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Understanding readiness for disasters on the East Coast, North Island, Aotearoa New Zealand

A summary of preparedness surveys

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Understanding readiness for disasters on the East Coast, North Island, Aotearoa New Zealand: A summary of preparedness surveys

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CONTENTS

Abstract	4
Keywords	4
1.0 Overview	5
1.1 Introduction	5
1.2 Background information	5
1.3 Understanding and building resilience in communities	6
1.4 Building resilience for disasters	6
2.0 Understanding and monitoring resilience	9
2.1 Summary of survey data	9
3.0 Summary of previous survey results	10
4.0 Recommended survey approach and questions	13
4.1 Complementary approaches to surveying	23
4.2 Survey timing	23
4.3 Importance of intervention	23
5.0 Acknowledgements	25
6.0 References	26
A1.0 Bibliography of surveys with preparedness elements undertaken along the East Coast of the North Island	33
A1.1 Local government surveys	33
A1.2 National surveys led by government	37
A1.3 Research surveys	50
A2.0 Examples of preparedness questions used previously	
A2.1 Hawke's Bay Regional Council residential survey questions	71
A2.2 WREMO survey questions	72
A2.3 MCDEM survey questions	73
A2.4 Community Engagement Theory/community resilience indicators	78
A2.5 Auckland People's Panel indicators	89
A2.6 Tsunami questions	90
A2.7 Measuring community resilience: Translation of BRIC indicators to the NZ context	94
A2.8 Social capital indicators from a Wellington-based study	99

ABSTRACT

This report summarises a range of disaster preparedness and readiness surveys undertaken along the East Coast of the North Island of Aotearoa New Zealand over the past 20 years (between 1999 and 2019), with a view to informing future preparedness surveys. The summary is aimed at providing guidance and insights to Civil Defence Emergency Management (CDEM) organisations and other local authority decision-makers to guide best practice preparedness evaluation approaches. We provide a high-level summary of the results of East Coast preparedness surveys and considering this data (and evidence from other preparedness/readiness research), provide suggestions for future preparedness surveys. We propose a set of survey questions targeted at understanding people's beliefs, community participation and feelings of empowerment, as well as more traditional measurements about awareness of hazards and any survival and structural actions people may have taken, or plan to take.

KEYWORDS

Preparedness, readiness, surveys, evaluation, East Coast, North Island, Aotearoa New Zealand

1.0 OVERVIEW

The following report summarises the range of preparedness and readiness surveys undertaken across the East Coast of the North Island of Aotearoa New Zealand over the past 20 years (between 1999 and 2019), with emphasis on understanding how preparedness has been evaluated, and with a view to informing future surveys. The East Coast is defined to include the Gisborne, Hawke's Bay, Manawatū-Whanganui and Wellington regions, as applicable to obtain a broad coverage of survey data.

Quantitative surveys have been undertaken across the East Coast region for diverse purposes, from national and regional surveys through to surveys more acutely focused on researching parameters of disaster resilience. Findings from many of these surveys provide insight into the evolution and fluctuation of community preparedness across a longitudinal timescale, and consequently, where agencies could potentially focus resources in the future.

In constructing this report, a wide range of survey material has been reviewed, including:

- Nationwide surveys, such as Ministry of Civil Defence & Emergency Management¹ (MCDEM) Colmar Brunton poll, which provides national data but can be analysed by region (i.e. the local East Coast Component).
- Community resilience surveys undertaken by local council bodies (e.g. Hawke's Bay Regional Council residential survey or Civil Defence Emergency Management (CDEM) Groups).
- Various research surveys, undertaken by researchers at the Joint Centre for Disaster Research (JCDR) Massey University, GNS Science and East Coast Life at the Boundary (East Coast LAB).

The objective of this work is to understand what future survey approaches, target areas and questioning techniques could be the most beneficial to understanding and developing preparedness. The summary is aimed at providing guidance and insights to Civil Defence and Emergency Management (CDEM) organisations and other local authority decision-makers to guide best practice research and evaluation approaches, including future quantitative surveys.

