and recovery)</li> <li>- Preparing is a 'way of life' (e.g. being mentally and physically prepared on a 'day to day' basis will be useful in a disaster)</li> <li>- Preparing is easy and achievable (outlining that preparedness is easy to undertake, but also linking with ways of addressing resource issues such as time and cost)</li> <li>- Preparing is a personal responsibility</li> <li>- You have a responsibility to others to get prepared (e.g. children, family, community)</li> <li>- Other people in your community are getting or have already got prepared.</li> </ul>
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One of the greatest challenges for earthquake educators lies with tackling aspects that are not easily changed by provision of information alone. For instance, there is a need to acknowledge that there is an emotional aspect to hazards and preparing, and that emotions can both have positive and negative effects on the preparedness process. Earthquake educators need to attempt to raise levels of concern in individuals so that they perceive a need to prepare, but avoid creating too much anxiety that leads to denial and fatalism. This may be attempted through a multitude of avenues. Having an education programme that includes a lot of interactive activities can assist with reducing 'negative' emotions and feelings as people can interact with others to find out more information about the nature of the hazard and how to prepare, reducing any worry or anxiety. Appropriate messaging in earthquake education programmes can also be utilised. Messages about the realistic impacts of earthquakes (rather than extreme impacts) can be given to help people acquire a level of hazard concern that promotes action. Practical advice about preparedness measures and their effectiveness should also be given so that people develop the confidence to prepare and respond, which in turn should reduce anxiety.

Additionally, a number of societal factors cannot be tackled through provision of information alone. These factors include: encouraging community participation; fostering leadership in communities; building and sustaining trust; and developing helpful social norms. A wider effort is required to nurture and grow these attributes in communities.

At the regional and local CDEM level, emergency managers responsible for earthquake education should partner with others within their local authority offices to develop societal attributes that assist with fostering household preparedness. For example, the building of community participation, leadership, and trust could all be tackled through the community development division of the local authority. Developing such attributes requires ongoing interaction and engagement with the community not only on hazard-related matters, but in a general community development sense as well. Emergency managers should also work with other relevant local and national organisations that can contribute to building such attributes (e.g. local service groups such as Rotary, local businesses, community boards, Red Cross, MCDEM, EQC, etc.). For example, working with local service groups on hazard and preparedness issues may help build

community participation, while working with EQC could be beneficial in helping ensure that people trust the information about hazards and preparedness they receive.

National, regional and local agencies responsible for earthquake education should work together to attempt to change social norms around earthquake preparedness. The Canterbury earthquake sequence has likely contributed to some norm change, with people now realising that earthquakes are a reality and that preparing is an important necessity. Earthquake educators should use this experience to provide traction to strengthen helpful social norms (i.e. helpful attitudes and beliefs to hazards and preparedness, behavioural norms around undertaking preparedness activities, reinforcing people's sense of moral obligation to help those dependent on them).

## **9.4 Limitations and future research directions**

This research was qualitative in nature, designed to capture details about the earthquake information meaning-making and preparedness process, from which a model has been subsequently derived. While the model is applicable in the context of the 48 interviewees, it is not known whether the model is representative across the general populace. One obvious extension of this study, therefore, is to undertake a second phase of research whereby quantitative research is employed to test the model in a wider sense. This research could be undertaken both within the New Zealand context and at an international level.

A number of aspects were not explored in detail during the interviews or subsequent analysis. Further qualitative study is needed to fully explore the role that anxiety has on meaning-making and adjustment adoption, including the exact nature and levels of anxiety that influence the preparedness process; the complex nature of 'sense of community' and how this interacts within the meaning-making and preparedness process; and the full range of personality traits that influence the process.

As the study itself was undertaken within a limited context (i.e. time, space and nature of location), understanding may still be incomplete about certain aspects of the information meaning-making and preparedness process. For example, there had been no large earthquake events at the time of the study, so questions remain about the meaning-making process operates now there has been a sequence of large earthquakes

in the Canterbury region. Another example is that while interactive information was shown to be effective in prompting preparedness, such interactive information was limited in its use at the time of the study. Questions remain about how the meaning-making and preparedness process might change if more interactive activities were introduced as part of earthquake education initiatives. The limited context of the study may even mean that some important aspects of meaning-making were not identified during the interviews if these aspects not actively operating at the time of the study, or in the location where the interviews took place. Thus the results from the interviews represent a snapshot, and further qualitative research is required to measure the evolution of the meaning-making and preparedness process over time and space. Such research could well include a longitudinal approach whereby the same participants are re-interviewed over time to assess how people continue to make meaning of earthquake information.

One restriction of the study is that in investigating the meaning-making process only individuals were interviewed by themselves about their individual perspectives. This means that the data captured represents individual perceptions of the interactions that occur when a person is exposed to information. It is possible that some of these perceptions may be inaccurate or biased, or that the interviewee was trying to give what they thought was the 'right' answer to the researcher. Further research could involve investigating the meaning-making process in a social rather than just an individual context (e.g. by use of focus groups or observation). Such research would allow the influence of meaning-making interactions to be identified within a true worldly context, allowing an accurate identification of how people interact within themselves and others in real time.

Finally, if elements of the findings from this study are applied by earthquake educators, research should be undertaken to evaluate any earthquake education initiatives that take place. It is only through continual assessment of such initiatives that emergency managers will know whether earthquake education programmes are being effective and household preparedness for earthquakes is increasing.

## 9.5 Conclusion

This thesis has explored the earthquake information meaning-making and preparedness processes. In particular it was interested in identifying the types of earthquake hazard and preparedness information people are exposed to; understanding the processes people go through to make meaning of this information, and the resulting effect on decisions about preparing for earthquakes; identifying the individual, community and societal factors that interact to influence meaning-making of information; and ascertaining how a better understanding of the meaning-making process can assist with developing more effective earthquake education strategies.

The results indicate that people are exposed to three main types of information: passive; interactive; and experiential. Each type of information has a unique influence on the interpretation and preparedness process, with passive information having a more restricted effect, and interactive and experiential information producing wider-ranging responses. People utilise all these types of information when interpreting and making meaning of hazard and preparedness issues. Consequently, future earthquake education programmes should accommodate passive, interactive and experiential information in their design and implementation.

In making meaning of information, and making decisions about whether to prepare or not, a number of aspects were found to be important to the overall process including: raising awareness and knowledge of earthquakes and preparedness; understanding earthquake consequences; stimulating thought and discussion; developing skills; information seeking; salient beliefs; emotions and feelings; societal influences; intentions to prepare; and resource issues. A number of key societal factors were also found to be influential on the meaning-making and preparedness process including: community (community participation, sense of community); leadership; responsibility (responsibility for preparing, responsibility for others); social norms; trust; and societal requirements. As well as accounting for a range of information types, earthquake education programs also need to take such factors into account in their design.

## References

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# Appendix 1 Modified Mercalli Intensity Scale

The following table (A1.1) is taken from Dowrick (1996) and reproduced on the GeoNet website (<http://www.geonet.org.nz/earthquake/modified-mercalli-intensity-scale.html>).

**Table A1.1** Modified Mercalli Intensity Scale (Dowrick, 1996)

<b>Level</b>	<b>Description</b>
<b>MM 1</b>	<b>People</b> Not felt except by a very few people under exceptionally favourable circumstances.
<b>MM 2</b>	<b>People</b> Felt by persons at rest, on upper floors or favourably placed.
<b>MM 3</b>	<b>People</b> Felt indoors; hanging objects may swing, vibration similar to passing of light trucks, duration may be estimated, may not be recognised as an earthquake.
<b>MM 4</b>	<b>People</b> Generally noticed indoors but not outside. Light sleepers may be awakened. Vibration may be likened to the passing of heavy traffic, or to the jolt of a heavy object falling or striking the building.  <b>Fittings</b> Doors and windows rattle. Glassware and crockery rattle. Liquids in open vessels may be slightly disturbed. Standing motorcars may rock.  <b>Structures</b> Walls and frames of buildings, and partitions and suspended ceilings in commercial buildings, may be heard to creak.
<b>MM 5</b>	<b>People</b> Generally felt outside, and by almost everyone indoors. Most sleepers awakened. A few people alarmed.  <b>Fittings</b> Small unstable objects are displaced or upset. Some glassware and crockery may be broken. Hanging pictures knock against the wall. Open doors may swing. Cupboard doors secured by magnetic catches may open. Pendulum clocks stop, start, or change rate.

Level	Description
	<p><b>Structures</b> Some windows Type I cracked. A few earthenware toilet fixtures cracked.</p>
<b>MM 6</b>	<p><b>People</b> Felt by all. People and animals alarmed. Many run outside. Difficulty experienced in walking steadily.</p> <p><b>Fittings</b> Objects fall from shelves. Pictures fall from walls. Some furniture moved on smooth floors, some unsecured free-standing fireplaces moved. Glassware and crockery broken. Very unstable furniture overturned. Small church and school bells ring. Appliances move on bench or table tops. Filing cabinets or "easy glide" drawers may open (or shut).</p> <p><b>Structures</b> Slight damage to Buildings Type I. Some stucco or cement plaster falls. Windows Type I broken. Damage to a few weak domestic chimneys, some may fall.</p> <p><b>Environment</b> Trees and bushes shake, or are heard to rustle. Loose material may be dislodged from sloping ground, e.g. existing slides, talus slopes, shingle slides.</p>
<b>MM 7</b>	<p><b>People</b> General alarm. Difficulty experienced in standing. Noticed by motorcar drivers who may stop.</p> <p><b>Fittings</b> Large bells ring. Furniture moves on smooth floors, may move on carpeted floors. Substantial damage to fragile contents of buildings.</p> <p><b>Structures</b> Unreinforced stone and brick walls cracked. Buildings Type I cracked with some minor masonry falls. A few instances of damage to Buildings Type II. Unbraced parapets, unbraced brick gables, and architectural ornaments fall. Roofing tiles, especially ridge tiles may be dislodged. Many unreinforced domestic chimneys damaged, often falling from roof-line. Water tanks Type I burst. A few instances of damage to brick veneers and plaster or cement-based linings. Unrestrained water cylinders (water tanks Type II) may move and leak. Some windows Type II cracked. Suspended ceilings damaged.</p> <p><b>Environment</b> Water made turbid by stirred up mud. Small slides such as falls of sand and gravel banks, and small rock-falls from steep slopes and</p>

<b>Level</b>	<b>Description</b>
	cuttings. Instances of settlement of unconsolidated or wet, or weak soils. Some fine cracks appear in sloping ground. A few instances of liquefaction (i.e. small water and sand ejections).
<b>MM 8</b>	<p><b>People</b> Alarm may approach panic. Steering of motorcars greatly affected.</p> <p><b>Structures</b> Buildings Type I heavily damaged, some collapse. Buildings Type II damaged, some with partial collapse. Buildings Type III damaged in some cases. A few instances of damage to Structures Type IV. Monuments and pre-1976 elevated tanks and factory stacks twisted or brought down. Some pre-1965 infill masonry panels damaged. A few post-1980 brick veneers damaged. Decayed timber piles of houses damaged. Houses not secured to foundations may move. Most unreinforced domestic chimneys damaged, some below roof-line, many brought down.</p> <p><b>Environment</b> Cracks appear on steep slopes and in wet ground. Small to moderate slides in roadside cuttings and unsupported excavations. Small water and sand ejections and localised lateral spreading adjacent to streams, canals, lakes, etc.</p>
<b>MM 9</b>	<p><b>Structures</b> Many Buildings Type I destroyed. Buildings Type II heavily damaged, some collapse. Buildings Type III damaged, some with partial collapse. Structures Type IV damaged in some cases, some with flexible frames seriously damaged. Damage or permanent distortion to some Structures Type V. Houses not secured to foundations shifted off. Brick veneers fall and expose frames.</p> <p><b>Environment</b> Cracking of ground conspicuous. Landsliding general on steep slopes. Liquefaction effects intensified and more widespread, with large lateral spreading and flow sliding adjacent to streams, canals, lakes, etc.</p>
<b>MM 10</b>	<p><b>Structures</b> Most Buildings Type I destroyed. Many Buildings Type II destroyed. Buildings Type III heavily damaged, some collapse. Structures Type IV damaged, some with partial collapse. Structures Type V moderately damaged, but few partial collapses. A few instances of damage to Structures Type VI. Some well-built timber buildings moderately damaged (excluding damage from falling chimneys).</p> <p><b>Environment</b> Landsliding very widespread in susceptible terrain, with very large</p>

Level	Description
	rock masses displaced on steep slopes. Landslide dams may be formed. Liquefaction effects widespread and severe.
<b>MM 11</b>	<p><b>Structures</b>                      Most Buildings Type II destroyed. Many Buildings Type III destroyed. Structures Type IV heavily damaged, some collapse. Structures Type V damaged, some with partial collapse. Structures Type VI suffer minor damage, a few moderately damaged.</p>
<b>MM 12</b>	<p><b>Structures</b>                      Most Buildings Type III destroyed. Structures Type IV heavily damaged, some collapse. Structures Type V damaged, some with partial collapse. Structures Type VI suffer minor damage, a few moderately damaged.</p>

## Construction types

### Buildings

#### Buildings Type I

Buildings with low standard of workmanship, poor mortar, or constructed of weak materials like mud brick or rammed earth. Soft storey structures (e.g. shops) made of masonry, weak reinforced concrete or composite materials (e.g. some walls timber, some brick) not well tied together. Masonry buildings otherwise conforming to buildings Types I to III, but also having heavy unreinforced masonry towers. (Buildings constructed entirely of timber must be of extremely low quality to be Type I.)

#### Buildings Type II

Buildings of ordinary workmanship, with mortar of average quality. No extreme weakness, such as inadequate bonding of the corners, but neither designed nor reinforced to resist lateral forces. Such buildings not having heavy unreinforced masonry towers.

#### Buildings Type III

Reinforced masonry or concrete buildings of good workmanship and with sound mortar, but not formally designed to resist earthquake forces.

## **Structures**

### Structures Type IV

Buildings and bridges designed and built to resist earthquakes to normal use standards, i.e. no special collapse or damage limiting measures taken (mid-1930s to c. 1970 for concrete and to c. 1980 for other materials).

### Structures Type V

Buildings and bridges, designed and built to normal use standards, i.e. no special damage limiting measures taken, other than code requirements, dating from since c. 1970 for concrete and c. 1980 for other materials.

### Structures Type VI

Structures, dating from c. 1980, with well-defined foundation behaviour, which have been specially designed for minimal damage, e.g. seismically isolated emergency facilities, some structures with dangerous or high contents, or new generation low damage structures.

## **Windows**

### Type I

Large display windows, especially shop windows.

### Type II

Ordinary sash or casement windows.

## **Water tanks**

### Type I

External, stand mounted, corrugated iron tanks.

### Type II

Domestic hot-water cylinders unrestrained except by supply and delivery pipes.

### **Other comments**

"Some" or "a few" indicates that the threshold of a particular effect has just been reached at that intensity.

"Many run outside" (MM 6) is variable depending upon mass behaviour, or conditioning by occurrence or absence of previous earthquakes, i.e. may occur at MM 5 or not until MM 7.

"Fragile contents of buildings": fragile contents include weak, brittle, unstable, unrestrained objects in any kind of building.

"Well-built timber buildings" have: wall openings not too large; robust piles or reinforced concrete strip foundations; superstructure tied to foundation.

Buildings Type III to V at MM 10 and greater intensities are more likely to exhibit the damage levels indicated for low-rise buildings on firm or stiff ground and for high-rise buildings on soft ground. By inference lesser damage to low-rise buildings on soft ground and high-rise buildings on firm or stiff ground may indicate the same intensity. These effects are due to attenuation of short period vibrations and amplification of longer period vibrations in soft soils.

### **Reference**

Dowrick, D. J. (1996). The modified Mercalli earthquake intensity scale: Revisions arising from recent studies of New Zealand earthquakes. *Bulletin of the New Zealand National Society for Earthquake Engineering*, 29(2), 92-106.

# Appendix 2 Statement of Contribution sheets for submitted journal papers

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## Chapter 4

Becker, J. S., Johnston, D. M., Paton, D., & Ronan, K. R. (submitted-b). Re-conceptualising hazards and preparedness information: types, use and effectiveness. *Natural Hazards Review*.

## Chapter 5

Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (submitted-a). A model of household preparedness for earthquakes. *Natural Hazards*.

## Chapter 6

Becker, J. S., Johnston, D. M., Paton, D., & Ronan, K. R. (submitted-c). The role of prior experience in informing and motivating earthquake preparedness. *Disasters*.

## Chapter 7

Becker, J., Paton, D., Johnston, D. M., & Ronan, K. R. (submitted-b). Salient beliefs about earthquake hazards and household preparedness. *Risk Analysis*.

## Chapter 8

Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (submitted-c). Societal factors of earthquake information meaning-making and preparedness. *Qualitative Research in Psychology*.



**MASSEY UNIVERSITY**  
**GRADUATE RESEARCH SCHOOL**

**STATEMENT OF CONTRIBUTION**  
**TO DOCTORAL THESIS CONTAINING PUBLICATIONS**

(To appear at the end of each thesis chapter/section/appendix submitted as an article/paper or collected as an appendix at the end of the thesis)

We, the candidate and the candidate's Principal Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

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**STATEMENT OF CONTRIBUTION**  
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We, the candidate and the candidate's Principal Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

**Name of Candidate:** Julia Becker

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**Name of Published Paper:** Societal factors of earthquake information meaning-making and preparedness

**In which Chapter is the Published Work:** Chapter 8

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# Appendix 3 Documentation for human ethics requirements

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15 November 2007

Julia Becker  
16 Waipounamu Drive  
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**LOWER HUTT**

Dear Julia

**Re: Increasing Community Resilience: Understanding How Individuals Make Meaning of Hazard Information and How This Relates to Preparing for Hazards**

Thank you for your Low Risk Notification which was received on 12 November 2007.

Your project has been recorded on the Low Risk Database which is reported in the Annual Report of the Massey University Human Ethics Committees.

Please notify me if situations subsequently occur which cause you to reconsider your initial ethical analysis that it is safe to proceed without approval by one of the University's Human Ethics Committees.

**A reminder to include the following statement on all public documents:**

*"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research.*

*If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Ethics & Equity), telephone 06 350 5249, e-mail humanethics@massey.ac.nz".*

Please note that if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to provide a full application to one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

Yours sincerely

Sylvia V Rumball (Professor)  
**Chair, Human Ethics Chairs' Committee and  
Assistant to the Vice-Chancellor (Research Ethics)**

cc Assoc Prof David Johnston et al  
School of Psychology  
**WELLINGTON**

Prof Ian Evans, HoS  
School of Psychology  
**PN320**



Disaster Research Centre, School of Psychology, Massey University, Newtown, Wellington  
GNS Science, P.O. Box 30368, Avalon, Lower Hutt

April 2008

### **Natural Hazard Preparedness Study - Information for participants**

Massey University and GNS Science are carrying out a research project looking at how people deal with the threat of natural hazards. As part of this PhD research project, we wish to conduct anonymous interviews with individuals in your community to explore why people do, or do not, prepare for hazards.

The aim of this research is to enhance community resilience to natural hazards. By undertaking such research, a better understanding can be gained about how to encourage household and community preparation.

We have written to your organisation to see if there any members of your organisation who would be willing to participate in such an interview. If you, or another member in your organisation are happy to be interviewed, please read the attached form which outlines the nature of the research project and the interview, and fill out and return the consent form in the Freepost envelope. We have enclosed several information sheets and consent forms in case a number of people are interested in participating.

Your views are very important to the success of this study, and we look forward to hearing from you.

Kind regards

Julia Becker  
Massey University / GNS Science  
For further information, please contact Julia Becker at:  
Phone: 04-570 4795 or Email: [j.becker@gns.cri.nz](mailto:j.becker@gns.cri.nz)



Disaster Research Centre, School of Psychology, Massey University, Newtown, Wellington  
GNS Science, P.O. Box 30368, Avalon, Lower Hutt

***Increasing Community Resilience: Understanding how individuals make meaning of hazard information and how this relates to preparing for hazards***

**INFORMATION SHEET**

**Introduction**

This study focuses on how people do, or do not, deal with the threat of natural hazards. In particular the study will investigate how people render hazard information meaningful, and how this process translates into preparedness actions.

To carry out this research, a number of interviews will be undertaken with individuals in each community (Napier, Wanganui, Timaru) to explore the factors which influence whether people do, or do not, prepare.

The aim of this research is to enhance community resilience to natural hazards. By undertaking such research, a better understanding can be gained about how to encourage household and community preparation.

The project forms part of a student PhD research project by Julia Becker through the School of Psychology at Massey University. Research funding has been provided by the Foundation for Research Science and Technology through GNS Science, of which the student is also an employee. Supervision of the student is provided by Assoc. Prof. David Johnston at Massey University, Prof. Douglas Paton at the University of Tasmania and Prof. Kevin Ronan at the University of Central Queensland.

**Participant Recruitment**

We are looking for approximately 15-20 volunteers from your community who would be willing to participate in an interview about how people do, or do not, deal with the threat of natural hazards. Volunteers must be 18 years or over to be able to participate.

**Project Procedures**

Interviews will either be undertaken in person or by telephone. Before an interview is conducted, all interviewees will be informed about the nature of the research being undertaken, their rights as participants, and will be asked to sign a consent form.

Interviews will be taped and transcribed. Following transcription, all individuals will be sent their transcripts to check and confirm that what is represented in the transcripts is correct. Themes will be extracted from the interview transcriptions and general findings reported on only. Consent sheets will be stored separate from interview transcriptions

to ensure anonymity of participants. Project results will be accessible by contacting Julia Becker, or the relevant district or regional council, and will also be published in a variety of formats.

All data will be collected, utilised and stored by methods that comply with the Massey University Code of Ethical Conduct.

### **Participant involvement**

Interviews will be between 30 minutes to 1 hour long, and will be held at a time suitable to the participant.

### **Participant's Rights**

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study at any time before the results are sent for publication;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- ask for the audio tape to be turned off at any time during the interview;
- be given access to a summary of the project findings when it is concluded.

### **Project Contacts**

For further information about the project, please contact:

Julia Becker, Massey University / GNS Science, P.O. Box 30386, Avalon, Lower Hutt, Ph: 04 570 4795, [j.becker@gns.cri.nz](mailto:j.becker@gns.cri.nz)

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### **Project Evaluation**

*This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research.*

*If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Ethics & Equity), telephone 06 350 5249, email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz).*



Disaster Research Centre, School of Psychology, Massey University, Newtown, Wellington  
GNS Science, P.O. Box 30368, Avalon, Lower Hutt

***Increasing Community Resilience: Understanding how individuals make meaning of hazard information and how this relates to preparing for hazards***

**PARTICIPANT CONSENT FORM**

**This consent form will be held for a period of five (5) years**

I have read the Information Sheet and have had the details of the study outlined to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

- I agree/do not agree to participate in an interview (circle one).
- I prefer to have an interview in person / by telephone (circle one).
- I agree/do not agree to the interview being audio taped (circle one).
- I wish/do not wish to have my audio digital files returned to me (circle one).
- I wish/do not wish to have data placed in an official archive (circle one).
- I agree to participate in this study under the conditions set out in the Information Sheet.

**Date:**

**Signature:**

.....

**Full Name - printed**

**Contact Number (to arrange interview time):**

.....

**Preferred interview time**

- If by telephone (write preferred date/time):
- If in person (circle the dates that are okay for you, and write a preferred time underneath):

8, 9, April; 11, 12, 13, 14 May



# Appendix 4 Themes discussed during the interviews

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## A4.1 Interview Format

Introduce self to participants and outline the nature of the study (e.g. the objective is to build a deeper understanding of hazards and preparedness, and that their input is important), and the ethical considerations (e.g. can opt out any time, anonymity, confidentiality).

Ask person to sign the interview consent form (if this is not done already via post).

## A4.2 Questions (ask for specific examples for each question)

- On a scale of 1-10 how important do you think it is that people should prepare for natural hazards/disasters (with 1 the least, and 10 the most important)?
- What can you tell me about natural hazards in New Zealand? In your town/city?
- How do you think people should go about dealing with hazards?
  - What can you tell me about earthquakes?
  - How do you think people should go about dealing with earthquakes?
- What types of information have you seen or heard about hazards? (If none, you do intend to 'seek' any? Why? Where from?)
- Where did you see/hear this information?
- What did you think about this information?
  - (e.g. Liked/disliked, understood/did not understand it, clear/unclear, trusted/not trusted, useful/not useful, etc).

- What do you think people should do with this type of information? Why?
- What did you do with this information? Why?
- How do you think people can practically make use of this type of information?
  - (e.g. What kind of activities might you carry out to prepare, etc)
- What have you done to prepare for hazards? For earthquakes?
- Why would you prepare/not prepare for hazards?
  - (e.g. coping, self-efficacy, empowerment, resources, etc)
- Are there any benefits/negatives of preparing? Why do you say this?
- What do you think the outcome will be if you prepare? Why?
  - (e.g. good/bad, survival, reduced damage, etc)
- Who do you talk to about hazards?
  - (Family, friends, neighbours, organisations, community groups)
- What do you talk about with respect to hazards? What kind of things do you ask/talk about? What kind of things do other people say/talk about?
- Why do you talk / not talk about hazards?
- Why do you talk about hazards with the people/organisations you identified?
- How do you feel about hazards? About earthquakes? Why?
  - (e.g. anxious, fatalistic, positive/negative, etc)
- When do you think a hazard event might occur next? An earthquake?
- What would you do if there was an earthquake today, in your current situation?
  - (During the earthquake? After the earthquake?).
- Tell me about any past experiences you have had with hazards?
  - (e.g. hazards general and earthquakes)

- Whose responsibility is it to look after/ deal with hazards (or the impact of hazards)? Why did you say those people are responsible?
- Is there anything that we haven't talked about, that you think is important, and would like to discuss?
- Are there any questions you would like to ask me?

#### **A4.3 Other attributes to record**

- Timing of interview (date and sequence)
- Age
- Gender
- A feel for their socio-economic status (e.g. struggling, comfortable, well-off)
- How long have you lived in this house?
- How long have you lived in the community?
- How long have you lived in this location (town)?
- How do you feel about living in this community?
- Were things already 'set up' when you moved in? (e.g. in terms of adjustment measures)
- What community groups do you belong to?
- What activities do they engage in?
- Record any recent events (e.g. Gisborne Earthquake), or activities of interest that may have an influence on answers.



## Appendix 5 Variety and frequency of codes used in analysis of the interviews

Table A5.1 presents the variety of codes (“Code Title”) that emerged from analysis of the interview data from Napier, Timaru and Wanganui. The “Quotation Count” reflects the number of times a concept was referred to, rather than the number of individuals who brought the concept up (thus an individual may have made reference to a concept several times). Table A5.2 presents the most frequently occurring codes that emerged during analysis of the interviews.

**Table A5.1** Variety of codes used in analysis of the interviews

QUOTATION COUNT	CODE TITLE
2	Ability to help in an event: access to networks
2	Ability to help in an event: provide knowledge
13	Acceptance of fate / can't do anything about it
6	Acceptance of this is "how things are" (the world, hazards, etc.)
2	Approximate age: 20-30 years
4	Approximate age: 30-40 years
5	Approximate age: 40-50 years
11	Approximate age: 50-60 years
22	Approximate age: 60-70 years
4	Approximate age: 70-80 years
2	Attitude: I take the same attitude on everything
1	Attitude: my family is 'tuned in' to hazards/preparing because of my attitude
1	Attitude: should help other people / the community
3	Attitude: that's probably a 'head in the sand attitude' (denial)
1	Attitudes: other people's: bleak
2	Attitudes: other people's: what are you going to do for me?
163	Awareness
10	Awareness: a realisation there is danger/a hazard/ etc.
5	Awareness: at the front of people's minds / brings to the front of people's minds
5	Awareness: cautious awareness
7	Awareness: high levels
2	Awareness: I'm not aware of many / some things
1	Awareness: in organised settings in New Zealand
10	Awareness: it is possible that events/disasters can happen
3	Awareness: occurs because you are sharp / intelligent / smart
14	Awareness: of 'what to do'
1	Awareness: of being on own/isolation
11	Awareness: of being prepared / current preparedness
2	Awareness: of climate change/global warming
5	Awareness: of danger
1	Awareness: of existing conditions (e.g. weather, etc.)
1	Awareness: of having to provide for / look after yourself
2	Awareness: of hazards related to equipment in the house (e.g. computers)

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QUOTATION COUNT	CODE TITLE
33	Awareness: of hazards/disasters/events occurring
9	Awareness: of hazards/preparedness information
31	Awareness: of impacts/consequences of disasters
2	Awareness: of items that may be available in an emergency, but aren't specifically 'prepared' for one
23	Awareness: of mitigation measures
2	Awareness: of other people who have prepared
5	Awareness: of other people/the community
6	Awareness: of past events
4	Awareness: of planning in other areas / sectors
10	Awareness: of preparedness (or preparedness items) needed
1	Awareness: of problems with information
1	Awareness: of reduced or lack of insurance
6	Awareness: of risks from a hazard/disaster (or hazardous pursuit)
3	Awareness: of safe areas to live / be
44	Awareness: of the landscape/location and risks associated with that
1	Awareness: of what can and can't be done in a disaster
1	Awareness: of what is going on in a disaster
3	Awareness: of what is going on in other sectors
1	Awareness: of what it is like to be without comforts and civilisation / features of modern society
1	Awareness: of who to contact in an event/disaster
1	Awareness: of world hazards/disasters / what is happening overseas
4	Awareness: people not aware of hazards/preparedness information
9	Awareness: people not aware of the consequences/impacts of disasters
1	Awareness: people not aware of the hazards here
17	Awareness: people should be / need to be aware of potential hazards
8	Awareness: people should be aware of how to prepare
2	Awareness: people should be aware of past events
1	Awareness: people should be aware that preparedness is generally necessary, not specifically for any one event
1	Awareness: people unaware of the consequences will end up in a bad situation / die
1	Awareness: people with low awareness/appreciation of hazards will still buy properties in hazardous locations
1	Awareness: should be more aware now
1	Awareness: there is not enough attention attracted to the fact our town is low lying / below sea level
8	Awareness: understanding how you will need to respond in an emergency
2	Awareness: would be good to raise awareness
63	Basic / basics
13	Benefits of preparing (external to preparedness itself)
1	Benefits of talking about schoolwork and disasters/preparing
1	Can't do it: belief you can't do anything about human made hazards
1	Can't do it: belief you can't do anything about making others prepare
29	Can't do it: belief you can't do anything about natural hazards / natural hazard impacts
27	Can do it: belief in ability to do something about problems for natural hazards (preparedness)
27	Can do it: belief in ability to do something about problems for natural hazards (response)
5	Can do it: belief you can do something about human made hazards
82	Can happen
6	Can happen AGAIN
3	Can happen: but hasn't happened yet
2	Can happen: in the Western world
9	Can happen: when: at any time
2	Can happen: where: while you are in any place
1	Cannot happen: therefore don't think about it
1	Community group: activities: assist with local research
10	Community group: activities: make up disaster kits for other countries / overseas / internationally
18	Community group: activities: meetings
1	Community group: activities: nothing related to preparedness
4	Community group: activities: preparedness activities

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QUOTATION COUNT	CODE TITLE
1	Community group: activities: relationship building
5	Community group: activities: social gatherings
2	Community group: activities: team building exercises
4	Community group: activities: tours/field visits of key sites
5	Community group: civil defence: know others who belong/ed to
2	Community group: decided to help a smaller/more achievable area
2	Community group: don't belong to any
1	Community group: don't belong to: Civil Defence
1	Community group: don't belong to: community watch/patrol
2	Community group: don't belong to: neighbourhood watch
1	Community group: don't belong to: rotary
1	Community group: frequency of meeting: not often
1	Community group: nature Victim Support
3	Community group: nature: 4wd club
1	Community group: nature: Amnesty International
1	Community group: nature: beekeeping
2	Community group: nature: book club
1	Community group: nature: bridge club
3	Community group: nature: budgeting services
3	Community group: nature: business group
4	Community group: nature: car / vehicle club
6	Community group: nature: church groups / churches / religious centres
5	Community group: nature: Citizens' Advice Bureau
83	Community group: nature: civil defence
1	Community group: nature: civil defence: attitude toward: 'alive' (operating)
1	Community group: nature: civil defence: attitude toward: apathy
8	Community group: nature: civil defence: attitude toward: criticism
1	Community group: nature: civil defence: attitude toward: fun
7	Community group: nature: civil defence: attitude toward: good
1	Community group: nature: civil defence: attitude toward: more relaxed (less Dad's army / military)
1	Community group: nature: civil defence: attitude toward: necessary
1	Community group: nature: civil defence: attitude toward: trying best to get people prepared
2	Community group: nature: civil defence: attitude toward: well organised
1	Community group: nature: civil defence: composition is older/less active people
1	Community group: nature: civil defence: composition is only made up of small numbers
2	Community group: nature: civil defence: expect/depend on civil defence
1	Community group: nature: civil defence: have re-vamped their procedures lately
3	Community group: nature: Coastguard
7	Community group: nature: community trust / development / urban renewal, etc.
3	Community group: nature: community watch (volunteers helping the police)
12	Community group: nature: craft or hobby group (e.g. photography, gardening)
2	Community group: nature: dinner club
5	Community group: nature: education / teaching
2	Community group: nature: emergency services
2	Community group: nature: ex-pats group
13	Community group: nature: fire service
4	Community group: nature: Forest and Bird
2	Community group: nature: Founders Society
1	Community group: nature: genealogy
1	Community group: nature: health services
5	Community group: nature: hospital board
1	Community group: nature: hospital board: attitude toward: criticism
1	Community group: nature: Inner Wheel (wives of Rotarians)
1	Community group: nature: Institute of Building Officials
4	Community group: nature: Keep 'the town' beautiful committee/group
3	Community group: nature: Life Education Trust

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QUOTATION COUNT	CODE TITLE
6	Community group: nature: Lions
1	Community group: nature: local issues (environment, traffic, coastal erosion, etc.)
2	Community group: nature: Masonic Lodge / Freemasons
1	Community group: nature: medical / health society (e.g. cancer, diabetes, etc.)
4	Community group: nature: music/choir
8	Community group: nature: National Council of Women
2	Community group: nature: needle exchange
27	Community group: nature: neighbourhood support
1	Community group: nature: neighbourhood support: attitude toward: strong
1	Community group: nature: neighbourhood support: not just about crime
1	Community group: nature: play centre / early childhood centre
9	Community group: nature: Probus
10	Community group: nature: red cross
3	Community group: nature: relating to disabled persons
8	Community group: nature: religion/faith
22	Community group: nature: Rotary
1	Community group: nature: RSA
3	Community group: nature: running a museum / science centre
2	Community group: nature: salvation army
7	Community group: nature: school committee / board
6	Community group: nature: scouts/guides (or similar)
4	Community group: nature: Search and rescue
20	Community group: nature: sports group / sports activities
10	Community group: nature: St. Johns
1	Community group: nature: theosophical society
2	Community group: nature: women's club (general)
2	Community group: nature: Women's Institute
6	Community group: nature: Zonta
1	Community group: neighbourhood watch doesn't operate any more
1	Community group: see different roles (and abilities to deal with hazards) for community group vs. the individual
1	Community group: used to belong: civil defence: why not now: felt like achieving nothing
1	Community group: volunteer position
1	Community group: we address legislative issues
1	Community group: we are a lobby group
1	Community group: we focus on certain topics each year
1	Community group: we focus on certain topics each year: topic: sustainability
1	Community group: we focus on certain topics each year: topic: violence
6	Community group: we raised/donated money/resources for relief efforts
11	Community group: we raised/donated money/resources for relief efforts: internationally
1	Community group: we raised/donated money/resources for relief efforts: internationally: not sure
2	Community group: we raised/donated money/resources for relief efforts: within NZ
2	Community group: why joined: had family members involved
1	Community group: why joined: invited by another member
1	Community group: why joined: thought I could help
1	Community group: why joined: working in the area of interest at the time
4	Community groups: are skilled / able to help with certain aspects of a disaster
200	Community groups: belong to
4	Community groups: belong to: why joined: wanted to find out more about hazards and what to do, to allay concerns
1	Community groups: can link with emergency services on developing preparedness
1	Community groups: has a leader
2	Community groups: help set up
8	Community groups: involved with many/used to be involved with many/not as involved now
15	Community groups: time participating in
41	Community groups: used to belong
3	Community groups: used to belong: civil defence: why not now: didn't want to be responsible if everything

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QUOTATION COUNT	CODE TITLE
	went wrong
1	Community groups: why I left: give a chance for others to implement their ideas
4	Community groups: would help out in a disaster
4	Community: a desire or active part in helping improve the 'quality' of a community
1	Community: a group/activities can be compromised if you don't hold the same values
2	Community: actively offered assistance in an event (e.g. called)
1	Community: all help out with neighbourhood watch
1	Community: Attends local community meetings but doesn't belong to a group as such
4	Community: being vocal in the community / asking for more assistance
18	Community: call on (phone, visit) people to check they are okay in an event
2	Community: call on (phone, visit) to warn people about an impending event
4	Community: caring
1	Community: chat/interact via social media
1	Community: close
1	Community: combine preparedness activities with other activities
2	Community: communities are different now to what they were in the past
1	Community: communities divide up tasks between community members
2	Community: community-minded people are the ones who could best look after themselves in a disaster
1	Community: considers it to be a 'moderate' community
2	Community: consultation with the community by an organisation / local authority
1	Community: could contribute to designing preparedness information
1	Community: could do more around advocating hazards/preparedness
1	Community: don't know neighbours at all
1	Community: don't know some neighbours at all (but know others)
2	Community: don't know whether / how neighbours are set up for a disaster/emergency
1	Community: expectations that the community will solve problems post-event
2	Community: feels fortunate to be living in such a community
10	Community: feels support is available in community
3	Community: friendship / friendly
1	Community: goes beyond the bounds/call of duties to get people planning/prepared
1	Community: good size
1	Community: good to know who might need help in an emergency
1	Community: got other members to join forces in responding to an event
11	Community: has long term connections with the community (e.g. other family members living there, long term friends)
1	Community: has received an award for services to community
14	Community: has resources they can share in a disaster/shared resources
15	Community: have good neighbours / neighbourhood
1	Community: have NOT organised themselves to prepare for/respond to an event
2	Community: have organised themselves to prepare for/respond to an event
1	Community: have to work actively at getting/continuing to know neighbours
40	Community: help the community currently
47	Community: helped the community and/or neighbours out in a past event
20	Community: helped the community in the past (general)
1	Community: individuals should help / contribute to society where they can
2	Community: is well defined geographically
2	Community: it's a small town (and therefore know lots of people there, easier to recover, etc.)
1	Community: it's good that people are responding / being proactive
2	Community: know needs of immediate neighbours/community
40	Community: know neighbours well
8	Community: know what is happening in community / details about community members
5	Community: knows neighbours a bit
1	Community: likely that other people around you won't be prepared when a disaster occurs
6	Community: likes living in community / community is good
4	Community: likes to volunteer/help the community
12	Community: look after each other
1	Community: many previous friends have moved away

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QUOTATION COUNT	CODE TITLE
13	Community: might need to ask for others' help in an emergency
5	Community: might not be personally impacted (or badly impacted) in an event but other community members might be (or might be worse off)
1	Community: more social activity would be good
1	Community: need good general resources (e.g. jobs, schools, doctor) in a community
4	Community: neighbourhood has a mix of people / families / ages
1	Community: no apparent poverty
1	Community: no extreme affluence
1	Community: not a close neighbourhood / don't know everybody
1	Community: not a lot of interaction occurring
3	Community: Other members might also share the same attitude to not preparing / don't prepare
1	Community: our community is smaller and more connected
63	Community: proactive in the community with respect to mitigating 'hazards'
1	Community: proud to be involved in planning/preparing
5	Community: provide advice to mitigate hazard: community responds by doing so
2	Community: quiet community
4	Community: relationships between responding organisations important
7	Community: relationships within a community are important
1	Community: relief: don't like to donate relief money overseas because it's a remote country I've had nothing to do with
1	Community: relief: don't like to donate relief money overseas because not sure how effective it will be
2	Community: relief: if a disaster occurred in NZ, I would donate money
6	Community: selling emergency kits/items to other community members
3	Community: so concerned with helping others hasn't stopped to think about helping himself/helped self
11	Community: talk/interact with neighbours regularly
2	Community: the council should have adequate discussions / consultation with the community (e.g. ask them what to do, not tell them)
2	Community: too old to get (fully) involved with civil defence/preparedness in community
20	Community: volunteer / belong to voluntary organisations
19	Community: want to/will actively participate in disaster response/recovery
6	Community: will respond accordingly to something unexpected
64	Community: will/did help each other out in an event
2	Community: works with groups/organisations at a local, national and international level
3	Community: your friends may be far away/not easy to access after an event
3	Concern for others: children (grown)
3	Concern for others: children (young)
2	Concern for others: family (general)
2	Concern for others: grandchildren
2	Concern for others: neighbours
1	Concern for others: parents
1	Concern for others: people might get sick if they don't undertake sustained preparedness
1	Concern for others: pets
1	Concern: about houses being 100% electricity
2	Concern: over earthquake impacts
1	Concern: over responsibilities for emergencies
2	Concern: people more concerned with human-made than natural disasters
1	Concern: that hospital/medical facilities might not be available in an emergency
24	Conscious
3	Conscious of: earthquakes
2	Conscious of: fire
2	Conscious of: flooding
3	Conscious of: personal accidents
1	Conscious of: security
1	Conscious of: the need for / question of preparedness
3	Conscious of: tsunamis
1	Conscious of: volcanoes
1	Conscious: everybody I know is conscious of the need for preparedness

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QUOTATION COUNT	CODE TITLE
3	Conscious: high in consciousness
1	Conscious: not consciously keeping/gathering some preparedness items
1	Conscious: of danger
1	Conscious: of others
6	Conscious: of safety
1	Conscious: of the potential for disasters occurring
2	Convenience means: being able to live without normal features of modern living
1	Convenience means: convenience in case of a disaster
1	Convenience means: the convenience of contracting out / lending out tasks to certain organisations
4	Country of origin: United kingdom
1	Country of origin: various
5	Cultural differences
31	Danger
7	Disaster/event experience: accidents: response: helped others
2	Disaster/event experience: accidents: saw a wooden house stand up to / be okay in an accident
12	Disaster/event experience: actions taken during/post event
4	Disaster/event experience: a lot / many events
76	Disaster/event experience: assist in responding to an event
3	Disaster/event experience: assist with sound building (incl. mitigating hazards)
6	Disaster/event experience: assist with surveying buildings after an event
2	Disaster/event experience: bad weather / rain: feelings: frightening
1	Disaster/event experience: bad weather / rain: feelings: used to love rain on the roof
1	Disaster/event experience: can see the danger ourselves, but others don't see it
1	Disaster/event experience: changes since event: none or few
15	Disaster/event experience: civil defence planning (during quiescence)
1	Disaster/event experience: coastal inundation / storm surge: feelings: not dangerous
1	Disaster/event experience: coastal inundation / storm surge: feelings: scary
4	Disaster/event experience: coastal inundation / storm surge: response: did nothing
1	Disaster/event experience: coastal inundation / storm surge: response: did nothing: why: didn't feel that anything could be done
2	Disaster/event experience: coastal inundation / storm surge: response: kept an eye on / kept watching the hazard / 'wait and see'
1	Disaster/event experience: coastal inundation / storm surge: response: would have done something if water was higher
13	Disaster/event experience: communication important
1	Disaster/event experience: costal inundation / storm surge: has threatened more than once / several times
2	Disaster/event experience: crime / violence / disruption from activities: response: called police
1	Disaster/event experience: crime / violence / disruption from activities: response: other people had worse impacts
2	Disaster/event experience: crime / violence / disruption from activities: response: wasn't an emergency
4	Disaster/event experience: cyclone/hurricane: impacts: building damage
2	Disaster/event experience: cyclone/hurricane: impacts: environmental damage (trees, beaches)
1	Disaster/event experience: cyclone/hurricane: impacts: harbour and boat damage
1	Disaster/event experience: cyclone/hurricane: impacts: infrastructure damage
1	Disaster/event experience: cyclone/hurricane: impacts: major
1	Disaster/event experience: cyclone/hurricane: impacts: minor
1	Disaster/event experience: cyclone/hurricane: impacts: no deaths
1	Disaster/event experience: cyclone/hurricane: impacts: no injuries
2	Disaster/event experience: cyclone/hurricane: impacts: no water
1	Disaster/event experience: cyclone/hurricane: impacts: other people had (worse) impacts
1	Disaster/event experience: cyclone/hurricane: impacts: power outage
1	Disaster/event experience: cyclone/hurricane: impacts: slips / landslides
1	Disaster/event experience: cyclone/hurricane: impacts: storm surge
1	Disaster/event experience: cyclone/hurricane: impacts: transport disrupted
2	Disaster/event experience: cyclone/hurricane: not serious/bad
2	Disaster/event experience: cyclone/hurricane: response: helped others after the event
1	Disaster/event experience: cyclone/hurricane: response: just handle them / deal with them
1	Disaster/event experience: cyclone/hurricane: response: people had to prepare/protect roofs