1.1 Introduction

1.2 Background information

The North Island's East Coast sits adjacent to the active plate boundary known as the Hikurangi subduction zone. The risk posed by the Hikurangi subduction zone, and the potentially widespread disastrous impacts of major tectonic movements along the margin, facilitated the establishment of the East Coast LAB (Life at the Boundary) in 2016. East Coast LAB is a collaborative programme focused on learning more about natural hazards by bringing together scientists, emergency managers, experts and stakeholders across the East Coast, with an emphasis on better understanding the hazards and risks and how to improve and sustain preparedness and resilience across the region into the future.

The geographic area encompassed by East Coast LAB is defined broadly, but includes the Gisborne, Hawke's Bay, Manawatū-Whanganui and Wellington regions as the wider area of

¹ Now the National Emergency Management Agency (NEMA)

focus to this research. A broad range of hazard risks are encountered on a relatively regular basis across these four regions, which are outlined by their CDEM Group Plans to include:

- Earthquake
- Tsunami
- Flooding and storm events
- Landslides
- Coastal erosion
- Lifeline failure (power, water, gas)
- Human pandemic and infection diseases
- Rural wildfire
- Fire in urban areas.

In this summary, we have focused on earthquake and tsunami hazards. Earthquakes and tsunami have the potential to cause major and widespread impacts across the East Coast. Given the diverse nature of the Hawke's Bay hazardscape, preparedness and resilience theories and practices with demonstrated all-hazards utility will be especially relevant.

1.3 Understanding and building resilience in communities

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is the first major agreement of the post-2015 development agenda, with seven targets and four priorities for action. It aims to achieve “the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries” (UNDRR, 2015). Priorities for action include: 1. Understanding disaster risk; 2. strengthening disaster risk governance to manage disaster risk; 3. investing in disaster risk reduction for resilience; and 4. enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

While the Sendai Framework is a voluntary, non-binding agreement, New Zealand's previous Ministry of Civil Defence & Emergency Management (MCDEM), now the National Emergency management Agency (NEMA), operates within its template of best practice at a national level. Similar objectives, including those related to resilience and preparedness, are central to the Civil Defence and Emergency Management Act (2002) and the National Disaster Resilience Strategy (2019). Regional Civil Defence and Emergency Management (CDEM) groups are responsible for specific tasks, including those related to improving local preparedness and readiness.

1.4 Building resilience for disasters

It is widely accepted in disaster management theory and practice that preparedness (also known as readiness) improves community resilience by helping to mitigate the impact of hazard events and enabling more effective post-event response and recovery. However, facilitating social behaviour change on a broad-scaled basis so that communities become better prepared for future hazard events is an ongoing and complex challenge for disaster management organisations.²

Preparedness is often misrepresented as a single ‘task’ to be completed, whereas, preparedness covers a range of tasks generally clustered under three main functional

² Public impetus towards being better prepared has improved gradually (e.g. Colmar Brunton, 2016, 2017, 2018, 2019). However, this has occurred in spikes following major disaster events, such as the 2010-2011 Canterbury Earthquake Sequence, the 2016 Kaikōura earthquake and weather events such as ex-tropical cyclones and storms, the 2017 Edgecumbe floods and the 2019 Tasman wildfires.

categories. These categories include structural preparedness (e.g. securing a house to its foundations), preparedness for survival (e.g. storing food and water to cover the immediate impact period) and community preparedness (e.g. developing community/neighbourhood-wide plans for responding independently of societal assistance) (Russell et al., 1995; Lindell et al., 2009; Paton et al., 2014; 2015).

Ideally preparedness should increase the likelihood of organisations, businesses, households and communities being able to respond in pre-planned and functional ways to large-scale hazard events, rather than being forced to react to them in ad hoc ways. Both the process involved in getting ready, combined with actual physical preparedness items assist people in coping with, adapting to, and recovering from hazard event consequences.

Referring to Figure 1, research in Community Engagement Theory (CET) emphasises that many individual community and societal factors contribute to people becoming prepared, including beliefs and capacities, participation in the community and empowerment. The more people believe that personal actions can mitigate risk (outcome expectancy) the more citizens can collectively formulate their risk management needs and strategies (community participation and collective efficacy). Additionally, the more they perceive their needs as having been met through their relationship with civic agencies (empowerment), the more likely people are to trust civic agencies and the information they provide and use this information to make preparedness decisions (Paton et al., 2020 submitted). These factors highlight that processes that help people interpret information under conditions of uncertainty, are as important as the information they have available. The social nature of several of these, and the fact that they originate in people's everyday experiences over time introduce the benefits of including community development strategies to complement risk management activities.