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QUOTATION COUNT	CODE TITLE
1	Disaster/event experience: cyclone/hurricane: response: people salvaging and protecting remaining items
1	Disaster/event experience: cyclone: impacts: did not severely impact this location
1	Disaster/event experience: cyclone: response: help out from the office
1	Disaster/event experience: direct landslides/slippage
13	Disaster/event experience: direct: accidents (car, plane, work, personal, etc.)
9	Disaster/event experience: direct: bad weather / rain
3	Disaster/event experience: direct: bushfire
7	Disaster/event experience: direct: coastal inundation / storm surge
5	Disaster/event experience: direct: cold war
4	Disaster/event experience: direct: contact with poor quality water
23	Disaster/event experience: direct: cyclone/hurricane
1	Disaster/event experience: direct: drought
7	Disaster/event experience: direct: everyday emergencies
2	Disaster/event experience: direct: fire
31	Disaster/event experience: direct: flooding
2	Disaster/event experience: direct: food supply issues
5	Disaster/event experience: direct: frequently occurring
9	Disaster/event experience: direct: health issues
1	Disaster/event experience: direct: lightening
22	Disaster/event experience: direct: power cuts
28	Disaster/event experience: direct: recreational pursuits (e.g. tramping, boating) and dangers associated with these
1	Disaster/event experience: direct: road closures
2	Disaster/event experience: direct: safety issues
1	Disaster/event experience: direct: sinkholes
91	Disaster/event experience: direct: snowstorm / heavy snow
10	Disaster/event experience: direct: storms (general)
3	Disaster/event experience: direct: terrorism
1	Disaster/event experience: direct: the depression
2	Disaster/event experience: direct: tornadoes
7	Disaster/event experience: direct: volcanoes
8	Disaster/event experience: direct: war time
21	Disaster/event experience: direct: windstorm
1	Disaster/event experience: drought: response: conserve water / water restrictions
1	Disaster/event experience: earthquake: impacts: road/transport route damage
1	Disaster/event experience: earthquake: response: change travel patterns
2	Disaster/event experience: earthquakes from mine-shaft collapse: minor
14	Disaster/event experience: earthquakes: common
1	Disaster/event experience: earthquakes: community members experienced a big earthquake
13	Disaster/event experience: earthquakes: family member experienced a big earthquake
1	Disaster/event experience: earthquakes: feelings: 'different' to the other earthquakes
2	Disaster/event experience: earthquakes: feelings: 'nasty one'
1	Disaster/event experience: earthquakes: feelings: 'weird ones'
11	Disaster/event experience: earthquakes: feelings: a 'beauty' / felt big / bad shake
1	Disaster/event experience: earthquakes: feelings: amazing
1	Disaster/event experience: earthquakes: feelings: not too bad
1	Disaster/event experience: earthquakes: feelings: not too traumatic
1	Disaster/event experience: earthquakes: feelings: shock
5	Disaster/event experience: earthquakes: feelings: some of them have been quite scary
1	Disaster/event experience: earthquakes: feelings: spooked / spooky
5	Disaster/event experience: earthquakes: feelings: will the earthquake get worse (while experiencing a shake)?
1	Disaster/event experience: earthquakes: feelings: will there be another earthquake to follow (while experiencing a shake)?
6	Disaster/event experience: earthquakes: Gisborne quake
1	Disaster/event experience: earthquakes: Gisborne quake: response: sought information on the internet
1	Disaster/event experience: earthquakes: Gisborne quake: response: turned on radio for information

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QUOTATION COUNT	CODE TITLE
11	Disaster/event experience: earthquakes: grew up or lived in an earthquake prone area
7	Disaster/event experience: earthquakes: haven't felt/experienced any damaging earthquakes
2	Disaster/event experience: earthquakes: haven't felt/experienced any earthquakes in other locations
12	Disaster/event experience: earthquakes: haven't felt/experienced any earthquakes in this location
1	Disaster/event experience: earthquakes: identified and moved dangerous objects
2	Disaster/event experience: earthquakes: impacts: building collapse
2	Disaster/event experience: earthquakes: impacts: computer/electronic damage
5	Disaster/event experience: earthquakes: impacts: cracked buildings
2	Disaster/event experience: earthquakes: impacts: dust explosion from failing building
9	Disaster/event experience: earthquakes: impacts: falling (and damaged) items / items shifting
1	Disaster/event experience: earthquakes: impacts: felt that money paid out by EQC was not enough (out of pocket financially)
1	Disaster/event experience: earthquakes: impacts: impacts don't finish at the earthquake, they continue through recovery
2	Disaster/event experience: earthquakes: impacts: major structural damage
8	Disaster/event experience: earthquakes: impacts: minor structural damage
10	Disaster/event experience: earthquakes: impacts: no major impacts
2	Disaster/event experience: earthquakes: impacts: sloshed water out of swimming pool
1	Disaster/event experience: earthquakes: impacts: time of school/work
1	Disaster/event experience: earthquakes: impacts: transportation route damaged/disrupted
1	Disaster/event experience: earthquakes: impacts: woke me/us up
5	Disaster/event experience: earthquakes: major
115	Disaster/event experience: earthquakes: minor
30	Disaster/event experience: earthquakes: moderate
6	Disaster/event experience: earthquakes: not experienced
1	Disaster/event experience: earthquakes: nothing fell down/off
1	Disaster/event experience: earthquakes: other people have felt/experienced earthquakes in this location
2	Disaster/event experience: earthquakes: response: call friends/family after an event
1	Disaster/event experience: earthquakes: response: coped okay
1	Disaster/event experience: earthquakes: response: couldn't believe what the earthquake did!
1	Disaster/event experience: earthquakes: response: do I stay with family or get to somewhere safe (e.g. in the doorway?)
1	Disaster/event experience: earthquakes: response: felt calmer after I had experienced my first one
1	Disaster/event experience: earthquakes: response: fire brigade called out
2	Disaster/event experience: earthquakes: response: gathered up/grabbed children
6	Disaster/event experience: earthquakes: response: got under table/doorway
4	Disaster/event experience: earthquakes: response: had to call in / deal with EQC insurers
2	Disaster/event experience: earthquakes: response: helped with repairs
1	Disaster/event experience: earthquakes: response: it went on for longer so had time to react (e.g. Gisborne)
1	Disaster/event experience: earthquakes: response: keep heavy objects down low
2	Disaster/event experience: earthquakes: response: not much / carry on with activities
1	Disaster/event experience: earthquakes: response: ran/went outside
1	Disaster/event experience: earthquakes: response: run
2	Disaster/event experience: earthquakes: response: stay in bed and hold on
1	Disaster/event experience: earthquakes: response: yell at other people to find safety
1	Disaster/event experience: earthquakes: we are accustomed to having several small earthquakes a year
1	Disaster/event experience: earthquakes: we used to live on/near fault lines
1	Disaster/event experience: electricity infrastructural failure
1	Disaster/event experience: emergency plan: did the opposite to what trained to do
24	Disaster/event experience: evacuation drills, practices or exercises
1	Disaster/event experience: evacuation drills, practices or exercises: none
1	Disaster/event experience: evacuation drills, practices or exercises: response: had to revise procedure
2	Disaster/event experience: evacuation drills, practices or exercises: timing of practices
1	Disaster/event experience: evacuation drills, practices or exercises: until something happens/you try it you don't realise what's needed
5	Disaster/event experience: everyday emergencies: response: just handle them / deal with them
1	Disaster/event experience: family member's life in danger
1	Disaster/event experience: family member's life in danger: response: reactionary - different to what you

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QUOTATION COUNT	CODE TITLE
	think about beforehand
2	Disaster/event experience: family member's life in danger: response: refer back to something someone had told you in the past
2	Disaster/event experience: family member's life in danger: response: was isolated, so had to respond (up to own resources)
1	Disaster/event experience: few people step forward / respond in an emergency
1	Disaster/event experience: few people step forward / respond in an emergency: why: uncertainty
1	Disaster/event experience: fire: impacts: burned items in house
1	Disaster/event experience: fire: impacts: not bad
1	Disaster/event experience: fire: response: put it out
1	Disaster/event experience: first time it had happened to such a great extent
2	Disaster/event experience: flooding: big one
1	Disaster/event experience: flooding: feelings: personal invasion of privacy
2	Disaster/event experience: flooding: feelings: scary / frightening
1	Disaster/event experience: flooding: feelings: stunned
4	Disaster/event experience: flooding: impacts: could not get to work or school
1	Disaster/event experience: flooding: impacts: affected power
3	Disaster/event experience: flooding: impacts: bad flood / severe
1	Disaster/event experience: flooding: impacts: big logs in river causing damage
2	Disaster/event experience: flooding: impacts: closed work/schools/shops etc.
6	Disaster/event experience: flooding: impacts: communication difficult
10	Disaster/event experience: flooding: impacts: damaged / impacted transport route
5	Disaster/event experience: flooding: impacts: damaged farms/animals affected
1	Disaster/event experience: flooding: impacts: damaged fences
28	Disaster/event experience: flooding: impacts: damaged houses/buildings
2	Disaster/event experience: flooding: impacts: depends on the type of flood (e.g. flash floods vs. slow floods)
3	Disaster/event experience: flooding: impacts: did not severely impact this location
2	Disaster/event experience: flooding: impacts: differed depending on age
2	Disaster/event experience: flooding: impacts: differed depending on experience
2	Disaster/event experience: flooding: impacts: dirty residue/silt
1	Disaster/event experience: flooding: impacts: economic impacts
1	Disaster/event experience: flooding: impacts: family member affected by flooding
4	Disaster/event experience: flooding: impacts: fell into flooded river
2	Disaster/event experience: flooding: impacts: flash flood / fast flood
1	Disaster/event experience: flooding: impacts: floodwaters remaining long term
2	Disaster/event experience: flooding: impacts: houses lifted off foundations / pushed over
1	Disaster/event experience: flooding: impacts: long term
2	Disaster/event experience: flooding: impacts: lost business gear / stock
1	Disaster/event experience: flooding: impacts: lost personal items
5	Disaster/event experience: flooding: impacts: on people
1	Disaster/event experience: flooding: impacts: other people didn't cope well
4	Disaster/event experience: flooding: impacts: people had no supplies in house (e.g. food, water, medication)
11	Disaster/event experience: flooding: impacts: ponding on section / under house
4	Disaster/event experience: flooding: impacts: power off/issues
4	Disaster/event experience: flooding: impacts: sewage systems down / damaged
10	Disaster/event experience: flooding: impacts: significant/major
1	Disaster/event experience: flooding: impacts: the flood has been like it never has before (increased impacts from climate change)
20	Disaster/event experience: flooding: impacts: trapped, could not get out/travel
9	Disaster/event experience: flooding: impacts: washed away transport route (e.g. bridge, road)
1	Disaster/event experience: flooding: impacts: water got ponded on wrong side of stop bank
2	Disaster/event experience: flooding: impacts: water off/issues
1	Disaster/event experience: flooding: impacts: waves created by moving vehicles causing damage
1	Disaster/event experience: flooding: look after themselves for a few days
5	Disaster/event experience: flooding: not experienced
2	Disaster/event experience: flooding: not large human/welfare issues
1	Disaster/event experience: flooding: not life-changing

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QUOTATION COUNT	CODE TITLE
4	Disaster/event experience: flooding: not life-threatening / no-one killed
15	Disaster/event experience: flooding: not personally affected
9	Disaster/event experience: flooding: other people have experienced flooding / been impacted
1	Disaster/event experience: flooding: people drowned
7	Disaster/event experience: flooding: personally affected
1	Disaster/event experience: flooding: personally threatened
1	Disaster/event experience: flooding: response: assisted with updates/communications
4	Disaster/event experience: flooding: response: clean out buildings / structures
2	Disaster/event experience: flooding: response: coordinate/get assistance to others
2	Disaster/event experience: flooding: response: deliver essential supplies
8	Disaster/event experience: flooding: response: evacuation
2	Disaster/event experience: flooding: response: expectation of help
4	Disaster/event experience: flooding: response: felt sorry for people affected
3	Disaster/event experience: flooding: response: had to change travel patterns
1	Disaster/event experience: flooding: response: had to move things
1	Disaster/event experience: flooding: response: had to use insurance company to get repairs
1	Disaster/event experience: flooding: response: have to cope with
12	Disaster/event experience: flooding: response: helped people during the flood
1	Disaster/event experience: flooding: response: I didn't understand what that roaring sound was
1	Disaster/event experience: flooding: response: I would never do what those people did
1	Disaster/event experience: flooding: response: installed a mitigation measure (e.g. sump, barrier)
1	Disaster/event experience: flooding: response: need to get (better) insurance
1	Disaster/event experience: flooding: response: older people help out younger ones
1	Disaster/event experience: flooding: response: people affected were horrified
5	Disaster/event experience: flooding: response: people needed to ask for help
2	Disaster/event experience: flooding: response: people used inflatables/ boats in the floodwater
1	Disaster/event experience: flooding: response: pumped out water
2	Disaster/event experience: flooding: response: pumps were used to clear floodwater
1	Disaster/event experience: flooding: response: raise valuables/ furniture
1	Disaster/event experience: flooding: response: registers in your consciousness
1	Disaster/event experience: flooding: response: reinstated farm / land
7	Disaster/event experience: flooding: response: repair buildings/houses
1	Disaster/event experience: flooding: response: responded according to knowledge
1	Disaster/event experience: flooding: response: ring the fire service to help out
1	Disaster/event experience: flooding: response: sandbagged
2	Disaster/event experience: flooding: response: shocked by damage
1	Disaster/event experience: flooding: response: used generators for power
1	Disaster/event experience: flooding: response: wary of being in low-lying areas
2	Disaster/event experience: flooding: response: went to look at flooded river
2	Disaster/event experience: grew up in an organised household
1	Disaster/event experience: icy roads
1	Disaster/event experience: impacts: no lives lost
17	Disaster/event experience: impacts: not personally experienced
24	Disaster/event experience: in an occupation related to emergency / preparedness /safety planning during times of quiescence (external to CD)
8	Disaster/event experience: indirect
15	Disaster/event experience: indirect: accidents (car, plane, general accidents)
1	Disaster/event experience: indirect: bio and chemical hazard spills
2	Disaster/event experience: indirect: coastal erosion
6	Disaster/event experience: indirect: crime / violence / community disruption from activities
4	Disaster/event experience: indirect: cyclone / hurricane
1	Disaster/event experience: indirect: drought
5	Disaster/event experience: indirect: earthquakes
7	Disaster/event experience: indirect: fire
136	Disaster/event experience: indirect: floods
4	Disaster/event experience: indirect: frequently occurring
3	Disaster/event experience: indirect: infrastructure failure

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QUOTATION COUNT	CODE TITLE
3	Disaster/event experience: indirect: lahar
9	Disaster/event experience: indirect: landslides / slippage
1	Disaster/event experience: indirect: lightening
4	Disaster/event experience: indirect: pandemic
1	Disaster/event experience: indirect: seen things happen
26	Disaster/event experience: indirect: snowstorm
3	Disaster/event experience: indirect: terrorism
4	Disaster/event experience: indirect: tornado
1	Disaster/event experience: indirect: town planner, looked at hazards
1	Disaster/event experience: indirect: tsunami
3	Disaster/event experience: indirect: volcanic eruption
2	Disaster/event experience: indirect: war time
10	Disaster/event experience: indirect: windstorm
2	Disaster/event experience: indirect: Y2K
1	Disaster/event experience: influence:
2	Disaster/event experience: influence: 'wake-up call' about disasters happening
13	Disaster/event experience: influence: 'wake-up call' about preparedness / brought it home how prepared people should be / reinforced need for preparedness
2	Disaster/event experience: influence: appreciate or value life / make you want to continue living
2	Disaster/event experience: influence: are frightened/nervous of future events
2	Disaster/event experience: influence: because of own experience, are conscious of the effects on others
1	Disaster/event experience: influence: become wiser
10	Disaster/event experience: influence: caused trauma
1	Disaster/event experience: influence: checked insurance levels / got some or better insurance
1	Disaster/event experience: influence: considers themselves a 'survivor of events'
12	Disaster/event experience: influence: did nothing differently post-event
5	Disaster/event experience: influence: did nothing differently post-event: why: didn't affect me/my property
1	Disaster/event experience: influence: did nothing differently post-event: why: impacts were from the natural environment (uncontrollable)
1	Disaster/event experience: influence: did nothing differently post-event: why: only poorly built structures failed
1	Disaster/event experience: influence: did nothing differently post-event: why: weather/flooding happening more frequently
3	Disaster/event experience: influence: did nothing differently post-event: why: were okay in an event
1	Disaster/event experience: influence: did nothing differently post-event: why: won't happen again
2	Disaster/event experience: influence: did nothing differently post-event: why: wont strike the same way again
2	Disaster/event experience: influence: did nothing differently post event: why: won't happen again for another XX years.
1	Disaster/event experience: influence: don't know if done anything more for next event
1	Disaster/event experience: influence: don't listen to others who scoff an believe disasters won't happen
1	Disaster/event experience: influence: ensuring gutters around house are clear (e.g. clean leaves out, put netting over)
3	Disaster/event experience: influence: even if only have indirect experience/impacts, are conscious of the effects on others
1	Disaster/event experience: influence: experience probably influences preparedness
2	Disaster/event experience: influence: felt confident that could respond accordingly to an event next time
10	Disaster/event experience: influence: got myself/people thinking about preparedness
1	Disaster/event experience: influence: got people's attention
7	Disaster/event experience: influence: got people talking about the event
1	Disaster/event experience: influence: hard to put myself in a disaster victim's place
1	Disaster/event experience: influence: have a different perception of hazards, than other people
1	Disaster/event experience: influence: have coped with past emergencies so believe can cope with future/worse events
40	Disaster/event experience: influence: helped hone preparedness
1	Disaster/event experience: influence: it's not something you can do anything about
1	Disaster/event experience: influence: it's something you CAN do something about
3	Disaster/event experience: influence: made an event seem very real
5	Disaster/event experience: influence: made people realise need log burners (shouldn't do away with them)
1	Disaster/event experience: influence: made sure didn't put people/children in danger of falling objects in

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QUOTATION COUNT	CODE TITLE
	future
1	Disaster/event experience: influence: might make people pay more attention to information
1	Disaster/event experience: influence: my partner/family's fear of an event makes me more sensitive to events
15	Disaster/event experience: influence: normalised a person to an event / emergencies
1	Disaster/event experience: influence: other people follow those who have had experience
1	Disaster/event experience: influence: pay more attention to where lines are above/below ground
3	Disaster/event experience: influence: people rushed out afterwards to buy items
17	Disaster/event experience: influence: raised/es awareness (e.g. of dangers/impacts, etc.)
3	Disaster/event experience: influence: raises awareness for a while then forget about it (short memory)
1	Disaster/event experience: influence: realisation that 'things weren't on tap'
8	Disaster/event experience: influence: realised it can happen (again)
3	Disaster/event experience: influence: realised needed to be self-sufficient / self-reliant
1	Disaster/event experience: influence: reinforces / validates thoughts and actions about the importance of preparing
4	Disaster/event experience: influence: should learn from event (e.g. what could be done better?)
3	Disaster/event experience: influence: sought more information
2	Disaster/event experience: influence: talked about getting more prepared
2	Disaster/event experience: influence: that shook/threw the area
1	Disaster/event experience: influence: the event stuck in my mind
1	Disaster/event experience: influence: think more broadly
2	Disaster/event experience: influence: think the event will be the same/similar every time
3	Disaster/event experience: influence: thought that could have been worse
2	Disaster/event experience: influence: WANT to be more prepared next time
1	Disaster/event experience: influence: will not help others in future, because had a poor response from them
2	Disaster/event experience: influence: wouldn't buy a house in a hazardous location
1	Disaster/event experience: keep workplace/school place preparedness items stocked up
5	Disaster/event experience: landslides / slippage: impacts: isolation / cut off / transport disrupted
1	Disaster/event experience: landslides / slippage: impacts: no major impacts
1	Disaster/event experience: landslides / slippage: response: cleaned up
1	Disaster/event experience: landslides / slippage: response: made a mess on property
1	Disaster/event experience: landslides / slippage: response: needed goods dropped off / flown in
2	Disaster/event experience: landslides / slippage: response: repairs undertaken
12	Disaster/event experience: length of disruption: few days
5	Disaster/event experience: length of disruption: lasted weeks
1	Disaster/event experience: length of disruption: not long
6	Disaster/event experience: life or lifetime experience
1	Disaster/event experience: made plans for CD functions
5	Disaster/event experience: missed experiencing an event because they were not there at the time
1	Disaster/event experience: most people won't ever experience / face a disaster
2	Disaster/event experience: no damage to house
15	Disaster/event experience: nothing else
4	Disaster/event experience: other people are/have been affected by disasters
1	Disaster/event experience: other people had damage to house
7	Disaster/event experience: overseas
1	Disaster/event experience: pandemic: impacts: didn't happen here
1	Disaster/event experience: power cuts: learned to live with them
1	Disaster/event experience: power cuts: impacts: can't heat water bottle to keep warm
1	Disaster/event experience: power cuts: impacts: can't see / no light
2	Disaster/event experience: power cuts: impacts: can't use farm equipment
1	Disaster/event experience: power cuts: impacts: can't watch television
2	Disaster/event experience: power cuts: impacts: took a long time to fix
1	Disaster/event experience: power cuts: response: listen to radio
1	Disaster/event experience: reported on events for a newspaper
3	Disaster/event experience: response: community helped together to clear snow/ice
1	Disaster/event experience: response: insurance claims (fraudulent)
1	Disaster/event experience: response: insurance claims (real)
1	Disaster/event experience: response: people played in / entered floodwater

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QUOTATION COUNT	CODE TITLE
39	Disaster/event experience: rural living
11	Disaster/event experience: rural living: isolated/cut off
2	Disaster/event experience: rural living: lack of facilities in general
6	Disaster/event experience: rural living: power cuts
2	Disaster/event experience: rural working
1	Disaster/event experience: searching for lost people
1	Disaster/event experience: snowstorm: closed shops
1	Disaster/event experience: snowstorm: comfortable: why: felt weren't in any danger
2	Disaster/event experience: snowstorm: comfortable: why: knew had food and water
1	Disaster/event experience: snowstorm: comfortable: why: reminded me of war time
4	Disaster/event experience: snowstorm: coped okay: why: had items to see me though
5	Disaster/event experience: snowstorm: didn't worry / bother us / me
1	Disaster/event experience: snowstorm: feelings: eerie
1	Disaster/event experience: snowstorm: feelings: excited
1	Disaster/event experience: snowstorm: feelings: it was amazing
1	Disaster/event experience: snowstorm: feelings: sick of staying inside during snowstorm!
1	Disaster/event experience: snowstorm: feelings: was a shock
6	Disaster/event experience: snowstorm: impacts: collapsed/damaged trees
5	Disaster/event experience: snowstorm: impacts: could get out of house / travel
1	Disaster/event experience: snowstorm: impacts: could not contact others for help
4	Disaster/event experience: snowstorm: impacts: could not get home help/home services
13	Disaster/event experience: snowstorm: impacts: could not get out / travel / trapped in house
4	Disaster/event experience: snowstorm: impacts: could not go to work
2	Disaster/event experience: snowstorm: impacts: damage to buildings/structures
6	Disaster/event experience: snowstorm: impacts: damage/impacts to infrastructure
1	Disaster/event experience: snowstorm: impacts: did not need to go and get any supplies
1	Disaster/event experience: snowstorm: impacts: disruption generally
1	Disaster/event experience: snowstorm: impacts: farm animals
1	Disaster/event experience: snowstorm: impacts: first time for many to experience such impacts
6	Disaster/event experience: snowstorm: impacts: had no heating
4	Disaster/event experience: snowstorm: impacts: heavy / a lot of snow
2	Disaster/event experience: snowstorm: impacts: inconvenience only
1	Disaster/event experience: snowstorm: impacts: lack of awareness of impacts on people
2	Disaster/event experience: snowstorm: impacts: lack of communication / communication didn't happen properly
3	Disaster/event experience: snowstorm: impacts: lack of generators
38	Disaster/event experience: snowstorm: impacts: lack of power / unreliable power
6	Disaster/event experience: snowstorm: impacts: minor
2	Disaster/event experience: snowstorm: impacts: needed to use stored food
1	Disaster/event experience: snowstorm: impacts: no back-ups (e.g. batteries)
1	Disaster/event experience: snowstorm: impacts: no damage
8	Disaster/event experience: snowstorm: impacts: no disruption to services
2	Disaster/event experience: snowstorm: impacts: no easy access to medication
9	Disaster/event experience: snowstorm: impacts: not prepared
3	Disaster/event experience: snowstorm: impacts: not too disruptive
12	Disaster/event experience: snowstorm: impacts: other people had (worse) impacts
1	Disaster/event experience: snowstorm: impacts: other people were worse off, so didn't mind putting up with impacts
1	Disaster/event experience: snowstorm: impacts: people who were impacted were not living close by
11	Disaster/event experience: snowstorm: impacts: phones/communications down
3	Disaster/event experience: snowstorm: impacts: roads icy / dangerous to drive on
1	Disaster/event experience: snowstorm: impacts: sewage septic tank system not working
1	Disaster/event experience: snowstorm: impacts: varied geographically
3	Disaster/event experience: snowstorm: impacts: water supplies cut
2	Disaster/event experience: snowstorm: impacts: wide ranging
5	Disaster/event experience: snowstorm: personally affected
3	Disaster/event experience: snowstorm: response: 4wd club assisted with transporting people

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QUOTATION COUNT	CODE TITLE
4	Disaster/event experience: snowstorm: response: assisted in clearing up
1	Disaster/event experience: snowstorm: response: call power company about power cut
3	Disaster/event experience: snowstorm: response: check on neighbours
5	Disaster/event experience: snowstorm: response: checked on community members
1	Disaster/event experience: snowstorm: response: city sprung to action
1	Disaster/event experience: snowstorm: response: distributed medication
2	Disaster/event experience: snowstorm: response: dug out a phone that doesn't run on power to use
1	Disaster/event experience: snowstorm: response: had to wait a long time to get damage fixed
1	Disaster/event experience: snowstorm: response: had to work as part of the response during that event
1	Disaster/event experience: snowstorm: response: help from radio people
1	Disaster/event experience: snowstorm: response: hired a generator
1	Disaster/event experience: snowstorm: response: it was an awakening
2	Disaster/event experience: snowstorm: response: lent items/supplies to neighbours
1	Disaster/event experience: snowstorm: response: listened to car radio for information
2	Disaster/event experience: snowstorm: response: listened to radio for information
3	Disaster/event experience: snowstorm: response: log fires a big asset in a snowstorm
2	Disaster/event experience: snowstorm: response: other people had put measures in place
1	Disaster/event experience: snowstorm: response: people resilient
1	Disaster/event experience: snowstorm: response: people wanted to assist in the event
1	Disaster/event experience: snowstorm: response: roads icy so walked into town
2	Disaster/event experience: snowstorm: response: rushed to get necessary items/supplies
1	Disaster/event experience: snowstorm: response: some people had to be given alternative accommodation
1	Disaster/event experience: snowstorm: response: stayed indoors as recommended
2	Disaster/event experience: snowstorm: response: supplies made available to people
1	Disaster/event experience: snowstorm: response: used car battery to charge phone
7	Disaster/event experience: snowstorm: response: used preparedness items to see through
3	Disaster/event experience: snowstorm: response: used snow chains
8	Disaster/event experience: snowstorm: unusual
9	Disaster/event experience: snowstorm: was a bad / major / prominent storm
1	Disaster/event experience: snowstorm: we were upstaged by another 'disaster'
3	Disaster/event experience: snowstorms (general)
2	Disaster/event experience: storm: impacts: building damage
2	Disaster/event experience: storm: impacts: isolated/cut off
5	Disaster/event experience: storm: impacts: lack of power / power outage
1	Disaster/event experience: storm: impacts: nasty storm
1	Disaster/event experience: storm: impacts: no TV
2	Disaster/event experience: storm: response: fixed damage
1	Disaster/event experience: storm: response: had to get insurance assessor
1	Disaster/event experience: storm: response: had to make alternative provision for water
1	Disaster/event experience: storm: response: had to use alternative transport
1	Disaster/event experience: storm: response: lent items/supplies to neighbours
1	Disaster/event experience: storm: response: used a preparedness item to assist
3	Disaster/event experience: storm: saw the impact of a lack of supplies on other people
1	Disaster/event experience: terrorism: response: careful approach to bags/bomb potential
3	Disaster/event experience: tornado: impacts: damaged buildings
1	Disaster/event experience: tornado: impacts: no water
1	Disaster/event experience: tornado: response: checked on neighbours
1	Disaster/event experience: tornado: response: people salvaging and protecting remaining items
3	Disaster/event experience: tsunami: heard / experienced warnings
9	Disaster/event experience: under or not prepared: who: civil defence
1	Disaster/event experience: under or not prepared: who: government department
4	Disaster/event experience: under or not prepared: who: home help/home services
0	Disaster/event experience: under or not prepared: who: infrastructure providers
1	Disaster/event experience: under or not prepared: who: lifestyle block owners
4	Disaster/event experience: under or not prepared: who: local authority
4	Disaster/event experience: under or not prepared: who: other people/public

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QUOTATION COUNT	CODE TITLE
2	Disaster/event experience: under or not prepared: who: telecommunications
22	Disaster/event experience: very little / none
1	Disaster/event experience: volcanoes: feelings: it was amazing
1	Disaster/event experience: volcanoes: haven't experienced a volcanic eruption
6	Disaster/event experience: volcanoes: impacts: falling ash
2	Disaster/event experience: volcanoes: impacts: falling ash causing a nuisance/minor impacts
1	Disaster/event experience: volcanoes: impacts: sulphur/gases in the air
1	Disaster/event experience: volcanoes: response: disconnected downpipes
1	Disaster/event experience: volcanoes: response: the ash was only a little bit
1	Disaster/event experience: volcanoes: response: watched the eruption from afar
6	Disaster/event experience: war: family member/s experienced war
1	Disaster/event experience: war: impacts: house destroyed
1	Disaster/event experience: war: impacts: no lives lost for family
4	Disaster/event experience: was prepared
2	Disaster/event experience: water (poor quality): impacts: never suffered any harm from drinking poor quality water
10	Disaster/event experience: we were lucky/fortunate in the past
2	Disaster/event experience: weather: impacts: major
1	Disaster/event experience: windstorm: big/huge disaster
1	Disaster/event experience: windstorm: feelings: a relief it didn't do more damage
1	Disaster/event experience: windstorm: feelings: a relief that no lives were lost
4	Disaster/event experience: windstorm: feelings: frightening scary
1	Disaster/event experience: windstorm: impacts: affected a lot of other people
7	Disaster/event experience: windstorm: impacts: building damage
7	Disaster/event experience: windstorm: impacts: collapsed trees
6	Disaster/event experience: windstorm: impacts: damage to neighbourhood
2	Disaster/event experience: windstorm: impacts: damaged the region
1	Disaster/event experience: windstorm: impacts: no property damage
2	Disaster/event experience: windstorm: impacts: not widespread / not much
1	Disaster/event experience: windstorm: impacts: power outages/ disruption
1	Disaster/event experience: windstorm: impacts: trouble standing up
1	Disaster/event experience: windstorm: not personally impacted
2	Disaster/event experience: windstorm: personally affected
1	Disaster/event experience: working in cold war era / nuclear deterrence
2	Disaster/event experience: Y2K: impacts: didn't happen here
1	Disaster/event experienced: tornadoes: not experienced
1	Disaster/event experience: volcanoes: not personally impacted
1	Disaster/event experience: flooding: not experienced: didn't know what a flood was like
4	Disaster/event: can't avoid or eliminate the possibility or risk
2	Disaster/event: if event exceeds standards/mitigation, there will be failure
5	Disaster/event: it hasn't happened in xx years so we shouldn't worry
31	Disaster/event: possible
1	Disaster/event: possible: mathematical possibility
3	Disaster/event: what would happen and whether people would follow plans, is another story
1	Disaster/event: refers to them as catastrophic / catastrophe
18	Do what can in an event/deal with it: actions not specified
17	Does / do happen
1	Does affect you
12	Don't know when/if something is going to occur
23	Emergency plan: assumes informal actions (reactions) will occur in an emergency
1	Emergency plan: can't forward plan for what to do in an earthquake because there's no time
1	Emergency plan: essential for operating an organisation
5	Emergency plan: expect CD/emergency services/key agencies to have plans
8	Emergency plan: haven't formally sat down and made a plan
2	Emergency plan: haven't formally sat down and made a plan: why: key person left
1	Emergency plan: haven't sat down and formally made a plan: why: didn't know whether needed permission to collate names/numbers/items on a list

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QUOTATION COUNT	CODE TITLE
1	Emergency plan: haven't thought about what would do if someone didn't turn up at meeting point
10	Emergency plan: nature of plan: an understanding between family of what needs to happen
1	Emergency plan: nature of plan: borrowed from another source/plan
2	Emergency plan: nature of plan: depends of type of hazard/disaster
1	Emergency plan: nature of plan: depends on lead-in time from hazard (e.g. with floods have time to make a plan, with earthquakes, no)
1	Emergency plan: nature of plan: depends on time of day/night
1	Emergency plan: nature of plan: depends on type of impacts (different plans for different impacts)
1	Emergency plan: nature of plan: designed by children
3	Emergency plan: nature of plan: detailed
15	Emergency plan: nature of plan: escape routes / evacuation
3	Emergency plan: nature of plan: for schools
11	Emergency plan: nature of plan: for the workplace
2	Emergency plan: nature of plan: for the workplace: business continuance planning
1	Emergency plan: nature of plan: for the workplace: IT continuance planning
1	Emergency plan: nature of plan: general
1	Emergency plan: nature of plan: get kids and stand under doorway
1	Emergency plan: nature of plan: government will keep overseas pandemic victims out of NZ
6	Emergency plan: nature of plan: grab emergency / preparedness kit / items
3	Emergency plan: nature of plan: have loose plans
1	Emergency plan: nature of plan: have loose plans: why: bedroom is in a hazardous spot
1	Emergency plan: nature of plan: leave a note to tell people where you have gone
4	Emergency plan: nature of plan: making contact
1	Emergency plan: nature of plan: making instructions for sustained preparedness
2	Emergency plan: nature of plan: need to have different options (i.e. Plan A, Plan B...)
5	Emergency plan: nature of plan: needs following an event / what would need to be done
1	Emergency plan: nature of plan: plan for the next aftershock
1	Emergency plan: nature of plan: plans for community groups to assist CD in an event
2	Emergency plan: nature of plan: plans for including better provision for water
4	Emergency plan: nature of plan: preparedness items / resources needed
1	Emergency plan: nature of plan: secure home (e.g. for tsunami or wind etc.)
1	Emergency plan: nature of plan: security arrangements
2	Emergency plan: nature of plan: should have basic ideas in your mind of what you should do
1	Emergency plan: nature of plan: simple in nature
1	Emergency plan: nature of plan: support one another once all at home
3	Emergency plan: nature of plan: survival, get yourself safe
1	Emergency plan: nature of plan: telephone tree for community
3	Emergency plan: nature of plan: thinks through what would do in the event of a plane/car crash
7	Emergency plan: nature of plan: where to meet / go following an event
1	Emergency plan: nature of plan: will / power of attorney/who will look after kids
1	Emergency plan: nature of plan: will move into alternative accommodation
36	Emergency plan: none
1	Emergency plan: none: haven't checked that others are thinking of responding the same way
1	Emergency plan: none: perhaps should have done it at our meeting, instead of tried to do it later
3	Emergency plan: none: simply reacted to events as they occurred
2	Emergency plan: none: why: assumes family will just head home as there is nowhere else obvious to meet
1	Emergency plan: none: why: can't do anything about natural hazards/impacts
3	Emergency plan: none: why: depends what happens at the time
1	Emergency plan: none: why: didn't know an event was going to occur
1	Emergency plan: none: why: doesn't think need to meet up somewhere (assumes will all be at home)
1	Emergency plan: none: why: don't know what scenario to make the plan for
2	Emergency plan: none: why: don't know what to put in/how to make a plan
1	Emergency plan: none: why: group doesn't meet often
2	Emergency plan: none: why: haven't lived here long
1	Emergency plan: none: why: haven't thought about it (much)
4	Emergency plan: none: why: no plan was made for the community group to follow
2	Emergency plan: none: why: none or few family members living in the house

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QUOTATION COUNT	CODE TITLE
1	Emergency plan: none: why: planned to help by belonging to an organisation (e.g. fire service, CD)
1	Emergency plan: none: why: rely on CD / emergency services to get through
1	Emergency plan: none: why: rely on family and/or extended family to get through
1	Emergency plan: none: why: thinks house is pretty safe
3	Emergency plan: reduces worry
1	Emergency plan: why make one: I was away a lot, so the family had to have a plan
22	Empathy for others
1	EQ scenario: impacts: shake people up / scare people / alert people to earthquakes
1	EQ scenario: coping: don't know how we/I would cope
1	EQ scenario: coping: don't know whether you would be in a good state to be a 'strong' person
1	EQ scenario: coping: don't want to be the victim
1	EQ scenario: coping: hopes that the things have put together would see them through
3	EQ scenario: coping: how would we cope?
2	EQ scenario: coping: know I would cope somehow
1	EQ scenario: coping: possible to cope if have place to live and infrastructure intact
1	EQ scenario: coping: would be traumatic if the house was lost
6	EQ scenario: coping: would cope well
5	EQ scenario: coping: would get through by doing something about the problem
1	EQ scenario: estimation of impacts on other people: more 'bewildered' than me
6	EQ scenario: estimation of impacts on other people: they'd be worse off than me
8	EQ scenario: how fare: depends on nature of impacts
5	EQ scenario: how fare: depends on scale of earthquake
1	EQ scenario: how fare: depends on what you do
9	EQ scenario: how fare: depends on where you are
2	EQ scenario: how fare: don't know
3	EQ scenario: how fare: might not fare well
1	EQ scenario: how fare: might not fare well if a tsunami occurred
2	EQ scenario: how fare: might not fare well if area with supplies damaged / could not be accessed
1	EQ scenario: how fare: what if I get injured / taken out in an event - how would the family fare?
1	EQ scenario: how fare: will be able to access supplies
1	EQ scenario: how fare: would fare well / okay: why: as long as adults could manage situation
33	EQ scenario: how fare: would fare well /okay
1	EQ scenario: how fare: would fare well /okay : why we are medical professionals
1	EQ scenario: how fare: would fare well /okay: as long as no bad injuries
1	EQ scenario: how fare: would fare well /okay: unsecured items are not in dangerous locations
2	EQ scenario: how fare: would fare well /okay: why: located in town (not rural)
9	EQ scenario: how fare: would fare well/okay: why: because have preparedness items
1	EQ scenario: how fare: would fare well/okay: why: because our house is structurally sound
2	EQ scenario: how fare: would fare well/okay: why: if could get to preparedness items
2	EQ scenario: how fare: wouldn't fare well
2	EQ scenario: how fare: wouldn't fare well: why: not prepared
3	EQ scenario: impacts: timber houses will flex in an earthquake, solid houses (e.g. brick) will be destroyed
11	EQ scenario: impacts: a lot of damage/destruction/ devastation
4	EQ scenario: impacts: bricks might fall off house
2	EQ scenario: impacts: broken windows / glass
3	EQ scenario: impacts: building standards: assumes construction has met building standards
12	EQ scenario: impacts: buildings wouldn't/unlikely to fall down
1	EQ Scenario: impacts: building standards: hopes construction has met building standards
1	EQ scenario: impacts: can't imagine my house being totally demolished
1	EQ scenario: impacts: can't wash clothes
1	EQ scenario: impacts: cell phones might still be working
1	EQ scenario: impacts: cold, wet, damp
44	EQ scenario: impacts: collapsing buildings
10	EQ scenario: impacts: communication disruption (general)
2	EQ scenario: impacts: community would be severely affected
1	EQ scenario: impacts: could be like the 1931 Napier earthquake

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QUOTATION COUNT	CODE TITLE
10	EQ scenario: impacts: could be stuck at a particular location
7	EQ scenario: impacts: could be trapped
3	EQ scenario: impacts: could change the path of the river
1	EQ scenario: impacts: damage to farmland
46	EQ scenario: impacts: damaged buildings
1	EQ scenario: impacts: damaged buildings: some parts might be damaged, some unscathed
1	EQ scenario: impacts: depend on whether river was in flood or not
6	EQ scenario: impacts: depends on damage to building
1	EQ scenario: impacts: depends on damage to cars
7	EQ scenario: impacts: depends on location of earthquake
7	EQ scenario: impacts: depends on scale of earthquake
1	EQ scenario: impacts: depends on what services went down
2	EQ scenario: impacts: depends on where you are
5	EQ scenario: impacts: destruction/damage of structures (general)
3	EQ scenario: impacts: disruption to businesses / economy
2	EQ scenario: impacts: disruption to businesses / economy: horrendous / devastating / disastrous
4	EQ scenario: impacts: disruption to life (general)
2	EQ scenario: impacts: don't know
4	EQ scenario: impacts: don't know how house would perform
1	EQ scenario: impacts: don't know how wooden houses fare in earthquakes
1	EQ scenario: impacts: earthquake might go on for a long time / longer than usual
1	EQ scenario: impacts: electricity a key part of society
1	EQ scenario: impacts: falling trees
8	EQ scenario: impacts: fires
3	EQ scenario: impacts: food/item delivery and supply disrupted
4	EQ scenario: impacts: foundation damage on buildings
32	EQ scenario: impacts: furniture falling/falling items
10	EQ scenario: impacts: gives finer details about what the impacts/consequences might be
1	EQ scenario: impacts: hard to say
1	EQ scenario: impacts: hope our building won't fall down
7	EQ scenario: impacts: hospital/medical services interrupted
1	EQ scenario: impacts: how fare: would (have to) somehow
2	EQ scenario: impacts: if it is a serious earthquake the impacts will be widespread
1	EQ scenario: impacts: if my house is damaged my community's' will be too
1	EQ scenario: impacts: if no-one had shelter the situation would be dire
1	EQ scenario: impacts: impacts reduced because I live on the flat
2	EQ scenario: impacts: impacts would be less because less people live here
2	EQ scenario: impacts: impacts would last a long time / long term
1	EQ scenario: impacts: industrial hazard impacts (e.g. chemical spill)
22	EQ scenario: impacts: infrastructure damage
14	EQ scenario: impacts: isolation / on your own
5	EQ scenario: impacts: large/ huge/ phenomenal / big
1	EQ scenario: impacts: length of time of disruption - 3 months
1	EQ scenario: impacts: limit what you could do
4	EQ scenario: impacts: liquefaction
1	EQ scenario: impacts: liquefaction: will be serious
2	EQ scenario: impacts: live electrical wires
2	EQ scenario: impacts: major changes in landscape
1	EQ scenario: impacts: may not provide protection/mitigation as it is supposed to do
1	EQ scenario: impacts: medium scale damage
2	EQ scenario: impacts: might be unscathed/uninjured
11	EQ scenario: impacts: might not be able to get to other people/places
4	EQ scenario: impacts: might not have enough preparedness items
3	EQ scenario: impacts: minor/minimal
2	EQ scenario: impacts: my family's house might be affected
19	EQ scenario: impacts: my house might be affected

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QUOTATION COUNT	CODE TITLE
4	EQ scenario: impacts: my house might be okay
10	EQ scenario: impacts: my house would be okay
3	EQ scenario: impacts: no food/food sourcing issues
2	EQ scenario: impacts: no gas / gas issues
6	EQ scenario: impacts: no sewerage
1	EQ scenario: impacts: no storm water facility
28	EQ scenario: impacts: no water / water disruption
1	EQ scenario: impacts: not many
1	EQ scenario: impacts: not many people buried in rubble
1	EQ scenario: impacts: only short term
3	EQ scenario: impacts: other people/ community members around you might not be organised/able to respond as quickly
3	EQ scenario: impacts: other people/ community members around you might not be prepared
4	EQ scenario: impacts: other peoples' houses might be affected
1	EQ scenario: impacts: outside my house anything could happen
4	EQ scenario: impacts: people will need accommodation
1	EQ scenario: impacts: pets injured / affected
1	EQ scenario: impacts: phone off
1	EQ scenario: impacts: possible
9	EQ scenario: impacts: potential deaths
2	EQ scenario: impacts: potential impacts on other services or organisations
29	EQ scenario: impacts: potential injuries
1	EQ scenario: impacts: potential injuries: don't know what would do if self/family injured
27	EQ scenario: impacts: power off/issues
1	EQ scenario: impacts: rain might flood the house/building with water
5	EQ scenario: impacts: reliant on things controlled by others
1	EQ scenario: impacts: rubble, glass, etc., on ground
8	EQ scenario: impacts: sliding buildings/land sliding
2	EQ scenario: impacts: solid houses (e.g. brick) will be destroyed
2	EQ scenario: impacts: some businesses might have positive impacts (e.g. tents, rental cars, building industry)
2	EQ scenario: impacts: stress
1	EQ scenario: impacts: survival needs need to be met
4	EQ scenario: impacts: the ground might open up and swallow you
1	EQ scenario: impacts: the impacts of an earthquake are longer than the event itself (go on into recovery)
4	EQ scenario: impacts: the land could move in the opposite direction and drop/rise a metre/few metres
11	EQ scenario: impacts: things falling off shelves / off house
2	EQ scenario: impacts: thinks basic structure of house solid, but may fall off foundations
3	EQ scenario: impacts: thinks through different scenarios of hazards/impacts
18	EQ scenario: impacts: transport (roads, etc.) disrupted
1	EQ scenario: impacts: trauma / psychosocial impacts
7	EQ scenario: impacts: tsunami could occur
1	EQ scenario: impacts: unable to clean
1	EQ scenario: impacts: unable to cook
2	EQ Scenario: impacts: uncertain of exact impacts
8	EQ scenario: impacts: unliveable/inaccessible buildings
1	EQ scenario: impacts: work / schools closed
4	EQ scenario: impacts: would need a very strong earthquake to create severe impacts
1	EQ scenario: impacts: wouldn't bother me as long as could do something about it
2	EQ scenario: response: adjust your daily living after an event for a short period
2	EQ scenario: response: aid will come quickly in a disaster
2	EQ scenario: response: assess situation
3	EQ scenario: response: assist with first aid
2	EQ scenario: response: begin recovery
2	EQ scenario: response: check communication channels working (e.g. phones)
1	EQ scenario: response: check essential services operating in home (or not)
1	EQ scenario: response: check insurance was up to date

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QUOTATION COUNT	CODE TITLE
22	EQ scenario: response: check on / look for other family members
3	EQ scenario: response: check on damage and disruption to others' homes
8	EQ scenario: response: check on damage and disruption to own home
5	EQ scenario: response: check on yourself first/your own safety
35	EQ scenario: response: checking on/helping the community
1	EQ scenario: response: civil defence would need to 'kick in'
2	EQ scenario: response: clean up / tidy up
1	EQ scenario: response: comfort one another
5	EQ scenario: response: depends on health / injuries after an event
14	EQ scenario: response: depends on nature of earthquake / impacts
1	EQ scenario: response: depends on the construction of your house
6	EQ scenario: response: depends on what damage there is to the house
4	EQ scenario: response: depends on where you are / your location
1	EQ scenario: response: depends on whether you are responsible for other people
2	EQ scenario: response: depends on who is with you
5	EQ Scenario: response: do as Civil Defence instructed
12	EQ scenario: response: don't know what to do / how to respond
1	EQ scenario: response: don't moan / complain about what you can't do / get
4	EQ scenario: response: DON'T run out of building / outside
1	EQ scenario: response: eat frozen food
1	EQ Scenario: response: escape from being trapped
16	EQ scenario: response: escape or leave and go to a safe place/make sure you are safe
3	EQ scenario: response: fall to pieces later
8	EQ scenario: response: find preparedness items (to use)
2	EQ scenario: response: get family together
1	EQ scenario: response: get prepared for future
30	EQ scenario: response: get under table/doorway
2	EQ scenario: response: getting under a desk may not be a safe place
2	EQ scenario: response: getting under a doorway may not be a safe place
3	EQ scenario: response: go to a Civil Defence outpost/ community centre
2	EQ scenario: response: go to family elsewhere / another part of country
1	EQ scenario: response: go to high ground
9	EQ scenario: response: grab/get children
5	EQ scenario: response: have to look after self for a few days
6	EQ scenario: response: head home
9	EQ scenario: response: helping Civil Defence
1	EQ scenario: response: hold legs of table when underneath
7	EQ Scenario: response: how we deal with it would depend on impacts
4	EQ scenario: response: it's your choice / decision on what you do
5	EQ scenario: response: keep away from falling / flying objects
2	EQ scenario: response: keep away from power lines
1	EQ scenario: response: look for survivors / bodies in rubble
6	EQ scenario: response: look for water / food
1	EQ scenario: response: make plans once the event has occurred
3	EQ scenario: response: meet family at a pre-arranged place
7	EQ scenario: response: might be called in to work / have to work
3	EQ scenario: response: might need to seek medical help
2	EQ scenario: response: need to think clearly
2	EQ scenario: response: not supposed to use phones after an event
1	EQ scenario: response: not sure how the EQC would be able to pay out insurance money, because they would have so many others to pay out too
1	EQ scenario: response: panic
1	EQ scenario: response: protect myself
3	EQ scenario: response: pull car/vehicle over and stop
37	EQ scenario: response: react as needed at time
1	EQ scenario: response: rescue falling items
5	EQ scenario: response: rise to the occasion

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QUOTATION COUNT	CODE TITLE
5	EQ scenario: response: run out of building
8	EQ scenario: response: see what happens
10	EQ scenario: response: seek alternative shelter
3	EQ scenario: response: seek help
1	EQ scenario: response: seek information (general)
7	EQ scenario: response: seek information: turn on local radio station
2	EQ scenario: response: send children/family away (e.g. to another part of country)
1	EQ scenario: response: some people might go rubber-necking
3	EQ scenario: response: start insurance process
8	EQ scenario: response: stay at home and get by
12	EQ scenario: response: take / grab things needed
3	EQ scenario: response: take on different roles within family
2	EQ scenario: response: there is a limit to what you can do to respond after a disaster
1	EQ scenario: response: turn off gas
2	EQ scenario: response: turn off power
1	EQ scenario: response: turn off water
6	EQ scenario: response: undertake remedial repairs
1	EQ scenario: response: unlikely to seek help / think are prepared enough
2	EQ scenario: response: use alternative transport routes
1	EQ scenario: response: use stairs not lifts
1	EQ scenario: response: wait for civil defence
3	EQ scenario: response: wait for help
1	EQ scenario: response: wait until power comes on
3	EQ scenario: response: watch for other potential hazards
1	EQ scenario: response: we would manage
1	EQ scenario: response: when things get back to normal, services will be reinstated
5	EQ scenario: response: would get organised quickly
1	EQ scenario: response: wouldn't worry if we had to camp for a week
1	EQ scenario: response: might not be able to do anything
1	Estimation of other people's preparedness: under or not prepared: who lifestyle block owners
2	Estimation of other people's preparedness: considers others to be resilient
15	Estimation of other people's preparedness: don't know
17	Estimation of other people's preparedness: don't know anyone else who has prepared
2	Estimation of other people's preparedness: have undertaken specific tasks
9	Estimation of other people's preparedness: might be prepared
1	Estimation of other people's preparedness: might be prepared: why: person is organised
1	Estimation of other people's preparedness: might not be prepared
2	Estimation of other people's preparedness: more prepared after a discussion/meeting
4	Estimation of other people's preparedness: not as prepared as they could be
1	Estimation of other people's preparedness: not as prepared as they could be: why: taken log burners out
67	Estimation of other people's preparedness: prepared
5	Estimation of other people's preparedness: prepared / in control: who: older, more experienced people
2	Estimation of other people's preparedness: prepared: conscious of need to prepare, but don't know how many have put into action
2	Estimation of other people's preparedness: prepared: it's amazing how prepared some people are
1	Estimation of other people's preparedness: prepared: who: children's families
1	Estimation of other people's preparedness: prepared: who: community leader
2	Estimation of other people's preparedness: prepared: who: family (general)
10	Estimation of other people's preparedness: prepared: who: farmers/rural folk
5	Estimation of other people's preparedness: prepared: who: friends
11	Estimation of other people's preparedness: prepared: who: grown children
1	Estimation of other people's preparedness: prepared: who: hospital/medical facility
1	Estimation of other people's preparedness: prepared: who: households
3	Estimation of other people's preparedness: prepared: who: local authority / council
1	Estimation of other people's preparedness: prepared: who: my child / children
4	Estimation of other people's preparedness: prepared: who: neighbour
1	Estimation of other people's preparedness: prepared: who: other businesses/workplaces

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QUOTATION COUNT	CODE TITLE
4	Estimation of other people's preparedness: prepared: who: parents
2	Estimation of other people's preparedness: prepared: who: people I know
1	Estimation of other people's preparedness: prepared: who: policy makers
3	Estimation of other people's preparedness: prepared: who: power companies
1	Estimation of other people's preparedness: prepared: who: religious groups
1	Estimation of other people's preparedness: prepared: who: trampers
2	Estimation of other people's preparedness: prepared: who: workmates/ staff
76	Estimation of other people's preparedness: under or not prepared
1	Estimation of other people's preparedness: under or not prepared: who: businesses
4	Estimation of other people's preparedness: under or not prepared: who: civil defence
12	Estimation of other people's preparedness: under or not prepared: who: community (general)
5	Estimation of other people's preparedness: under or not prepared: who: family
4	Estimation of other people's preparedness: under or not prepared: who: family: adult children
5	Estimation of other people's preparedness: under or not prepared: who: friends
2	Estimation of other people's preparedness: under or not prepared: who: government
2	Estimation of other people's preparedness: under or not prepared: who: hospital
1	Estimation of other people's preparedness: under or not prepared: who: individuals
1	Estimation of other people's preparedness: under or not prepared: who: infrastructure providers
1	Estimation of other people's preparedness: under or not prepared: who: infrastructure providers: why: were better managed by government departments in the past (rather than private)
2	Estimation of other people's preparedness: under or not prepared: who: local authority / council
1	Estimation of other people's preparedness: under or not prepared: who: low socio-economic groups
11	Estimation of other people's preparedness: under or not prepared: who: people impacted by an event
7	Estimation of other people's preparedness: under or not prepared: who: people in rural /isolated areas
2	Estimation of other people's preparedness: under or not prepared: who: people in urban areas
1	Estimation of other people's preparedness: under or not prepared: who: people who are 'disasters'
2	Estimation of other people's preparedness: under or not prepared: who: telecommunications
2	Estimation of other people's preparedness: under or not prepared: who: telecommunications: didn't perform in a disaster
1	Estimation of other people's preparedness: under or not prepared: who: television audience
3	Estimation of other people's preparedness: under or not prepared: who: tourists
4	Estimation of other people's preparedness: under or not prepared: who: workplaces
1	Estimation of other people's preparedness: who government department: didn't perform in a disaster
6	Estimation of other people's preparedness: who has prepared
1	Estimation of other people's preparedness: who: likeminded people
26	Estimation of own preparedness: considered a bit prepared
31	Estimation of own preparedness: considered not prepared for a hazard situation
1	Estimation of own preparedness: considered not prepared for a hazard situation: what: human made hazards
2	Estimation of own preparedness: considered not prepared for a hazard situation: what: pandemic
2	Estimation of own preparedness: considers themselves resilient
12	Estimation of own preparedness: could survive a few days with supplies
10	Estimation of own preparedness: could survive a week - few weeks / month with supplies
2	Estimation of own preparedness: don't know
1	Estimation of own preparedness: don't know how long could survive
1	Estimation of own preparedness: I'm not aware of many things
38	Estimation of own preparedness: prepared
1	Estimation of own preparedness: prepared / in control
2	Estimation of own preparedness: would go up when reacting to an event (rise to the occasion)
1	Estimation of preparedness as a community: don't know
1	Event familiar with: earthquakes
1	Event familiar with: floods
1	Event not familiar with: earthquake
1	Event not familiar with: impacts of losing water, power, etc.
1	Event not familiar with: tsunami
4	Exciting
1	Expanding people's thinking important, how to do this?
1	Experienced direct damage from an event

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QUOTATION COUNT	CODE TITLE
1	Expertise: I'm not an expert
107	Family members
6	Fascinated by hazards/disasters
1	Fatalism: direct reference to fatalism
5	Feelings about an event: concern
1	Feelings about an event: concern: why: can happen anytime
1	Feelings about an event: concern: why: might not be able to escape
7	Feelings about an event: exciting
1	Feelings about an event: flooding: devastating
9	Feelings about an event: flooding: horrible / horrific / horrendous
1	Feelings about an event: good
1	Feelings about an event: good: why: reduces complacency
1	Feelings about an event: got to be optimistic
1	Feelings about an event: nervous
1	Feelings about an event: not worried
1	Feelings about an event: other people can be scared of them
8	Feelings about an event: scary
1	Feelings about an event: spectacular
13	Feelings about an event: strange/unusual/out of the ordinary
1	Feelings about an event: unease
2	Feelings about an event: unpleasant
1	Feelings about an event: volcanic eruption: horrible / horrific / horrendous
1	Feelings about an event: wants an event to occur
2	Feelings about bad weather / rain: frightening
2	Feelings about bad weather / rain: frightening: why: experienced a rain-induced disaster
0	Feelings about bad weather/ heavy rain: a fear/fearful
1	Feelings about disasters: 'doesn't turn me on' to think about them
2	Feelings about disasters: frightening
1	Feelings about disasters: frightening: why: have to choose who lives and dies
1	Feelings about disasters: frightening: why: if you have a family member going to / in the area
1	Feelings about disasters: frightening: why: out of your control
1	Feelings about disasters: frightening: why: people aren't equipped / have skills to cope any more
1	Feelings about disasters: frightening: why: what other organisations have got planned
1	Feelings about drought: not frightened / fearful
4	Feelings about earthquakes: a fear / fearful
2	Feelings about earthquakes: a fear: why: my house might be ruined
2	Feelings about earthquakes: anxious
3	Feelings about earthquakes: blasé / ho hum
6	Feelings about earthquakes: concern
1	Feelings about earthquakes: concern: why damage might occur to house
1	Feelings about earthquakes: concerned: who: myself as a new arrival/immigrants
1	Feelings about earthquakes: couldn't relax if I lived in a high-risk area
1	Feelings about earthquakes: disconcerting
1	Feelings about earthquakes: don't like them
1	Feelings about earthquakes: don't mind them
2	Feelings about earthquakes: don't want to think about them
2	Feelings about earthquakes: dreadful
2	Feelings about earthquakes: exciting
1	Feelings about earthquakes: exciting: why: haven't experienced a previous disaster
16	Feelings about earthquakes: frightening / scary / terrified
1	Feelings about earthquakes: frightening: why: an event is overdue
1	Feelings about earthquakes: horrendous/horrific
1	Feelings about earthquakes: I hate still days / "earthquake weather"
1	Feelings about earthquakes: interesting
1	Feelings about earthquakes: just part of daily life
1	Feelings about earthquakes: learn to live with them

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QUOTATION COUNT	CODE TITLE
1	Feelings about earthquakes: love them
1	Feelings about earthquakes: might change when an event happens
3	Feelings about earthquakes: more relaxed now, than I used to be
3	Feelings about earthquakes: nervous
6	Feelings about earthquakes: not frightened
2	Feelings about earthquakes: not frightened: why: small earthquakes are common
1	Feelings about earthquakes: not nice
18	Feelings about earthquakes: not worried
1	Feelings about earthquakes: not worried: why: because think we are in a safe place
1	Feelings about earthquakes: not worried: why: can't do anything about
2	Feelings about earthquakes: not worried: why: experienced many before
2	Feelings about earthquakes: not worried: why: I've never been in a damage-causing earthquake
1	Feelings about earthquakes: not worried: why: knew they had them in that location before
1	Feelings about earthquakes: not worried: why: would hide under table/doorway
3	Feelings about earthquakes: other people can be scared of them
8	Feelings about earthquakes: other people: frightened/concerned
2	Feelings about earthquakes: other people: frightened/concerned: who: tourists or new arrivals/immigrants
1	Feelings about earthquakes: other people: frightened/concerned: who: wife
4	Feelings about earthquakes: other people: not worried / concerned
1	Feelings about earthquakes: other people: wary
1	Feelings about earthquakes: scary: why: come without warning
1	Feelings about earthquakes: scary: why: don't know how would cope
3	Feelings about earthquakes: uncomfortable
1	Feelings about earthquakes: unpleasant
2	Feelings about earthquakes: would be different if it was more severe
1	Feelings about earthquakes: would be more frightened about them if I had experienced a big one
1	Feelings about earthquakes: would hate a major earthquake to happen
1	Feelings about earthquakes: you can't fool around with them
1	Feelings about flooding: worried/concerned
5	Feelings about having not prepared: bad / not good
1	Feelings about having not prepared: wrong
1	Feelings about hazardous locations: frightening: because might not be able to get out of it
1	Feelings about helping out: enjoyable
1	Feelings about not having prepared: a shame
2	Feelings about not preparing: complacency / being complacent is dangerous
1	Feelings about nuclear threat: scary
1	Feelings about nuclear threat: scary: why: the threat is not visible
1	Feelings about organisations who don't prepare appropriately: negligent
1	Feelings about pandemic: paranoid
2	Feelings about people who aren't prepared: they can be a danger to others
1	Feelings about people who don't consider hazards/preparing: amazed
2	Feelings about people who don't prepare appropriately: stupid
2	Feelings about people who don't respond appropriately: foolish
1	Feelings about preparedness: defensive
1	Feelings about preparedness: failure for not having prepared
2	Feelings about preparedness: foolish/silly for not having prepared
2	Feelings about preparedness: guilt
1	Feelings about preparing: has a passion for it
2	Feelings about snowstorms: anxious
1	Feelings about snowstorms: not scary: why: dealt with that before / a lot
1	Feelings about tsunamis: not concerned about a tsunami affecting us personally
1	Feelings about tsunamis: scary: why: come without warning
1	Feelings about volcanoes: uneasy
1	Feelings about war: horrendous
3	Feelings about where I live: I feel safe where I live now, if I lived elsewhere (another location) I might feel differently
2	Feelings about windstorms: frightening

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QUOTATION COUNT	CODE TITLE
1	Feelings: about family members who may have to respond to an event / disaster: fearful
1	Feelings: about people living/working in hazardous areas: brave
1	Feelings: about people who are prepared: surprised
2	Feelings: about people who are prepared: wonderful
3	Feelings: about people who can't cope in a disaster: alarming
1	Feelings: about people who don't respond as they should in an event (follow the 'rules'): unbelievable
1	Feelings: about people who don't respond as they should in an event: silly
2	Feelings: about people who prepare too much / consider preparedness top priority: crazy/mad/nutter/fanatical
1	Feelings: about war: harrowing
1	Feelings: surprised that other people don't worry
3	Feelings: that things aren't set up properly/prepared properly: disappointment
1	Feelings: that things aren't set up properly/prepared properly: don't want to be there if a disaster happens
4	Feelings: that things aren't set up/prepared properly: horrible / horrifying / astonishing
5	Forward planning
2	Frustration: felt like I was achieving nothing
8	Frustration: that others won't take preparedness / response advice
4	Frustration: that others won't take preparedness / response advice: response: give up
4	Gender differences
21	Gender: female
27	Gender: male
1	Going to happen
1	Hazard knowledge/belief: civil defence is spread out
5	Hazard knowledge/belief: a disaster won't ever happen
3	Hazard knowledge/belief: all humans can do in response to a hazard is prepare
1	Hazard knowledge/belief: another sequence of events in close succession could happen here
1	Hazard knowledge/belief: bad weather: occurs seasonally
1	Hazard knowledge/belief: bio and chemical hazards: could be devastating/destructive
2	Hazard knowledge/belief: can expect these to occur from time to time
2	Hazard knowledge/belief: climate change/global warming: climate change is occurring
1	Hazard knowledge/belief: climate change/global warming: could be serious
4	Hazard knowledge/belief: climate is good
2	Hazard knowledge/belief: coastal erosion: beach may not be being replenished with shingle / gravel
1	Hazard knowledge/belief: coastal erosion: maybe the piece of land where I live won't last forever
1	Hazard knowledge/belief: coastal erosion: shingle / gravel extraction may contribute to coastal erosion
2	Hazard knowledge/belief: coastal erosion: the formation of the coastal area may be an accident of the last 200 years (therefore erosion may be possible)
1	Hazard knowledge/belief: coastal erosion: this location may be a bad/dumb/stupid place to live
5	Hazard knowledge/belief: coastal erosion: we live near to / in an area of coastal erosion / coastal hazard / coastal flooding
1	Hazard knowledge/belief: coastal erosion: won't insure anymore / premiums are going up
1	Hazard knowledge/belief: coastal erosion: historical data shows area is not at risk
1	Hazard knowledge/belief: disasters are isolated / not widespread / only affect a small area
3	Hazard knowledge/belief: disasters don't happen regularly
2	Hazard knowledge/belief: disasters happen a long way apart
4	Hazard knowledge/belief: disasters: New Zealand's history tells us we are NOT prone to disasters
2	Hazard knowledge/belief: disasters: the property's history tells us we are NOT prone to disasters
1	Hazard knowledge/belief: don't know much about tsunami
1	Hazard knowledge/belief: don't know why disasters happen
1	Hazard knowledge/belief: earthquakes: most of our town will survive
1	Hazard knowledge/belief: earthquakes: an earthquake will occur sooner rather than later
1	Hazard knowledge/belief: earthquakes: are part of our culture/ knowledge / experience
1	Hazard knowledge/belief: earthquakes: better to live on that flat than on a hill
1	Hazard knowledge/belief: earthquakes: can have so many different impacts/effects
10	Hazard knowledge/belief: earthquakes: could cause a tsunami
2	Hazard knowledge/belief: earthquakes: could have a small earthquake
13	Hazard knowledge/belief: earthquakes: could have a strong / decent earthquake

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QUOTATION COUNT	CODE TITLE
1	Hazard knowledge/belief: earthquakes: couldn't believe / understand facts presented about earthquakes
4	Hazard knowledge/belief: earthquakes: danger from shaking and liquefaction of soils
2	Hazard knowledge/belief: earthquakes: earthquake possible
4	Hazard knowledge/belief: earthquakes: earthquakes are a reality of living in New Zealand / our area
1	Hazard knowledge/belief: earthquakes: earthquakes are always big
9	Hazard knowledge/belief: earthquakes: earthquakes are unpredictable / unexpected
3	Hazard knowledge/belief: earthquakes: earthquakes aren't a serious threat
2	Hazard knowledge/belief: earthquakes: earthquakes have waves
1	Hazard knowledge/belief: earthquakes: earthquakes occur during earthquake / still weather
1	Hazard knowledge/belief: earthquakes: experts say it will happen
3	Hazard knowledge/belief: earthquakes: falling buildings less likely to impact people in our town
2	Hazard knowledge/belief: earthquakes: have aftershocks that continue on
4	Hazard knowledge/belief: earthquakes: if it happens, it happens
1	Hazard knowledge/belief: earthquakes: if you like where you live/scenery etc. have to accept there will be earthquakes
1	Hazard knowledge/belief: earthquakes: it doesn't matter what kind of house you live in
1	Hazard knowledge/belief: earthquakes: it will never happen here
10	Hazard knowledge/belief: earthquakes: most earthquakes that occur here are little/short/low level
2	Hazard knowledge/belief: earthquakes: New Zealand's history tells us we are prone to earthquakes
1	Hazard knowledge/belief: earthquakes: not uncommon
4	Hazard knowledge/belief: earthquakes: our area is not known in recent/historic memory for strong earthquakes
1	Hazard knowledge/belief: earthquakes: past earthquakes have happened in areas of low population
1	Hazard knowledge/belief: earthquakes: running outside could be dangerous
1	Hazard knowledge/belief: earthquakes: scientists are trying to understand and predict them
13	Hazard knowledge/belief: earthquakes: seem far away/ unlikely to affect us
1	Hazard knowledge/belief: earthquakes: seem to be a fair number of earthquakes in NZ
1	Hazard knowledge/belief: earthquakes: shouldn't assume New Zealand is safe
8	Hazard knowledge/belief: earthquakes: small earthquakes are happening here all the time
4	Hazard knowledge/belief: earthquakes: the bedrock or soil is solid / sound
5	Hazard knowledge/belief: earthquakes: the land could move up or down in response to an earthquake
1	Hazard knowledge/belief: earthquakes: there's no reason why they occur
3	Hazard knowledge/belief: earthquakes: there haven't been any damaging earthquakes for years/decades
2	Hazard knowledge/belief: earthquakes: there is a / always a risk
2	Hazard knowledge/belief: earthquakes: we are in an area of high seismic risk
6	Hazard knowledge/belief: earthquakes: we are in an area of low seismic risk
7	Hazard knowledge/belief: earthquakes: we are NOT directly on/near faults
12	Hazard knowledge/belief: earthquakes: we are on/near faults
1	Hazard knowledge/belief: earthquakes: we are on/near faults: response: so an event would not be so surprising
4	Hazard knowledge/belief: earthquakes: we live on the eastern tectonic plate / Pacific Rim
5	Hazard knowledge/belief: earthquakes: will have a strong/decent earthquake
5	Hazard knowledge/belief: earthquakes: you can hear them coming
2	Hazard knowledge/belief: earthquakes: earthquakes are the greatest danger
1	Hazard knowledge/belief: even a small/minor earthquake could cause damage/injury
1	Hazard knowledge/belief: fire: fires are not large scale disasters
1	Hazard knowledge/belief: fire: might not have warning time
1	Hazard knowledge/belief: flood: flood possible
1	Hazard knowledge/belief: flood: this location is at risk of a flood
1	Hazard knowledge/belief: flooding: accidental deaths
1	Hazard knowledge/belief: flooding: causes erosion / slippage/ undermining
1	Hazard knowledge/belief: flooding: depends on weather patterns
1	Hazard knowledge/belief: flooding: flash floods can't be warned for
2	Hazard knowledge/belief: flooding: flooding can cause health hazards from sewage, etc.
7	Hazard knowledge/belief: flooding: floods are the greatest danger
4	Hazard knowledge/belief: flooding: has a warning time
1	Hazard knowledge/belief: flooding: have no control about what is happening upstream (e.g. rainfall, mitigation)

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QUOTATION COUNT	CODE TITLE
1	Hazard knowledge/belief: flooding: is ferocious / ferocious river
1	Hazard knowledge/belief: flooding: is part of our culture/ knowledge / experience
14	Hazard knowledge/belief: flooding: much of our town is low-lying / below sea or river level
2	Hazard knowledge/belief: flooding: occurs seasonally
2	Hazard knowledge/belief: flooding: people have built in floodable areas
3	Hazard knowledge/belief: flooding: rivers can rise rapidly after heavy rain
2	Hazard knowledge/belief: flooding: should go to higher ground
2	Hazard knowledge/belief: flooding: the landscape has changed so there won't be another flood like last time / as big as last time
1	Hazard knowledge/belief: flooding: there is a warning system for flooding in our community/town
1	Hazard knowledge/belief: flooding: there is poor land-use planning here with respect to location of buildings in hazardous areas
8	Hazard knowledge/belief: flooding: we are high enough up/ far enough away for inundation
12	Hazard knowledge/belief: flooding: we are less likely to get flooding from a river
16	Hazard knowledge/belief: flooding: we are protected by mitigation measures (e.g. stopbanks, floodgates, pumps)
3	Hazard knowledge/belief: flooding: we have never had a flood that big in past history (e.g. 1 in 200 years)
8	Hazard knowledge/belief: flooding: we may NOT be protected by mitigation measures (e.g. stopbanks, floodgates, pumps)
1	Hazard knowledge/belief: flooding: would get up on roof if flooded in
2	Hazard knowledge/belief: flooding: would have to be a large flood to affect us
4	Hazard knowledge/belief: getting more extreme events / large magnitude
3	Hazard knowledge/belief: have lived in this area for XX years and been okay
23	Hazard knowledge/belief: hazards (or certain hazards) aren't likely to happen / to affect me
1	Hazard knowledge/belief: hazards are rare events
18	Hazard knowledge/belief: hazards are/can be destructive/cause big or major disasters
120	Hazard knowledge/belief: hazards at risk from or more at risk from
1	Hazard knowledge/belief: hazards can affect property values / prices
1	Hazard knowledge/belief: hazards known in Hawke's Bay/East Coast: coastal erosion
9	Hazard knowledge/belief: hazards known in Hawke's Bay/East Coast: earthquakes
1	Hazard knowledge/belief: hazards known in N New Zealand: volcanoes
1	Hazard knowledge/belief: hazards known in Napier: biohazards (e.g. red ants)
6	Hazard knowledge/belief: hazards known in Napier: coastal erosion
1	Hazard knowledge/belief: hazards known in Napier: cyclones
31	Hazard knowledge/belief: hazards known in Napier: earthquakes
1	Hazard knowledge/belief: hazards known in Napier: fire
36	Hazard knowledge/belief: hazards known in Napier: flooding
2	Hazard knowledge/belief: hazards known in Napier: landslides
1	Hazard knowledge/belief: hazards known in Napier: snowstorms
2	Hazard knowledge/belief: hazards known in Napier: some places on the hill look risky
4	Hazard knowledge/belief: hazards known in Napier: storms (general)
19	Hazard knowledge/belief: hazards known in Napier: tsunamis
7	Hazard knowledge/belief: hazards known in Napier: volcanic eruption (effects of)
40	Hazard knowledge/belief: hazards known in New Zealand: earthquakes
15	Hazard knowledge/belief: hazards known in New Zealand: flooding
1	Hazard knowledge/belief: hazards known in New Zealand: geothermal
2	Hazard knowledge/belief: hazards known in New Zealand: landslides
2	Hazard knowledge/belief: hazards known in New Zealand: snowstorms
2	Hazard knowledge/belief: hazards known in New Zealand: storms (general)
2	Hazard knowledge/belief: hazards known in New Zealand: tornadoes
9	Hazard knowledge/belief: hazards known in New Zealand: volcanoes
1	Hazard knowledge/belief: hazards known in NZ: windstorm
2	Hazard knowledge/belief: hazards known in the South Is: earthquakes
1	Hazard knowledge/belief: hazards known in the South Is: flooding
5	Hazard knowledge/belief: hazards known in Timaru: Timaru is one of the safer places in NZ
3	Hazard knowledge/belief: hazards known in Timaru: coastal erosion
27	Hazard knowledge/belief: hazards known in Timaru: earthquake
16	Hazard knowledge/belief: hazards known in Timaru: flooding

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QUOTATION COUNT	CODE TITLE
4	Hazard knowledge/belief: hazards known in Timaru: industrial hazards
2	Hazard knowledge/belief: hazards known in Timaru: infrastructural hazards (e.g. road, ports)
6	Hazard knowledge/belief: hazards known in Timaru: snowstorm
2	Hazard knowledge/belief: hazards known in Timaru: snowstorm: it doesn't snow in Timaru (before the last big one): why: because the last one happened so long ago
5	Hazard knowledge/belief: hazards known in Timaru: storms (general)
1	Hazard knowledge/belief: hazards known in Timaru: Timaru is safer: why: well-planned city
1	Hazard knowledge/belief: hazards known in Timaru: tornadoes
12	Hazard knowledge/belief: hazards known in Timaru: tsunami
1	Hazard knowledge/belief: hazards known in Timaru: volcanoes
5	Hazard knowledge/belief: hazards known in Timaru: windstorms
26	Hazard knowledge/belief: hazards known in Wanganui: earthquakes
1	Hazard knowledge/belief: hazards known in Wanganui: fire
40	Hazard knowledge/belief: hazards known in Wanganui: flooding
2	Hazard knowledge/belief: hazards known in Wanganui: heavy rainfall
11	Hazard knowledge/belief: hazards known in Wanganui: landslides/slippage
1	Hazard knowledge/belief: hazards known in Wanganui: pandemic
1	Hazard knowledge/belief: hazards known in Wanganui: storms
3	Hazard knowledge/belief: hazards known in Wanganui: tornadoes
4	Hazard knowledge/belief: hazards known in Wanganui: tsunami
8	Hazard knowledge/belief: hazards known in Wanganui: volcanoes / volcanic eruption
1	Hazard knowledge/belief: hazards known in Wanganui: windstorm
13	Hazard knowledge/belief: hazards known in Wellington: earthquakes
13	Hazard knowledge/belief: hazards known overseas
98	Hazard knowledge/belief: hazards not at risk from or at less risk from
17	Hazard knowledge/belief: hazards or disasters (or the impacts) are out of your control
2	Hazard knowledge/belief: hazards with a greater risk to life treated more importantly
1	Hazard knowledge/belief: hazards/preparedness never been a reality had to face previously to such an extent
3	Hazard knowledge/belief: high probability that nothing will happen in the next XX years
1	Hazard knowledge/belief: hillside/land erosion: is ceasing because we have planted trees
10	Hazard knowledge/belief: human-made hazards generated by human activities
5	Hazard knowledge/belief: human made hazards are more likely (or more at risk from) than natural hazards
2	Hazard knowledge/belief: humankind cannot stop an event occurring
2	Hazard knowledge/belief: I might be wrong / incorrect in my belief
2	Hazard knowledge/belief: knowledge of emergency (111) phone number
70	Hazard knowledge/belief: knowledge of hazards
2	Hazard knowledge/belief: knowledge of preparedness
2	Hazard knowledge/belief: lack of knowledge of civil defence centre/s
1	Hazard knowledge/belief: lack of knowledge of emergency plans
26	Hazard knowledge/belief: lack of knowledge: about hazards
2	Hazard knowledge/belief: lack of knowledge: about hazards: flooding: how long / how much work do the pumps need to do?
2	Hazard knowledge/belief: lack of knowledge: about hazards: flooding: what areas will flood?
7	Hazard knowledge/belief: lack of knowledge: about preparedness
3	Hazard knowledge/belief: landslides: seem far away/ unlikely to affect us
1	Hazard knowledge/belief: living in an apartment in a city is more risky
1	Hazard knowledge/belief: living in an remote/isolated location is more risky
1	Hazard knowledge/belief: nature (weather) is unforgiving
1	Hazard knowledge/belief: of past industrial accidents/events
1	Hazard knowledge/belief: other places in Napier are just as hazardous
4	Hazard knowledge/belief: other places in Napier are more hazardous
2	Hazard knowledge/belief: other places in New Zealand are just as hazardous
1	Hazard knowledge/belief: other places in New Zealand are less hazardous
20	Hazard knowledge/belief: other places in New Zealand are more hazardous
2	Hazard knowledge/belief: other places overseas are less hazardous
15	Hazard knowledge/belief: other places overseas are more hazardous
3	Hazard knowledge/belief: other places overseas are more hazardous: why: disasters occur more often

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QUOTATION COUNT	CODE TITLE
2	Hazard knowledge/belief: other places overseas are more hazardous: why: the hazardscape is different there (different weather)
2	Hazard knowledge/belief: other places overseas are more hazardous: why: you hear/are hearing about more disasters from there
4	Hazard knowledge/belief: other places overseas will have worse consequences than an event in NZ
2	Hazard knowledge/belief: our infrastructure is fragile / prone to hazards
2	Hazard knowledge/belief: our location makes us isolated in a disaster
1	Hazard knowledge/belief: pandemic: more people die in car accidents than pandemics
1	Hazard knowledge/belief: pandemic: pandemic will be massive / big disaster
1	Hazard knowledge/belief: pandemic: the risk from pandemic is low
8	Hazard knowledge/belief: past events in Napier: Cyclone Bola
6	Hazard knowledge/belief: past events in Napier: flooding
1	Hazard knowledge/belief: past events in Napier: flooding: the streets had to be pumped out
45	Hazard knowledge/belief: past events in Napier: Napier Earthquake
2	Hazard knowledge/belief: past events in Napier: Napier Earthquake: caused buildings to fall down
3	Hazard knowledge/belief: past events in Napier: Napier Earthquake: caused destruction
1	Hazard knowledge/belief: past events in Napier: Napier Earthquake: caused fires
2	Hazard knowledge/belief: past events in Napier: Napier Earthquake: caused items to fall down (e.g. chimney, bricks)
2	Hazard knowledge/belief: past events in Napier: Napier Earthquake: caused the sea to recede
3	Hazard knowledge/belief: past events in Napier: Napier earthquake: devastating / bad / caused deaths
1	Hazard knowledge/belief: past events in Napier: Napier Earthquake: had widespread geographical impacts
7	Hazard knowledge/belief: past events in Napier: Napier Earthquake: helped create the Art Deco city
3	Hazard knowledge/belief: past events in Napier: Napier Earthquake: killed people
1	Hazard knowledge/belief: past events in Napier: Napier earthquake: only one wooden building remained
1	Hazard knowledge/belief: past events in Napier: Napier earthquake: people left Napier for other parts of the country until they could rebuild
1	Hazard knowledge/belief: past events in Napier: Napier Earthquake: people ran out / ran home after the earthquake
1	Hazard knowledge/belief: past events in Napier: Napier Earthquake: people went out looking for others after the earthquake
1	Hazard knowledge/belief: past events in Napier: Napier Earthquake: the Napier Earthquake was a "one-off" earthquake
1	Hazard knowledge/belief: past events in Napier: Napier Earthquake: wooden framed buildings were still standing
2	Hazard knowledge/belief: past events in Napier: tsunamis
1	Hazard knowledge/belief: past events in Napier: tsunamis: the tsunamis were only small
4	Hazard knowledge/belief: past events in Napier: volcanic eruption (effects of)
2	Hazard knowledge/belief: past events in NZ: 1942 Masterton/Wellington earthquake
1	Hazard knowledge/belief: past events in NZ: Abbotsford landslide
10	Hazard knowledge/belief: past events in NZ: Cyclone Bola
3	Hazard knowledge/belief: past events in NZ: Edgecumbe earthquake
4	Hazard knowledge/belief: past events in NZ: flooding (general)
14	Hazard knowledge/belief: past events in NZ: Gisborne earthquake
11	Hazard knowledge/belief: past events in NZ: Inangahua earthquake
17	Hazard knowledge/belief: past events in NZ: Manawatu floods
2	Hazard knowledge/belief: past events in NZ: Matata earthquake swarm
1	Hazard knowledge/belief: past events in NZ: Murchison earthquake
7	Hazard knowledge/belief: past events in NZ: Ruapehu eruptions
1	Hazard knowledge/belief: past events in NZ: Tangiwai disaster
1	Hazard knowledge/belief: past events in NZ: Tarawera eruption
1	Hazard knowledge/belief: past events in NZ: Taupo eruption
5	Hazard knowledge/belief: past events in NZ: Wahine storm
1	Hazard knowledge/belief: past events in Timaru: flooding
3	Hazard knowledge/belief: past events in Timaru: industrial accident (e.g. chemical spill, gas leak)
1	Hazard knowledge/belief: past events in timer: windstorm
7	Hazard knowledge/belief: past events in Wanganui: earthquakes / earthquake swarms
45	Hazard knowledge/belief: past events in Wanganui: flooding
2	Hazard knowledge/belief: past events in Wanganui: flooding: big / bad / severe

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QUOTATION COUNT	CODE TITLE
6	Hazard knowledge/belief: past events in Wanganui: landslides/slippage
1	Hazard knowledge/belief: past events in Wanganui: landslides/slippage: no major impacts
3	Hazard knowledge/belief: past events in Wanganui: storms
3	Hazard knowledge/belief: past events in Wanganui: tornado
3	Hazard knowledge/belief: past events in Wanganui: volcanic eruption
2	Hazard knowledge/belief: past events in Wanganui: windstorm
1	Hazard knowledge/belief: plans are tested / exercised from time to time
4	Hazard knowledge/belief: shouldn't stop people undertaking hazardous activities, but can take precautions
2	Hazard knowledge/belief: snowstorm: occurs seasonally (winter)
1	Hazard knowledge/belief: some activities are undertake with 'measured exposure' / accept a certain degree of risk
6	Hazard knowledge/belief: some events can be excessive / overwhelming
1	Hazard knowledge/belief: storms: can cause unexpected impacts
2	Hazard knowledge/belief: storms: other storm events are on a smaller scale to Cyclone Bola
3	Hazard knowledge/belief: that doesn't/won't happen any more
1	Hazard knowledge/belief: the environment has got worse
6	Hazard knowledge/belief: the landscape changes over time
1	Hazard knowledge/belief: the risk will vary depending on the weather/wind direction at the time
2	Hazard knowledge/belief: there's not much happening locally in terms of hazards / nothing much happens here
8	Hazard knowledge/belief: there have been a lot of disasters / more disasters happening lately
1	Hazard knowledge/belief: there is a similar probability of an event occurring regarding house or life insurance (e.g. fire, death) as there is a disaster
1	Hazard knowledge/belief: tornadoes: can cause building damage
1	Hazard knowledge/belief: tornadoes: have high winds
1	Hazard knowledge/belief: tsunami: a distant event will take a number of hours to reach NZ
3	Hazard knowledge/belief: tsunami: a tsunami is like a sudden surge of water (not a tidal wave)
1	Hazard knowledge/belief: tsunami: after the Boxing day tsunami disasters/preparing was popular / the "in thing"
3	Hazard knowledge/belief: tsunami: can go up rivers
1	Hazard knowledge/belief: tsunami: could destroy all the buildings in Napier
2	Hazard knowledge/belief: tsunami: could destroy my house
2	Hazard knowledge/belief: tsunami: could get debris impacting in a tsunami event
1	Hazard knowledge/belief: tsunami: could survive a smaller tsunami by going upstairs / vertically evacuating
2	Hazard knowledge/belief: tsunami: could use our water equipment (e.g. life jacket, canoe) to assist us in a tsunami
2	Hazard knowledge/belief: tsunami: experts say it could happen
1	Hazard knowledge/belief: tsunami: have to be pretty high up in the hills to be out of harm's way
3	Hazard knowledge/belief: tsunami: Hawaii might collapse and cause a large tsunami
5	Hazard knowledge/belief: tsunami: if we only get a short warning of a tsunami (e.g. 5 min) it is pointless / dangerous to try and evacuate
3	Hazard knowledge/belief: tsunami: if we only get a short warning of a tsunami (e.g. 5 min) it is pointless to try and evacuate: why: traffic jams would stop you using your vehicle
2	Hazard knowledge/belief: tsunami: if you are in a strong building you will be safe from a tsunami
2	Hazard knowledge/belief: tsunami: may be only a short warning time
7	Hazard knowledge/belief: tsunami: may be warning time
3	Hazard knowledge/belief: tsunami: much of our town is low-lying / below sea level
1	Hazard knowledge/belief: tsunami: not a priority because none have occurred in recent history
7	Hazard knowledge/belief: tsunami: potential size of tsunami: large
1	Hazard knowledge/belief: tsunami: remembers / knows Chile tsunami
3	Hazard knowledge/belief: tsunami: remote chance of it occurring
1	Hazard knowledge/belief: tsunami: scientists have identified/measured past tsunamis
1	Hazard knowledge/belief: tsunami: scientists know the source/risk of future tsunamis
8	Hazard knowledge/belief: tsunami: seem far away/ unlikely to affect us
1	Hazard knowledge/belief: tsunami: seemed 'foreign' before Boxing Day tsunami
1	Hazard knowledge/belief: tsunami: seemed minor before Boxing Day tsunami
13	Hazard knowledge/belief: tsunami: should go to higher ground / inland
3	Hazard knowledge/belief: tsunami: should go to higher ground / inland: when: if the traffic is flowing
4	Hazard knowledge/belief: tsunami: should go to higher ground / inland: when: if you have enough time (e.g.