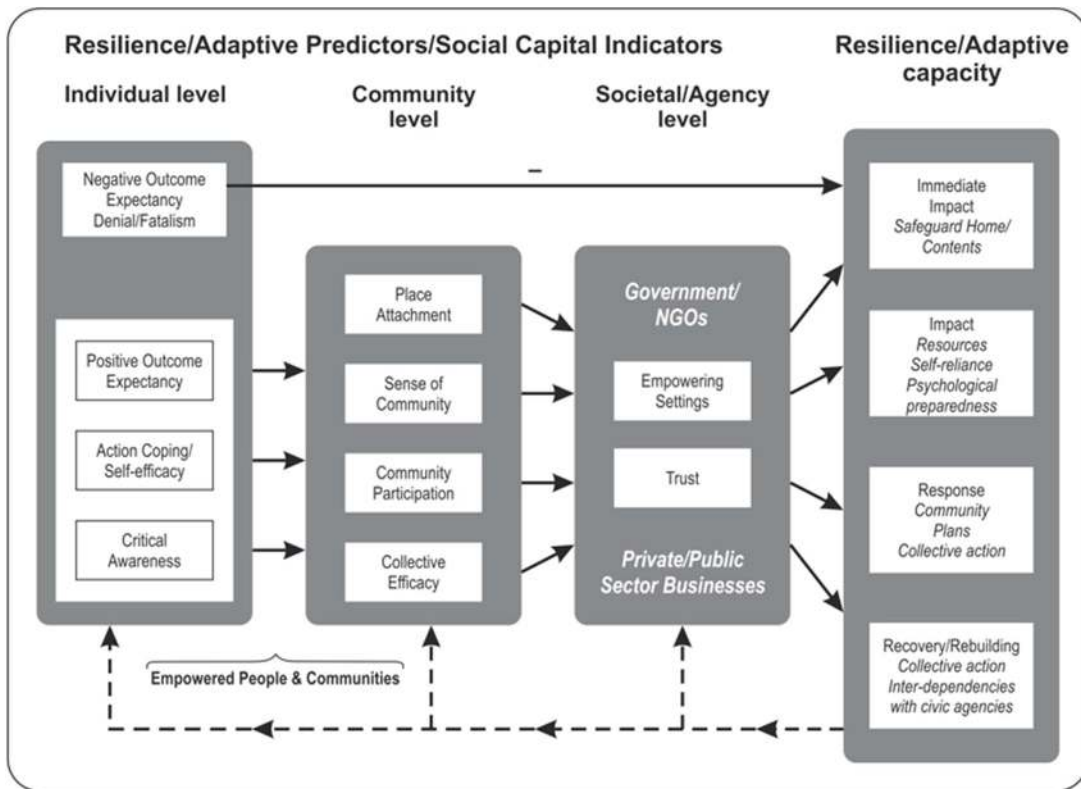


Figure 1. Model representing key components of Community Engagement Theory and how the components relate to each other (Paton, 2010 in Becker et al., 2013)

In addition to the factors listed above, improving the resilience of communities also relies on enabling the development of a well-planned and strong built environment, which assists with ensuring the safety of people. Community preparedness should also fit within a well-resourced and supported governance system that enables people to prepare and respond effectively. These additional facets are important to keep in mind within the context of this report, in terms of having a holistic viewpoint of preparedness.

A number of New Zealand studies have examined the CET in both a pre-event and post-event context, and across different perils (Paton et al., 2008 a, b; 2014; 2015). Additionally, the CET has been tested in international settings (Paton et al., 2010a, Jang et al., 2016). From such national and international testing, the CET has proved to have universal application, and the same factors are important for preparedness across different countries. The only established difference between countries or cultures in regard to the CET model, is that these factors are developed in different ways (for example different belief systems or ways of doing things, will influence how people talk about or act upon a hazard problem). The value of comparing research in Hawke’s Bay with research in places like Japan and Taiwan (which are more culturally collectivistic), and finding that the same theory can help explain preparedness, means that it increases confidence in using this as a planning and intervention framework when working with multicultural populations.