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QUOTATION COUNT	CODE TITLE
	1 hour)
2	Hazard knowledge/belief: tsunami: should vertically evacuate / go upstairs
1	Hazard knowledge/belief: tsunami: shouldn't go to the beach/coast in a tsunami
1	Hazard knowledge/belief: tsunami: the shape of the coast may cause significant tsunami
3	Hazard knowledge/belief: tsunami: the size of a tsunami will depend on where it arrives and the features at that location (e.g. narrow bay vs. open beach)
1	Hazard knowledge/belief: tsunami: the water would eventually recede
1	Hazard knowledge/belief: tsunami: the world's history tells us there have been tsunamis
2	Hazard knowledge/belief: tsunami: there is no recent history of that occurring in this area
5	Hazard knowledge/belief: tsunami: there may be traffic jams which prevent you from evacuating by car
14	Hazard knowledge/belief: tsunami: this location is at risk of a tsunami
1	Hazard knowledge/belief: tsunami: tsunami waves can 'bounce' around (be reflected off the coast etc.)
2	Hazard knowledge/belief: tsunami: tsunamis seem other-place-ish (a distant hazard, doesn't happen here)
1	Hazard knowledge/belief: tsunami: until the Boxing Day tsunami, nobody considered tsunamis a real event
6	Hazard knowledge/belief: tsunami: we are high enough up / far enough away for inundation
2	Hazard knowledge/belief: tsunami: we haven't had a significant tsunami here
1	Hazard knowledge/belief: tsunami: whether you get warned depends on whether you get the warning (awake? on radio? etc.)
8	Hazard knowledge/belief: tsunami: would be safer living on a hill / away from the coast
2	Hazard knowledge/belief: tsunami: would have to be a large tsunami to affect us
1	Hazard knowledge/belief: tsunamis: would be surprised if there was a tsunami
1	Hazard knowledge/belief: unless we have a strong (e.g. magnitude 7) earthquake, there won't be too much damage
4	Hazard knowledge/belief: volcanoes: no volcanoes can affect us / won't be a volcano here
1	Hazard knowledge/belief: volcanoes: a volcanic eruption could be devastating / damaging
3	Hazard knowledge/belief: volcanoes: a volcanic eruption is a likely event
1	Hazard knowledge/belief: volcanoes: all the volcanoes around here are old and eroded so are not active
1	Hazard knowledge/belief: volcanoes: less likely to have large groups of people caught out by a volcano
1	Hazard knowledge/belief: volcanoes: the volcanoes are dormant
3	Hazard knowledge/belief: volcanoes: the weather/wind will determine where ash falls
1	Hazard knowledge/belief: volcanoes: there are all sorts of ways a volcano can create a disaster
2	Hazard knowledge/belief: volcanoes: there could be a big eruption from a volcano
2	Hazard knowledge/belief: volcanoes: volcanic hazards are not so immediate over here
1	Hazard knowledge/belief: volcanoes: volcanoes build up (significant) layers of ash / volcanic material
1	Hazard knowledge/belief: volcanoes: volcanoes can have a range of effects
8	Hazard knowledge/belief: volcanoes: we are near volcanoes
1	Hazard knowledge/belief: volcanoes: we are near volcanoes: response: so an event would not be so surprising
8	Hazard knowledge/belief: volcanoes: we could be covered by ash / volcanic material
1	Hazard knowledge/belief: volcanoes: we could be covered by more than ash / greater effects
4	Hazard knowledge/belief: volcanoes: you can get warning for volcanoes
1	Hazard knowledge/belief: warnings: we have no warning system here
1	Hazard knowledge/belief: wasn't really a disaster, just an event
1	Hazard knowledge/belief: we are in an area of high seismic risk
3	Hazard knowledge/belief: we have had / there has been an event, therefore it won't happen again
3	Hazard knowledge/belief: we have had our XX year event, therefore it won't happen again for another XX years
10	Hazard knowledge/belief: we live in an environment/country prone to hazards
12	Hazard knowledge/belief: weather patterns are changing
2	Hazard knowledge/belief: weather: New Zealand won't be immune from weather / global warming / climate change
1	Hazard knowledge/belief: when lives are at risk it is a huge thing
3	Hazard knowledge/belief: where you are located has a bearing on the risks you face
1	Hazard knowledge/belief: wherever you live there are hazards
1	Hazard knowledge/belief: wind: occurs seasonally (change of seasons)
1	Hazard knowledge/belief: windstorms: are high energy events
1	Hazard knowledge/belief: windstorms: can cause damage
1	Hazard knowledge/belief: windstorms: trees can fall down
1	Hazard knowledge/belief: windstorms: will move things around / blow things around

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QUOTATION COUNT	CODE TITLE
11	Hazard knowledge: knowledge of civil defence / contingency plans
16	Hazard knowledge: knowledge of civil defence centre/s or have visited
1	Hazard knowledge/belief: tsunami: will be dirty water / full of debris
16	Hazard type: bad weather
11	Hazard type: bio and chemical hazards (e.g. red ants, agricultural spray, bait drops)
4	Hazard type: bushfire
56	Hazard type: car/aircraft/personal accidents
3	Hazard type: clean air / smog
17	Hazard type: climate change/global warming
10	Hazard type: coastal erosion
8	Hazard type: cold war / nuclear threat
11	Hazard type: crime / violence
2	Hazard type: crime / violence / community disruption from activities
2	Hazard type: cyclone/hurricane
3	Hazard type: depletion of world resources and supplies (e.g. oil, petrol, water in hydro lakes)
1	Hazard type: direct: sinkholes
4	Hazard type: drought
103	Hazard type: earthquakes
3	Hazard type: everyday emergencies
2	Hazard type: famine / starvation
49	Hazard type: fire
1	Hazard type: fire: response: it could have been worse
94	Hazard type: flooding
1	Hazard type: graffiti
1	Hazard type: hazards around the community, town or country
5	Hazard type: hazards around the home
9	Hazard type: health hazards
8	Hazard type: Hillside/land erosion/landslides
7	Hazard type: industrial hazards
8	Hazard type: infrastructural hazards (e.g. roads, port, electricity, footpaths)
6	Hazard type: international relations / international falling-out
1	Hazard type: lightening
3	Hazard type: meteorite strike
21	Hazard type: pandemic
8	Hazard type: pollution
30	Hazard type: recreational pursuits (tramping, mountaineering, diving, boating, fireworks)
6	Hazard type: snowstorm
1	Hazard type: storm (general)
11	Hazard type: terrorism
4	Hazard type: the sun (and its harsh rays)
3	Hazard type: there are other hazards
10	Hazard type: tornadoes
48	Hazard type: tsunami
35	Hazard type: volcanoes
13	Hazard type: war
9	Hazard type: windstorm
23	Hazard type: work place hazards / OSH
10	Hazard type: Y2k / millennium bug
1	Hazards knowledge/belief: flooding: historically flooding (or problems associated with flooding) has been a problem
1	Hazards knowledge/belief: flooding: the river is higher than the surrounding land level
2	Hazards knowledge/belief: New Zealand is not too bad in terms of hazards
1	Hazards knowledge/belief: there have always been disasters
6	Hazards/preparedness knowledge: prior knowledge helps with response
3	Hazards: A disaster is something that strikes without warning / some hazards can't be warned for
5	Hazards: Can't comprehend what the impacts will be/were like
1	Hazards: earthquakes: can't understand why the NZ government is in an area of earthquake risk

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QUOTATION COUNT	CODE TITLE
19	Hazards: earthquakes: don't have a warning time / occur instantaneously
1	Hazards: flooding: there are different kinds of flooding (e.g. flash floods vs. slow floods)
6	Hazards: hazards are unpredictable
191	Hazards: hazards may be associated with other activities / problems
1	Hazards: how you deal with hazards depends on what the hazards are
20	Hazards: natural hazards vs. those of your own making (human-made)
9	Hazards: natural hazards vs. unnatural hazards
1	Hazards: natural hazards: depends on how wide you spread the hazards (i.e. when is it a hazard/disaster, when is it not)
1	Hazards: natural hazards: depends on where you live whether fire is a natural hazard
14	Hazards: natural hazards: what I consider natural hazards to be
10	Hazards: refers to them as a force of nature / mother nature, etc.
4	Hazards: refers to them as an Act of God or God decides (e.g. In the lap of the Gods)
14	Hazards: shouldn't dominate your life/thinking
35	Hazards: some hazards have a warning time / or can be forecast
4	Hazards: the nature of hazards vary so the response will too
1	Hazards: there are a broad spectrum of hazards
1	Hazards: volcanoes: anything can happen if a volcano erupts
1	Hazards: volcanoes: can erupt anytime
3	Hazards: we are at the mercy / whim of hazards
4	Hazards: were/are tuned into hazards or what was/is happening in an event
6	Hazards: what I don't consider (natural) hazards to be
1	Hope event won't happen in our time
4	Hope for the best in an event
3	Hopefully can do something about your hazards/risks
2	Hopes a future event wouldn't be too big
10	Hopes event won't happen
1	Hopes event won't happen: but it's not realistic
1	Hopes event won't happen: why: optimistic
1	Hopes help might come quickly
2	Hopes not in an area that could be impacted by an event
1	Hopes people will look out for each other / look after children in a disaster
1	Hopes that there will be warning of an impending event
1	Hopes that what you have learned will 'kick in' during an event
2	Hopes will get by for a few days with supplies/items
23	Hopes won't be impacted by an event (or impacted too much)
1	Hopes won't be impacted by an event (or impacted too much): why: not to many items out on show
2	House building/structure: our house was (likely) damaged in the Napier earthquake
1	House building: would encourage landlord to pay for preparedness/safety 'items' if thought they were important
1	House/building structure: it doesn't matter what kind of house you live in if there is an earthquake
3	House/building structure: our house survived the Napier earthquake
2	House/building structure: our house will move with a quake rather than be jolted around
4	House/building: building regulation and consent process is rigorous in New Zealand
1	House/building: don't spend much time at home
1	House/building: location: is behind other houses, so wouldn't get full impact of tsunami
1	House/building: location: near stream but thought won't flood because of mitigation measures (e.g. floodgates, stopbanks, etc.)
4	House/building: location: not at risk
5	House/building: location: on a hill
1	House/building: location: our house has been here a long time so will be okay
5	House/building: location: our house is on soft sediment (e.g. pumice, soft soils)
2	House/building: location: SHOULD consider hazards when selecting a location to live in
9	House/building: location: this location is probably not the best to live in / is hazardous
4	House/building: location: this location might be at risk
1	House/building: location: thought about safety on the flat vs. more risk on a hill
7	House/building: location: thought about safety on the hill vs. more risk on the flat

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QUOTATION COUNT	CODE TITLE
2	House/building: modern houses are built on concrete (solid) platforms
12	House/building: owns home
11	House/building: rental (or doesn't own it themselves)
1	House/building: structure: alterations may have made our house less strong to earthquakes
3	House/building: structure: assumed it would be safe
1	House/building: structure: building might be structurally sound, but other fittings might be dangerous (e.g. parapet, veranda, chimney)
3	House/building: structure: checked general safety things when buying
2	House/building: structure: concrete block
3	House/building: structure: concrete slab foundation
1	House/building: structure: concrete walls
7	House/building: structure: don't have things that could fall off our house (e.g. parapets, veranda, chimney, bricks, items inside)
2	House/building: structure: expect houses to be built with hazards in mind
1	House/building: structure: has extra piles/foundations
2	House/building: structure: have a heavy tile roof
5	House/building: structure: have made alterations/fixes things up/built it to ensure general safety
2	House/building: structure: have thought about / recommended making alterations to mitigate hazards
13	House/building: structure: have thought about its safety
1	House/building: structure: have thought about its safety: why: occupation related to housing/structure
13	House/building: structure: haven't made any alterations for safety/preparedness
1	House/building: structure: haven't made any alterations for safety/preparedness: why: can't rebuild/modify the structure
3	House/building: structure: haven't made any alterations for safety/preparedness: why: rented
1	House/building: structure: haven't thought about its safety
1	House/building: structure: hopes alterations that have been made are very strong (enough to cope with hazards)
1	House/building: structure: houses are affected by earthquakes differently in different areas
17	House/building: structure: made alterations for other reasons (e.g. aesthetics, warmth)
5	House/building: structure: made alterations for other reasons, but factored earthquake alterations in at the same time
8	House/building: structure: many older buildings aren't built to earthquake code or strengthened
1	House/building: structure: most buildings have been rebuilt since the Napier earthquake and can withstand earthquakes
8	House/building: structure: most houses/buildings around here are well made, or well designed for disasters
3	House/building: structure: needed to make alterations (or pull down) to comply with building code
2	House/building: structure: not well made for an earthquake
4	House/building: structure: one storey
1	House/building: structure: other people's houses are poorly constructed
2	House/building: structure: polystyrene
1	House/building: structure: solid houses (e.g. brick) will be destroyed
2	House/building: structure: the doorframe is the strongest part of the house
3	House/building: structure: there are problems with it, but that's just the way it's built!
2	House/building: structure: think about house's structural safety before renting: no
1	House/building: structure: think about house's structural safety before renting: no: why: we can't do anything about it
4	House/building: structure: thinks building is not safe/okay
2	House/building: structure: thinks is well made /solid: but then really doesn't know how it would perform
29	House/building: structure: thinks it is made of strong/good building materials or is 'solid'
6	House/building: structure: thinks it might be safe/okay
20	House/building: structure: thinks it will be safe/okay
1	House/building: structure: thinks the biggest risk is from earthquake
6	House/building: structure: timber house
1	House/building: structure: timber house: don't know how wooden houses fare in earthquakes
4	House/building: structure: timber houses will flex in an earthquake, solid houses (e.g. brick) will be destroyed
5	House/building: structure: timber houses will flex/stand in an earthquake / don't collapse
6	House/building: structure: two storey
2	House/building: structure: wooden frame

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QUOTATION COUNT	CODE TITLE
4	House/building: structure: would take a very big earthquake to do damage
1	House/building: structure: can't imagine it would be completely demolished by an event
1	House/building: we don't have a lot of big buildings in our residential areas
8	House/building: wouldn't buy in a hazardous area
1	House/building: wouldn't buy in a hazardous area but might live there if I was renting
1	House/building: wouldn't know where a safe area was to move to around here
25	House: built when moved in
1	House: my house and property mean everything to me
13	House: new when moved in
9	House: newer house
9	House: older house
20	House: other considerations when buying/building the house (not related to preparedness)
1	House: structure: some houses in our town have been raised for flooding
6	House: think about preparedness before renting: yes
18	House: think about preparedness/hazards before building/buying: no
1	House: think about preparedness/hazards before building/buying: no: why: assumed another family member was thinking about those things
1	House: think about preparedness/hazards before building/buying: no: why: trusted builders
15	House: think about preparedness/hazards before building/buying: yes
1	House: think about preparedness/hazards before building/buying: yes but discounted it
1	House: think about preparedness/hazards before renting: no
2	Ideas person
87	If it happens
25	Imagination / imagine
3	Impacts from a potential disaster: earthquakes
14	Influenced by other people
1	Influenced by politics
37	Information dissemination: by interviewee
2	Information dissemination: by interviewee's family
1	Information dissemination: I hope everyone is getting the message about preparedness / emergency planning
3	Information dissemination: need to "sell" or get message to the public
1	Information dissemination: should convey information of 'what to do' before a disaster
8	Information dissemination: to a network/other people
4	Information dissemination: to school children
4	Information dissemination: to tourists
3	Information dissemination: when there is an event
3	Information picked up along way
1	Information receipt: 6 months prior to interview
1	Information receipt: a few years ago
1	Information receipt: about 10 years ago
2	Information receipt: about 18 months ago
1	Information receipt: about a year ago
1	Information receipt: action: filed it
1	Information receipt: at different times
4	Information receipt: can't remember when I first became aware of it / learnt about it
1	Information receipt: don't know
1	Information receipt: door-knocking
7	Information receipt: I've known this 'as long as I can remember' / grown up with it
1	Information receipt: in recent past
13	Information receipt: mail delivery
1	Information receipt: mail delivery: preferred method
1	Information receipt: neighbours would have received the same information as me
2	Information receipt: some years ago
5	Information receipt: via school
2	Information receipt: via workplace
1	Information receipt: we are prepared to sacrifice public safety messages (as we prefer not to receive advertising material)

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QUOTATION COUNT	CODE TITLE
1	Information receipt: we don't get junk mail (so don't get delivered brochures, etc.)
1	Information response for information: I don't LIKE to listen to the damage/destruction (e.g. I turn the radio down/off)
54	Information seeking
1	Information seeking: about anything interesting / likes to learn or find out more about things
20	Information seeking: about hazards / preparedness generally
1	Information seeking: about hazards on a property thinking of buying
4	Information seeking: about impacts on buildings
4	Information seeking: about nature and/or impacts of an earthquake that has just occurred
1	Information seeking: about response to an earthquake
1	Information seeking: about school response / emergency plans
1	Information seeking: about the impacts and consequences of a disaster (general)
3	Information seeking: about the impacts and consequences of a potential earthquake
3	Information seeking: about the impacts of flooding
1	Information seeking: about the nature and impacts of a tsunami
2	Information seeking: about the snowstorm
1	Information seeking: about warning of an impending event
1	Information seeking: about warning systems
2	Information seeking: could not find information
10	Information seeking: haven't
1	Information seeking: haven't: why: got it off someone/something else who has looked it up or provided it
9	Information seeking: need to do / should undertake
1	Information seeking: not actively seeking information, but open to receiving it if on offer
1	Information seeking: prompt: a speaker at a community meeting/activity
1	Information seeking: prompt: an article in a magazine
1	Information seeking: prompt: didn't believe/understand the facts presented
1	Information seeking: prompt: hot/current topic
2	Information seeking: prompt: talking with interviewer
1	Information seeking: should be well informed
1	Information seeking: why: after an event, like to know been down right track
1	Information seeking: why: exposure to new unknown events
1	Information seeking: why: past experience of events
1	Information seeking: why: wanted to allay concerns about earthquakes / hazards
8	Information seeking: would be interested to find out
3	Information source: ACC
21	Information source: advertisements / notices
1	Information source: advertisements / notices: we try to keep ourselves free from advertising, so don't receive public safety messages either
5	Information source: Art deco buildings/theme
1	Information source: attempt to validate: unsuccessful
10	Information source: books
1	Information source: building assessors
1	Information source: campaigns
2	Information source: children's advertising campaigns (e.g. Firewise)
4	Information source: children's group (scouts, guides, St. John's, etc.)
1	Information source: children, own (adult)
1	Information source: Citizens' Advice Bureau
109	Information source: civil defence
1	Information source: civil defence: not publicised very well
1	Information source: conference display
10	Information source: council (refers to generally)
1	Information source: Department of Conservation
8	Information source: DHB/hospital/medical/MOH
1	Information source: diary
3	Information source: disaster commemorations
25	Information source: discussion (general)
1	Information source: discussion (general): most information comes from discussions

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QUOTATION COUNT	CODE TITLE
7	Information source: discussion groups
1	Information source: display of CD signs in local area
9	Information source: draws upon own ideas/experience
3	Information source: email
1	Information source: emergency (111) number
13	Information source: EQC
11	Information source: family
16	Information source: film / video
6	Information source: fire brigade
6	Information source: fridge magnets
8	Information source: friends
8	Information source: general hazard signage
1	Information source: general observation
1	Information source: general public
85	Information source: geographic/environmental cues
2	Information source: GeoNet
1	Information source: GNS
3	Information source: government
2	Information source: greenies
3	Information source: insurance
33	Information source: internet/websites
1	Information source: internet/websites: Google searches
5	Information source: internet/websites: NZ seismic site / GeoNet
1	Information source: interviewee
2	Information source: library
22	Information source: local or world history / historical information
5	Information source: magazines
1	Information source: manufacturer's instructions
1	Information source: meetings at civil defence
1	Information source: meetings: at school
5	Information source: meetings: at work
1	Information source: meetings: don't work
14	Information source: meetings: street or community meetings
19	Information source: multiple sources
16	Information source: museum (or similar 'display' - type places e.g. aquarium)
1	Information source: need to know where to get help in a disaster
1	Information source: neighbours
59	Information source: news media (general)
1	Information source: news media (general): I don't think the news media talk about return periods much
41	Information source: newspaper
1	Information source: newspaper: we don't/seldom get one
1	Information source: not sure/don't know
1	Information source: open day/display
9	Information source: OSH
35	Information source: pamphlets/brochures/cards
11	Information source: pamphlets/brochures: civil defence brochure
48	Information source: phone book/yellow pages
8	Information source: photographs
4	Information source: police
2	Information source: Port Authority
8	Information source: printed/reading material (general)
3	Information source: radio: I/we don't listen to commercial or local radio
5	Information source: radio: local radio
3	Information source: radio: national radio
31	Information source: radio: radio in general
3	Information source: radio: talkback radio

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QUOTATION COUNT	CODE TITLE
5	Information source: radio: we use a different radio station to the one used for disasters
31	Information source: regional council
54	Information source: school education
3	Information source: school education: curriculum
13	Information source: scientist/researcher/experts
1	Information source: shops/businesses
24	Information source: sirens
40	Information source: speaker at community group meeting/ organisation meeting
2	Information source: St Johns
6	Information source: stories / narratives
2	Information source: tagging of hazards on land/building title (LIM, PIM, etc.)
1	Information source: territorial authority / local council
5	Information source: tourist guides / tourist information
7	Information source: tours/field visits of key sites
3	Information source: travel/transport (e.g. ferry, plane)
106	Information source: TV
3	Information source: TV: don't use / don't own
2	Information source: TV: got the most information from TV
2	Information source: well-known TV personality
61	Information source: workplace
3	Information source: workplace: induction
1	Information source: workplace: isolated exposure to information
1	Information source: workplace: not many people would get information from the workplace
1	Information type: volcanoes: Taupo eruption
9	Information type: "Get ready get thru"
1	Information type: "Join Civil Defence"
2	Information type: accidents in the workplace
13	Information type: advice of 'what to do' while a disaster is happening
1	Information type: artworks
1	Information type: awareness
1	Information type: Be prepared - you never know what will happen
3	Information type: be prepared (general)
1	Information type: be prepared, in case of emergencies
1	Information type: benefits of preparing
2	Information type: bio and chemical hazards
1	Information type: blogs
1	Information type: building retrofitting
2	Information type: buildings falling / fallen down: damage to multi-storey buildings
20	Information type: buildings or structures falling / fallen down / destroyed
1	Information type: children saving the family in a fire
3	Information type: children trapped / hurt / affected
1	Information type: civil defence personnel
3	Information type: climate change / global warming
9	Information type: coastal erosion
4	Information type: coastal hazard zone
1	Information type: cold war / nuclear threat
2	Information type: consequences of not preparing / preparing
1	Information type: continuous flow of info
3	Information type: cyclone / hurricane
16	Information type: deaths in a disaster
7	Information type: disaster stories / experiences from survivors
10	Information type: discussion panel on TV about hazards / preparedness
8	Information type: documentary / programmes
10	Information type: earthquake damage
1	Information type: earthquake engineering
34	Information type: earthquake impacts (general)

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QUOTATION COUNT	CODE TITLE
1	Information type: earthquake impacts: economic impacts
2	Information type: earthquake impacts: ground opening up
1	Information type: earthquake impacts: hospital impacted
2	Information type: earthquake impacts: injuries
1	Information type: earthquake impacts: power off
11	Information type: earthquake: alpine fault
3	Information type: earthquake: earthquakes in Canterbury
24	Information type: earthquake: earthquakes in New Zealand
1	Information type: earthquake: earthquakes in NZ are (quite) strong
2	Information type: earthquake: earthquakes in Wanganui
1	Information type: earthquake: haven't really affected people in the past in NZ
16	Information type: earthquake: past earthquake events in New Zealand
8	Information type: earthquake: securing your property for earthquakes
20	Information type: earthquakes (general)
2	Information type: earthquakes: an earthquake event that could cause a tsunami
20	Information type: earthquakes: past earthquake events overseas
4	Information type: evacuation information
49	Information type: events/disasters closer to home (e.g. Pacific, Asia, US)
5	Information type: events/disasters further away (e.g. Iran)
89	Information type: events/disasters outside of New Zealand
37	Information type: events/disasters that happened
16	Information type: events/disasters that happened locally
1	Information type: events/disasters that happened: why they happened
30	Information type: events/disasters within New Zealand
3	Information type: falling items
1	Information type: fault-lines advertisements (EQC)
4	Information type: fire escape plan
7	Information type: fire preparedness
6	Information type: fires affecting other people
13	Information type: fixing furniture
1	Information type: flood height markers for past events
12	Information type: flood mitigation
5	Information type: flood plan
45	Information type: flooding
1	Information type: flooding: sewage in a flood
1	Information type: floods of the last 200 years preserved in shingle
2	Information type: general film with disasters in it
31	Information type: general hazards information
2	Information type: general news media about disasters/preparedness
118	Information type: general preparedness information
16	Information type: geology, earth movement
3	Information type: hazard related projects / activities (e.g. building of a pumping station)
1	Information type: hazards around the community, town or country
4	Information type: hazards in the local area
3	Information type: hazards related to recreational pursuits (e.g. tramping, mountaineering)
20	Information type: Health and safety/OSH
17	Information type: household emergency checklist
1	Information type: how long it took for people to get help
1	Information type: how often earthquakes occur
6	Information type: how people react in a disaster/emergency
1	Information type: how to fix/repair items
3	Information type: how to prepare/store water properly
2	Information type: human-made disasters
1	Information type: I heard they won't insure that place anymore / premiums are going up
2	Information type: impacts of a disaster on other people
1	Information type: industrial accidents that occurred

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QUOTATION COUNT	CODE TITLE
2	Information type: information 'alert' about preparedness
4	Information type: information / maps identifying areas at risk
1	Information type: information about refugees
21	Information type: information on response/impacts during an event
1	Information type: insurance claim
1	Information type: interactive earthquake display (shaking house)
6	Information type: landslides / potential landslides / slippage
3	Information type: lifelines or infrastructure setup
1	Information type: media releases
1	Information type: must know where the CD headquarters are in a disaster
5	Information type: must listen to the radio in a disaster / know your radio stations
25	Information type: Napier earthquake
10	Information type: need to have food and water in case of a disaster
10	Information type: need to look after yourself/family for 3 days
5	Information type: notices/newsletters
1	Information type: nuclear threat and how to respond to it
1	Information type: opinion piece
18	Information type: pandemic
18	Information type: pandemic planning
3	Information type: people having to leave their homes in an event
2	Information type: people not knowing what to do after a disaster
1	Information type: people rebuilding after a disaster
6	Information type: photographs / images
3	Information type: plans / planning of the local authority
10	Information type: policies on how to deal with hazards/preparedness (e.g. earthquakes, tsunami)
1	Information type: pollution/recycling
4	Information type: posters / billboards
1	Information type: potential events/disasters that could happen in the area
2	Information type: predictions / forecasts of future hazard
2	Information type: probability (e.g. 1.5% of flooding in any year)
6	Information type: QuakeSafe
1	Information type: reassurance will be okay / not get an event again
3	Information type: relief/aid campaigns
4	Information type: relief/aid workers going in after a disaster
1	Information type: report on preparedness/planning
3	Information type: responding to tsunami
1	Information type: responsibilities for land use planning and building
18	Information type: return periods (e.g. 100 year floods; 1:100 years)
2	Information type: river tragedy at Tongariro
3	information type: safety instructions for traffic accidents (e.g. aircraft, boat)
8	Information type: scientific study/report/research
2	Information type: seismograph readings / recordings
1	Information type: selling emergency kits/items
5	Information type: should have an emergency/preparedness kit
12	Information type: sirens
3	Information type: sirens: continuous sirens mean civil defence
1	Information type: sirens: couldn't hear sirens
1	Information type: sirens: don't know whether I should respond or not
1	Information type: sirens: going a few times means a fire
3	Information type: sirens: knew not to worry/knew the reason for the siren
2	Information type: sirens: not sure whether the siren he is hearing is for fire, tsunami, etc.
1	Information type: sirens: sirens mean a fire
5	Information type: sirens: sirens mean a warning
2	Information type: sirens: sirens mean flooding
3	Information type: sirens: sirens mean turn on the local radio station
3	Information type: sirens: what does the signal mean / do the different signals mean / what should I do?

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QUOTATION COUNT	CODE TITLE
3	Information type: sirens: will be sounding / tested at a certain date/time
1	Information type: situation reports
2	Information type: storms
1	Information type: survey data / land heights
1	Information type: survey of earthquake impacts and building safety
1	Information type: survival guide
6	Information type: survival skills
4	Information type: survivors in a disaster
3	Information type: terrorism: Twin Towers
1	Information type: the foolishness of people's actions during an event (e.g. going to the beach to look at a tsunami)
1	Information type: theoretical information about hazards/response
2	Information type: tornadoes
45	Information type: tsunami
38	Information type: tsunami: Boxing Day tsunami
1	Information type: tsunami: people up high survived, people down low washed away
1	Information type: tsunami: warnings
18	Information type: volcanoes
3	Information type: volcanoes: lahar
2	Information type: volcanoes: Ruapehu eruption
1	Information type: volcanoes: Tarawera eruption
1	Information type: war
16	Information type: warning of an impending event
1	Information type: water / rain gauge level recordings
3	Information type: water bad/impure water
1	Information type: water can be contaminated by plastic
2	Information type: water: getting water out of your hot water cylinder
1	Information type: water: should have water stored, because fresh water won't be available
2	Information type: water: storage time for water
3	Information type: weather / global warming / climate change
3	Information type: weather forecast
1	Information type: what to do in a storm
1	Information type: what to do in a tornado
4	Information type: what to do in a tsunami
22	Information type: what to do in an earthquake
3	Information type: what to do in an emergency
1	Information type: what to do in Y2K
1	Information type: where was Civil Defence during an event?
10	Information type: workplace instructions for responding to emergencies/evacuating
4	Information type: Y2K
11	Information: a lot of information is available in times of quiescence
4	Information: a lot of information is available when a hazard is threatening
26	Information: can't recall details
1	Information: can't recall details accurately
1	Information: frequency of information: a few times a month
2	Information: frequency of information: a few times a year
4	Information: frequency of information: annually
11	Information: frequency of information: constantly reminded
1	Information: frequency of information: daily
5	Information: frequency of information: from time to time / comes and goes
2	Information: frequency of information: if too frequent people get sick of it
2	Information: frequency of information: more frequent or greater amount today (than in past)
1	Information: frequency of information: not often / regular
8	Information: frequency of information: regular
5	Information: frequency of information: saw/heard a few times
1	Information: frequency of information: should be repeated
10	Information: frequency of receiving/seeking information

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QUOTATION COUNT	CODE TITLE
1	Information: haven't actively sat down and studied what to do in an event/disaster
20	Information: haven't seen / received anything
7	Information: haven't seen / received anything ELSE
7	Information: haven't seen / received anything much
1	Information: haven't seen / received anything: response: don't need to worry because the Council would publicise it if it were a concern
1	Information: haven't seen / received anything: topic: climate change
3	Information: haven't seen / received anything: topic: earthquakes
1	Information: haven't seen / received anything: topic: flooding and the pumps in Napier
1	Information: haven't seen / received anything: topic: general disaster preparedness/response information
1	Information: haven't seen / received anything: topic: hazards
1	Information: haven't seen / received anything: topic: volcanoes
3	Information: haven't seen / received anything: where: from schools
1	Information: haven't seen / received anything: topic: restraining items
1	Information: haven't seen received anything: topic: local hazards (e.g. in Napier, Wanganui, Timaru)
1	Information: information about preparedness planning for different perils 'fits together'
10	Information: need better/ simpler / clearer / more information about hazards, risk and preparedness
4	Information: need direct advice on what do to in an event
1	Information: only report sensational or unusual events, don't report regular/real risks
1	Information: preferred information source: national radio
2	Information: preferred information type: brochure with checklist
2	Information: preferred information type: don't know
1	Information: preferred information type: information in regional council newsletter
1	Information: preferred information type: newspaper
1	Information: preferred information type: something long term / that sticks around
1	Information: prompt: event that occurred overseas (e.g. tsunami, floods, earthquake)
7	Information: reaction to information
1	Information: reaction to information: it's the latest fashion (following an event)
1	Information: reaction to information: they've been paid to map as many faults as possible!
1	Information: response to information: there is no justice / people aren't getting a fair deal
7	Information: response to information: 'took it on board' / 'take in' / take notice
1	Information: response to information: there are hazards everywhere you live
3	Information: response to information: "supposed" / apparently / so-called
1	Information: response to information: "that's a fact"
8	Information: response to information: (regular) information reminds people something can/will happen / what the hazard is
2	Information: response to information: absorbed bits of interest/took in parts of it
1	Information: response to information: agreed with it
1	Information: response to information: alarmist
1	Information: response to information: all earthquakes are big earthquakes (like the ones in the media)
2	Information: response to information: altered / changed behaviour to suit circumstances / conditions
1	Information: response to information: amazing stories
2	Information: response to information: annoyed / bothered
1	Information: response to information: are we prepared enough?
7	Information: response to information: ask questions
1	Information: response to information: at least I wasn't there! / Thank goodness I wasn't there!
1	Information: response to information: because I know about our lifelines/infrastructure, I can see the problems that might occur in a disaster
6	Information: response to information: believed it
5	Information: response to information: brings it a little more to home
4	Information: response to information: brings to attention the possibilities
3	Information: response to information: can't / impossible / infeasible to undertake certain advice given
2	Information: response to information: can't do anything about / can't prepare yourself for those types of disaster
1	Information: response to information: can get instant information / doesn't take long
1	Information: response to information: changed the way people thought about tsunami
3	Information: response to information: checked / verified information
1	Information: response to information: clear and simple

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QUOTATION COUNT	CODE TITLE
1	Information: response to information: concise
2	Information: response to information: consistent / same information
3	Information: response to information: contradicts itself
2	Information: response to information: could relate it to my understanding/circumstances
2	Information: response to information: could relate to the people affected by the disaster
3	Information: response to information: could understand what was presented
9	Information: response to information: couldn't believe what was presented
6	Information: response to information: couldn't understand / hard to understand what was presented
2	Information: response to information: created policies to address hazards/preparedness
9	Information: response to information: critical
1	Information: response to information: critical: why: not new information
2	Information: response to information: desensitises people
3	Information: response to information: devastating
9	Information: response to information: didn't do anything / did nothing
1	Information: response to information: didn't know it existed / was there
1	Information: response to information: didn't learn anything new
5	Information: response to information: didn't read/look at
1	Information: response to information: didn't take much notice of it: why: more concerned for others safety than mine
1	Information: response to information: didn't want to take a risk
9	Information: response to information: didn't/aren't taking much notice of it
1	Information: response to information: disasters are landmarks in the history of an area
1	Information: response to information: doesn't increase understanding
1	Information: response to information: doesn't raise awareness
1	Information: response to information: doesn't stimulate discussion
2	Information: response to information: doesn't tell you what to do (e.g. to prepare/respond)
1	Information: response to information: don't know how effective advertising is
1	Information: response to information: don't know how the response workers can possibly help in a disaster
1	Information: response to information: don't know how they found this out
1	Information: response to information: don't know if it is up to date / recent
1	Information: response to information: don't know if that kind of thing happens not / don't know whether to believe info
1	Information: response to information: don't know if the organisations in charge are taking the right / correct actions
1	Information: response to information: don't know what it means
1	Information: response to information: don't need to read/look at it
3	Information: response to information: don't need to worry / be concerned / think about it anymore
3	Information: response to information: don't take it too seriously
1	Information: response to information: don't take too seriously: why: take it for granted that will be better informed because of where I work
1	Information: response to information: don't take too seriously: why: take it for granted that will be warned because of where I work
4	Information: response to information: don't think the same consequences will happen here
1	Information: response to information: don't think they should be telling us that
5	Information: response to information: earthquake: there is controversy over what the right thing to do is
1	Information: response to information: feel nervous
2	Information: response to information: feel uncomfortable
1	Information: response to information: felt sorry for the people involved
2	Information: response to information: focuses people's attention / paid attention
4	Information: response to information: followed advice of 'what to do' while a disaster or event is happening
5	Information: response to information: frightening/scary
2	Information: response to information: gave people a jolt / shook people up
1	Information: response to information: glad I don't live there
2	Information: response to information: glad it happened to other people, not to us
28	Information: response to information: good
2	Information: response to information: good way of getting real / credible information
2	Information: response to information: good, but...
1	Information: response to information: good: liked people could feel what an earthquake was like

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QUOTATION COUNT	CODE TITLE
42	Information: response to information: got a preparedness item/got prepared
1	Information: response to information: have to figure out what it means
2	Information: response to information: haven't done anything
1	Information: response to information: helped commission a more detailed study
5	Information: response to information: helped refresh / remind me of what I knew already
1	Information: response to information: historical stories are important because they are the stories of my past family/community as well
2	Information: response to information: hope that an event doesn't happen (again)
5	Information: response to information: horrified
1	Information: response to information: I'm the same as them - not prepared!
2	Information: response to information: I have these items already
1	Information: response to information: I think our infrastructure is better here
1	Information: response to information: imposed upon us / foisted on us / made to see or hear it
2	Information: response to information: increases knowledge
1	Information: response to information: increases worry/concern
1	Information: response to information: information is put out by people who haven't thought it through
12	Information: response to information: interesting
1	Information: response to information: it's a protocol to look at this / discuss this
1	Information: response to information: it's common knowledge / everyone knows this
1	Information: response to information: it's just general knowledge
5	Information: response to information: it's the luck of the draw / they're lucky / we are lucky
14	Information: response to information: it could happen here / or happen again the same way
5	Information: response to information: it doesn't relate to me / my area
1	Information: response to information: it might be worse here
2	Information: response to information: it was very 'human'
7	Information: response to information: it will never / won't happen here
1	Information: response to information: keeping momentum going is difficult
1	Information: response to information: laughed at it
1	Information: response to information: less or not relevant to New Zealand
4	Information: response to information: likes to visualise what an event is/might be like
1	Information: response to information: listened to it
3	Information: response to information: listens to it /does stuff for a certain time (then dwindles as time goes by)
2	Information: response to information: local press do okay /good
1	Information: response to information: local radio were great during event
6	Information: response to information: looked at it/read it
1	Information: response to information: looked at it/read it: why: responsible for other people's lives
8	Information: response to information: made a plan
1	Information: response to information: may not always take on the message that CD want you to take
1	Information: response to information: might be giving out right/ right amount of information
1	Information: response to information: might need to look beyond immediate history / historical information
3	Information: response to information: might not be a good place to live / bad/dumb/stupid place to live
1	Information: response to information: might not be true
3	Information: response to information: nasty / bad disaster
1	Information: response to information: need different kind of buildings to survive such destruction
1	Information: response to information: never know what part of the world will be hit next
1	Information: response to information: no major impacts / damage
1	Information: response to information: not any one hazard focused on more than others
4	Information: response to information: not correct / inaccurate
2	Information: response to information: not sure how to get information in a disaster
1	Information: response to information: not sure if there were no events, or if the information doesn't exist
5	Information: response to information: NZ is not as bad as places overseas in terms of hazard/risk
4	Information: response to information: objected to it
1	Information: response to information: observed it
3	Information: response to information: people made / make the right decisions
1	Information: response to information: people need to take it more seriously
1	Information: response to information: people think it's 'bad news' so they won't look at it

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QUOTATION COUNT	CODE TITLE
1	Information: response to information: people unaware / did not know a tsunami was coming
2	Information: response to information: people won't always follow information
1	Information: response to information: probabilities: can't understand them
22	Information: response to information: raised awareness / interest
7	Information: response to information: realised how widespread / large / major an event was
2	Information: response to information: realised it was a serious issue
5	Information: response to information: registers in your consciousness
1	Information: response to information: relevant to New Zealand
6	Information: response to information: reminds me to update/check/get supplies
1	Information: response to information: reports an earthquake on the GeoNet website
1	Information: response to information: return periods: a 100 year event happened over 100 years ago, therefore we are overdue
1	Information: response to information: return periods: an event could still be coming soon, even if you had an event (e.g. 1:50; 1:500) recently
1	Information: response to information: return periods: we have had a 100 year flood, we won't get one for another 100 years
3	Information: response to information: shocked
3	Information: response to information: should be ready when things (events, disasters) do happen
1	Information: response to information: should look at it when there is not an emergency
2	Information: response to information: small earthquakes are happening here all the time
11	Information: response to information: sought/seek further information
5	Information: response to information: started to get prepared, then stopped halfway though
1	Information: response to information: started to get prepared, then stopped halfway through: why: because have to get up and do it
1	Information: response to information: started to get prepared, then stopped halfway through: why: couldn't be bothered finishing it
1	Information: response to information: started to get prepared, then stopped halfway through: why: didn't want to undertake sustained preparedness
1	Information: response to information: stories of disasters far apart don't get passed between generations
1	Information: response to information: stuck on fridge
1	Information: response to information: such destruction that is it beyond resources to deal with it (e.g. even in the US)
2	Information: response to information: surprised
1	Information: response to information: surreal
30	Information: response to information: talked about it with others
4	Information: response to information: terrible / horrendous
2	Information: response to information: the direct telling of people's experiences was very powerful
2	Information: response to information: the effect was the important thing (took notice of the effect / impact)
2	Information: response to information: the event didn't happen the way they warned / told it
2	Information: response to information: the government hasn't handled an event well / handled badly
1	Information: response to information: the greenies are too much the 'other way', so I only take in parts of what they say
8	Information: response to information: the hazard/potential impacts seemed more real
1	Information: response to information: the information is not hard-hitting / strong enough
1	Information: response to information: the plain truth of it struck me
2	Information: response to information: the preparedness I've made might not be any good in an event
1	Information: response to information: there are some things I couldn't do after an event / limitations
1	Information: response to information: there have been a lot of disasters / more disasters happening lately
1	Information: response to information: there is a good argument/reasoning to prepare
1	Information: response to information: there was/is nothing left
1	Information: response to information: there wasn't total destruction (e.g. still some places standing): so my house will be okay too
3	Information: response to information: there wasn't total destruction / wasn't that bad (e.g. still some places standing)
1	Information: response to information: things are going crazy
2	Information: response to information: think their information comes from a good/proper source
3	Information: response to information: those people weren't prepared
6	Information: response to information: thought about the consequences of an event (in NZ)
17	Information: response to information: thought about the information
5	Information: response to information: thought it didn't make sense / wasn't sensible