2.0 UNDERSTANDING AND MONITORING RESILIENCE

Within New Zealand, CDEM groups have routinely used mechanisms such as quantitative surveys to understand levels of preparedness and resilience in communities and develop interventions to build resilience. Along the East Coast of the North Island there have been many surveys undertaken over the past 20 years to assist in understanding levels of community preparedness and resilience. This report summarises many of the surveys that have taken place to help understand what the significant findings have been. We also provide recommendations on future survey research to help inform preparedness initiatives and resilience building for the East Coast and more widely throughout New Zealand.

2.1 Summary of survey data

By way of overview, an analysis of surveys undertaken across the East Coast of the North Island between 1999 and 2019 has been conducted to provide empirical depth to this summary. The tables in Appendix 1 summarise a broad capture of survey data, with a breadth of detailed information condensed for analytical conciseness. Consequently, studies of interest should be referred to in full (see reference list to find the details of each publication). We have tried to collate as many surveys as possible, but there will inevitably be some we have missed in this summary.

Table A1.1 provides a tabulated summary of a selection of local government surveys (including CDEM) that have included preparedness aspects and are relevant to understanding disaster resilience across the East Coast. These surveys were selected based on knowledge of prior survey work via existing relationships. Similarly, Table A1.2 provides a summary of national surveys, such as the Colmar Brunton for MCDEM surveys. In general, these surveys are higher level and lower resolution in terms of local information but provide useful percentage information and highlight national trends. Table A1.3 provides a high-level summary of all research related surveys, where data collection has been approached in a diverse range of ways depending on the objectives of a study and the scale of the research methodology.

As well as providing brief details on the objectives and findings of each survey, the summary sought insights into questionnaire design and appropriate questioning to guide effective future surveys. As a general observation, survey design over the past 20 years has become increasingly nuanced in both the questioning approach within questionnaires and the detail of information obtained from sample communities. This may be reflective of improving awareness of risk exposure but also the receptiveness of people to DRR information, which is discussed further in Section 3.

3.0 SUMMARY OF PREVIOUS SURVEY RESULTS

In this section we provide a high-level summary of the results of the preparedness surveys that have been undertaken on the East Coast and considering this data and evidence from other preparedness research, provide suggestions for future preparedness surveys.

For the wider North Island East Coast area as defined above, awareness about earthquakes is high for those surveyed (e.g. 75% in HBRC, 2019; 86% HBRC 2017; over 90% in Johnston et al., 2013) but for other hazards (e.g. tsunami, flooding, coastal and climate issues) awareness is generally reported in lesser proportions (for example, less than 50% for most hazards, see Johnston et al., 2003; Becker et al., 2018a; HBRC, 2017; 2019). Beliefs about how to deal with these hazards varies, with some thinking that they can prepare for these hazards easily, and others thinking that it is too hard, or that preparing will not make a difference (Becker et al., 2013a). Some people are optimistic that an event will not happen or if it does they will easily be able to cope, and therefore do not plan to prepare for a future disaster (Spittal et al., 2005; McClure et al., 2011 a,b, 2015; Colmar Brunton, 2018, 2019).

Given these dynamics, in terms of preparing for hazards the percentages of people who consider themselves 'fully prepared' (i.e. having undertaken a variety of activities at home and work) generally sits at about 20-30% over time. In general we see higher levels of preparedness for the collection of basics survival items (e.g. food, water), but lower proportions of people reporting more complex actions (e.g. structural mitigation actions; have an emergency plan; undertake an exercise) (e.g. Saunders & Becker, 2009; McClure et al., 2015a; HBRC, 2017), or community preparedness activities (e.g. Saunders & Becker, 2009).