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QUOTATION COUNT	CODE TITLE
7	Information: response to information: thought it made sense / sensible
2	Information: response to information: thought it was an okay place to live
1	Information: response to information: thought it was ridiculous
2	Information: response to information: thought it was stupid / daft
23	Information: response to information: thought should prepare/get involved
7	Information: response to information: thought the likelihood of something happening not high / not likely
5	Information: response to information: threw or put it away
4	Information: response to information: unbelievable destruction
4	Information: response to information: understand the consequences / what an event is really like
1	Information: response to information: used it to form 'experience'
2	Information: response to information: useful
4	Information: response to information: vivid images
1	Information: response to information: wasn't immediate / didn't prepare straight away
1	Information: response to information: we are not prepared enough
1	Information: response to information: we get a lot of junk mail, which hazards/preparedness info gets lost amongst
1	Information: response to information: we have already completed all the suggestions for realistic hazards
3	Information: response to information: we should have a plan in place
2	Information: response to information: what if it happened to me?
1	Information: response to information: will follow the older advice
1	Information: response to information: will happen
3	Information: response to information: You're on your own / help not available
1	Information: response: small earthquakes are nothing to someone who has experienced a big one
3	Information: should be understandable
1	Information: should change format of information to remind people / shake people up
4	Information: should update / refresh information every so often
18	Information: stopped
3	Information: stopped: don't know why its stopped
2	Information: stopped: response: don't talk about it any more
2	Information: stopped: response: don't think about it any more
4	Information: stopped: response: forget to prepare
1	Information: stopped: response: the risk is obviously not as great now
3	Information: stopped: timing of stoppage
1	Information: suggested information type: fridge magnets
3	Information: Uncertainty about
1	Information: will never reach everyone / the people who need it
2	Interest: lack of interest in hazards/preparing
2	Interested in community safety
14	Interested in hazards/disasters
1	Interested in helping people prepare
3	Interested in international relations
1	Interested in the arts
1	Interested in the environment
1	Interested in the history of the area
1	Interested in: geology
1	Interested that people are aware
9	Interesting
24	Interview: in person
24	Interview: telephone
1	Isn't part of psyche
46	Issue (refers to an event, or consequences as being an issue)
1	Justice / fairness
2	Justification for an occurrence
4	Lateral thinker / think outside the square
5	Leadership: leader/s in community promote preparedness
1	Leadership: look to Civil Defence to show leadership in an event
2	Leadership: look to large organisations to show leadership in an event

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QUOTATION COUNT	CODE TITLE
5	Leadership: role in community
26	Leadership: role in leading community groups or organisations
1	Leadership: there is a lack of leadership about hazards/preparedness in our community
12	Length of time living in house in Napier: long
5	Length of time living in house in Napier: short
16	Length of time living in house in Timaru: long
2	Length of time living in house in Timaru: short
8	Length of time living in house in Wanganui: long
6	Length of time living in house in Wanganui: short
30	Length of time living in Napier: long
2	Length of time living in Napier: short
20	Length of time living in Timaru: long
18	Length of time living in Wanganui: long
8	Length of time living in Wanganui: short
1	Length of time living on East Coast: long
15	Listens to other people's ideas / advice
1	Listens to other people's ideas / advice: parents
2	Listens to other people's ideas / advice: who: children
1	Listens to other people's ideas / advice: who: people in your own iwi group
2	Listens to other people's ideas: older people
2	Listens to other people's ideas: older people: why: more experienced
1	Listens to other people's ideas: who: long term friends/residents
6	Lived previously: North Island: Auckland
9	Lived previously: North Island: Bay of Plenty
4	Lived previously: North Island: East Coast
6	Lived previously: North Island: Manawatu Region
2	Lived previously: North Island: Northland
3	Lived previously: North Island: Taranaki Region
2	Lived previously: North Island: Waikato
10	Lived previously: North Island: Wellington Region
1	Lived previously: North Island: Wellington Region: on fault line
3	Lived previously: overseas locations (not specified)
2	Lived previously: overseas locations: Asia
29	Lived previously: overseas locations: Europe/UK
11	Lived previously: overseas locations: North America
11	Lived previously: overseas locations: Pacific Region
6	Lived previously: overseas locations: South Africa
10	Lived previously: South Island: Canterbury
7	Lived previously: South Island: Otago
4	Lived previously: South Island: Southland
46	Lives with
2	Lives with: by themselves
1	Lives with: children (older)
12	Lives with: children (young)
1	Lives with: flatmates
1	Lives with: lodger
2	Lives with: parent/s
63	Lives with: spouse
16	Location: Napier
24	Location: street/area
18	Location: Timaru
14	Location: Wanganui
80	Luck: general reference to luck or being lucky/unlucky or fortunate/unfortunate
33	Might happen
9	Might not happen
7	Most likely event: bad weather

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QUOTATION COUNT	CODE TITLE
1	Most likely event: chemical spill
1	Most likely event: climate change/global warming type impacts
1	Most likely event: cyclone
9	Most likely event: don't know
19	Most likely event: earthquake
4	Most likely event: earthquake: minor
17	Most likely event: flooding
1	Most likely event: flooding: why: had bad weather recently (or is likely in future)
2	Most likely event: flooding: why: it's winter
2	Most likely event: human-made hazards / disasters
1	Most likely event: impossible question
2	Most likely event: power failure
4	Most likely event: snowstorm
4	Most likely event: tsunami
4	Most likely event: unpredictable
1	Most likely event: volcanic eruption
5	Most likely event: windstorm
1	Most likely event: windstorm: why evidence of past events
5	Not at direct risk
1	Occupation (past or present): accountant
1	Occupation (past or present): business people
24	Occupation (past or present): duties: advocating or looking after emergency preparedness
2	Occupation (past or present): duties: looking after infrastructure (general)
3	Occupation (past or present): duties: looking after road network infrastructure
1	Occupation (past or present): duties: looking after water/sewerage infrastructure
1	Occupation (past or present): duties: looking at environmental issues
2	Occupation (past or present): duties: making information accessible
1	Occupation (past or present): duties: marine and aerodynamic engineering
1	Occupation (past or present): duties: marketing
5	Occupation (past or present): duties: modelling/forecasting floods and tsunamis
4	Occupation (past or present): duties: needed to be prepared
2	Occupation (past or present): duties: Operations Manager
7	Occupation (past or present): duties: planning to avoid hazards
2	Occupation (past or present): duties: protection of transmission lines
6	Occupation (past or present): duties: Recovery Manager
1	Occupation (past or present): duties: reporting on disasters
26	Occupation (past or present): duties: responding to events
1	Occupation (past or present): duties: running a clinic to check on people's health
1	Occupation (past or present): duties: setting protection systems for earthquakes
2	Occupation (past or present): duties: talking about Art Deco / Napier earthquake
1	Occupation (past or present): duties: visiting rural areas to check on people's health
5	Occupation (past or present): duties: working as a Plunket Nurse
5	Occupation (past or present): duties: working in/with the community
1	Occupation (past or present): engineer: role: design
10	Occupation (past or present): red cross worker
10	Occupation (past or present): retired
1	Occupation (past or present): role: accountant
2	Occupation (past or present): role: amateur historian
1	Occupation (past or present): role: architect
6	Occupation (past or present): role: army
2	Occupation (past or present): role: beekeeper
12	Occupation (past or present): role: builder / in building industry
7	Occupation (past or present): role: builder / in building industry: role: building inspector
3	Occupation (past or present): role: caravan / holiday park operator
1	Occupation (past or present): role: clothes stylist
1	Occupation (past or present): role: consultant

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QUOTATION COUNT	CODE TITLE
5	Occupation (past or present): role: electricity industry
1	Occupation (past or present): role: electricity industry: electricity industry very serious about survival of equipment/staff
10	Occupation (past or present): role: engineer
2	Occupation (past or present): role: factory worker or manager
3	Occupation (past or present): role: farmer
1	Occupation (past or present): role: fire service
2	Occupation (past or present): role: forestry worker
3	Occupation (past or present): role: homecare / carer
1	Occupation (past or present): role: international relations
1	Occupation (past or present): role: manufacturer
2	Occupation (past or present): role: Ministry of Works
4	Occupation (past or present): role: modeller / forecaster
4	Occupation (past or present): role: Mountain Safety administration officer
1	Occupation (past or present): role: newspaper reporter
4	Occupation (past or present): role: pilot
10	Occupation (past or present): role: police
1	Occupation (past or present): role: record-keeper
2	Occupation (past or present): role: researcher
16	Occupation (past or present): role: school teacher
1	Occupation (past or present): role: security / security guard
7	Occupation (past or present): role: shop owner / worker / manager
2	Occupation (past or present): role: tour guide
1	Occupation (past or present): role: town planner
1	Occupation (past or present): role: vehicle driver
2	Occupation (past or present): role: veterinarian
25	Occupation (past or present): role: work for regional council
2	Occupation (past or present): role: work in the area of disability
24	Occupation (past or present): role: worked/s for council
29	Occupation (past or present): role: worked/s with/for medical profession
1	Occupation (past or present): role: working in a rural environment
3	Occupation (past or present): role: working in cold war era / nuclear deterrence
8	Occupation (past or present): role: working in law enforcement computing centre
1	Occupation (past or present): role: writer
3	Occupation (past or present): time spent working in role
3	Occupation: past or present: duties: doing emergency planning
5	Optimism
1	Optimism: so only undertook some preparedness actions
12	Panic: don't/won't panic
7	Panic: will or might panic
1	Personality: do things my way
1	Personality: doesn't like to dwell on dark / depressing topics
1	Personality: doesn't like to dwell on problems
1	Personality: likes a challenge
1	Personality: organised / likes organisation
1	Personality: practical person/people
2	Pessimism
1	Potential impacts of an event: might not be at the site of preparedness in an event
10	Potential impacts of an event: (many) people are doing to be injured
3	Potential impacts of an event: a large proportion of the population impacted
1	Potential impacts of an event: anything can happen in a volcanic eruption
5	Potential impacts of an event: could be disrupted longer than 3 days / might need to plan for longer
21	Potential impacts of an event: could be on your own / help not available
2	Potential impacts of an event: could move from one location and get caught with something worse at another
6	Potential impacts of an event: damaged house
1	Potential impacts of an event: damaged house: can't do much about that

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QUOTATION COUNT	CODE TITLE
16	Potential impacts of an event: depends on exact nature of event
11	Potential impacts of an event: depends on time of year (season) or weather at time
2	Potential impacts of an event: destroy the buildings in my town
1	Potential impacts of an event: destruction of the environment
6	Potential impacts of an event: disrupted communications
15	Potential impacts of an event: disrupted food and water
5	Potential impacts of an event: disrupted services
9	Potential impacts of an event: disrupted transport
3	Potential impacts of an event: disruption to life in general
1	Potential impacts of an event: drought: crop failure and food shortages
17	Potential impacts of an event: earthquake/disaster: just don't know what is going to happen/anything could happen
5	Potential impacts of an event: economic impacts / losses
1	Potential impacts of an event: hospital affected
7	Potential impacts of an event: I might be injured / die / out of action
3	Potential impacts of an event: if electricity goes off can't pump water
3	Potential impacts of an event: if electricity goes off won't have a freezer / fridge
3	Potential impacts of an event: if electricity goes off won't have lighting
5	Potential impacts of an event: if electricity goes off, might not have heating
7	Potential impacts of an event: if electricity goes off, need an alternative way of cooking
2	Potential impacts of an event: if power goes off can't listen to a plug-in radio
4	Potential impacts of an event: impacts on animals
3	Potential impacts of an event: increase in insurance costs / rejection of insurance
2	Potential impacts of an event: increase in rates
4	Potential impacts of an event: infrastructure damage
1	Potential impacts of an event: insurance company might go out of business
4	Potential impacts of an event: many people are doing to die
3	Potential impacts of an event: may have to move people out of harm's way
1	Potential impacts of an event: may have to wait until the event is over before you can do anything
11	Potential impacts of an event: may not be at home
6	Potential impacts of an event: might be separated from our friends/family
1	Potential impacts of an event: might need to ask for external (out of country) assistance
15	Potential impacts of an event: might not be able to reach preparedness items
4	Potential impacts of an event: might not be able to think/act clearly after an event
5	Potential impacts of an event: other people will be/are in the same (e.g. unprepared, damaged, suffering) situation as you.
22	Potential impacts of an event: power failure
1	Potential impacts of an event: Red tape might stop the flow of aid/relief/assistance
2	Potential impacts of an event: shocked by a loss of services (power, water, etc.)
1	Potential impacts of an event: snowstorm: ruined garden
3	Potential impacts of an event: staff unable to work
2	Potential impacts of an event: the quicker you can recover, the less likelihood that damage/disruption is an issue
3	Potential impacts of an event: the time may come when you don't have what you take for granted (water, power, etc.)
3	Potential impacts of an event: wind
1	Potential impacts of an event: wind: being struck by debris
3	Potential impacts of an event: wind: power lines going down
1	Potential impacts on an event: don't know how other people will fare (better than me or not?)
1	Potential impacts on an event: volcanic: breathing difficulties
25	Potential type of event: severe
1	Preparedness means: experience
3	Preparedness items owned: food: how much: 3 days' supply
3	Preparedness items owned: water: how much: 3 days' supply
1	Preparedness items: batteries (rechargeable): can't re-charge if there is a disaster / no power!
1	Preparedness items: batteries: can go flat
1	Preparedness items: can last for weeks
1	Preparedness items: cost: \$200-300

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QUOTATION COUNT	CODE TITLE
1	Preparedness items: disaster preparation is not their primary purpose
1	Preparedness items: empty water containers would be better to hold on to in a tsunami!
3	Preparedness items: for work: batteries
2	Preparedness items: for work: emergency plan
2	Preparedness items: for work: first aid kit
4	Preparedness items: for work: food
2	Preparedness items: for work: had a phone that didn't run off power
1	Preparedness items: for work: hand sanitizer
1	Preparedness items: for work: interviewee developed for work
1	Preparedness items: for work: masks
1	Preparedness items: for work: plastic bags
7	Preparedness items: for work: preparedness kit
2	Preparedness items: for work: radio
1	Preparedness items: for work: toilet paper
3	Preparedness items: for work: torch
1	Preparedness items: for work: warm blankets / bedding
1	Preparedness items: for work: water
1	Preparedness items: I don't know how long I should have it for
1	Preparedness items: I don't know if my preparedness item will work now
1	Preparedness items: I don't know what I should have
2	Preparedness items: items NOT owned: alternative cooking
1	Preparedness items: items NOT owned: alternative to electricity
1	Preparedness items: items NOT owned: buckets
1	Preparedness items: items NOT owned: candles
10	Preparedness items: items NOT owned: emergency kit
3	Preparedness items: items NOT owned: food
3	Preparedness items: items NOT owned: generator
1	Preparedness items: items NOT owned: log burner
3	Preparedness items: items NOT owned: matches
2	Preparedness items: items NOT owned: medication
1	Preparedness items: items NOT owned: radio
18	Preparedness items: items NOT owned: restrained furniture / objects / strengthening
1	Preparedness items: items NOT owned: spoons
2	Preparedness items: items NOT owned: torch
18	Preparedness items: items NOT owned: water
7	Preparedness items: items owned by others: alternative cooking
2	Preparedness items: items owned by others: alternative heating
6	Preparedness items: items owned by others: alternative power supply (generators, turbines)
5	Preparedness items: items owned by others: camping gear
1	Preparedness items: items owned by others: clothing
4	Preparedness items: items owned by others: emergency plan
2	Preparedness items: items owned by others: first aid kit
11	Preparedness items: items owned by others: food supply
2	Preparedness items: items owned by others: furniture/item restraints
1	Preparedness items: items owned by others: insurance
2	Preparedness items: items owned by others: liquids for drinking
1	Preparedness items: items owned by others: log fire
1	Preparedness items: items owned by others: mobile phone
11	Preparedness items: items owned by others: preparedness kit
1	Preparedness items: items owned by others: smoke alarm
1	Preparedness items: items owned by others: they have what we have
2	Preparedness items: items owned by others: tools
17	Preparedness items: items owned by others: water
1	Preparedness items: items owned: 4wd
1	Preparedness items: items owned: alcohol and other beverages!
42	Preparedness items: items owned: alternative cooking

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QUOTATION COUNT	CODE TITLE
3	Preparedness items: items owned: alternative power supply (generators, turbines)
20	Preparedness items: items owned: alternative temporary accommodation (e.g. tent, caravan)
21	Preparedness items: items owned: batteries
2	Preparedness items: items owned: batteries (rechargeable)
23	Preparedness items: items owned: BBQ
7	Preparedness items: items owned: blankets / warm bedding
6	Preparedness items: items owned: bleach
4	Preparedness items: items owned: bucket
12	Preparedness items: items owned: camping gear
2	Preparedness items: items owned: can opener
19	Preparedness items: items owned: candles
1	Preparedness items: items owned: cash / money (not relying on electronic sources)
5	Preparedness items: items owned: cell phone
2	Preparedness items: items owned: cleaning equipment/items
1	Preparedness items: items owned: dust mask
1	Preparedness items: items owned: emergency blanket
9	Preparedness items: items owned: extra fuel or keep car topped up with fuel
5	Preparedness items: items owned: fire extinguisher
1	Preparedness items: items owned: fireproof cupboard / area
16	Preparedness items: items owned: first aid
102	Preparedness items: items owned: food supply
1	Preparedness items: items owned: food supply: 2 weeks: why: people in poorer countries subsist on less
4	Preparedness items: items owned: food supply: how much 3-4 weeks
5	Preparedness items: items owned: food supply: how much: 1 month
1	Preparedness items: items owned: food supply: how much: 2 weeks
3	Preparedness items: items owned: food supply: how much: few days
1	Preparedness items: items owned: food supply: length keep: canned food could last for decades
1	Preparedness items: items owned: food supply: why: easy to keep
2	Preparedness items: items owned: food supply: why: keeps you alive
1	Preparedness items: items owned: food supply: why: might not be able to get food for a few days
16	Preparedness items: items owned: gas bottle/canister
1	Preparedness items: items owned: gas bottle/canister: length last: 2 weeks
8	Preparedness items: items owned: gas cooker / hob
1	Preparedness items: items owned: gas mask
1	Preparedness items: items owned: gun
13	Preparedness items: items owned: has an emergency plan
18	Preparedness items: items owned: heating device
1	Preparedness items: items owned: how decided they needed those items
2	Preparedness items: items owned: how much: 3 month supply
15	Preparedness items: items owned: insurance
1	Preparedness items: items owned: insurance: you pay someone else to worry about your hazards in future
9	Preparedness items: items owned: lighting
1	Preparedness items: items owned: lighting: can use street lights for lighting
10	Preparedness items: items owned: list of phone numbers/people who can help/network of people
22	Preparedness items: items owned: log burner/fireplace
8	Preparedness items: items owned: Matches / lighter
7	Preparedness items: items owned: medication
1	Preparedness items: items owned: more than one of each item (in case one isn't available in an emergency)
1	Preparedness items: items owned: Newspaper
1	Preparedness items: items owned: organised when moved in so don't have to think about it anymore
1	Preparedness items: items owned: pet food
6	Preparedness items: items owned: phone that doesn't run off power
4	Preparedness items: items owned: plastic bags
1	Preparedness items: items owned: plastic gloves
17	Preparedness items: items owned: preparedness kit
1	Preparedness items: items owned: preparedness kit: don't want it too heavy

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QUOTATION COUNT	CODE TITLE
5	Preparedness items: items owned: purifying tablets or a way of purifying water
25	Preparedness items: items owned: radio
2	Preparedness items: items owned: rain gear
14	Preparedness items: items owned: restrained furniture
2	Preparedness items: items owned: restraints: why: did when moved in
1	Preparedness items: items owned: restraints: why: insurance company required it
2	Preparedness items: items owned: restraints: why: personal safety
3	Preparedness items: items owned: restraints: why: to save valuable items
1	Preparedness items: items owned: rope
11	Preparedness items: items owned: small power source (e.g. solar, crank, campervan engine)
14	Preparedness items: items owned: smoke / fire alarm
3	Preparedness items: items owned: snow chains
11	Preparedness items: items owned: spare clothing / appropriate clothing
1	Preparedness items: items owned: table to shelter under
4	Preparedness items: items owned: tank water
3	Preparedness items: items owned: toilet paper
10	Preparedness items: items owned: tools
37	Preparedness items: items owned: torch
5	Preparedness items: items owned: vegetable garden, bees, etc.
113	Preparedness items: items owned: water
3	Preparedness items: items owned: water from tap
2	Preparedness items: items owned: water from tap: why: trusts fresh water from tap
5	Preparedness items: items owned: water pump
1	Preparedness items: items owned: water safety equipment (e.g. life jackets, canoe)
4	Preparedness items: items owned: water: bottled water
4	Preparedness items: items owned: water: can rely on nearby creeks / rivers
3	Preparedness items: items owned: water: can use hot water cylinder for additional water
10	Preparedness items: items owned: water: can use rain / tank / bore water for water
2	Preparedness items: items owned: water: can use toilet cistern for additional water
5	Preparedness items: items owned: water: how much: 20 litres
4	Preparedness items: items owned: water: how much: 200-400 gallons (tank)
1	Preparedness items: items owned: water: how much: 30 litres
3	Preparedness items: items owned: water: how much: 4 litres
1	Preparedness items: items owned: water: how much: 40 litres
3	Preparedness items: items owned: water: how much: 6 litres
2	Preparedness items: items owned: water: how much: 60 litres
1	Preparedness items: items owned: water: how much: a week's supply
1	Preparedness items: items owned: water: how much: enough for 1 day
1	Preparedness items: items owned: water: how much: not much / not a lot
1	Preparedness items: items owned: water: how much: one bottle
3	Preparedness items: items owned: water: how much: still might not have enough
1	Preparedness items: items owned: water: how much: we wouldn't run out of water
1	Preparedness items: items owned: water: length it would last in an emergency
4	Preparedness items: items owned: water: why: can't exist without water/water essential
1	Preparedness items: items owned: water: why: fussy about water quality
1	Preparedness items: items owned: water: why: have travelled widely and experienced poor water
1	Preparedness items: items owned: water: why: in case I need it
1	Preparedness items: items owned: water: why: might need to survive a long time
1	Preparedness items: items owned: water: why: water stops first/easily cut off
1	Preparedness items: items owned: wet wipes
1	Preparedness items: items owned: wet wipes: why: conserve water
1	Preparedness items: items owned: wet wipes: why: use for cleaning
1	Preparedness items: items owned: why it was the one thing I didn't have already
1	Preparedness items: items owned: why they keep them in certain places
7	Preparedness items: items owned: wood
1	Preparedness items: it's amazing what is available

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QUOTATION COUNT	CODE TITLE
2	Preparedness items: log burner / fire: good because you can cook on them
7	Preparedness items: log burner / fire: were trying to get people to do away with them
11	Preparedness items: many items/plans can be used for lots of types of emergencies / disasters ('all hazards' or 'general preparedness')
1	Preparedness items: most important items: emergency blanket
2	Preparedness items: most important items: food
1	Preparedness items: most important items: furniture restraints / restraints general
2	Preparedness items: most important items: heating
1	Preparedness items: most important items: light
1	Preparedness items: most important items: restraints more important than water/food because will be affected first by falling furniture
1	Preparedness items: most important items: shelter / alternative accommodation
10	Preparedness items: most important items: water
7	Preparedness items: preparedness items / needs have changed over the years
8	Preparedness items: should have: batteries
5	Preparedness items: should have: buckets
2	Preparedness items: should have: can opener
3	Preparedness items: should have: candles
6	Preparedness items: should have: communication method
10	Preparedness items: should have: cooking facility
3	Preparedness items: should have: electricity alternative
1	Preparedness items: should have: emergency blanket
15	Preparedness items: should have: emergency plan
1	Preparedness items: should have: extra gas
9	Preparedness items: should have: first aid
52	Preparedness items: should have: food
1	Preparedness items: should have: food: for 5 days
3	Preparedness items: should have: fuel
2	Preparedness items: should have: generator
6	Preparedness items: should have: heating facility
1	Preparedness items: should have: identification
7	Preparedness items: should have: insurance
4	Preparedness items: should have: items that are reliant on each other (e.g. can and can opener; torch and batteries)
4	Preparedness items: should have: light facility
1	Preparedness items: should have: liquids for drinking
7	Preparedness items: should have: list of phone numbers/ contacts in an emergency
2	Preparedness items: should have: list of resources or items within the community that can be used in an emergency
5	Preparedness items: should have: matches/lighter
5	Preparedness items: should have: medication
1	Preparedness items: should have: money available
2	Preparedness items: should have: phone that doesn't run off power
4	Preparedness items: should have: plastic bags
27	Preparedness items: should have: preparedness kit
9	Preparedness items: should have: radio
1	Preparedness items: should have: radio: why: to be aware of what is going on in a disaster
7	Preparedness items: should have: restraints for furniture or objects
1	Preparedness items: should have: sandbags
10	Preparedness items: should have: shelter / alternative accommodation
1	Preparedness items: should have: shelter / alternative accommodation: why: without it creates a lot of other problems
2	Preparedness items: should have: tarpaulin/heavy plastic
2	Preparedness items: should have: teach someone how to use/do it before hand
1	Preparedness items: should have: toilet paper
4	Preparedness items: should have: tools
13	Preparedness items: should have: torch
6	Preparedness items: should have: torch/radio that doesn't need batteries/power

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QUOTATION COUNT	CODE TITLE
1	Preparedness items: should have: utensils
13	Preparedness items: should have: warm / appropriate clothing
5	Preparedness items: should have: warm blankets / covers
56	Preparedness items: should have: water
1	Preparedness items: should have: water for a few days
1	Preparedness items: should have: water for more than 3 days
1	Preparedness items: should have: water: 4-5 litres per day
3	Preparedness items: should have: water: why: can't exist without water/water essential
1	Preparedness items: should have: water: why: might need to survive long time
1	Preparedness items: should have: water: why: might not be available
2	Preparedness items: should have: water: why: water stops first/easily cut off
2	Preparedness items: should have: water: why: won't be able to access fresh / good water
7	Preparedness items: some items rely on others to be of use (e.g. batteries and radio; protected by restraints first, then can use food water))
1	Preparedness items: water: don't actually know if people would use water in toilet cistern
2	Preparedness items: water: don't know how long it lasts
2	Preparedness items: where keeps: if you keep in two places you're doubling your chances
4	Preparedness items: where keeps: in car
3	Preparedness items: where keeps: in different locations
2	Preparedness items: where keeps: in different locations: why in case can't get to some locations to reach them
11	Preparedness items: where keeps: in house (general)
3	Preparedness items: where keeps: in house: bedroom
4	Preparedness items: where keeps: in house: spare bedroom/room
13	Preparedness items: where keeps: items: in easily accessible places
11	Preparedness items: where keeps: kit/items: freezer/fridge
1	Preparedness items: where keeps: kit/items: freezer: why: saves energy and is a place to keep spare water
28	Preparedness items: where keeps: kit/items: Outside of house (e.g. garage, shed, flat)
1	Preparedness items: where keeps: kit/items: Outside of house (e.g. garage, shed, flat): why: a personal space not in/different from the house
1	Preparedness items: where keeps: kit/items: Outside of house (e.g. garage, shed, flat): why: don't know where else to put it
1	Preparedness items: where keeps: my spouse/family does know where I keep an item
1	Preparedness items: where keeps: my spouse/family probably doesn't know where I keep an item
1	Preparedness items: where keeps: not all together in one place
2	Preparedness items: where keeps: on bottom shelf (so don't fall off / doesn't injure)
4	Preparedness items: where keeps: the item/s are small so it's no problem where to keep them
1	Preparedness items: where keeps: we don't have much room for storage, so had to find a place
1	Preparedness items: wouldn't worry about collecting preparedness items, if you were in immediate response/survival mode
6	Preparedness means: able to live without normal features of modern society
3	Preparedness means: being alert to danger
3	Preparedness means: being prepared for an eventuality
8	Preparedness means: being prepared for life / daily living / everything we do / a philosophy
8	Preparedness means: being prepared for rural living
7	Preparedness means: being prepared to act/respond in a disaster
11	Preparedness means: being proactive
4	Preparedness means: being self-sufficient to sustain life in a disaster
1	Preparedness means: being wary
6	Preparedness means: considering the possibility of natural hazards in advance/ahead of time
6	Preparedness means: creating a safe environment
1	Preparedness means: depends on the circumstances
7	Preparedness means: forward planning or having a plan / strategy
2	Preparedness means: having alternatives or knowing what alternatives are available
2	Preparedness means: having an idea of what might happen
11	Preparedness means: having the recommended emergency items (e.g. from phone book, survival bucket)
3	Preparedness means: having the required items to survive
3	Preparedness means: intelligent anticipation

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QUOTATION COUNT	CODE TITLE
7	Preparedness means: knowing what and how you could / should respond in an event
3	Preparedness means: knowing who to contact in an event / where to get help
1	Preparedness means: knowledge
2	Preparedness means: looking after your personal health
6	Preparedness means: personal safety
1	Preparedness means: prevention
7	Preparedness means: protecting yourself (and your family/children)
2	Preparedness means: retrofitting / earthquake proofing your house
8	Preparedness means: safety of everybody / keeping yourself safe
13	Preparedness means: self-reliance / looking after yourself
1	Preparedness means: showing initiative
2	Preparedness means: staying alive in a disaster
13	Preparedness means: taking sensible precautions
3	Preparedness means: thinking about what might happen in advance/ahead of time (rather than the practical steps)
1	Preparedness prompt: observing natural phenomena, or possibility of unnatural phenomena
1	Preparedness prompt: OSH regulations at work
1	Preparedness prompt: seeing how others have prepared
33	Preparedness type: always keep extra supplies at home just so not to run out
2	Preparedness type: appropriate storage of hazardous substances
1	Preparedness type: are aware items are available if needed
17	Preparedness type: basic skills to survive (e.g. camping, lighting fires, boiling water, etc.)
37	Preparedness type: building code/standards/good construction/safe structures
4	Preparedness type: calling/asking a service to help out (e.g. training, install smoke alarms, etc.)
4	Preparedness type: convenience of having things ready
35	Preparedness type: drills / evacuations / exercises
1	Preparedness type: drills / evacuations / exercises: have done some drills (e.g. fire), but not others (e.g. tsunami)
2	Preparedness type: drive through flooded / snowfall areas in a particular way
1	Preparedness type: emergency centres for living/sleeping
19	Preparedness type: ensure exits and escape routes are available/clear
1	Preparedness type: ensuring gutters around house are clear (e.g. clean leaves out, put netting over)
6	Preparedness type: exercise caution / take more care
13	Preparedness type: general safety
1	Preparedness type: get to know neighbours
27	Preparedness type: hard / structural mitigation measures in the town
5	Preparedness type: having the skills to be able to find food, water, shelter in a disaster
37	Preparedness type: hazards/preparedness education for school aged children
5	Preparedness type: incorporates preparedness into household/work routine
47	Preparedness type: just what is in the house now / things we normally have
3	Preparedness type: keep heavy items down low / in places where they can't fall
11	Preparedness type: keep important documents in a safe or accessible place
8	Preparedness type: keeps a preparedness kit
1	Preparedness type: know where everything is: why: had to use them in a previous event
24	Preparedness type: know where items are in house/building, or where to find them
12	Preparedness type: learn lessons from the past
2	Preparedness type: look for a "way out" every time
13	Preparedness type: move to another (safer) house/building/area
1	Preparedness type: need to define the likelihood of an event for yourself
2	Preparedness type: need to improvise when a disaster occurs for the things I haven't done
3	Preparedness type: need to look after for a period of time (not specified)
4	Preparedness type: need to look after for the short term
24	Preparedness type: need to look after ourselves for three days
5	Preparedness type: our organisation/group supplies preparedness/relief items in a disaster
5	Preparedness type: pandemic
7	Preparedness type: plan for longer than 3 days
3	Preparedness type: plans for the operation of community services / CD during a disaster

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QUOTATION COUNT	CODE TITLE
7	Preparedness type: plans to be involved in an organisation during an emergency (e.g. fire, CD, CAB)
1	Preparedness type: plans to turn over (and use) food every 6 months as part of sustained preparedness
10	Preparedness type: policies/procedures on how to deal with hazards/preparedness (e.g. earthquakes, tsunami)
2	Preparedness type: prepare as well as you can so that you can cope in a disaster
3	Preparedness type: prepared as a community as a whole
13	Preparedness type: prepared for electricity failure
2	Preparedness type: prepared from time to time / not always specifically prepared
52	Preparedness type: prepared item/s specifically for an emergency
2	Preparedness type: preparedness for a hazardous recreational pursuit
1	Preparedness type: preparedness for climate change / global warming
1	Preparedness type: preparedness for vehicles, aircraft safety etc.
12	Preparedness type: preparedness required in the school environment
1	Preparedness type: preparedness required in the school environment: response: ridiculous: why: kids wouldn't stay there in a disaster
44	Preparedness type: preparedness required in the workplace / OSH
4	Preparedness type: put items away, but not 'planned' for an emergency as such
44	Preparedness type: refers to survival items / survival
2	Preparedness type: rely on own background and/or training
2	Preparedness type: remove dangerous items (e.g. trees, structures)
7	Preparedness type: retrofitting building for hazards, when upgrading or making alterations to building
2	Preparedness type: sandbagging for flooding
1	Preparedness type: sometimes get the children to look after the emergency supplies
14	Preparedness type: town/land-use planning for hazards (including houses, roads, etc.)
1	Preparedness type: training: community safety / community awareness
4	Preparedness type: training: fire safety
14	Preparedness type: training: first aid /medical training
13	Preparedness type: training: for basic survival skills (e.g. camping, lighting fires, etc.)
1	Preparedness type: training: for crashes
2	Preparedness type: training: for hazardous recreational pursuits
1	Preparedness type: training: haven't kept it up to date since I left work
3	Preparedness type: training: induction at the workplace
5	Preparedness type: training: pass on skills to family
1	Preparedness type: training: preparing the workplace for a disaster (i.e. putting mitigation in place)
6	Preparedness type: training: safe practices in the workplace
2	Preparedness type: training: should undertake
18	Preparedness type: training: trained others for emergencies / disasters
1	Preparedness type: training: trained others on safety issues
20	Preparedness type: training: training for emergencies / disasters
2	Preparedness type: training: training should focus on young people
2	Preparedness type: training: training was/should be repeated frequently
1	Preparedness type: try to live in an area where you can receive a warning
1	Preparedness type: try not to go to a hazardous area
24	Preparedness type: try not to live in a hazardous area
1	Preparedness type: undertaken an action per week
24	Preparedness type: use of existing items (or items in general use) for preparing.
1	Preparedness type: wearing protective hat / clothing / sunscreen for the sun's rays
1	Preparedness/response: affected if you are from overseas/tourist
5	Preparedness: acceptance of some uncertainty that (your) "preparing may not be enough"
8	Preparedness: better to eliminate/avoid a hazard than to have a problem/accident
2	Preparedness: can't comprehend what you might need if you haven't experienced it
3	Preparedness: can't help other people if you can't help yourself OR if you help yourself you can better help others
13	Preparedness: can't see how they can possibly prepare/plan for certain disasters (or prepare fully)
2	Preparedness: can become an obsession if you prepare for what MIGHT happen
2	Preparedness: can make decisions about what you do
1	Preparedness: can only plan for earthquake by engineering structures

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QUOTATION COUNT	CODE TITLE
12	Preparedness: can only take a limited number of preparedness actions / can only do so much
3	Preparedness: can prepare for some hazards and not for others (e.g. hazard type, minor vs. large, etc.)
3	Preparedness: can prepared all you like, but it's how you respond at the time (decisions you make) that will determine survival
1	Preparedness: cannot legislate for
1	Preparedness: depends on how long your disaster lasts
1	Preparedness: depends on the degree of the disaster
2	Preparedness: depends on the person / personality
4	Preparedness: different for urban vs. rural
1	Preparedness: doesn't take a lot of planning to get together some simple preparedness items
1	Preparedness: doesn't think renting or not owning home makes a difference to preparing
3	Preparedness: don't focus (create a life) around emergency/hazard situations, focus on being prepared for anything
1	Preparedness: don't know what I would do if lasts longer than I have prepared for
5	Preparedness: don't know what you are preparing for / can't tell before the event
1	Preparedness: don't know when I last undertook the preparedness
5	Preparedness: don't need to be totally prepared because it might/will never happen
1	Preparedness: earthquakes you are likely to be less prepared for: why: because the come without warning
9	Preparedness: easy
3	Preparedness: education / awareness raising should not scare people
2	Preparedness: education for older people would be good
6	Preparedness: education is important / should undertake
1	Preparedness: encompasses logical thinking
2	Preparedness: familiar with preparedness / preparing
1	Preparedness: has become more developed over time
4	Preparedness: have helped others with 'preparedness' but haven't done anything ourselves
2	Preparedness: how prepare: use a checklist of preparedness items
1	Preparedness: how prepare: used telephone book information
2	Preparedness: I find it easier to do those things (i.e. preparedness actions) that I can do myself
1	Preparedness: if an event never happens, and you haven't prepared, then you haven't lost anything
1	Preparedness: if in regular use, have to be careful you don't use the item before you need it (e.g. medicine, food, etc.)
1	Preparedness: if you plan for these things and nothing happens, is it a problem? No
21	Preparedness: intends to prepare
10	Preparedness: intends to prepare: but hasn't / never gets it done
1	Preparedness: intends to prepare: what: make an emergency plan
3	Preparedness: intends to prepare: when: makes alterations to house
1	Preparedness: intends to prepare: when: when builds own house
1	Preparedness: is a 'yes' or 'no' - can't put a number on it
13	Preparedness: is seen as a requirement (e.g. under OSH, insurance, pool regulations)
3	Preparedness: issues: region divided into different jurisdictions/fragmented
2	Preparedness: it's a 'difficult thing' (in terms of choices over what to)
4	Preparedness: it's a bit like having 'insurance'
4	Preparedness: like the "boy scouts"
1	Preparedness: likely that other people around you won't be prepared when a disaster occurs
1	Preparedness: made no special precautions for an earthquake
1	Preparedness: may not have equipment if they don't use it regular (e.g. matches)
4	Preparedness: maybe should prepare
5	Preparedness: might never be needed but at least it's there
9	Preparedness: might not be available in a disaster
3	Preparedness: might not need it for many years until an event happens
1	Preparedness: might plan for one hazard but miss another
2	Preparedness: need to be able to communicate in a disaster
1	Preparedness: need to be familiar with thinking about preparedness
9	Preparedness: need to be prepared for/with simple things
4	Preparedness: need to think about it and recognise it
2	Preparedness: needs to be 'chipped away' at / keep at it

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QUOTATION COUNT	CODE TITLE
1	Preparedness: never actually looked into whether need preparedness items
3	Preparedness: never had to use preparedness kit / items before
3	Preparedness: not a social norm
2	Preparedness: occurs because you are sharp / intelligent / smart
2	Preparedness: once prepared, then can put that to one side / forget about it
1	Preparedness: other people should prepare (not me - I don't need to)
2	Preparedness: people are moving away from log burners, etc., and toward electricity (not good with no power)
1	Preparedness: people should assume something might/will happen in their lifetime and prepare
5	Preparedness: prompt: being in the boy scouts / girl guides (or similar organisation) as a youngster
2	Preparedness: prompt: experiencing power cuts
3	Preparedness: prompt: hopes that they would receive a warning so they could prepare
1	Preparedness: prompt: neighbourhood watch
1	Preparedness: prompt: recreational activity (e.g. walking near a hazardous area)
1	Preparedness: prompt: safety for outdoor activities (e.g. tramping)
1	Preparedness: prompt: seeing a panel discussion on TV about hazards/preparedness
1	Preparedness: prompt: smoke alarm kept going off
17	Preparedness: prompt: working with an organisation in the past or present that deals with hazard/preparedness issues
2	Preparedness: prompt: Y2k
1	Preparedness: protecting yourself means: avoiding problems in the first place
1	Preparedness: protecting yourself means: look after yourself as best you can
9	Preparedness: seeks to improve - anything that's done already can always be done better
1	Preparedness: sees actions undertaken as positive or beneficial
2	Preparedness: should be a social norm
19	Preparedness: should be prepared "for life" / daily living / for everything we do
7	Preparedness: should be prepared because we are subject to hazards
2	Preparedness: should be prepared for anything
31	Preparedness: should just be prepared if / just in case it does come
1	Preparedness: should not be a surprise
1	Preparedness: should occur well before an event
11	Preparedness: should prepare because you never know / don't know
1	Preparedness: should prepare for what you think might happen
12	Preparedness: shouldn't totally focus on / obsess about / worry about something that might happen
3	Preparedness: some preparedness is better than nothing / got to start somewhere / do the minimum
2	Preparedness: takes a nudge / prompt to get started
9	Preparedness: the preparedness I've made (or could make) might not be any good in an event
3	Preparedness: there are different levels of preparedness (e.g. preparedness items versus preparedness planning)
1	Preparedness: those who aren't prepared can be a danger to others
2	Preparedness: town planning for hazards is a near impossible/ineffective task
23	Preparedness: understanding a need to be prepared but being under or not prepared
1	Preparedness: we can SEE those preparations
4	Preparedness: were/are tuned into what was/is required
1	Preparedness: who needs to prepare: rural people / easily isolated people
1	Preparedness: who undertakes: children
2	Preparedness: who undertakes: community-minded people more likely to undertake preparedness
3	Preparedness: who undertakes: fire service
22	Preparedness: who undertakes: I do
8	Preparedness: who undertakes: my spouse
1	Preparedness: who undertakes: neighbourhood watch
4	Preparedness: who undertakes: shared / collective
1	Preparedness: would be more resilient/prepared if you had to forage / survive as part of a daily basis
1	Preparedness: would seem silly to get to a disaster and say "I always meant to" prepare
1	Preparedness meaning: letting people know what you expect of them in a disaster
94	Preparing important
1	Preparing important: more important now-days than in the past

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QUOTATION COUNT	CODE TITLE
8	Preparing important: only a bit/relatively important
3	Preparing important: why: avoid problems so there are no serious results
1	Preparing important: why: because there will be no response if something happens and you are not prepared
2	Preparing important: why: because we could be on our own in an event
1	Preparing important: why: can't expect others to look after you
3	Preparing important: why: can get caught out if not prepared
4	Preparing important: why: can happen
3	Preparing important: why: disasters happening more often / frequently
2	Preparing important: why: do happen
2	Preparing important: why: event overdue
1	Preparing important: why: have seen the consequences of not preparing
2	Preparing important: why: hazards are common here / there
2	Preparing important: why: high probability of something happening today (than in past)
2	Preparing important: why: higher chance of safety
2	Preparing important: why: higher chance of survival
2	Preparing important: why: I value my life / want to survive
1	Preparing important: why: is a necessity of nature
1	Preparing important: why: it will make life easier after a disaster if you're prepared
1	Preparing important: why: know the local area has experienced past disasters
1	Preparing important: why: less scary
9	Preparing important: why: live in hazardous location (or if you live in a hazardous location)
1	Preparing important: why: might not get a warning
1	Preparing important: why: need to make provision to protect yourself
1	Preparing important: why: seen the consequences of disasters overseas
1	Preparing important: why: should prepare for the type of disasters we get here
2	Preparing important: why: so you know what to do in a disaster
3	Preparing important: why: will happen
1	Preparing not that important
1	Preparing not that important: don't think a disaster will happen / won't happen
1	Preparing: a certain action might be important
1	Preparing: allows you to 'sit back and wait it out' after a disaster
11	Preparing: can be or 'is over the top' / an over-reaction
2	Preparing: depends on the amount of risk for a particular disaster / weigh up risk
1	Preparing: don't have a lot of experience in that area
1	Preparing: I'm not sure if I'm typical / like others or not
3	Preparing: I like to be prepared
10	Preparing: is a balance
3	Preparing: is a personal choice
4	Preparing: is a personal judgement call
2	Preparing: is the right thing to do
2	Preparing: makes life easier after a disaster
7	Preparing: makes sense / is sensible
2	Preparing: more importance placed on preparing as more aware of hazards/disasters occurring
16	Preparing: needs planning and organisation to happen
1	Preparing: not a huge sacrifice
2	Preparing: not considered practical
2	Preparing: other people aren't cooperative when it comes to preparing
3	Preparing: reduces a risk
11	Preparing: relative importance of activities related to preparing, compared with other activities
1	Preparing: should 'step up' to it
11	Preparing: should be a middle ground/lower level/minimum (rather than to the extreme)
12	Preparing: should be based on common sense / realistic expectations / is practical
1	Preparing: sometimes need to compromise between doing some things and not doing others
1	Preparing: until you've had to do it yourself, you're not the least bit interested
9	Preparing: what I/we think and what I/we do are different
3	Preparing: you can't protect yourself against / plan for everything

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QUOTATION COUNT	CODE TITLE
21	Priorities in disasters
1	Priorities in disasters: children first
4	Priorities in disasters: family
1	Priorities in disasters: finding shelter
1	Priorities in disasters: government will be dealing with larger issues first (than the individual)
1	Priorities in disasters: many people don't think 'women and children are first' now
1	Priorities in disasters: the elderly first
1	Priorities in disasters: women and children first
2	Priorities in disasters: yourself/own safety
41	Priorities in times of quiescence
1	Priorities in times of quiescence: community access to / connectivity with the river
1	Priorities in times of quiescence: community activities
18	Priorities in times of quiescence: daily life
2	Priorities in times of quiescence: equipment in the house (e.g. computer safety)
5	Priorities in times of quiescence: family
2	Priorities in times of quiescence: financial 'hazards' (money issues)
1	Priorities in times of quiescence: fire safety
2	Priorities in times of quiescence: having a view of the river
7	Priorities in times of quiescence: health and medical wellbeing
1	Priorities in times of quiescence: industrial hazards
2	Priorities in times of quiescence: insurance
1	Priorities in times of quiescence: need to deal with 'tomorrows issues' rather than a disaster that might occur 25 years from now
13	Priorities in times of quiescence: other priorities (general)
1	Priorities in times of quiescence: other priorities are understandable
6	Priorities in times of quiescence: work
1	Priorities: Preserving/protecting assets more important (bigger driver) than safety
9	Problem solver
1	Question: are the younger generation aware of global warming?
1	Question: what do other towns do to make...
1	Question: Where do other people keep their preparedness items?
1	Questions: do you know anything about how buildings stand up to earthquakes?
1	Questions: Do you live in fear of a hazard happening?
1	Questions: do you think earthquakes are more frequent now?
1	Questions: Do you think the army would be called to help in a hazardous situation?
3	Questions: have you experienced any earthquakes (there)?
1	Questions: Have you gone through an earthquake?
1	Questions: have you lived through anything?
1	Questions: how do you avoid dangerous situations? (e.g. where a river rises rapidly)
5	Questions: how do you motivate people to prepare for an event?
1	Questions: How much water should I store?
1	Questions: How prepared would YOU be?
2	Questions: what hazards are there here?
1	Questions: what is the best way of preparing? / How should I prepare?
1	Questions: what is the level of preparedness?
1	Questions: what would you/other people do for a flood event?
1	Questions: why don't we talk about hazards/preparedness?
1	Questions: will you suggest that hospital boards be included in emergency planning?
1	Questions: would it be big/strong enough to cause damage?
20	Reaction in an event
3	Reactor
4	Realism: realistic expectations
1	Realism: realistic optimism
1	Realism: realistic pessimism
26	Reality: hazards/preparedness is a reality / fact of life
12	Reliant on things controlled by others
2	Resource issues: capability

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QUOTATION COUNT	CODE TITLE
1	Resource issues: capability: emergency kits will only be made up by people with capability
1	Resource issues: incentives: offering incentives for participating / preparing
1	Resource issues: infrastructure providers don't have the resources available for emergencies
58	Resource issues: money
1	Resource issues: money: affects us filling up our car/ cans with fuel
2	Resource issues: money: communication costs are expensive in a rural area in a disaster
2	Resource issues: money: council assisted community by buying back hazardous properties
1	Resource issues: money: cutbacks to civil defence budget
1	Resource issues: money: don't often see what your money contributes to at the CD level
10	Resource issues: money: have to balance the cost against the consequences
1	Resource issues: money: have to be aware of whether you can/can't get insurance with such high property prices
1	Resource issues: money: hazards can affect property values / prices
2	Resource issues: money: I'm happy to pay rates toward preparedness mechanism
2	Resource issues: money: I've paid my taxes / rates so I should be helped
7	Resource issues: money: interviewee seems financially able or admits is financially able
1	Resource Issues: money: living in a hazardous area costs more money (e.g. rates, insurance, higher)
3	Resource issues: money: makes economic sense to prepare
3	Resource issues: money: might not have enough money/resources to recover (quickly) after a disaster (beyond our resources)
4	Resource issues: money: not economically feasible to protect yourself against large/some events (e.g. 1,000 year flood)
1	Resource issues: money: not economically feasible to retrofit entire house/building
1	Resource issues: money: not enough money to replace infrastructure
7	Resource issues: money: not worth it to spend money making lots of preparations
1	Resource issues: money: our taxes/rates can help pay for more personnel for emergencies
1	Resource issues: money: people who are well off might expect more help in a disaster
1	Resource issues: money: people with resources will be the only ones with emergency kits
15	Resource issues: money: preparedness is/can be expensive
1	Resource issues: money: preparedness needs to be funded adequately
3	Resource issues: money: ratepayers had to pay for new council building
2	Resource issues: money: rates are used to pay for flood mitigation
1	Resource issues: money: the government has provided a lot of funding for emergency management
7	Resource issues: money: the preparedness/safety things that need to be done are not expensive
3	Resource issues: money: the things that cost money are the things that take longest to do
2	Resource issues: money: there are more urgent / important things to spend our money on
1	Resource issues: money: who should pay?
4	Resource issues: money: why should we pay for something that might never happen to us?
1	Resource issues: money: would restrict how much I could donate for relief / aid
2	Resource issues: resources: need good general resources (e.g. jobs, schools, doctor) in a community
1	Resource issues: resources: civil defence have resources to help in an emergency
1	Resource issues: resources: civil defence have supplied resources to the community to help in an emergency
1	Resource issues: resources: don't have good equipment/resources for finding out information
2	Resource issues: resources: government (e.g. local, central) is the only organisation that has the resources to deal with a disaster
1	Resource issues: resources: have discussed what resources or items might be available in our community following a disaster
1	Resource issues: resources: need to have alternative resources for a disaster
2	Resource issues: resources: there are only limited resources available in an emergency
1	Resource issues: resources: we have ready access to hazard/preparedness resources at our workplace
2	Resource issues: resources: we have ready access to hazard/preparedness resources in our community
15	Resource issues: time
2	Resource issues: time: don't have time to commit to too many community groups/activities
2	Resource issues: time: don't have time to find out more information about hazards/preparedness
1	Resource issues: time: need to set aside time to prepare/plan
2	Resource issues: time: not enough time is spent consulting on important hazard issues
1	Resource issues: time: preparing takes a bit of time now and again
1	Resource issues: time: takes time to think about and discuss hazard issues

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QUOTATION COUNT	CODE TITLE
1	Resource issues: time: takes time/resources to update information
2	Resource issues: time: time spent preparing for hazards is time not spent on other things
1	Resource issues: time: too much time is spent deciding what to do on preparedness/mitigation
1	Resource: personnel issues: key person undertaking preparedness/planning task left
2	Resourceful: considers the elderly to be more resourceful: why: because of their upbringing
23	Resourceful: considers themselves (or others) to be resourceful
1	Resourceful: considers themselves able to alter a situation to become more acceptable
2	Resourceful: considers themselves to be a fast reactor
3	Resourceful: if resourceful can cope/not panic
3	Response: depends on the person / personality
2	Response: people may respond differently to normal / how they think they will respond
2	Response: should be based on common sense / realistic expectations
6	Responsibility for dealing with hazards depends whether its big/severe (e.g. major earthquake) or small (e.g. burglaries; house fire)
2	Responsibility for dealing with hazards/preparedness: central government: IMMEDIATELY post disaster
2	Responsibility for dealing with hazards/preparedness: local government: IMMEDIATELY post disaster
1	Responsibility for dealing with hazards: a desire for it to be someone else responsibility
8	Responsibility for dealing with hazards: adults / parents
2	Responsibility for dealing with hazards: adults: role: guiding children
7	Responsibility for dealing with hazards: army
4	Responsibility for dealing with hazards: army: role: call on army to respond / assist in a disaster
1	Responsibility for dealing with hazards: building inspectors
1	Responsibility for dealing with hazards: can't expect children to be responsible
1	Responsibility for dealing with hazards: central government: role assist individuals
24	Responsibility for dealing with hazards: central government
1	Responsibility for dealing with hazards: central government: role: assist after 3 days
1	Responsibility for dealing with hazards: central government: role: deal with large disasters / big recovery
6	Responsibility for dealing with hazards: central government: role: education
1	Responsibility for dealing with hazards: central government: role: ensure delivery of services post disaster
1	Responsibility for dealing with hazards: central government: role: ensure there is a system of tsunami measurement and notification
1	Responsibility for dealing with hazards: central government: role: funding hazard mitigation
3	Responsibility for dealing with hazards: central government: role: have plans / systems in place
1	Responsibility for dealing with hazards: central government: role: international relations
8	Responsibility for dealing with hazards: central government: role: mobilisation / coordination to deal with issues post disaster
1	Responsibility for dealing with hazards: central government: role: research tsunami risk
1	Responsibility for dealing with hazards: central government: when: declared disaster
32	Responsibility for dealing with hazards: Civil Defence
1	Responsibility for dealing with hazards: Civil Defence: role: declare a civil emergency
5	Responsibility for dealing with hazards: Civil Defence: role: education
2	Responsibility for dealing with hazards: Civil Defence: role: have plans/systems in place
2	Responsibility for dealing with hazards: Civil Defence: role: having a warning /alarm system
2	Responsibility for dealing with hazards: Civil Defence: role: having organised meeting places
1	Responsibility for dealing with hazards: Civil Defence: role: having regional CDEM groups
2	Responsibility for dealing with hazards: civil defence: role: information provision during a disaster
4	Responsibility for dealing with hazards: civil defence: role: mobilisation / coordination to deal with issues post disaster
1	Responsibility for dealing with hazards: Civil Defence: role: notifying / warning people of an impending event
1	Responsibility for dealing with hazards: Civil Defence: role: organise preparedness items into kits for people
1	Responsibility for dealing with hazards: Civil Defence: role: organising people after a disaster (e.g. collecting names)
1	Responsibility for dealing with hazards: Civil Defence: role: protection and defence
2	Responsibility for dealing with hazards: commercial/shops
2	Responsibility for dealing with hazards: commercial/shops: role: securing/restraining objects
2	Responsibility for dealing with hazards: community (general)
1	Responsibility for dealing with hazards: community (general): role: safety/security
16	Responsibility for dealing with hazards: community groups

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QUOTATION COUNT	CODE TITLE
8	Responsibility for dealing with hazards: community groups: role: disaster relief
2	Responsibility for dealing with hazards: community groups: role: hands-on support
1	Responsibility for dealing with hazards: community groups: role: help others during a disaster
5	Responsibility for dealing with hazards: community groups: role: organising preparedness/emergency kits for the community
2	Responsibility for dealing with hazards: community groups: role: safety/security
3	Responsibility for dealing with hazards: community groups: role: support role rather than an organisational role (coordinated by others)
2	Responsibility for dealing with hazards: depends if the individual can cope with it on their own or not (overwhelms)
1	Responsibility for dealing with hazards: depends on the circumstances
4	Responsibility for dealing with hazards: depends on the scale of disaster
6	Responsibility for dealing with hazards: depends on the type of disaster/hazard
1	Responsibility for dealing with hazards: depends on warning time
1	Responsibility for dealing with hazards: depends on where you are
5	Responsibility for dealing with hazards: different depending on the timeframe (i.e. individual first 3 days, authorities help after that)
2	Responsibility for dealing with hazards: don't know
1	Responsibility for dealing with hazards: during/after a disaster you should leave certain tasks to others (and not interfere)
4	Responsibility for dealing with hazards: emergency services
1	Responsibility for dealing with hazards: emergency services: respond/assist in a disaster
1	Responsibility for dealing with hazards: emergency services: role: follow instructions during a disaster
1	Responsibility for dealing with hazards: EQC
1	Responsibility for dealing with hazards: every household
1	Responsibility for dealing with hazards: everyone should work in with those in charge
1	Responsibility for dealing with hazards: future generations
2	Responsibility for dealing with hazards: general: role: have plans / systems in place
1	Responsibility for dealing with hazards: God
1	Responsibility for dealing with hazards: government (general): role: communication during a disaster
15	Responsibility for dealing with hazards: government (general)
2	Responsibility for dealing with hazards: government (general): role: coordinate response / relief after a disaster
2	Responsibility for dealing with hazards: government (general): role: getting supplies out
1	Responsibility for dealing with hazards: government (general): role: have plans/systems in place
1	Responsibility for dealing with hazards: government (general): role: political decisions about whether to rebuild a city
2	Responsibility for dealing with hazards: government (general): role: prepare for hazards
2	Responsibility for dealing with hazards: government (general): role: publicise risks and what people should do
3	Responsibility for dealing with hazards: hospital board / hospital
1	Responsibility for dealing with hazards: hospital board / hospital: having the required preparedness items
1	Responsibility for dealing with hazards: if you know about a hazard you should do something to deal with it
7	Responsibility for dealing with hazards: individual: role: look after self
1	Responsibility for dealing with hazards: individual: role: look after self: how long: days to weeks
9	Responsibility for dealing with hazards: infrastructure providers or relevant companies/businesses
4	Responsibility for dealing with hazards: infrastructure providers/businesses: role: getting supplies out / ensuring resources are available
15	Responsibility for dealing with hazards: insurance
11	Responsibility for dealing with hazards: insurance: role: fixing damage \ assisting after a disaster
2	Responsibility for dealing with hazards: it's about dealing with the consequences of hazards, not the hazard per-se
1	Responsibility for dealing with hazards: leaders
1	Responsibility for dealing with hazards: local authority: ensure people are trained / suitable to do this kind of work
1	Responsibility for dealing with hazards: local authority: role: get lifelines working again after an event
1	Responsibility for dealing with hazards: local government: role: assist individuals
46	Responsibility for dealing with hazards: local government
2	Responsibility for dealing with hazards: local government: role: advertising/publicising hazard and preparedness information
2	Responsibility for dealing with hazards: local government: role: assist after 3 days

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QUOTATION COUNT	CODE TITLE
5	Responsibility for dealing with hazards: local government: role: education
1	Responsibility for dealing with hazards: local government: role: ensure delivery of services post disaster
2	Responsibility for dealing with hazards: local government: role: ensure there is a civil defence operating
4	Responsibility for dealing with hazards: local government: role: good land use planning
1	Responsibility for dealing with hazards: local government: role: have plans / systems in place
13	Responsibility for dealing with hazards: local government: role: looking after flood mitigation /stopbank / flood maintenance / flood equipment
14	Responsibility for dealing with hazards: local government: role: mobilisation / coordination to deal with issues post disaster
1	Responsibility for dealing with hazards: local government: role: provide alternative accommodation
2	Responsibility for dealing with hazards: local government: role: provide information / messages during an emergency
2	Responsibility for dealing with hazards: local government: role: provide warnings during an emergency
2	Responsibility for dealing with hazards: local government: why: need a larger body coordinating the region's interests
1	Responsibility for dealing with hazards: local government: why: they are trained to deal with these situations / hazards / emergencies
1	Responsibility for dealing with hazards: local government: why: we pay rates for this to happen
2	Responsibility for dealing with hazards: mayor
1	Responsibility for dealing with hazards: mayor: role: providing interest and leadership in hazards/preparedness
2	Responsibility for dealing with hazards: medical institutions / medical based organisations
1	Responsibility for dealing with hazards: medical institutions: role having a disaster plan
2	Responsibility for dealing with hazards: neighbours/communities
1	Responsibility for dealing with hazards: neighbours/communities: role: should look after themselves
1	Responsibility for dealing with hazards: no-ones
1	Responsibility for dealing with hazards: Non-Government Organisations
1	Responsibility for dealing with hazards: Non-Government Organisations: role: international relations
1	Responsibility for dealing with hazards: NOT: central government
1	Responsibility for dealing with hazards: NOT: central government: role: land-use planning
10	Responsibility for dealing with hazards: NOT: dad's army / an army of civil defence - you're on your own
3	Responsibility for dealing with hazards: one agency (generally): coordinate response / relief after a disaster
1	Responsibility for dealing with hazards: OSH: role:
1	Responsibility for dealing with hazards: OSH: role: education
114	Responsibility for dealing with hazards: personal/individual
1	Responsibility for dealing with hazards: personal/individual: role: be aware
1	Responsibility for dealing with hazards: personal/individual: role: be conscious
16	Responsibility for dealing with hazards: personal/individual: role: be/get prepared
4	Responsibility for dealing with hazards: personal/individual: role: check on family after a disaster
2	Responsibility for dealing with hazards: personal/individual: role: contributing to / helping society
21	Responsibility for dealing with hazards: personal/individual: role: do the best for themselves / to look after themselves
2	Responsibility for dealing with hazards: personal/individual: role: don't build / live in the wrong place
2	Responsibility for dealing with hazards: personal/individual: role: follow instructions during a disaster
1	Responsibility for dealing with hazards: personal/individual: role: get insurance
10	Responsibility for dealing with hazards: personal/individual: role: help others during a disaster/event
1	Responsibility for dealing with hazards: personal/individual: role: if you know about a hazard you should do something to deal with it
1	Responsibility for dealing with hazards: personal/individual: role: listen to instructions during a disaster (e.g. on radio)
6	Responsibility for dealing with hazards: personal/individual: role: look after / protect your assets
15	Responsibility for dealing with hazards: personal/individual: role: look after selves for first 3 / few days
1	Responsibility for dealing with hazards: personal/individual: role: look after your street /area
1	Responsibility for dealing with hazards: personal/individual: role: look for signs / warnings
3	Responsibility for dealing with hazards: personal/individual: role: safety/security
2	Responsibility for dealing with hazards: personal/individual: why: we are able / able-bodied to do it ourselves
4	Responsibility for dealing with hazards: personal/individual: why: we have only lent certain tasks to organisations, but we are still responsible for them
1	Responsibility for dealing with hazards: personal/individual: wouldn't just sit around waiting for someone to help us

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QUOTATION COUNT	CODE TITLE
11	Responsibility for dealing with hazards: police
1	Responsibility for dealing with hazards: police: respond/assist in a disaster
2	Responsibility for dealing with hazards: police: role crime / violence / disruption
1	Responsibility for dealing with hazards: police: role: having the required preparedness items
1	Responsibility for dealing with hazards: police: role: terrorism (e.g. bomb disposal, etc.)
1	Responsibility for dealing with hazards: police: traffic accidents
1	Responsibility for dealing with hazards: port authority
1	Responsibility for dealing with hazards: port authority: role: industrial hazards
4	Responsibility for dealing with hazards: power companies
2	Responsibility for dealing with hazards: power companies: responding to events
1	Responsibility for dealing with hazards: prisons
1	Responsibility for dealing with hazards: prisons: role having a disaster plan
4	Responsibility for dealing with hazards: radio/computer/phone communications people
1	Responsibility for dealing with hazards: radio/computer/phone communications people: role: plan for averting network/infrastructure failure
3	Responsibility for dealing with hazards: radio/computer/phone communications people: role: re-establishing communications and networks
2	Responsibility for dealing with hazards: red cross
1	Responsibility for dealing with hazards: red cross: clothing
1	Responsibility for dealing with hazards: red cross: role: medical help
1	Responsibility for dealing with hazards: red cross: shelter
6	Responsibility for dealing with hazards: regional council rather than district council
1	Responsibility for dealing with hazards: regional council rather than district council: why: people don't take notice of district council
1	Responsibility for dealing with hazards: regional council rather than district council: why: regional council more tuned in to hazards issues
2	Responsibility for dealing with hazards: religious institutions
1	Responsibility for dealing with hazards: religious institutions: role: allowing / advocating effective response and recovery
1	Responsibility for dealing with hazards: salvation army
1	Responsibility for dealing with hazards: salvation army: role: provide food
10	Responsibility for dealing with hazards: schools
1	Responsibility for dealing with hazards: search and rescue
11	Responsibility for dealing with hazards: should be shared /collective
1	Responsibility for dealing with hazards: should be up to everyone: why: no one authority can do everything
11	Responsibility for dealing with hazards: shouldn't rely on / expect other / sole organisations or people to assist in a disaster
2	Responsibility for dealing with hazards: somebody will deal with it
1	Responsibility for dealing with hazards: state housing
1	Responsibility for dealing with hazards: state housing: role: install smoke alarms
5	Responsibility for dealing with hazards: telecommunications
1	Responsibility for dealing with hazards: telecommunications: role: responding to events
2	Responsibility for dealing with hazards: the bigger the disaster the more powerful / larger organisations need to take responsibility and vice versa
66	Responsibility for dealing with hazards: there are different roles for different people/organisations
12	Responsibility for dealing with hazards: up to everyone
1	Responsibility for dealing with hazards: up to everyone: role: taking precautions in your own environment
1	Responsibility for dealing with hazards: water companies
1	Responsibility for dealing with hazards: what should be done pre-disaster: don't know
9	Responsibility for dealing with hazards: work place
1	Responsibility for dealing with hazards: your job might be on the line if you don't undertake your designated role adequately
5	Responsibility for others: children (adult)
55	Responsibility for others: children (young)
39	Responsibility for others: community (neighbours, friends, community in general)
1	Responsibility for others: elderly
34	Responsibility for others: family (general)
4	Responsibility for others: family (general): role: help/encourage to prepare
1	Responsibility for others: family: role: make sure you are prepared

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QUOTATION COUNT	CODE TITLE
1	Responsibility for others: friends
10	Responsibility for others: general
8	Responsibility for others: grandchildren
1	Responsibility for others: has lessened / changed over time
1	Responsibility for others: make sure people are safe
3	Responsibility for others: need to take care of others
1	Responsibility for others: need to take care of others so tragedy doesn't happen
1	Responsibility for others: need to take care of others so you don't lose what you've got / disrupt your life
2	Responsibility for others: neighbouring countries
7	Responsibility for others: neighbours
1	Responsibility for others: others are dependent on you
3	Responsibility for others: parents
5	Responsibility for others: people involved in disasters overseas
3	Responsibility for others: pets or animals
1	Responsibility for others: shouldn't have to set things up for an entire neighbourhood
20	Responsibility for others: spouse
3	Responsibility for others: to make sure they are okay in a disaster
11	Responsibility for others: workmates / employees / clients
1	Responsibility for others: younger people
27	Responsibility for yourself
5	Responsibility for yourself: role: make sure you are prepared
1	Responsibility priority: children (young)
1	Responsibility priority: elderly
7	Responsibility priority: family
5	Responsibility priority: spouse
1	Responsibility priority: women and children
6	Responsibility priority: yourself/individual
1	Responsibility: I don't expect other people to do things for me
1	Responsibility: acceptance of responsibility
1	Responsibility: cannot legislate for preparedness
1	Responsibility: changing gender roles in responsibilities
1	Responsibility: children
2	Responsibility: don't feel responsibility for others
1	Responsibility: don't like the 'nanny state' where everything is provided
4	Responsibility: for doing the "right thing" (morally obliged / ethical)
5	Responsibility: hard to get others to take responsibility for themselves preparing / sell the message / convince others
2	Responsibility: I'm independent
2	Responsibility: I'm responsible for many or all things in this household
3	Responsibility: it's a different thing being responsible for others versus just being responsible for yourself
4	Responsibility: to keep workplace/school place preparedness items stocked up
5	Responsibility: to undertake a job designated to them
1	Responsibility for dealing with hazards: up to everyone: why: if everyone made an effort it would make a difference
91	Safety important
3	School influence: awareness
1	School influence: disasters / preparedness in the curriculum
9	School influence: drills /exercises/ practices
16	School influence: emergency plans
4	School influence: experience an event while at school
1	School influence: indirect only
7	School influence: information coming home from school
1	School influence: learned about art deco
3	School influence: learned about past events (e.g. Napier Earthquake)
14	School influence: learning what to do in an earthquake (or emergency)
1	School influence: not aware of any (major) influence on disasters / preparedness
22	School influence: project / activity on disasters/preparedness

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QUOTATION COUNT	CODE TITLE
5	School influence: taught survival / basic skills (e.g. camping, lighting fires)
15	Self-sufficiency
4	Social norm
2	Survival means: going back to basics / basic issues
3	Sustained preparedness: casual/slow about undertaking it
9	Sustained preparedness: does not undertake
5	Sustained preparedness: does not undertake: preparedness dwindles over time
1	Sustained preparedness: does not undertake: why not: don't unless you are constantly reminded of it / constant information
1	Sustained preparedness: does not undertake: why: can't physically do it themselves
2	Sustained preparedness: does not undertake: why: got in the way
1	Sustained preparedness: does not undertake: why: thought water was covered by other arrangements
1	Sustained preparedness: don't know if other people undertake
3	Sustained preparedness: if can't keep it up, it's of no use
4	Sustained preparedness: important
3	Sustained preparedness: intends to undertake
5	Sustained preparedness: must be a conscientious / continual effort
6	Sustained preparedness: should undertake
29	Sustained preparedness: timing of checking / replacing
2	Sustained preparedness: timing of checking / replacing: 3 monthly
2	Sustained preparedness: timing of checking / replacing: constantly
3	Sustained preparedness: timing of checking / replacing: daylight savings changes
9	Sustained preparedness: timing of checking / replacing: every six months
3	Sustained preparedness: timing of checking / replacing: every year
4	Sustained preparedness: timing of checking / replacing: periodically
1	Sustained preparedness: timing of checking / replacing: when going on holiday
1	Sustained preparedness: timing of checking / replacing: when it comes up in my diary
4	Sustained preparedness: timing of checking / replacing: when it expires or close to expiry
1	Sustained preparedness: timing of checking / replacing: when smoke alarm beeps
2	Sustained preparedness: timing of checking / replacing: why: cleaning garage out
2	Sustained preparedness: timing of checking/replacing: every few years
57	Sustained preparedness: undertakes
1	Sustained preparedness: undertakes: but gets annoyed because has to keep throwing out expired items
1	Sustained preparedness: undertakes: sometimes gets the children to do it
1	Sustained preparedness: undertakes: takes half an hour to change the supplies
4	Sustained preparedness: undertakes: timing of checking/replacing: when we use some supplies up
6	Sustained preparedness: undertakes: why: don't want it to go off / keeps it fresh
3	Sustained preparedness: undertakes: why: once it's set up, it takes very little effort to keep it going
1	Sustained preparedness: undertakes: why: so not to run out of food generally
4	Sustained preparedness: undertook for a while then gave up / waned
1	Sustained preparedness: water: doesn't know whether assumptions are right or wrong
4	Sustained preparedness: water: why: know that the water is clean and safe to drink
1	Talking about hazards/preparedness: brief comments only
1	Talking about hazards preparedness: response: people think I over-analyse things
1	Talking about hazards preparedness: topics: what would have happened if the bridge had gone?
1	Talking about hazards/preparedness: where: neighbourhood watch meeting
1	Talking about hazards/preparedness: topics: climate change/global warming
2	Talking about hazards/preparedness: best timing of conversation: before a disaster
2	Talking about hazards/preparedness: could provide an opportunity to pool resources
1	Talking about hazards/preparedness: don't CHOOSE people to talk about it with, just comes up in conversation
1	Talking about hazards/preparedness: flooding: town-planning for floods in Napier
1	Talking about hazards/preparedness: frequency: 2-3 times a year
1	Talking about hazards/preparedness: frequency: annually
2	Talking about hazards/preparedness: frequency: at several meetings in a row
1	Talking about hazards/preparedness: frequency: every 3-4 months
1	Talking about hazards/preparedness: frequency: every few years

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QUOTATION COUNT	CODE TITLE
11	Talking about hazards/preparedness: frequency: every so often / occasionally
2	Talking about hazards/preparedness: frequency: frequently / for a long time now
2	Talking about hazards/preparedness: frequency: frequently and for a long time after experiencing a significant event
3	Talking about hazards/preparedness: frequency: frequently when an event threatens
1	Talking about hazards/preparedness: frequency: nearly every day
13	Talking about hazards/preparedness: frequency: not often
12	Talking about hazards/preparedness: frequency: often
1	Talking about hazards/preparedness: frequency: people should have frequent discussions
1	Talking about hazards/preparedness: frequency: used to all the time but stopped because people thought I was mad
67	Talking about hazards/preparedness: haven't or don't
1	Talking about hazards/preparedness: haven't or don't why: it's not something that has ever happened
1	Talking about hazards/preparedness: haven't or don't: but might still undertake action privately
1	Talking about hazards/preparedness: haven't or don't: didn't in past
1	Talking about hazards/preparedness: haven't or don't: It's not avoided as such
2	Talking about hazards/preparedness: haven't or don't: topic: earthquake response
1	Talking about hazards/preparedness: haven't or don't: topics: local tsunami
6	Talking about hazards/preparedness: haven't or don't: who: children (adults)
2	Talking about hazards/preparedness: haven't or don't: who: community members
4	Talking about hazards/preparedness: haven't or don't: who: family (general)
5	Talking about hazards/preparedness: haven't or don't: who: friends
1	Talking about hazards/preparedness: haven't or don't: who: neighbours
2	Talking about hazards/preparedness: haven't or don't: who: parents
2	Talking about hazards/preparedness: haven't or don't: who: people impacted by an event
1	Talking about hazards/preparedness: haven't or don't: who: school teachers
1	Talking about hazards/preparedness: haven't or don't: who: spouse
1	Talking about hazards/preparedness: haven't or don't: who: workmates
1	Talking about hazards/preparedness: haven't or don't: why: aren't likely to happen / affect me
4	Talking about hazards/preparedness: haven't or don't: why: deal with my own issues/worries, don't talk about them with others / just deal with it
1	Talking about hazards/preparedness: haven't or don't: why: don't feel like you can talk about these things with people higher up/people of respect
2	Talking about hazards/preparedness: haven't or don't: why: don't have regular disasters/events
3	Talking about hazards/preparedness: haven't or don't: why: don't know why we don't talk about it
1	Talking about hazards/preparedness: haven't or don't: why: don't like to dwell on dark / depressing topics
2	Talking about hazards/preparedness: haven't or don't: why: don't see it as my role / nothing to do with me
2	Talking about hazards/preparedness: haven't or don't: why: don't think about it (e.g. disasters)
1	Talking about hazards/preparedness: haven't or don't: why: feel guilty about exposing your attitude
1	Talking about hazards/preparedness: haven't or don't: why: feel guilty because haven't done enough
1	Talking about hazards/preparedness: haven't or don't: why: focused on other things
1	Talking about hazards/preparedness: haven't or don't: why: haven't had any feedback
1	Talking about hazards/preparedness: haven't or don't: why: haven't seen any regular information about it
1	Talking about hazards/preparedness: haven't or don't: why: I'm young
1	Talking about hazards/preparedness: haven't or don't: why: I've got no reason to talk about it
2	Talking about hazards/preparedness: haven't or don't: why: I talk about other subjects
1	Talking about hazards/preparedness: haven't or don't: why: independent person
1	Talking about hazards/preparedness: haven't or don't: why: information just raised awareness, it doesn't stimulate discussion
1	Talking about hazards/preparedness: haven't or don't: why: it's more 'current affairs' that are discussed
3	Talking about hazards/preparedness: haven't or don't: why: it's more 'social things' that are discussed
1	Talking about hazards/preparedness: haven't or don't: why: it's not something that happens often
2	Talking about hazards/preparedness: haven't or don't: why: it's not something that happens/will happen ever
10	Talking about hazards/preparedness: haven't or don't: why: it's not something you talk about as part of general conversation/doesn't come up
2	Talking about hazards/preparedness: haven't or don't: why: maybe there is a degree of reluctance to talk about it
1	Talking about hazards/preparedness: haven't or don't: why: more a topic those with families are interested in
2	Talking about hazards/preparedness: haven't or don't: why: needs to be stimulated by something (e.g. an

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QUOTATION COUNT	CODE TITLE
	event which makes people think)
3	Talking about hazards/preparedness: haven't or don't: why: not a priority / other things come first
1	Talking about hazards/preparedness: haven't or don't: why: not interested or interest disappears
1	Talking about hazards/preparedness: haven't or don't: why: they'll need to look after themselves anyway
1	Talking about hazards/preparedness: haven't or don't: why: think the other person is able enough to organise themselves
2	Talking about hazards/preparedness: haven't or don't: why: threat reduced or non-existent
1	Talking about hazards/preparedness: haven't or don't: why: war is too horrendous
1	Talking about hazards/preparedness: haven't or don't: why: you can't bore people with serious subjects too much
6	Talking about hazards/preparedness: I can't recall anything
5	Talking about hazards/preparedness: I have not raised topic
29	Talking about hazards/preparedness: I/we do
12	Talking about hazards/preparedness: informal/indirect discussion
1	Talking about hazards/preparedness: My friends/contacts have not raised the topic
9	Talking about hazards/preparedness: not in detail / in any depth
1	Talking about hazards/preparedness: not in detail / in any depth: why: take it for granted you should be prepared
1	Talking about hazards/preparedness: people should have intelligent discussions
1	Talking about hazards/preparedness: possibly we might if the topic came up
9	Talking about hazards/preparedness: possibly we should
3	Talking about hazards/preparedness: possibly we should: could be done through neighbourhood support
2	Talking about hazards/preparedness: prompt: an exercise / drill being held
1	Talking about hazards/preparedness: prompts: I'VE been doing it (so want to convince you too)
6	Talking about hazards/preparedness: prompts: a community member experiences an event
5	Talking about hazards/preparedness: prompts: a family member asks/talks about what happened to another family member in an event
14	Talking about hazards/preparedness: prompts: a potential threat
3	Talking about hazards/preparedness: prompts: a stranger experiences an event
5	Talking about hazards/preparedness: prompts: accident or mishap
3	Talking about hazards/preparedness: prompts: an electricity blackout
37	Talking about hazards/preparedness: prompts: an event which has affected someone/somewhere else
1	Talking about hazards/preparedness: prompts: asks for other people's ideas
5	Talking about hazards/preparedness: prompts: being a tourist guide for a location / assisting tourists / tourism
5	Talking about hazards/preparedness: prompts: being aware that a hazard could affect you
11	Talking about hazards/preparedness: prompts: being in an occupation dealing with hazards/preparedness
1	Talking about hazards/preparedness: prompts: being prepared for an event experienced
5	Talking about hazards/preparedness: prompts: being unprepared for an event experienced
6	Talking about hazards/preparedness: prompts: belonging to a civil defence group
3	Talking about hazards/preparedness: prompts: buying a house
4	Talking about hazards/preparedness: prompts: call people to check they are okay in an event
12	Talking about hazards/preparedness: prompts: community group activity/project
3	Talking about hazards/preparedness: prompts: concern over environmental problems / issues
2	Talking about hazards/preparedness: prompts: disaster commemoration activities
4	Talking about hazards/preparedness: prompts: discussion at a board / committee meeting
2	Talking about hazards/preparedness: prompts: doing an interview
1	Talking about hazards/preparedness: prompts: experience a 'close call' of some description
2	Talking about hazards/preparedness: prompts: experience a cyclone event
4	Talking about hazards/preparedness: prompts: experience a fire alarm / potential fire
10	Talking about hazards/preparedness: prompts: experience a flood
25	Talking about hazards/preparedness: prompts: experience a local earthquake event
18	Talking about hazards/preparedness: prompts: experience a snowstorm
1	Talking about hazards/preparedness: prompts: experience a storm
2	Talking about hazards/preparedness: prompts: experience weather / heavy rain / storm
1	Talking about hazards/preparedness: prompts: experiencing infrastructure failure
2	Talking about hazards/preparedness: prompts: family gathering/occasion
22	Talking about hazards/preparedness: prompts: family member experiences an event

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QUOTATION COUNT	CODE TITLE
1	Talking about hazards/preparedness: prompts: feedback from parents about hazards/preparedness education
4	Talking about hazards/preparedness: prompts: fires, clean air, and safety in cold temperatures (e.g. after a snowstorm)
12	Talking about hazards/preparedness: prompts: friend experiences an event
3	Talking about hazards/preparedness: prompts: general discussion on escaping from fires / fire drills
5	Talking about hazards/preparedness: prompts: general topics/stimuli that promote discussion
4	Talking about hazards/preparedness: prompts: having a responsibility for others (e.g. family)
2	Talking about hazards/preparedness: prompts: how people coped / are coping in an event
4	Talking about hazards/preparedness: prompts: invite a service/person to help with preparedness (e.g. fire, civil defence)
6	Talking about hazards/preparedness: prompts: just comes up in general discussion
8	Talking about hazards/preparedness: prompts: located in area at risk of a hazard
1	Talking about hazards/preparedness: prompts: needing to rely on others in a potential emergency
2	Talking about hazards/preparedness: prompts: needing to use a 'preparedness' item in an event
2	Talking about hazards/preparedness: prompts: neighbour experiences an event
1	Talking about hazards/preparedness: prompts: new civil defence centre
2	Talking about hazards/preparedness: prompts: not generally part of an "organised" discussion
20	Talking about hazards/preparedness: prompts: organised discussions as part of a community group/meeting
3	Talking about hazards/preparedness: prompts: organised discussions as part of a TV show
11	Talking about hazards/preparedness: prompts: OSH / workplace safety
2	Talking about hazards/preparedness: prompts: pandemic
4	Talking about hazards/preparedness: prompts: plans for evacuation/exercises
6	Talking about hazards/preparedness: prompts: proposed mitigation measures for hazards
2	Talking about hazards/preparedness: prompts: receiving some information (e.g. from CD)
2	Talking about hazards/preparedness: prompts: recreational pursuits that are hazardous
1	Talking about hazards/preparedness: prompts: safety important
2	Talking about hazards/preparedness: prompts: school policy
28	Talking about hazards/preparedness: prompts: school project / activity
1	Talking about hazards/preparedness: prompts: seeing hazards signage
1	Talking about hazards/preparedness: prompts: seeing someone prepare
1	Talking about hazards/preparedness: prompts: should be encouraged by authorities
9	Talking about hazards/preparedness: prompts: something in the news media (general)
5	Talking about hazards/preparedness: prompts: something in the paper
2	Talking about hazards/preparedness: prompts: something on radio
10	Talking about hazards/preparedness: prompts: something on TV
19	Talking about hazards/preparedness: prompts: speaker at a community group meeting / or meeting of an organisation
3	Talking about hazards/preparedness: prompts: the history of the area
2	Talking about hazards/preparedness: prompts: traffic hazards/accidents
2	Talking about hazards/preparedness: prompts: training for emergencies / preparedness
2	Talking about hazards/preparedness: prompts: trying to solve problem/get some planning and preparedness underway
9	Talking about hazards/preparedness: prompts: tsunami event
10	Talking about hazards/preparedness: prompts: tsunami event: Boxing Day tsunami
1	Talking about hazards/preparedness: prompts: visiting places that have hazard information (e.g. museum)
1	Talking about hazards/preparedness: prompts: what to do if an event happens
14	Talking about hazards/preparedness: prompts: workplace project/activity
7	Talking about hazards/preparedness: prompts: Y2K
5	Talking about hazards/preparedness: response: a similar event could happen here
1	Talking about hazards/preparedness: response: after some initial discussion stop talking (so not to get into a difficult conversation about why people aren't preparing)
1	Talking about hazards/preparedness: response: agreed with the information/though it was true
1	Talking about hazards/preparedness: response: can't believe people went to beach to watch Chile tsunami
1	Talking about hazards/preparedness: response: checked on current preparedness
1	Talking about hazards/preparedness: response: collated further information
1	Talking about hazards/preparedness: response: compromising over what preparedness items are needed
1	Talking about hazards/preparedness: response: despite issues, decide not to 'prepare' for other reasons
2	Talking about hazards/preparedness: response: didn't listen to people / take advice

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QUOTATION COUNT	CODE TITLE
1	Talking about hazards/preparedness: response: didn't use advice
2	Talking about hazards/preparedness: response: disagreeing about whether (certain) preparedness necessary
1	Talking about hazards/preparedness: response: don't understand why they are worried enough to prepare
1	Talking about hazards/preparedness: response: everyone is familiar with what to do in a disaster
29	Talking about hazards/preparedness: response: get an item or items to prepare, or made a plan
1	Talking about hazards/preparedness: response: glad I don't live there
3	Talking about hazards/preparedness: response: go home from community activity and check/organise preparedness
7	Talking about hazards/preparedness: response: go home from school and check/organise preparedness with parents
18	Talking about hazards/preparedness: response: go home from school and talk about it with parents
2	Talking about hazards/preparedness: response: got annoyed
2	Talking about hazards/preparedness: response: got people looking into their own preparedness
4	Talking about hazards/preparedness: response: got people thinking about preparedness
1	Talking about hazards/preparedness: response: I'm going to worry now
1	Talking about hazards/preparedness: response: I'm going to worry now: why: It's my personality
1	Talking about hazards/preparedness: response: I'm not 'over the top' /over-prepared
1	Talking about hazards/preparedness: response: I don't know how many emergency kits sold
1	Talking about hazards/preparedness: response: I know where the items are
1	Talking about hazards/preparedness: response: impressed with the response to the disaster
1	Talking about hazards/preparedness: response: it's never going to happen again
2	Talking about hazards/preparedness: response: it's no problem/ of no concern / not an issue now
1	Talking about hazards/preparedness: response: it's only a small event
1	Talking about hazards/preparedness: response: it's a concern / worry
3	Talking about hazards/preparedness: response: learned something from the training
1	Talking about hazards/preparedness: response: might not fully understand hazard/event/consequences
6	Talking about hazards/preparedness: response: not prepared
3	Talking about hazards/preparedness: response: nothing happened / no action taken
2	Talking about hazards/preparedness: response: other people had no idea about hazards / preparing / response
2	Talking about hazards/preparedness: response: people's views would change as you talked about it with them
6	Talking about hazards/preparedness: response: people do or might think I'm crazy/mad/nutter/paranoid/pathetic
1	Talking about hazards/preparedness: response: person is an alarmist
2	Talking about hazards/preparedness: response: preparations are 'over the top'
1	Talking about hazards/preparedness: response: preparing is a waste of time
1	Talking about hazards/preparedness: response: realised was at risk from hazards
1	Talking about hazards/preparedness: response: recall things about hazards/preparedness
1	Talking about hazards/preparedness: response: saw building collapse and wonder how strong buildings were/are
1	Talking about hazards/preparedness: response: sees the value of preparing based on how response to an event unfolded
4	Talking about hazards/preparedness: response: sought further information
1	Talking about hazards/preparedness: response: sounds like a risky thing to do
1	Talking about hazards/preparedness: response: surprised at how resilient people were in an event
1	Talking about hazards/preparedness: response: talked about it with others
1	Talking about hazards/preparedness: response: talked through some informal emergency response plans
1	Talking about hazards/preparedness: response: talking about it with other people helped me
2	Talking about hazards/preparedness: response: that's interesting
1	Talking about hazards/preparedness: response: their response to an event is 'over the top'
2	Talking about hazards/preparedness: response: think suggestions are sensible/good
1	Talking about hazards/preparedness: response: think we will be okay in a certain event
1	Talking about hazards/preparedness: response: thinks they may understand why they responded the way they did post-event
1	Talking about hazards/preparedness: response: those talking to not pleased with the person bringing up the topic
5	Talking about hazards/preparedness: response: thought should prepare / take action
1	Talking about hazards/preparedness: response: training is a waste of time
2	Talking about hazards/preparedness: response: undertook recommended actions

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QUOTATION COUNT	CODE TITLE
1	Talking about hazards/preparedness: response: undertook sustained preparedness
3	Talking about hazards/preparedness: response: used advice
2	Talking about hazards/preparedness: response: want to assist with disaster relief
1	Talking about hazards/preparedness: response: we'll worry about it when it happens
1	Talking about hazards/preparedness: response: what are you talking about? (indicating hadn't thought about or considered it themselves)
1	Talking about hazards/preparedness: topics NOT discussed: preparing
1	Talking about hazards/preparedness: topics NOT discussed: what if there had been people on the bridge, and it went in the flood?
1	Talking about hazards/preparedness: topics: 1960 Chilean tsunami
2	Talking about hazards/preparedness: topics: a community member experiences an event
5	Talking about hazards/preparedness: topics: accident or mishap
1	Talking about hazards/preparedness: topics: Activating people's knowledge and understanding about hazards/preparedness
3	Talking about hazards/preparedness: topics: advice that you shouldn't move into a hazardous area
1	Talking about hazards/preparedness: topics: air crash
2	Talking about hazards/preparedness: topics: are you aware of this hazard/preparedness information?
2	Talking about hazards/preparedness: topics: are you aware? (of hazards/preparedness)
10	Talking about hazards/preparedness: topics: berating others for not preparing/planning/responding properly
1	Talking about hazards/preparedness: topics: building collapse
2	Talking about hazards/preparedness: topics: can't do anything about it
1	Talking about hazards/preparedness: topics: can't remember what the details were regarding hazards/preparedness
1	Talking about hazards/preparedness: topics: can I borrow a preparedness item?
2	Talking about hazards/preparedness: topics: civil defence
1	Talking about hazards/preparedness: topics: climate change / global warming / sea level rise
5	Talking about hazards/preparedness: topics: coastal erosion
1	Talking about hazards/preparedness: topics: cold war / nuclear threat
1	Talking about hazards/preparedness: topics: concern for other family members
1	Talking about hazards/preparedness: topics: contact numbers in an emergency
2	Talking about hazards/preparedness: topics: could you hear the siren?
4	Talking about hazards/preparedness: topics: crime / violence / community disruption from activities
3	Talking about hazards/preparedness: topics: criticism of CD / a responding organisation
3	Talking about hazards/preparedness: topics: cyclone / hurricane
2	Talking about hazards/preparedness: topics: depletion of world resources and supplies (e.g. oil, petrol, water in hydro lakes)
10	Talking about hazards/preparedness: topics: disaster relief efforts
1	Talking about hazards/preparedness: topics: disasters do happen / have happened in the past
1	Talking about hazards/preparedness: topics: do you think people are prepared?
2	Talking about hazards/preparedness: topics: don't consider the area will be impacted by an event
1	Talking about hazards/preparedness: topics: don't you worry about how big an event might be?
58	Talking about hazards/preparedness: topics: earthquakes
1	Talking about hazards/preparedness: topics: earthquakes: the bedrock or soil underneath buildings/houses
9	Talking about hazards/preparedness: topics: earthquakes: what to do if you feel an earthquake (e.g. go to table, under doorway)
35	Talking about hazards/preparedness: topics: emergency plans
14	Talking about hazards/preparedness: topics: family member experiences an event
14	Talking about hazards/preparedness: topics: fire
4	Talking about hazards/preparedness: topics: fire alarms
8	Talking about hazards/preparedness: topics: fires, clean air, and safety in cold temperatures (e.g. after a snowstorm)
44	Talking about hazards/preparedness: topics: flooding
11	Talking about hazards/preparedness: topics: flooding: flood mitigation
1	Talking about hazards/preparedness: topics: flooding: has there ever been any flooding around here?
2	Talking about hazards/preparedness: topics: flooding: pumps in Napier
2	Talking about hazards/preparedness: topics: food availability/ issues
11	Talking about hazards/preparedness: topics: friend experiences an event
3	Talking about hazards/preparedness: topics: Gisborne Earthquake
1	Talking about hazards/preparedness: topics: hazards around the community, town or country

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QUOTATION COUNT	CODE TITLE
6	Talking about hazards/preparedness: topics: health/safety
3	Talking about hazards/preparedness: topics: history of the area
6	Talking about hazards/preparedness: topics: how a community group (or members from that group) could help in a disaster
5	Talking about hazards/preparedness: topics: how people coped /managed in an event
1	Talking about hazards/preparedness: topics: how prepared were people in an event
8	Talking about hazards/preparedness: topics: how should we evacuate?
23	Talking about hazards/preparedness: topics: how to respond to an event
1	Talking about hazards/preparedness: topics: I'm not getting rid of my log burner / will use for preparedness
1	Talking about hazards/preparedness: topics: I can't understand why they didn't prepare
1	Talking about hazards/preparedness: topics: I don't think about it
2	Talking about hazards/preparedness: topics: I know where everything is
1	Talking about hazards/preparedness: topics: I should prepare
13	Talking about hazards/preparedness: topics: impacts/consequences of an event
3	Talking about hazards/preparedness: topics: injuries/deaths in an event
1	Talking about hazards/preparedness: topics: insurance assessment
3	Talking about hazards/preparedness: topics: international relations / hazards
3	Talking about hazards/preparedness: topics: It's never going to happen to me
1	Talking about hazards/preparedness: topics: keep documents together / in a safe place
1	Talking about hazards/preparedness: topics: local environmental/community issues
3	Talking about hazards/preparedness: topics: low lying areas / property
1	Talking about hazards/preparedness: topics: make a plan
1	Talking about hazards/preparedness: topics: medication for pandemic/other event
4	Talking about hazards/preparedness: topics: movement in an earthquake, what it felt like/did
1	Talking about hazards/preparedness: topics: Napier being an art deco city because of an earthquake
15	Talking about hazards/preparedness: topics: Napier earthquake
20	Talking about hazards/preparedness: topics: natural hazards / preparedness in general
1	Talking about hazards/preparedness: topics: infrastructure damage
1	Talking about hazards/preparedness: topics: not sure how would cope in a disaster
4	Talking about hazards/preparedness: topics: offering /providing help in a disaster
1	Talking about hazards/preparedness: topics: only things I am interested in
12	Talking about hazards/preparedness: topics: OSH / workplace safety
17	Talking about hazards/preparedness: topics: overseas disasters
10	Talking about hazards/preparedness: topics: pandemic
4	Talking about hazards/preparedness: topics: policies on how to deal with hazards/preparedness (e.g. earthquakes, tsunami)
3	Talking about hazards/preparedness: topics: pollution/recycling
11	Talking about hazards/preparedness: topics: Preparedness kits
30	Talking about hazards/preparedness: topics: preparedness to be undertaken
36	Talking about hazards/preparedness: topics: preparedness undertaken
3	Talking about hazards/preparedness: topics: rainstorm
2	Talking about hazards/preparedness: topics: recreational pursuits that are hazardous
1	Talking about hazards/preparedness: topics: restraints for furniture or other objects
4	Talking about hazards/preparedness: topics: should I move (or not) into an area affected by a hazard?
2	Talking about hazards/preparedness: topics: sirens
10	Talking about hazards/preparedness: topics: snowstorm
2	Talking about hazards/preparedness: topics: storms
3	Talking about hazards/preparedness: topics: structures / buildings built to be earthquake resistant
1	Talking about hazards/preparedness: topics: suggest sharing preparedness ideas with others
1	Talking about hazards/preparedness: topics: terrorism
2	Talking about hazards/preparedness: topics: the nature of a hazard
2	Talking about hazards/preparedness: topics: the psychological / psychosocial impacts of a disaster
1	Talking about hazards/preparedness: topics: there have always been disasters
1	Talking about hazards/preparedness: topics: there is a market for selling preparedness items/kits
2	Talking about hazards/preparedness: topics: tornadoes
3	Talking about hazards/preparedness: topics: traffic hazards/accidents
1	Talking about hazards/preparedness: topics: tsunami: if we only get a short warning of a tsunami (e.g. 5

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QUOTATION COUNT	CODE TITLE
	min) it is pointless to try and evacuate
29	Talking about hazards/preparedness: topics: tsunamis
3	Talking about hazards/preparedness: topics: tsunamis: are we high enough up/inland enough?
1	Talking about hazards/preparedness: topics: victim support work
3	Talking about hazards/preparedness: topics: volcanoes
7	Talking about hazards/preparedness: topics: war time
4	Talking about hazards/preparedness: topics: warnings
10	Talking about hazards/preparedness: topics: water availability/issues
1	Talking about hazards/preparedness: topics: we need to get (better) insurance
1	Talking about hazards/preparedness: topics: we will rely on you for help in a disaster
2	Talking about hazards/preparedness: topics: weather / storms (general)
1	Talking about hazards/preparedness: topics: what are you going to do for me?
57	Talking about hazards/preparedness: topics: what happened in an event
1	Talking about hazards/preparedness: topics: what happened in an event: everything went like clockwork
1	Talking about hazards/preparedness: topics: what if the event had been bigger and the impacts greater?
4	Talking about hazards/preparedness: topics: what if there was no power?
1	Talking about hazards/preparedness: topics: what NOT to do (shouldn't do) in a disaster
1	Talking about hazards/preparedness: topics: what people learnt from an event
3	Talking about hazards/preparedness: topics: what resources or items are available within a community to help in a disaster
13	Talking about hazards/preparedness: topics: what would happen in a certain disaster/event?
3	Talking about hazards/preparedness: topics: what would you do if something similar happened here?
24	Talking about hazards/preparedness: topics: What would you do if there was an event here?
5	Talking about hazards/preparedness: topics: what's happening at work regarding preparedness
1	Talking about hazards/preparedness: topics: where is a safe place to go in house
2	Talking about hazards/preparedness: topics: where to keep preparedness items
4	Talking about hazards/preparedness: topics: whose fault the disaster is (e.g. council, etc.)
1	Talking about hazards/preparedness: topics: why I prepare
8	Talking about hazards/preparedness: topics: Y2k
1	Talking about hazards/preparedness: topics: Y2k: people were saying the services were going to not work
1	Talking about hazards/preparedness: topics: you are on your own/help not available
1	Talking about hazards/preparedness: topics: you need to look after yourself
3	Talking about hazards/preparedness: where: meetings
2	Talking about hazards/preparedness: where: social gatherings of friends
4	Talking about hazards/preparedness: where: workplace
1	Talking about hazards/preparedness: who flatmates
1	Talking about hazards/preparedness: who raised topic: adult child
5	Talking about hazards/preparedness: who raised topic: arose as part of normal conversation
1	Talking about hazards/preparedness: who raised topic: could be anybody
20	Talking about hazards/preparedness: who raised topic: myself
2	Talking about hazards/preparedness: who raised topic: myself as chairperson of organisation
1	Talking about hazards/preparedness: who raised topic: neighbour
1	Talking about hazards/preparedness: who raised topic: parent
1	Talking about hazards/preparedness: who raised topic: spouse
2	Talking about hazards/preparedness: who raised topic: stranger
5	Talking about hazards/preparedness: who raised topic: young child
13	Talking about hazards/preparedness: who: acquaintance/s from a community group
22	Talking about hazards/preparedness: who: children in schools
20	Talking about hazards/preparedness: who: civil defence personnel
9	Talking about hazards/preparedness: who: community groups
32	Talking about hazards/preparedness: who: community in general
5	Talking about hazards/preparedness: who: community leaders
37	Talking about hazards/preparedness: who: family (general)
51	Talking about hazards/preparedness: who: friends
2	Talking about hazards/preparedness: who: grandchildren
5	Talking about hazards/preparedness: who: grandparents
1	Talking about hazards/preparedness: who: health professional

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QUOTATION COUNT	CODE TITLE
2	Talking about hazards/preparedness: who: infrastructure providers
1	Talking about hazards/preparedness: who: insurance assessor
3	Talking about hazards/preparedness: who: intelligent people
1	Talking about hazards/preparedness: who: land/building developer
7	Talking about hazards/preparedness: who: local council
2	Talking about hazards/preparedness: who: mayor
1	Talking about hazards/preparedness: who: media generally
1	Talking about hazards/preparedness: who: medical professional
0	Talking about hazards/preparedness: who: more of a social topic of conversation
13	Talking about hazards/preparedness: who: neighbours
30	Talking about hazards/preparedness: who: own children (grown)
19	Talking about hazards/preparedness: who: own children (when young)
20	Talking about hazards/preparedness: who: parents
5	Talking about hazards/preparedness: who: part of 'our dialogue' here (general community dialogue)
1	Talking about hazards/preparedness: who: people new to an area
2	Talking about hazards/preparedness: who: police
2	Talking about hazards/preparedness: who: radio or TV
1	Talking about hazards/preparedness: who: rural communities
1	Talking about hazards/preparedness: who: school staff
4	Talking about hazards/preparedness: who: scientists/researchers
1	Talking about hazards/preparedness: who: sibling
22	Talking about hazards/preparedness: who: spouse
5	Talking about hazards/preparedness: who: staff / clients at work
3	Talking about hazards/preparedness: who: staff at another organisation
29	Talking about hazards/preparedness: who: staff at work
1	Talking about hazards/preparedness: who: stranger
2	Talking about hazards/preparedness: who: they are the type/sort of people I would discuss it with
3	Talking about hazards/preparedness: who: tourists / tour guides
1	Talking about hazards/preparedness: why: "as and when" situation arises, not purposeful
1	Talking about hazards/preparedness: why: a catharsis / debrief / healing
1	Talking about hazards/preparedness: why: a threat that could cause big problems
1	Talking about hazards/preparedness: why: an event had a big impact on people
1	Talking about hazards/preparedness: why: first time an event had happened to such an extent
1	Talking about hazards/preparedness: why: impact on economic fabric of society
1	Talking about hazards/preparedness: why: impact on social fabric of society
1	Talking about hazards/preparedness: why: shared experiences
1	Talking about hazards/preparedness: topics: return periods
1	Talking about hazards: response: It's an awful thing to say...
2	Talking about preparedness: who: older people
1	Think about hazards/preparedness before building/buying: no: why: hazard issues didn't come up/to my attention until recently
1	Thinking about hazards preparedness: topics: damaged buildings
1	Thinking about hazards/knowledge: don't have to think about it any more
6	Thinking about hazards/preparedness: didn't in past
1	Thinking about hazards/preparedness: didn't in past: why: not an issue that has arisen
1	Thinking about hazards/preparedness: didn't in the past: why less probability of something happening
1	Thinking about hazards/preparedness: didn't in the past: why: the issue hasn't come up/to my attention until recently
5	Thinking about hazards/preparedness: didn't think about particular hazards
1	Thinking about hazards/preparedness: didn't/haven't thought about the contradiction between me helping others to prepare, but not preparing myself.
5	Thinking about hazards/preparedness: don't know what kind of knowledge you have, until you need to use it
4	Thinking about hazards/preparedness: don't think about details of implications/consequences
2	Thinking about hazards/preparedness: don't think about earthquake impacts / damage
1	Thinking about hazards/preparedness: don't think about emergency plans
1	Thinking about hazards/preparedness: don't think about emergency plans: why: do/think about these things as part of life's other activities (e.g. work)
17	Thinking about hazards/preparedness: don't think about hazards

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QUOTATION COUNT	CODE TITLE
6	Thinking about hazards/preparedness: don't think about hazards a lot
2	Thinking about hazards/preparedness: don't think about hazards: why: (historical) data shows area is not at risk
1	Thinking about hazards/preparedness: don't think about hazards: why: can't do anything about natural hazards/events
4	Thinking about hazards/preparedness: don't think about hazards: why: can't imagine something I haven't experienced
1	Thinking about hazards/preparedness: don't think about hazards: why: don't like to think about things that have happened to you
2	Thinking about hazards/preparedness: don't think about moving away
1	Thinking about hazards/preparedness: don't think about moving away: why: not reality
8	Thinking about hazards/preparedness: don't think about preparedness
2	Thinking about hazards/preparedness: don't think about preparedness a lot
1	Thinking about hazards/preparedness: don't think about preparedness FOR US
2	Thinking about hazards/preparedness: don't think about some reactions before an event
7	Thinking about hazards/preparedness: don't LIKE to think about it / let myself think about it
1	Thinking about hazards/preparedness: earthquakes: what if there was a big one?
2	Thinking about hazards/preparedness: frequency: All the time/constantly
1	Thinking about hazards/preparedness: frequency: every few months
1	Thinking about hazards/preparedness: frequency: every six months
4	Thinking about hazards/preparedness: frequency: I/we think about earthquakes most often
2	Thinking about hazards/preparedness: frequency: more often than other people
1	Thinking about hazards/preparedness: frequency: not constantly
7	Thinking about hazards/preparedness: frequency: occasionally / a few times
7	Thinking about hazards/preparedness: frequency: often
1	Thinking about hazards/preparedness: frequency: people should think about it frequently
2	Thinking about hazards/preparedness: frequency: think more often about human hazards than natural hazards
1	Thinking about hazards/preparedness: haven't thought about: how long water would last
8	Thinking about hazards/preparedness: I'm sure most people don't think that way / others don't think the same as me / not like minded
8	Thinking about hazards/preparedness: I'm sure most people think that way / others think the same as us / like minded
1	Thinking about hazards/preparedness: I'm the exception rather than the rule
1	Thinking about hazards/preparedness: I don't LIKE to think about it / let myself think about it
1	Thinking about hazards/preparedness: I don't LIKE to think about it / let myself think about it: why: don't want it to happen to you
26	Thinking about hazards/preparedness: in detail
2	Thinking about hazards/preparedness: more deeply than other people
1	Thinking about hazards/preparedness: need to be able to think through what you would do in an event
4	Thinking about hazards/preparedness: need to remember to think ahead / prepare
7	Thinking about hazards/preparedness: need to think about these ahead of a disaster / well before / in advance
1	Thinking about hazards/preparedness: need to think for yourself
2	Thinking about hazards/preparedness: need to think laterally
2	Thinking about hazards/preparedness: not living in a hazardous area
9	Thinking about hazards/preparedness: people SHOULD think about it
1	Thinking about hazards/preparedness: people SHOULD think about it: why: creates an environment of preparedness in the mind
1	Thinking about hazards/preparedness: prompts: public events with hazards
1	Thinking about hazards/preparedness: prompt: reliant on others / at the whim of others / dependent on others
4	Thinking about hazards/preparedness: prompt: visiting people / working in rural or isolated areas
2	Thinking about hazards/preparedness: prompts: a development nearby / construction going in the coastal zone
4	Thinking about hazards/preparedness: prompts: a potential threat
1	Thinking about hazards/preparedness: prompts: a scare/fright
3	Thinking about hazards/preparedness: prompts: an event which has affected someone/somewhere else
4	Thinking about hazards/preparedness: prompts: being aware that a hazard could affect you
4	Thinking about hazards/preparedness: prompts: Boxing Day tsunami
2	Thinking about hazards/preparedness: prompts: family member experiences an event
3	Thinking about hazards/preparedness: prompts: hard to get other people to actually think about preparing

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QUOTATION COUNT	CODE TITLE
6	Thinking about hazards/preparedness: prompts: having children / family to consider
1	Thinking about hazards/preparedness: prompts: having to remember what you did in an event
1	Thinking about hazards/preparedness: prompts: hazard event: accident
13	Thinking about hazards/preparedness: prompts: hazard event: earthquake
3	Thinking about hazards/preparedness: prompts: hazard event: general
1	Thinking about hazards/preparedness: prompts: hazard event: infrastructure failure
2	Thinking about hazards/preparedness: prompts: hazard event: snowstorm
2	Thinking about hazards/preparedness: prompts: hazard event: tsunami
4	Thinking about hazards/preparedness: prompts: hazard event: tsunami warning
6	Thinking about hazards/preparedness: prompts: hear information on radio/TV
1	Thinking about hazards/preparedness: prompts: insurance company requirements
3	Thinking about hazards/preparedness: prompts: moving to / living in a hazardous location
2	Thinking about hazards/preparedness: prompts: overseas events / disasters
1	Thinking about hazards/preparedness: prompts: seeing the effects of disaster on other people: through my work
2	Thinking about hazards/preparedness: prompts: seeing unrestrained objects
1	Thinking about hazards/preparedness: prompts: siren
1	Thinking about hazards/preparedness: prompts: speaker at a community meeting
4	Thinking about hazards/preparedness: prompts: talking about preparedness/hazards: with the researcher
1	Thinking about hazards/preparedness: prompts: talking about preparedness: with a friend
1	Thinking about hazards/preparedness: prompts: talking about preparedness: with family
1	Thinking about hazards/preparedness: prompts: talking with staff from an organisation
1	Thinking about hazards/preparedness: prompts: think about preparedness before renting
1	Thinking about hazards/preparedness: prompts: visit to civil defence site
1	Thinking about hazards/preparedness: prompts: when it comes up in my diary to change items
18	Thinking about hazards/preparedness: prompts: working in a workplace/role that deals with hazards/preparedness/safety issues
1	Thinking about hazards/preparedness: response: didn't undertake a risky action
6	Thinking about hazards/preparedness: response: got prepared or made a plan
2	Thinking about hazards/preparedness: response: it's not normal/unusual to think the way I do
1	Thinking about hazards/preparedness: response: understood the importance of preparedness
1	Thinking about hazards/preparedness: topics: a crank torch would be good to have in case our batteries aren't working
1	Thinking about hazards/preparedness: topics: a future event/disaster could be bad
1	Thinking about hazards/preparedness: topics: after an event - why aren't we prepared
3	Thinking about hazards/preparedness: topics: are we/am I/are you prepared?
1	Thinking about hazards/preparedness: topics: being exposed by an event
1	Thinking about hazards/preparedness: topics: can't have perfection in an event
4	Thinking about hazards/preparedness: topics: can I/we escape?
1	Thinking about hazards/preparedness: topics: car/plane accidents
2	Thinking about hazards/preparedness: topics: climate change / global warming / sea level rise
1	Thinking about hazards/preparedness: topics: coastal hazards
3	Thinking about hazards/preparedness: topics: collapsing buildings
1	Thinking about hazards/preparedness: topics: communicating with others (e.g. family) during a disaster
1	Thinking about hazards/preparedness: topics: damaged buildings
3	Thinking about hazards/preparedness: topics: deaths or injuries
1	Thinking about hazards/preparedness: topics: development in the coastal hazard zone
1	Thinking about hazards/preparedness: topics: don't think about fires much
1	Thinking about hazards/preparedness: topics: don't think of earthquakes as affecting here
1	Thinking about hazards/preparedness: topics: don't think that earthquakes will cause a lot of damage here
2	Thinking about hazards/preparedness: topics: drinkability of water
7	Thinking about hazards/preparedness: topics: earthquakes (general)
2	Thinking about hazards/preparedness: topics: effects of an earthquake
7	Thinking about hazards/preparedness: topics: escape routes/exits
1	Thinking about hazards/preparedness: topics: fire
1	Thinking about hazards/preparedness: topics: fires, clean air and pollution
6	Thinking about hazards/preparedness: topics: flood

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QUOTATION COUNT	CODE TITLE
11	Thinking about hazards/preparedness: topics: general planning and preparedness
1	Thinking about hazards/preparedness: topics: hope that an event doesn't happen (again)
1	Thinking about hazards/preparedness: topics: how can we help others after an event (e.g. relief efforts)?
1	Thinking about hazards/preparedness: topics: how do earthquake work?
1	Thinking about hazards/preparedness: topics: how they haven't done much to prepare yet
2	Thinking about hazards/preparedness: topics: how would I get to my children/family in a disaster?
1	Thinking about hazards/preparedness: topics: how would we cope after an earthquake?
3	Thinking about hazards/preparedness: topics: human made hazards / disasters
9	Thinking about hazards/preparedness: topics: I should prepare
5	Thinking about hazards/preparedness: topics: I/we should make an emergency plan
1	Thinking about hazards/preparedness: topics: imagine a big wave rolling in while you are at the beach
1	Thinking about hazards/preparedness: topics: imagine if there was a big ash fall from a volcano
3	Thinking about hazards/preparedness: topics: impacts of an actual future event
2	Thinking about hazards/preparedness: topics: impacts will be different depending on time of year (season)
1	Thinking about hazards/preparedness: topics: it's likely a similar event will happen in future
1	Thinking about hazards/preparedness: topics: landslides
1	Thinking about hazards/preparedness: topics: magnitude of an actual event
1	Thinking about hazards/preparedness: topics: making alterations to my house / building
2	Thinking about hazards/preparedness: topics: mitigation for hazards
2	Thinking about hazards/preparedness: topics: Napier earthquake
1	Thinking about hazards/preparedness: topics: need to keep power lines away from trees
1	Thinking about hazards/preparedness: topics: nuclear winter
1	Thinking about hazards/preparedness: topics: pandemic
1	Thinking about hazards/preparedness: topics: past event: deaths or injuries not caused by collapsing buildings
4	Thinking about hazards/preparedness: topics: personal or family safety
1	Thinking about hazards/preparedness: topics: post-event impacts weeks afterward
5	Thinking about hazards/preparedness: topics: preparedness
4	Thinking about hazards/preparedness: topics: restraints for furniture or other objects
1	Thinking about hazards/preparedness: topics: short term disasters versus long term disasters, influencing time for recovery
1	Thinking about hazards/preparedness: topics: sirens
3	Thinking about hazards/preparedness: topics: the impact of overseas disasters
2	Thinking about hazards/preparedness: topics: the need for water
1	Thinking about hazards/preparedness: topics: thinking about your 'environment'
9	Thinking about hazards/preparedness: topics: tsunami or impacts of a tsunami
1	Thinking about hazards/preparedness: topics: use of (or attempting to use) preparedness items in an event
3	Thinking about hazards/preparedness: topics: volcano impacts
6	Thinking about hazards/preparedness: topics: water availability/issues
1	Thinking about hazards/preparedness: topics: what could you do in a similar event to the Boxing Day tsunami
1	Thinking about hazards/preparedness: topics: what if the event had been bigger and the impacts greater?
1	Thinking about hazards/preparedness: topics: what if there was no power?
18	Thinking about hazards/preparedness: topics: What if XX happened (consequences)?
3	Thinking about hazards/preparedness: topics: what would I do if it happens right now
17	Thinking about hazards/preparedness: topics: what would we do if XX happened?
2	Thinking about hazards/preparedness: topics: where to put things, in case they fall off in an earthquake
3	Thinking about hazards/preparedness: topics: will the earthquake I am experiencing get worse?
2	Thinking about hazards/preparedness: topics: workplace safety / OSH
1	Thinking about hazards/preparedness: topics: would we be high enough/out of harm's way?
1	Thinking about hazards/preparedness: why: 'it's just a basic thing that you see'
7	Thinking about hazards/preparedness: why: at the back of people's minds
1	Thinking about hazards/preparedness: why: don't know
2	Thinking about hazards/preparedness: why: earthquakes are always in the back of people's minds in Napier
3	Thinking about hazards/preparedness: why: family could be affected by them
2	Thinking about hazards/preparedness: why: geographic cues
1	Thinking about hazards/preparedness: why: have a responsibility for people

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QUOTATION COUNT	CODE TITLE
1	Thinking about hazards/preparedness: why: I'm interested in how people think/behave
1	Thinking about hazards/preparedness: why: I like to solve problems
1	Thinking about hazards/preparedness: why: I like to think laterally
1	Thinking about hazards/preparedness: why: impacts on family
1	Thinking about hazards/preparedness: why: impacts on property
1	Thinking about hazards/preparedness: why: interested in how prepared people are
1	Thinking about hazards/preparedness: why: involved in civil defence group
1	Thinking about hazards/preparedness: why: involved in disability group
1	Thinking about hazards/preparedness: why: issues over a new development brought it to the forefront of my thoughts / mind
4	Thinking about hazards/preparedness: why: personal safety
4	Thinking about hazards/preparedness: why: positions have held through work
2	Thinking about hazards/preparedness: why: previous experience with water quality
1	Thinking about hazards/preparedness: why: work brought it to the forefront of my thoughts / mind
24	Thinking about hazards/preparedness: yes, I/we do
1	Thinking about hazards/preparedness: yes, I/we do: as a family
3	Thinking about hazards/preparedness: your thoughts about preparedness evolve over time
1	Thinking about hazards/preparedness: don't / might not have thought about getting a speaker in to talk
1	Thinking about hazards: topics: what if it happened to me?
206	Thinking/talking about hazards/preparedness: response: laughing about situation
1	Time since last event: generations
2	Time since last event: it hasn't happened in the known past
39	Time since last event: long
1	Time since last event: long: but short in the persons memory
1	Time since last event: not in my lifetime
33	Time since last event: short
3	Time since last event: within our/a person's lifetime
6	Time to next event: 'one day'
6	Time to next event: (hopefully) not in our lifetime
3	Time to next event: 10 years from now
2	Time to next event: 100 years from now
3	Time to next event: 20-30 years from now
2	Time to next event: 5 years from now
3	Time to next event: 60 years
12	Time to next event: don't know
1	Time to next event: hopefully will never happen
1	Time to next event: if it doesn't come in the next 5 years it probably won't come
1	Time to next event: in a few hundred years
32	Time to next event: might happen out of blue / unexpectedly / right now / anytime
4	Time to next event: more frequent
1	Time to next event: must be getting closer
1	Time to next event: next year
1	Time to next event: not particularly soon
8	Time to next event: overdue
1	Time to next event: some statistical figure
2	Time to next event: sooner or later / sometime
2	Time to next event: sooner rather than later
3	Time to next event: this year
7	Time to next event: today/tonight
6	Time to next event: tomorrow
2	Time to next event: within our lifetime
2	Transfer of responsibility: building standards
1	Transfer of responsibility: central government
2	Transfer of responsibility: civil defence
2	Transfer of responsibility: council
1	Transfer of responsibility: EQC
1	Transfer of responsibility: EQC: they have "stood up" and therefore taken responsibility by acknowledging

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QUOTATION COUNT	CODE TITLE
	they have a role
3	Transfer of responsibility: fire service
2	Transfer of responsibility: for other people to organise preparedness items into a kit
1	Transfer of responsibility: God
4	Transfer of responsibility: insurance
3	Transfer of responsibility: insurance: insurance companies organise rebuilding/repairs
1	Transfer of responsibility: local government
1	Transfer of responsibility: only when very serious
2	Transfer of responsibility: police
1	Transfer of responsibility: power companies
2	Transfer of responsibility: sell our property / move away and let other people take on the hazard / someone else's problem
3	Transfer of responsibility: someone else will provide/look after us after a disaster
1	Transfer of responsibility: spouse
1	Transfer of responsibility: the council will protect us because we are located alongside public land (e.g. road, park)
2	Transfer of responsibility: why: feel that other organisations/people love doing it
2	Transfer of responsibility: why: we are well served by organisations that can do it (help prepare or respond)
3	Trust issues: building standards
3	Trust issues: building standards: does trust standards
1	Trust issues: businesses: why: they aren't prepared
1	Trust issues: civil defence
1	Trust issues: civil defence: weren't able to perform in an event because of lack of a generator
1	Trust issues: doesn't trust CD
2	Trust issues: emergency (111) number
1	Trust issues: emergency (111) number: why: did not/slow to answer call for help
2	Trust issues: EQC
4	Trust issues: government
2	Trust issues: government: doesn't trust the government to provide during quiescence therefore doesn't trust them in a disaster situation
1	Trust issues: government: doesn't trust them to provide in a disaster situation
1	Trust issues: government: why: didn't perform in a disaster
13	Trust issues: local authority
1	Trust issues: local authority transparent about costs of disaster mitigation
4	Trust issues: local authority: authorities haven't done what they should be doing (e.g. looking after flood mitigation properly)
0	Trust issues: local authority: doesn't trust them to provide in a disaster situation
2	Trust issues: local authority: lack of consultation / discussion
2	Trust issues: local authority: performance of mitigation in an event was not good
1	Trust issues: local authority: think the local authority is overstating the risk
1	Trust issues: local authority: weren't able to perform in an event because of lack of a generator
2	Trust issues: mitigation may not work as it is supposed to
1	Trust issues: money spent to mitigate hazards, when the building, etc., looked fine and safe as it was
2	Trust issues: police
1	Trust issues: police: doesn't trust them to provide/assist in future
1	Trust issues: police: influence: will not help police out in future (e.g. by providing information about crime, etc.)
2	Trust issues: police: why: did not assist when asked for help
1	Trust issues: power company
1	Trust issues: regional CDEM structure
4	Trust issues: reliant on things controlled by others
1	Trust issues: schools: if a school let things down it would be pretty serious
2	Trust issues: telecommunications
2	Trust issues: telecommunications: why: didn't perform/respond appropriately in a disaster
1	Trust issues: trusts builder who built house
5	Trust issues: trusts CD / emergency services
1	Trust issues: trusts CD / emergency services: thinks they have good information
2	Trust issues: trusts CD / emergency services: why: saw that the response was good/appropriate in an event

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QUOTATION COUNT	CODE TITLE
1	Trust: it seems reasonable that people should have trust
1	Trusts CD / emergency services: why: thinks they are coordinated
1	Trusts CD / emergency services: why: thinks they are really trying to help
3	Trusts/respects: television/radio personality
1	Trusts: God
1	Trusts: neighbours
1	Trusts: neighbours: think their information comes from a good/proper source
2	Trusts: power company
2	Trusts: power company: why: positive experience in past (got power back on quickly)
3	Trusts: schools and the preparedness/plans they have in place
32	Uncertainty over event or eventualities arising from the event
14	Uncertainty over how to respond / what to do / other aspects of response
6	Vulnerabilities: some more vulnerable than others in an event: disabled people
1	Vulnerabilities: some more vulnerable than others in an event: drug users
18	Vulnerabilities: some more vulnerable than others in an event: older/elderly people
2	Vulnerabilities: some more vulnerable than others in an event: older/elderly people: why: because not as agile/mobile
2	Vulnerabilities: some more vulnerable than others in an event: older/elderly people: why: because they find it cold with no heating
1	Vulnerabilities: can be geographically widespread
1	Vulnerabilities: during an event certain actions might not occur to people
6	Vulnerabilities: has a disability, health issues or less mobile than most
7	Vulnerabilities: our services / infrastructure / buildings are vulnerable
1	Vulnerabilities: our town /country is more built up than it used to be
2	Vulnerabilities: People are generally vulnerable to events/disasters
8	Vulnerabilities: people lack the skills / knowledge to survive in a disaster
3	Vulnerabilities: quite vulnerable now because dependent on electricity
1	Vulnerabilities: should ensure vulnerable people know how to make contact in a disaster
8	Vulnerabilities: some more vulnerable than others in an event: low socio-economic groups / poor people or countries
1	Vulnerabilities: some more vulnerable than others in an event: people not 'smart enough'
1	Vulnerabilities: some more vulnerable than others in an event: people who have more frequent disasters
2	Vulnerabilities: some more vulnerable than others in an event: the sick
5	Vulnerabilities: some more vulnerable than others in an event: those in hazardous locations
3	Vulnerabilities: some more vulnerable than others in an event: those that can't cope/need help
1	Vulnerabilities: some people more vulnerable in an event: townies / urban people: why: don't have stockpiles / appropriate items
12	Vulnerabilities: some people more vulnerable in an event: young people/children
2	Vulnerabilities: some people more vulnerable in an event: young people/children: why: don't have stockpiles / appropriate items
1	Vulnerabilities: some people more vulnerable than others in an event: people who are dependant
1	Vulnerabilities: some people more vulnerable than others in an event: people who are not prepared
1	Vulnerabilities: some people more vulnerable than others in an event: people with dependants (e.g. children, or just other's dependent on them)
8	Vulnerabilities: some people more vulnerable than others in an event: rural people / easily isolated people
2	Vulnerabilities: some people more vulnerable than others in an event: townies / urban people
2	Vulnerabilities: the people who need it most / benefit from it most, aren't going to undertake preparedness
13	Vulnerabilities: vulnerabilities have changed over time
1	Vulnerabilities: women are more independent today (thus less vulnerable)
2	Vulnerabilities: young people aren't very 'streetwise'
1	Vulnerability: thinks will have NO problem evacuating / escaping
6	Wants to help others
1	What can any of us do against nature?
5	What might allow people to prepare: having another family member help them / encourage them to prepare
1	What might allow people to prepare: Not having too many hazards facing them
7	What might motivate people to prepare: a scare / shock / jolt
2	What might motivate people to prepare: acknowledging that hazards can happen
1	What might motivate people to prepare: being at high/more risk of an event occurring
2	What might motivate people to prepare: being aware

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QUOTATION COUNT	CODE TITLE
2	What might motivate people to prepare: being conscious of how your body reacts to circumstances
2	What might motivate people to prepare: being conscious of what the environment can do (e.g. weather, flooding of rivers)
3	What might motivate people to prepare: being conscious/aware that hazards can happen
1	What might motivate people to prepare: being high in consciousness all the time
3	What might motivate people to prepare: emergency services interacting with community groups
15	What might motivate people to prepare: experiencing an event or disaster / personal experience
7	What might motivate people to prepare: having a rural / farming background (where isolation is common, have to look after selves/stock, etc.)
10	What might motivate people to prepare: having children (or other family) to look after
1	What might motivate people to prepare: having had a large disaster in your location/area before (e.g. Napier earthquake)
1	What might motivate people to prepare: hedge bets / keep some stuff just in case
1	What might motivate people to prepare: if everybody else did it
1	What might motivate people to prepare: in response to other's (or my) attitude
7	What might motivate people to prepare: knowing that help might not be available in a disaster
2	What might motivate people to prepare: making it 'real'
1	What might motivate people to prepare: pandemic
2	What might motivate people to prepare: preserving/protecting their assets / property
1	What might motivate people to prepare: realise they don't have the preparedness items to deal with a disaster
1	What might motivate people to prepare: realise they don't have the skills to deal with a disaster
1	What might motivate people to prepare: realising the benefits
2	What might motivate people to prepare: reduce the worry/ scariness
2	What might motivate people to prepare: responding to social norms
1	What might motivate people to prepare: safety
1	What might motivate people to prepare: social vilification for not preparing
2	What might motivate people to prepare: survival
5	What might motivate people to prepare: thinking about outcomes/consequences
3	What might motivate people to prepare: thinking it will happen (inevitable)
4	What might motivate people to prepare: worry about an event/disaster occurring
1	What might motivate people to prepare: a 'cooperative impulse', cooperation from a number of community members
1	Why I prepare: responding to social norms
8	When it happens
1	What might motivate people to prepare: an overseeing/integrated authority
2	Why I prepare: having children (or other family) to look after
1	Why I don't prepare: I've got through other unexpected adverse events before
1	Why I don't prepare: because I don't like to think I'll need them
1	Why I don't prepare: because the items can only be stored for a certain period of time
3	Why I don't prepare: big events don't happen very often
9	Why I don't prepare: can't / don't know where to store/keep everything
1	Why I don't prepare: can't cover all the disaster options
3	Why I don't prepare: can't do anything about it
3	Why I don't prepare: can't manage to undertake sustained preparedness
1	Why I don't prepare: can't move furniture once restrained
2	Why I don't prepare: Can't predict what will happen (what kind of disaster will happen)
4	Why I don't prepare: choose to put it at the back of my mind / at the back of my mind
2	Why I don't prepare: complacency
1	Why I don't prepare: complacency: why: live in a less hazardous area
2	Why I don't prepare: denial
1	Why I don't prepare: do the opposite of what you are instructed to do (e.g. 'anti' the campaign)
1	Why I don't prepare: don't believe it will work
2	Why I don't prepare: don't consider it urgent
4	Why I don't prepare: don't have children / others to look after
1	Why I don't prepare: don't have enough time
1	Why I don't prepare: don't have much furniture that needs restraining
3	Why I don't prepare: don't know how to prepare
3	Why I don't prepare: don't know if it will ever happen

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QUOTATION COUNT	CODE TITLE
1	Why I don't prepare: don't know what might need to do to overcome things
2	Why I don't prepare: don't know what to put in emergency kit
3	Why I don't prepare: don't know what you are catering for (what an event might look like)
3	Why I don't prepare: don't like the thought of it sitting there not being used / used regularly
1	Why I don't prepare: don't see earthquakes as a serious threat
1	Why I don't prepare: don't see pandemic as a serious / high threat
2	Why I don't prepare: don't want to keep something I won't use regularly and thus might not work in an event
1	Why I don't prepare: feel have enough items already as part of daily life
1	Why I don't prepare: feel like I need to get/buy everything all at once
1	Why I don't prepare: felt 'defeated' because didn't know how to prepare
1	Why I don't prepare: forgot about it
1	Why I don't prepare: furniture strapping is ugly
1	Why I don't prepare: hadn't seen/received any information
1	Why I don't prepare: have a disability or health issues that prevent me from preparing in a certain way
2	Why I don't prepare: haven't been bothered
2	Why I don't prepare: haven't experienced a major event
19	Why I don't prepare: haven't got around to it
2	Why I don't prepare: haven't got around to it: what: planning for longer than a few days
1	Why I don't prepare: haven't got around to it: what: removing dangerous items (e.g. trees, structures)
1	Why I don't prepare: haven't lived here long
2	Why I don't prepare: haven't managed to get it hooked up / to work
1	Why I don't prepare: I'm a bit casual about water
1	Why I don't prepare: I've been okay for XX years, and so will be okay in future
1	Why I don't prepare: I've been okay in past events / circumstances
2	Why I don't prepare: I don't know
1	Why I don't prepare: I don't want to accept that something could affect me
2	Why I don't prepare: I just don't think about it
2	Why I don't prepare: it's not going to happen again
4	Why I don't prepare: it's not going to happen to me
1	Why I don't prepare: lack of knowledge about certain aspects
4	Why I don't prepare: lazy
2	Why I don't prepare: messages about things to do not seen as practical
1	Why I don't prepare: might cause damage (e.g. leave holes in walls)
2	Why I don't prepare: no-one else does it / other people don't prepare
1	Why I don't prepare: no space to restrain furniture
1	Why I don't prepare: not a social norm
2	Why I don't prepare: other things are more important
1	Why I don't prepare: over time it fades out of my interest/awareness
1	Why I don't prepare: physical preparedness is given less priority
2	Why I don't prepare: power is underground (thus protected from disasters)
1	Why I don't prepare: preparedness item/s not easy to procure
1	Why I don't prepare: the 'reality of what could happen doesn't kick in'
1	Why I don't prepare: things affect other people, not me
2	Why I don't prepare: think that the item won't move anyway
1	Why I don't prepare: think we can look after ourselves after a disaster
3	Why I don't prepare: too expensive (lack of money)
1	Why I don't prepare: unlikely to happen in my lifetime
1	Why I don't prepare: until I experienced a disaster I hadn't put it into context
7	Why I don't prepare: water might go bad / be contaminated
1	Why I don't prepare: we are renting and don't want to do stuff to the house
1	Why I don't prepare: we haven't used it previously
2	Why I don't prepare: will be able to procure more resources/items as needed
4	Why I don't prepare: will respond as needed to / rise to the occasion
1	Why I don't prepare: would just forget if you had a 'kit' or 'box'
4	Why I don't prepare: wouldn't prepare for a POSSIBLE, UNKNOWN, or MIGHT HAPPEN risk
12	Why I prepare

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QUOTATION COUNT	CODE TITLE
2	Why I prepare: have a family member involved in preparing
2	Why I prepare: cautious enough to want to do something
2	Why I prepare: common sense
1	Why I prepare: common sense: to have a fire extinguisher in a wooden house
2	Why I prepare: conscious of safety: because I or someone else has a disability
1	Why I prepare: conscious of safety: because of a previous or current health issue
5	Why I prepare: conscious of safety: because of what I've seen at work
1	Why I prepare: don't know when an emergency is going to happen
3	Why I prepare: everybody else does it
6	Why I prepare: feel a responsibility to help others (or myself)
6	Why I prepare: follow the rules / advice
2	Why I prepare: for a specific event (e.g. Y2K)
11	Why I prepare: for electricity failure
2	Why I prepare: for hazards more likely to occur
1	Why I prepare: for security / feeling secure
2	Why I prepare: habit / it's a good habit
2	Why I prepare: have a war background
7	Why I prepare: have experienced previous events / instances
3	Why I prepare: have to rely on only a few people (myself, one other) in an event
2	Why I prepare: I'm an organised person
1	Why I prepare: I've always had it in the past, so feel I need to have it now
1	Why I prepare: I am aware it could/can happen
1	Why I prepare: I am aware it does happen
1	Why I prepare: I have a family member who has experienced previous events / instances
1	Why I prepare: I know that things can go wrong despite infrastructure/planning in place
1	Why I prepare: I might feel sorry that I hadn't done it if there was a disaster
5	Why I prepare: I own a home / property (protect home /property)
2	Why I prepare: I value my life / want to survive
1	Why I prepare: I want to know I've done my share in a disaster
1	Why I prepare: I was away a lot, so the family had to have a plan
1	Why I prepare: if I leave it to others it won't happen
4	Why I prepare: if you don't prepare you could be in trouble
5	Why I prepare: important to have good clean water
2	Why I prepare: in response to an impending threat (e.g. pandemic)
2	Why I prepare: informational messages / reminders
2	Why I prepare: insurance company requirements
14	Why I prepare: it's due to my background / occupation / involvement in a role
1	Why I prepare: it's easier to undertake action yourself (rather than rely on others)
2	Why I prepare: it's part of my psyche
2	Why I prepare: it's part of the job / role
1	Why I prepare: it doesn't take much impact for the services to go down
1	Why I prepare: it's at the forefront of my interest / awareness
3	Why I prepare: like to be independent
2	Why I prepare: made a conscious decision
2	Why I prepare: need to be self-sufficient for a period after a disaster
2	Why I prepare: no point watching a disaster happen if you can avert it
1	Why I prepare: observing natural phenomena, or possibility of unnatural phenomena
1	Why I prepare: OSH requirements
1	Why I prepare: pragmatic
2	Why I prepare: preparedness campaign / information at work
2	Why I prepare: realise I haven't done a preparedness action I should have
3	Why I prepare: reduces concern / worry
1	Why I prepare: so I know resources are available that can help me
5	Why I prepare: that's my personality
1	Why I prepare: to avoid economic loss
1	Why I prepare: to have items essential to living/life

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QUOTATION COUNT	CODE TITLE
1	Why I prepare: undertake actions that are easier to do
4	Why I prepare: want to make sure the least harm possibly is done to me/my family (protect family)
1	Why I prepare: would seem silly to get to a disaster and say "I always meant to" prepare
3	Why I prepare: wouldn't survive if didn't have water
1	Why I prepare: wouldn't survive if I didn't have a smoke alarm
2	Why I prepare: you can't do anything once the hazard/disaster starts / too late
3	Why I prepare: You never know
1	Why people don't prepare: apathy
2	Why people don't prepare: can't do anything about it
2	Why people don't prepare: can't focus on what MIGHT happen (have to deal with what IS happening right now)
1	Why people don't prepare: can't imagine what might happen and the consequences of it
1	Why people don't prepare: choose to put it at the back of their minds
3	Why people don't prepare: complacency
1	Why people don't prepare: didn't feel like anything could be done for last event
3	Why people don't prepare: don't consider the area will be impacted by an event
2	Why people don't prepare: don't forward plan
1	Why people don't prepare: don't go seeking information
1	Why people don't prepare: don't have a full understanding of what an event will be like (consequences)
1	Why people don't prepare: don't have children/others to look after
2	Why people don't prepare: don't know how to prepare
5	Why people don't prepare: don't rate the risk as being there/low risk/ not high enough to plan for
2	Why people don't prepare: don't see any reason to
6	Why people don't prepare: don't think /aren't aware of the consequences of an event
6	Why people don't prepare: don't think about it
1	Why people don't prepare: don't think beyond their own (or immediate family's) safety
4	Why people don't prepare: don't think it will happen imminently / happen sometime in the future
1	Why people don't prepare: don't think it will happen like it's been told
2	Why people don't prepare: don't want to do it
1	Why people don't prepare: don't want to know
1	Why people don't prepare: everything will be damaged/fall down so there's no point
7	Why people don't prepare: expect civil authorities / civil defence / emergency services to take care of them
4	Why people don't prepare: get used to living with the threat of perils
7	Why people don't prepare: haven't experienced a major event
4	Why people don't prepare: haven't experienced regular disasters
1	Why people don't prepare: haven't experienced the implications of an event (e.g. power cuts, etc.)
7	Why people don't prepare: haven't got around to it
2	Why people don't prepare: haven't/hadn't thought it through
4	Why people don't prepare: hope an event won't happen
3	Why people don't prepare: I've been okay for xx years, and so will be okay in the future
2	Why people don't prepare: it's not very likely to happen so assume it won't happen
2	Why people don't prepare: it will happen somewhere else
1	Why people don't prepare: it will happen to someone else
25	Why people don't prepare: It won't happen to me / here (never happen)
6	Why people don't prepare: lack of money
1	Why people don't prepare: Lack of personal experience
8	Why people don't prepare: laissez faire/lax attitude/ blasé attitude
8	Why people don't prepare: Lazy or can't be bothered
3	Why people don't prepare: more separated from natural environment than they used to be so people aren't affected/don't think will be affected
2	Why people don't prepare: not conscious of it
1	Why people don't prepare: not conscious of it: why: never had to think about it
2	Why people don't prepare: not organised
1	Why people don't prepare: not really an indoor person
5	Why people don't prepare: people expect there will be enough supplies available
6	Why people don't prepare: rely on family, friends or other people/organisations to get through
1	Why people don't prepare: they are optimistic that nothing will happen/won't be impacted

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QUOTATION COUNT	CODE TITLE
2	Why people don't prepare: they are stupid
2	Why people don't prepare: they think it is a stupid idea
7	Why people don't prepare: think they will be okay in an event, or will be able to cope (aka "she'll be right")
10	Why people don't prepare: too busy doing other things with their lives (other priorities)
2	Why people don't prepare: wait for someone else to do it
1	Why people don't prepare: weather and/or flood events occurring more often
1	Why people don't prepare: why: don't perceive disasters/hazards can happen
5	Why people don't prepare: will worry about it/deal with it when it happens
1	Why people should prepare: it can happen at anytime
42	Will happen
3	Won't happen
3	Work (need to work) with others to achieve a result
1	Worry means: being prepared like the "boy scouts"
1	Worry: about a pandemic occurring
6	Worry: about an earthquake occurring
1	Worry: about an earthquake occurring: because it could be disastrous/dangerous
1	Worry: about an earthquake occurring: because you get no warning for an earthquake
1	Worry: about communication / access to information during a disaster
3	Worry: about damage occurring to house
5	Worry: about family members who might be in an event / disaster
1	Worry: about family members who might have to respond to an event / disaster (e.g. army)
2	Worry: about flooding
1	Worry: about flooding: why: because of landscape changes
1	Worry: about hurricanes/cyclones
2	Worry: about impacts that occur during an event
1	Worry: about volcanic eruptions
1	Worry: because I haven't done something I know I should have
1	Worry: big earthquake risk to NZ government
1	Worry: doesn't overwhelm me with worry
10	Worry: don't spend much time worrying about disasters
1	Worry: don't worry about drought
1	Worry: don't worry about earthquake because could go to your head / disturb you
1	Worry: don't worry about earthquake because it will happen when it happens
3	Worry: don't worry about earthquake because think we are less at risk / safe from then
1	Worry: don't worry about earthquake: why: complacency
2	Worry: don't worry about earthquakes because have experienced many before
1	Worry: don't worry about earthquakes because I've experienced other hazards / emergencies before
2	Worry: don't worry about earthquakes because I've never been in a damage-causing earthquake
1	Worry: don't worry about earthquakes because I know what to do if one occurs
1	Worry: don't worry about earthquakes because they are a fact of life/reality
1	Worry: don't worry about earthquakes because we have good building codes
3	Worry: don't worry about floods because not at risk from
1	Worry: don't worry about heavy rain occurring
2	Worry: don't worry about house structure / safety
1	Worry: don't worry about landslides because unlikely to affect us
1	Worry: don't worry about small earthquakes because have experienced a big one before
2	Worry: don't worry about something that MIGHT happen
1	Worry: don't worry about tsunami because we are not at risk from
1	Worry: don't worry about volcanoes because I can get a warning
1	Worry: don't worry about what has happened in the past, live for each future day
1	Worry: don't worry because civil defence and/or emergency service will take care of us
1	Worry: don't worry because it's never happened in the past
1	Worry: don't worry if you are prepared / gives you peace of mind
1	Worry: don't worry: about having to camp / look after ourselves after an earthquake
1	Worry: don't worry: because friends will take care of us
9	Worry: don't worry: because hazard unlikely to affect us / affect us again

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QUOTATION COUNT	CODE TITLE
2	Worry: don't worry: because they are rare events / don't happen often
1	Worry: don't worry: because we don't have children to look after
2	Worry: don't worry: because we will make do at the time / be able to respond
1	Worry: don't worry: hasn't affected me or my family in the past so why worry?
2	Worry: don't worry: nothing/not much you can do to stop them happening
1	Worry: don't worry: why: if it's okay to have our government near a fault line, what have we got to worry about?
1	Worry: don't worry about a large volcanic eruption because we'll all be 'goners' anyway
2	Worry: might worry more about our house if it were made of different / more dangerous materials
2	Worry: more anxious about earthquakes: because more likely to happen
2	Worry: more anxious about snowstorms: because more likely to happen
5	Worry: no one seems to worry about hazards/disasters
1	Worry: not going to spend my life worrying about earthquakes
2	Worry: other people worry about disasters
2	Worry: others might not be equipped with survival skills to survive a disaster
1	Worry: shouldn't worry about a hazard because the Council would publicise the required information if it was a concern
1	Worry: shouldn't worry children, because have discussed disasters and what to do about them at school
11	Worry: shouldn't worry too much
1	Worry: shouldn't worry too much: why: there are other great things in life to focus on
3	Worry: shouldn't worry too much: why: unlikely to happen in my lifetime
1	Worry: there are no shortage of things to worry about
1	Worry: too much focus on preparing can lead to worry
1	Worry: worry about heavy rain occurring

**Table A5.2** Most frequently occurring codes that emerged during analysis of the interviews (with at least 10 occurrences)

QUOTATION COUNT	CODE TITLE
206	Thinking/talking about hazards/preparedness: response: laughing about situation
200	Community groups: belong to
191	Hazards: hazards may be associated with other activities / problems
163	Awareness
136	Disaster/event experience: indirect: floods
120	Hazard knowledge/belief: hazards at risk from or more at risk from
118	Information type: general preparedness information
115	Disaster/event experience: earthquakes: minor
114	Responsibility for dealing with hazards: personal/individual
113	Preparedness items: items owned: water
109	Information source: civil defence
107	Family members
106	Information source: TV
103	Hazard type: earthquakes
102	Preparedness items: items owned: food supply
98	Hazard knowledge/belief: hazards not at risk from or at less risk from
94	Hazard type: flooding
94	Preparing important
91	Disaster/event experience: direct: snowstorm / heavy snow
91	Safety important
89	Information type: events/disasters outside of New Zealand
87	If it happens
85	Information source: geographic/environmental cues
83	Community group: nature: civil defence
82	Can happen
80	Luck: general reference to luck or being lucky/unlucky or fortunate/unfortunate

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QUOTATION COUNT	CODE TITLE
76	Disaster/event experience: assist in responding to an event
76	Estimation of other people's preparedness: under or not prepared
70	Hazard knowledge/belief: knowledge of hazards
67	Estimation of other people's preparedness: prepared
67	Talking about hazards/preparedness: haven't or don't
66	Responsibility for dealing with hazards: there are different roles for different people/organisations
64	Community: will/did help each other out in an event
63	Basic / basics
63	Community: proactive in the community with respect to mitigating 'hazards'
63	Lives with: spouse
61	Information source: workplace
59	Information source: news media (general)
58	Resource issues: money
58	Talking about hazards/preparedness: topics: earthquakes
57	Sustained preparedness: undertakes
57	Talking about hazards/preparedness: topics: what happened in an event
56	Hazard type: car/aircraft/personal accidents
56	Preparedness items: should have: water
55	Responsibility for others: children (young)
54	Information seeking
54	Information source: school education
52	Preparedness items: should have: food
52	Preparedness type: prepared item/s specifically for an emergency
51	Talking about hazards/preparedness: who: friends
49	Hazard type: fire
49	Information type: events/disasters closer to home (e.g. Pacific, Asia, US)
48	Hazard type: tsunami
48	Information source: phone book/yellow pages
47	Community: helped the community and/or neighbours out in a past event
47	Preparedness type: just what is in the house now / things we normally have
46	EQ scenario: impacts: damaged buildings
46	Issue (refers to an event, or consequences as being an issue)
46	Lives with
46	Responsibility for dealing with hazards: local government
45	Hazard knowledge/belief: past events in Napier: Napier Earthquake
45	Hazard knowledge/belief: past events in Wanganui: flooding
45	Information type: flooding
45	Information type: tsunami
44	Awareness: of the landscape/location and risks associated with that
44	EQ scenario: impacts: collapsing buildings
44	Preparedness type: preparedness required in the workplace / OSH
44	Preparedness type: refers to survival items / survival
44	Talking about hazards/preparedness: topics: flooding
42	Information: response to information: got a preparedness item/got prepared
42	Preparedness items: items owned: alternative cooking
42	Will happen
41	Community groups: used to belong
41	Information source: newspaper
41	Priorities in times of quiescence
40	Community: help the community currently
40	Community: know neighbours well
40	Disaster/event experience: influence: helped hone preparedness
40	Hazard knowledge/belief: hazards known in New Zealand: earthquakes
40	Hazard knowledge/belief: hazards known in Wanganui: flooding
40	Information source: speaker at community group meeting/ organisation meeting
39	Disaster/event experience: rural living

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QUOTATION COUNT	CODE TITLE
39	Responsibility for others: community (neighbours, friends, community in general)
39	Time since last event: long
38	Disaster/event experience: snowstorm: impacts: lack of power / unreliable power
38	Estimation of own preparedness: prepared
38	Information type: tsunami: Boxing Day tsunami
37	EQ scenario: response: react as needed at time
37	Information dissemination: by interviewee
37	Information type: events/disasters that happened
37	Preparedness items: items owned: torch
37	Preparedness type: building code/standards/good construction/safe structures
37	Preparedness type: hazards/preparedness education for school aged children
37	Talking about hazards/preparedness: prompts: an event which has affected someone/somewhere else
37	Talking about hazards/preparedness: who: family (general)
36	Emergency plan: none
36	Hazard knowledge/belief: hazards known in Napier: flooding
36	Talking about hazards/preparedness: topics: preparedness undertaken
35	EQ scenario: response: checking on/helping the community
35	Hazard type: volcanoes
35	Hazards: some hazards have a warning time / or can be forecast
35	Information source: pamphlets/brochures/cards
35	Preparedness type: drills / evacuations / exercises
35	Talking about hazards/preparedness: topics: emergency plans
34	Information type: earthquake impacts (general)
34	Responsibility for others: family (general)
33	Awareness: of hazards/disasters/events occurring
33	EQ scenario: how fare: would fare well /okay
33	Information source: internet/websites
33	Might happen
33	Preparedness type: always keep extra supplies at home just so not to run out
33	Time since last event: short
32	EQ scenario: impacts: furniture falling/falling items
32	Responsibility for dealing with hazards: Civil Defence
32	Talking about hazards/preparedness: who: community in general
32	Time to next event: might happen out of blue / unexpectedly / right now / any time
32	Uncertainty over event or eventualities arising from the event
31	Awareness: of impacts/consequences of disasters
31	Danger
31	Disaster/event experience: direct: flooding
31	Disaster/event: possible
31	Estimation of own preparedness: considered not prepared for a hazard situation
31	Hazard knowledge/belief: hazards known in Napier: earthquakes
31	Information source: radio: radio in general
31	Information source: regional council
31	Information type: general hazards information
31	Preparedness: should just be prepared if / just in case it does come
30	Disaster/event experience: earthquakes: moderate
30	EQ scenario: response: get under table/doorway
30	Hazard type: recreational pursuits (tramping, mountaineering, diving, boating, fireworks)
30	Information type: events/disasters within New Zealand
30	Information: response to information: talked about it with others
30	Length of time living in Napier: long
30	Talking about hazards/preparedness: topics: preparedness to be undertaken
30	Talking about hazards/preparedness: who: own children (grown)
29	Can't do it: belief you can't do anything about natural hazards / natural hazard impacts
29	EQ scenario: impacts: potential injuries
29	House/building: structure: thinks it is made of strong/good building materials or is 'solid'

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QUOTATION COUNT	CODE TITLE
29	Lived previously: overseas locations: Europe/UK
29	Occupation (past or present): role: worked/s with/for medical profession
29	Sustained preparedness: timing of checking / replacing
29	Talking about hazards/preparedness: I/we do
29	Talking about hazards/preparedness: response: get an item or items to prepare, or made a plan
29	Talking about hazards/preparedness: topics: tsunamis
29	Talking about hazards/preparedness: who: staff at work
28	Disaster/event experience: direct: recreational pursuits (e.g. tramping, boating) and dangers associated with these
28	Disaster/event experience: flooding: impacts: damaged houses/buildings
28	EQ scenario: impacts: no water / water disruption
28	Information: response to information: good
28	Preparedness items: where keeps: kit/items: Outside of house (e.g. garage, shed, flat)
28	Talking about hazards/preparedness: prompts: school project / activity
27	Can do it: belief in ability to do something about problems for natural hazards (preparedness)
27	Can do it: belief in ability to do something about problems for natural hazards (response)
27	Community group: nature: neighbourhood support
27	EQ scenario: impacts: power off/issues
27	Gender: male
27	Hazard knowledge/belief: hazards known in Timaru: earthquake
27	Preparedness items: should have: preparedness kit
27	Preparedness type: hard / structural mitigation measures in the town
27	Responsibility for yourself
26	Disaster/event experience: indirect: snowstorm
26	Estimation of own preparedness: considered a bit prepared
26	Hazard knowledge/belief: hazards known in Wanganui: earthquakes
26	Hazard knowledge/belief: lack of knowledge: about hazards
26	Information: can't recall details
26	Leadership: role in leading community groups or organisations
26	Occupation (past or present): duties: responding to events
26	Reality: hazards/preparedness is a reality / fact of life
26	Thinking about hazards/preparedness: in detail
25	House: built when moved in
25	Imagination / imagine
25	Information source: discussion (general)
25	Information type: Napier earthquake
25	Occupation (past or present): role: work for regional council
25	Potential type of event: severe
25	Preparedness items: items owned: radio
25	Talking about hazards/preparedness: prompts: experience a local earthquake event
25	Why people don't prepare: It won't happen to me / here (never happen)
24	Conscious
24	Disaster/event experience: evacuation drills, practices or exercises
24	Disaster/event experience: in an occupation related to emergency / preparedness /safety planning during times of quiescence (external to CD)
24	Information source: sirens
24	Information type: earthquake: earthquakes in New Zealand
24	Interview: in person
24	Interview: telephone
24	Location: street/area
24	Occupation (past or present): duties: advocating or looking after emergency preparedness
24	Occupation (past or present): role: worked/s for council
24	Preparedness type: know where items are in house/building, or where to find them
24	Preparedness type: need to look after ourselves for three days
24	Preparedness type: try not to live in a hazardous area
24	Preparedness type: use of existing items (or items in general use) for preparing.
24	Responsibility for dealing with hazards: central government

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QUOTATION COUNT	CODE TITLE
24	Talking about hazards/preparedness: topics: What would you do if there was an event here?
24	Thinking about hazards/preparedness: yes, I/we do
23	Awareness: of mitigation measures
23	Disaster/event experience: direct: cyclone/hurricane
23	Emergency plan: assumes informal actions (reactions) will occur in an emergency
23	Hazard knowledge/belief: hazards (or certain hazards) aren't likely to happen / to affect me
23	Hazard type: work place hazards / OSH
23	Hopes won't be impacted by an event (or impacted too much)
23	Information: response to information: thought should prepare/get involved
23	Preparedness items: items owned: BBQ
23	Preparedness: understanding a need to be prepared but being under or not prepared
23	Resourceful: considers themselves (or others) to be resourceful
23	Talking about hazards/preparedness: topics: how to respond to an event
22	Approximate age: 60-70 years
22	Community group: nature: Rotary
22	Disaster/event experience: direct: power cuts
22	Disaster/event experience: very little / none
22	Empathy for others
22	EQ scenario: impacts: infrastructure damage
22	EQ scenario: response: check on / look for other family members
22	Information source: local or world history / historical information
22	Information type: what to do in an earthquake
22	Information: response to information: raised awareness / interest
22	Potential impacts of an event: power failure
22	Preparedness items: items owned: log burner/fireplace
22	Preparedness: who undertakes: I do
22	School influence: project / activity on disasters/preparedness
22	Talking about hazards/preparedness: prompts: family member experiences an event
22	Talking about hazards/preparedness: who: children in schools
22	Talking about hazards/preparedness: who: spouse
21	Disaster/event experience: direct: windstorm
21	Gender: female
21	Hazard type: pandemic
21	Information source: advertisements / notices
21	Information type: information on response/impacts during an event
21	Potential impacts of an event: could be on your own / help not available
21	Preparedness items: items owned: batteries
21	Preparedness: intends to prepare
21	Priorities in disasters
21	Responsibility for dealing with hazards: personal/individual: role: do the best for themselves / to look after themselves
20	Community group: nature: sports group / sports activities
20	Community: helped the community in the past (general)
20	Community: volunteer / belong to voluntary organisations
20	Disaster/event experience: flooding: impacts: trapped, could not get out/travel
20	Hazard knowledge/belief: other places in New Zealand are more hazardous
20	Hazards: natural hazards vs. those of your own making (human-made)
20	House/building: structure: thinks it will be safe/okay
20	House: other considerations when buying/building the house (not related to preparedness)
20	Information seeking: about hazards / preparedness generally
20	Information type: buildings or structures falling / fallen down / destroyed
20	Information type: earthquakes (general)
20	Information type: earthquakes: past earthquake events overseas
20	Information type: Health and safety/OSH
20	Information: haven't seen / received anything
20	Length of time living in Timaru: long
20	Preparedness items: items owned: alternative temporary accommodation (e.g. tent, caravan)

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QUOTATION COUNT	CODE TITLE
20	Preparedness type: training: training for emergencies / disasters
20	Reaction in an event
20	Responsibility for others: spouse
20	Talking about hazards/preparedness: prompts: organised discussions as part of a community group/meeting
20	Talking about hazards/preparedness: topics: natural hazards / preparedness in general
20	Talking about hazards/preparedness: who raised topic: myself
20	Talking about hazards/preparedness: who: civil defence personnel
20	Talking about hazards/preparedness: who: parents
19	Community: want to/will actively participate in disaster response/recovery
19	EQ scenario: impacts: my house might be affected
19	Hazard knowledge/belief: hazards known in Napier: tsunamis
19	Hazards: earthquakes: don't have a warning time / occur instantaneously
19	Information source: multiple sources
19	Most likely event: earthquake
19	Preparedness items: items owned: candles
19	Preparedness type: ensure exits and escape routes are available/clear
19	Preparedness: should be prepared "for life" / daily living / for everything we do
19	Talking about hazards/preparedness: prompts: speaker at a community group meeting / or meeting of an organisation
19	Talking about hazards/preparedness: who: own children (when young)
19	Why I don't prepare: haven't got around to it
18	Community group: activities: meetings
18	Community: call on (phone, visit) people to check they are okay in an event
18	Do what can in an event/deal with it: actions not specified
18	EQ scenario: impacts: transport (roads, etc.) disrupted
18	Feelings about earthquakes: not worried
18	Hazard knowledge/belief: hazards are/can be destructive/cause big or major disasters
18	House: think about preparedness/hazards before building/buying: no
18	Information type: pandemic
18	Information type: pandemic planning
18	Information type: return periods (e.g. 100 year floods; 1:100 years)
18	Information type: volcanoes
18	Information: stopped
18	Length of time living in Wanganui: long
18	Location: Timaru
18	Preparedness items: items NOT owned: restrained furniture / objects / strengthening
18	Preparedness items: items NOT owned: water
18	Preparedness items: items owned: heating device
18	Preparedness type: training: trained others for emergencies / disasters
18	Priorities in times of quiescence: daily life
18	Talking about hazards/preparedness: prompts: experience a snowstorm
18	Talking about hazards/preparedness: response: go home from school and talk about it with parents
18	Thinking about hazards/preparedness: prompts: working in a workplace/role that deals with hazards/preparedness/safety issues
18	Thinking about hazards/preparedness: topics: What if XX happened (consequences)?
18	Vulnerabilities: some more vulnerable than others in an event: older/elderly people
17	Awareness: people should be / need to be aware of potential hazards
17	Disaster/event experience: impacts: not personally experienced
17	Disaster/event experience: influence: raised/es awareness (e.g. of dangers/impacts, etc.)
17	Does / do happen
17	Estimation of other people's preparedness: don't know anyone else who has prepared
17	Hazard knowledge/belief: hazards or disasters (or the impacts) are out of your control
17	Hazard knowledge/belief: past events in NZ: Manawatu floods
17	Hazard type: climate change/global warming
17	House/building: structure: made alterations for other reasons (e.g. aesthetics, warmth)
17	Information type: household emergency checklist

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QUOTATION COUNT	CODE TITLE
17	Information: response to information: thought about the information
17	Most likely event: flooding
17	Potential impacts of an event: earthquake/disaster: just don't know what is going to happen/anything could happen
17	Preparedness items: items owned by others: water
17	Preparedness items: items owned: preparedness kit
17	Preparedness type: basic skills to survive (e.g. camping, lighting fires, boiling water, etc.)
17	Preparedness: prompt: working with an organisation in the past or present that deals with hazard/preparedness issues
17	Talking about hazards/preparedness: topics: overseas disasters
17	Thinking about hazards/preparedness: don't think about hazards
17	Thinking about hazards/preparedness: topics: what would we do if XX happened?
16	EQ scenario: response: escape or leave and go to a safe place/make sure you are safe
16	Feelings about earthquakes: frightening / scary / terrified
16	Hazard knowledge/belief: flooding: we are protected by mitigation measures (e.g. stopbanks, floodgates, pumps)
16	Hazard knowledge/belief: hazards known in Timaru: flooding
16	Hazard knowledge: knowledge of civil defence centre/s or have visited
16	Hazard type: bad weather
16	Information source: film / video
16	Information source: museum (or similar 'display' - type places e.g. aquarium)
16	Information type: deaths in a disaster
16	Information type: earthquake: past earthquake events in New Zealand
16	Information type: events/disasters that happened locally
16	Information type: geology, earth movement
16	Information type: warning of an impending event
16	Length of time living in house in Timaru: long
16	Location: Napier
16	Occupation (past or present): role: school teacher
16	Potential impacts of an event: depends on exact nature of event
16	Preparedness items: items owned: first aid
16	Preparedness items: items owned: gas bottle/canister
16	Preparing: needs planning and organisation to happen
16	Responsibility for dealing with hazards: community groups
16	Responsibility for dealing with hazards: personal/individual: role: be/get prepared
16	School influence: emergency plans
15	Community groups: time participating in
15	Community: have good neighbours / neighbourhood
15	Disaster/event experience: civil defence planning (during quiescence)
15	Disaster/event experience: flooding: not personally affected
15	Disaster/event experience: indirect: accidents (car, plane, general accidents)
15	Disaster/event experience: influence: normalised a person to an event / emergencies
15	Disaster/event experience: nothing else
15	Emergency plan: nature of plan: escape routes / evacuation
15	Estimation of other people's preparedness: don't know
15	Hazard knowledge/belief: hazards known in New Zealand: flooding
15	Hazard knowledge/belief: other places overseas are more hazardous
15	House: think about preparedness/hazards before building/buying: yes
15	Listens to other people's ideas / advice
15	Potential impacts of an event: disrupted food and water
15	Potential impacts of an event: might not able to reach preparedness items
15	Preparedness items: items owned: insurance
15	Preparedness items: should have: emergency plan
15	Resource issues: money: preparedness is/can be expensive
15	Resource issues: time
15	Responsibility for dealing with hazards: government (general)
15	Responsibility for dealing with hazards: insurance

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QUOTATION COUNT	CODE TITLE
15	Responsibility for dealing with hazards: personal/individual: role: look after selves for first 3 / few days
15	Self-sufficiency
15	Talking about hazards/preparedness: topics: Napier earthquake
15	What might motivate people to prepare: experiencing an event or disaster / personal experience
14	Awareness: of 'what to do'
14	Community: has resources they can share in a disaster/shared resources
14	Disaster/event experience: earthquakes: common
14	EQ scenario: impacts: isolation / on your own
14	EQ scenario: response: depends on nature of earthquake / impacts
14	Hazard knowledge/belief: flooding: much of our town is low-lying / below sea or river level
14	Hazard knowledge/belief: past events in NZ: Gisborne earthquake
14	Hazard knowledge/belief: tsunami: this location is at risk of a tsunami
14	Hazards: natural hazards: what I consider natural hazards to be
14	Hazards: shouldn't dominate your life/thinking
14	Influenced by other people
14	Information source: meetings: street or community meetings
14	Information: response to information: it could happen here / or happen again the same way
14	Interested in hazards/disasters
14	Location: Wanganui
14	Preparedness items: items owned: restrained furniture
14	Preparedness items: items owned: smoke / fire alarm
14	Preparedness type: town/land-use planning for hazards (including houses, roads, etc.)
14	Preparedness type: training: first aid /medical training
14	Responsibility for dealing with hazards: local government: role: mobilisation / coordination to deal with issues post disaster
14	School influence: learning what to do in an earthquake (or emergency)
14	Talking about hazards/preparedness: prompts: a potential threat
14	Talking about hazards/preparedness: prompts: workplace project/activity
14	Talking about hazards/preparedness: topics: family member experiences an event
14	Talking about hazards/preparedness: topics: fire
14	Uncertainty over how to respond / what to do / other aspects of response
14	Why I prepare: it's due to my background / occupation / involvement in a role
13	Acceptance of fate / can't do anything about it
13	Benefits of preparing (external to preparedness itself)
13	Community group: nature: fire service
13	Community: might need to ask for others' help in an emergency
13	Disaster/event experience: communication important
13	Disaster/event experience: direct: accidents (car, plane, work, personal, etc.)
13	Disaster/event experience: earthquakes: family member experienced a big earthquake
13	Disaster/event experience: influence: 'wake-up call' about preparedness / brought it home how prepared people should be / reinforced need for preparedness
13	Disaster/event experience: snowstorm: impacts: could not get out / travel / trapped in house
13	Feelings about an event: strange/unusual/out of the ordinary
13	Hazard knowledge/belief: earthquakes: could have a strong / decent earthquake
13	Hazard knowledge/belief: earthquakes: seem far away/ unlikely to affect us
13	Hazard knowledge/belief: hazards known in Wellington: earthquakes
13	Hazard knowledge/belief: hazards known overseas
13	Hazard knowledge/belief: tsunami: should go to higher ground / inland
13	Hazard type: war
13	House/building: structure: have thought about it's safety
13	House/building: structure: haven't made any alterations for safety/preparedness
13	House: new when moved in
13	Information receipt: mail delivery
13	Information source: EQC
13	Information source: scientist/researcher/experts
13	Information type: advice of 'what to do' while a disaster is happening
13	Information type: fixing furniture

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QUOTATION COUNT	CODE TITLE
13	Preparedness items: items owned: has an emergency plan
13	Preparedness items: should have: torch
13	Preparedness items: should have: warm / appropriate clothing
13	Preparedness items: where keeps: items: in easily accessible places
13	Preparedness means: self reliance / looking after yourself
13	Preparedness means: taking sensible precautions
13	Preparedness type: general safety
13	Preparedness type: move to another (safer) house/building/area
13	Preparedness type: prepared for electricity failure
13	Preparedness type: training: for basic survival skills (e.g. camping, lighting fires, etc.)
13	Preparedness: can't see how they can possibly prepare/plan for certain disasters (or prepare fully)
13	Preparedness: is seen as a requirement (e.g. under OSH, insurance, pool regulations)
13	Priorities in times of quiescence: other priorities (general)
13	Responsibility for dealing with hazards: local government: role: looking after flood mitigation /stopbank / flood maintenance / flood equipment
13	Talking about hazards/preparedness: frequency: not often
13	Talking about hazards/preparedness: topics: impacts/consequences of an event
13	Talking about hazards/preparedness: topics: what would happen in a certain disaster/event?
13	Talking about hazards/preparedness: who: acquaintance/s from a community group
13	Talking about hazards/preparedness: who: neighbours
13	Thinking about hazards/preparedness: prompts: hazard event: earthquake
13	Trust issues: local authority
13	Vulnerabilities: vulnerabilities have changed over time
12	Community group: nature: craft or hobby group (e.g. photography, gardening)
12	Community: look after each other
12	Disaster/event experience: actions taken during/post event
12	Disaster/event experience: earthquakes: haven't felt/experienced any earthquakes in this location
12	Disaster/event experience: flooding: response: helped people during the flood
12	Disaster/event experience: influence: did nothing differently post-event
12	Disaster/event experience: length of disruption: few days
12	Disaster/event experience: snowstorm: impacts: other people had (worse) impacts
12	Don't know when/if something is going to occur
12	EQ scenario: impacts: buildings wouldn't/unlikely to fall down
12	EQ scenario: response: don't know what to do / how to respond
12	EQ scenario: response: take / grab things needed
12	Estimation of other people's preparedness: under or not prepared: who: community (general)
12	Estimation of own preparedness: could survive a few days with supplies
12	Hazard knowledge/belief: earthquakes: we are on/near faults
12	Hazard knowledge/belief: flooding: we are less likely to get flooding from a river
12	Hazard knowledge/belief: hazards known in Timaru: tsunami
12	Hazard knowledge/belief: weather patterns are changing
12	House/building: owns home
12	Information type: flood mitigation
12	Information type: sirens
12	Information: response to information: interesting
12	Length of time living in house in Napier: long
12	Lives with: children (young)
12	Occupation (past or present): role: builder / in building industry
12	Panic: don't/won't panic
12	Preparedness items: items owned: camping gear
12	Preparedness type: learn lessons from the past
12	Preparedness type: preparedness required in the school environment
12	Preparedness: can only take a limited number of preparedness actions / can only do so much
12	Preparedness: shouldn't totally focus on / obsess about / worry about something that might happen
12	Preparing: should be based on common sense / realistic expectations / is practical
12	Reliant on things controlled by others
12	Responsibility for dealing with hazards: up to everyone

Appendices Appendix 5

QUOTATION COUNT	CODE TITLE
12	Talking about hazards/preparedness: frequency: often
12	Talking about hazards/preparedness: informal/indirect discussion
12	Talking about hazards/preparedness: prompts: community group activity/project
12	Talking about hazards/preparedness: prompts: friend experiences an event
12	Talking about hazards/preparedness: topics: OSH / workplace safety
12	Time to next event: don't know
12	Vulnerabilities: some people more vulnerable in an event: young people/children
12	Why I prepare
11	Approximate age: 50-60 years
11	Awareness: of being prepared / current preparedness
11	Community group: we raised/donated money/resources for relief efforts: internationally
11	Community: has long term connections with the community (e.g. other family members living there, long term friends)
11	Community: talk/interact with neighbours regularly
11	Disaster/event experience: earthquakes: feelings: a 'beauty' / felt big / bad shake
11	Disaster/event experience: earthquakes: grew up or lived in an earthquake prone area
11	Disaster/event experience: flooding: impacts: ponding on section / under house
11	Disaster/event experience: rural living: isolated/cut off
11	Disaster/event experience: snowstorm: impacts: phones/communications down
11	Emergency plan: nature of plan: for the workplace
11	EQ scenario: impacts: a lot of damage/destruction/ devastation
11	EQ scenario: impacts: might not be able to get to other people/places
11	EQ scenario: impacts: things falling off shelves / off house
11	Estimation of other people's preparedness: prepared: who: grown children
11	Estimation of other people's preparedness: under or not prepared: who: people impacted by an event
11	Hazard knowledge/belief: hazards known in Wanganui: landslides/slippage
11	Hazard knowledge/belief: past events in NZ: Inangahua earthquake
11	Hazard knowledge: knowledge of civil defence / contingency plans
11	Hazard type: bio and chemical hazards (e.g. red ants, agricultural spray, bait drops)
11	Hazard type: crime / violence
11	Hazard type: terrorism
11	House/building: rental (or doesn't own it themselves)
11	Information source: family
11	Information source: pamphlets/brochures: civil defence brochure
11	Information type: earthquake: alpine fault
11	Information: a lot of information is available in times of quiescence
11	Information: frequency of information: constantly reminded
11	Information: response to information: sought/seek further information
11	Lived previously: overseas locations: North America
11	Lived previously: overseas locations: Pacific Region
11	Potential impacts of an event: depends on time of year (season) or weather at time
11	Potential impacts of an event: may not be at home
11	Preparedness items: items owned by others: food supply
11	Preparedness items: items owned by others: preparedness kit
11	Preparedness items: items owned: small power source (e.g. solar, crank, campervan engine)
11	Preparedness items: items owned: spare clothing / appropriate clothing
11	Preparedness items: many items/plans can be used for lots of types of emergencies / disasters ('all hazards' or 'general preparedness')
11	Preparedness items: where keeps: in house (general)
11	Preparedness items: where keeps: kit/items: freezer/fridge
11	Preparedness means: being proactive
11	Preparedness means: having the recommended emergency items (e.g. from phone book, survival bucket)
11	Preparedness type: keep important documents in a safe or accessible place
11	Preparedness: should prepare because you never know / don't know
11	Preparing: can be or 'is over the top' / an over-reaction
11	Preparing: relative importance of activities related to preparing, compared with other activities
11	Preparing: should be a middle ground/lower level/minimum (rather than to the extreme)

## Appendices Appendix 5

QUOTATION COUNT	CODE TITLE
11	Responsibility for dealing with hazards: insurance: role: fixing damage \ assisting after a disaster
11	Responsibility for dealing with hazards: police
11	Responsibility for dealing with hazards: should be shared /collective
11	Responsibility for dealing with hazards: shouldn't rely on / expect other / sole organisations or people to assist in a disaster
11	Responsibility for others: workmates / employees / clients
11	Talking about hazards/preparedness: frequency: every so often / occasionally
11	Talking about hazards/preparedness: prompts: being in an occupation dealing with hazards/preparedness
11	Talking about hazards/preparedness: prompts: OSH / workplace safety
11	Talking about hazards/preparedness: topics: flooding: flood mitigation
11	Talking about hazards/preparedness: topics: friend experiences an event
11	Talking about hazards/preparedness: topics: Preparedness kits
11	Thinking about hazards/preparedness: topics: general planning and preparedness
11	Why I prepare: for electricity failure
11	Worry: shouldn't worry too much
10	Awareness: a realisation there is danger/a hazard/ etc.
10	Awareness: it is possible that events/disasters can happen
10	Awareness: of preparedness (or preparedness items) needed
10	Community group: activities: make up disaster kits for other countries / overseas / internationally
10	Community group: nature: red cross
10	Community group: nature: St. Johns
10	Community: feels support is available in community
10	Disaster/event experience: direct: storms (general)
10	Disaster/event experience: earthquakes: impacts: no major impacts
10	Disaster/event experience: flooding: impacts: damaged / impacted transport route
10	Disaster/event experience: flooding: impacts: significant/major
10	Disaster/event experience: indirect: windstorm
10	Disaster/event experience: influence: caused trauma
10	Disaster/event experience: influence: got myself/people thinking about preparedness
10	Disaster/event experience: we were lucky/fortunate in the past
10	Emergency plan: nature of plan: an understanding between family of what needs to happen
10	EQ scenario: impacts: communication disruption (general)
10	EQ scenario: impacts: could be stuck at a particular location
10	EQ scenario: impacts: gives finer details about what the impacts/consequences might be
10	EQ scenario: impacts: my house would be okay
10	EQ scenario: response: seek alternative shelter
10	Estimation of other people's preparedness: prepared: who: farmers/rural folk
10	Estimation of own preparedness: could survive a week - few weeks / month with supplies
10	Hazard knowledge/belief: earthquakes: could cause a tsunami
10	Hazard knowledge/belief: earthquakes: most earthquakes that occur here are little/short/low level
10	Hazard knowledge/belief: human-made hazards generated by human activities
10	Hazard knowledge/belief: past events in NZ: Cyclone Bola
10	Hazard knowledge/belief: we live in an environment/country prone to hazards
10	Hazard type: coastal erosion
10	Hazard type: tornadoes
10	Hazard type: Y2k / millennium bug
10	Hazards: refers to them as a force of nature / mother nature, etc.
10	Hopes event won't happen
10	Information seeking: haven't
10	Information source: books
10	Information source: council (refers to generally)
10	Information type: discussion panel on TV about hazards / preparedness
10	Information type: earthquake damage
10	Information type: need to have food and water in case of a disaster
10	Information type: need to look after yourself/family for 3 days
10	Information type: policies on how to deal with hazards/preparedness (e.g. earthquakes, tsunami)
10	Information type: workplace instructions for responding to emergencies/evacuating

Appendices Appendix 5

QUOTATION COUNT	CODE TITLE
10	Information: frequency of receiving/seeking information
10	Information: need better/ simpler / clearer / more information about hazards, risk and preparedness
10	Lived previously: North Island: Wellington Region
10	Lived previously: South Island: Canterbury
10	Occupation (past or present): red cross worker
10	Occupation (past or present): retired
10	Occupation (past or present): role: engineer
10	Occupation (past or present): role: police
10	Potential impacts of an event: (many) people are doing to be injured
10	Preparedness items: items NOT owned: emergency kit
10	Preparedness items: items owned: list of phone numbers/people who can help/network of people
10	Preparedness items: items owned: tools
10	Preparedness items: items owned: water: can use rain / tank / bore water for water
10	Preparedness items: most important items: water
10	Preparedness items: should have: cooking facility
10	Preparedness items: should have: shelter / alternative accommodation
10	Preparedness type: policies/procedures on how to deal with hazards/preparedness (e.g. earthquakes, tsunami)
10	Preparedness: intends to prepare: but hasn't / never gets it done
10	Preparing: is a balance
10	Resource issues: money: have to balance the cost against the consequences
10	Responsibility for dealing with hazards: NOT: dad's army / an army of civil defence - you're on your own
10	Responsibility for dealing with hazards: personal/individual: role: help others during a disaster/event
10	Responsibility for dealing with hazards: schools
10	Responsibility for others: general
10	Talking about hazards/preparedness: haven't or don't: why: it's not something you talk about as part of general conversation/doesn't come up
10	Talking about hazards/preparedness: prompts: experience a flood
10	Talking about hazards/preparedness: prompts: something on TV
10	Talking about hazards/preparedness: prompts: tsunami event: Boxing Day tsunami
10	Talking about hazards/preparedness: topics: berating others for not preparing/planning/responding properly
10	Talking about hazards/preparedness: topics: disaster relief efforts
10	Talking about hazards/preparedness: topics: pandemic
10	Talking about hazards/preparedness: topics: snowstorm
10	Talking about hazards/preparedness: topics: water availability/issues
10	What might motivate people to prepare: having children (or other family) to look after
10	Why people don't prepare: too busy doing other things with their lives (other priorities)
10	Worry: don't spend much time worrying about disasters