Participation in drills and exercises (e.g. such as the ShakeOut earthquake drill and tsunami hīkoi) has slowly risen over time, but still only reaches certain members of the community. For example, in the 2015 ShakeOut drill, less than a quarter of people surveyed by Johnston et al. (2017 a,b,c) undertook the drill, consistent with Colmar Brunton (2019) findings (26%). Additionally, of those surveyed doing the drill in 2018, only about 16% practiced a tsunami hikoi (Lambie et al., 2019), however results are likely dependent on whether the participant was located in a tsunami-prone area, which was not differentiated in the analysis. However, on a positive note, consecutive ShakeOut evaluation surveys have highlighted that conversations about tsunami prompted by ShakeOut initiatives increased between 2015 and 2018 (from 16% to over 25%), indicating the value of linking tsunami discussions and activities with the ShakeOut drill (Lambie et al., 2019). The 2018 Shakeout drill also provided other benefits for types of preparedness (i.e. collecting survival items 33%; securing items 14%; and developing an emergency response plan 37%) (Lambie et al., 2019) with participants consistently more likely to undertake these actions before the drill rather than after the drill (Becker et al., 2016a; Lambie et al., 2019), highlighting that timing of preparedness activities is a key consideration.

Preparedness does tend to increase after a disaster event (e.g. Becker et al., 2018b; Doyle et al., 2018; Colmar Brunton, 2017, 2019). For example, the 2017 MCDEM survey showed that preparedness increased steeply following the 2016 Kaikōura earthquake, but there has been a steady reduction in nationwide preparedness over the past two years (Colmar Brunton 2018; 2019), as collective memory of the Kaikōura event has dissipated. Referring to the 2018 Colmar Brunton survey for MCDEM, two thirds or 67% of New Zealanders knew at least one correct action to take during an earthquake, which is a notable decline from the 73% who knew what to do in 2017. In addition, the sense of urgency New Zealander's had to prepare for disasters following the Kaikōura event has dropped, which is a similar pattern to that recorded following the Canterbury earthquakes. This speaks to a limited window of opportunity

in which to advocate for and raise preparedness within communities during these times (Doyle et al., 2018).

There has been locally based work undertaken to understand how best to communicate with communities before, during and after a disaster. The HBRC residential survey has found that varied geographic areas and demographic make-ups affect communication methods (HBRC, 2019), as have surveys undertaken within the Wellington region by Wellington Region Emergency Management Office (WREMO) (WREMO, 2019). Likewise, varied demographics also affect preparedness. For example, certain genders, ethnic groupings such as Māori, immigrants, renters and those under 40 are less likely to be less prepared in the traditional sense of having prepared survival items (Becker et al., 2018b; Colmar Brunton, 2018; Doyle et al., 2018; WREMO, 2019).

In terms of communicating hazard and risk, there has been both a local CDEM and nationwide focus on helping people to understand how to recognise and respond to a local tsunami. Awareness of the tsunami risk in coastal areas has been found to have increased in recent times (e.g. 71% in Dhellemmes et al., 2016). Comparing 2003 results (e.g. approximately one third or less aware of tsunami risk depending on location; Johnston et al., 2003) with the Dhellemmes et al., (2016) data shows a clear picture of tsunami awareness evolution within the previous ten years. Additionally, the national ‘Long or Strong, Get Gone’ public messaging campaign has been effective with maintaining public proactivity and awareness to tsunami threats along the New Zealand coastline. The 2018 and 2019 MCDEM public preparedness surveys identified that nearly all (90%; 85%) New Zealanders know to evacuate if they are near the coast and a long or strong earthquake happens. However actual immediate evacuation following a long or strong earthquake remains patchy with often only approximately 11% evacuating or intending to evacuate immediately (e.g. Saunders & Becker, 2009; Dhellemmes et al., 2016; Fraser et al., 2016; Blake et al., 2018a), and others slowly evacuating over longer timeframes (Blake et al., 2018). Modes of evacuation in potentially real tsunami events have also been challenging, with many evacuating following the Kaikōura earthquake in cars (Blake et al., 2018a), something which has also been seen in other local events in the past (Saunders & Becker, 2009).

Previous research in the context of the CET has highlighted the drivers of preparedness, which we discussed in the introduction. To re-cap, the more people believe that personal actions can mitigate risk (outcome expectancy) the more citizens can collectively formulate their risk management needs and strategies (community participation and collective efficacy). Additionally, the more they perceive their needs as having been met through their relationship with civic agencies (empowerment), the more likely people are to trust civic agencies and the information they provide and use this information to make preparedness decisions (Paton et al., 2020 submitted).

At least seven studies have been undertaken in Hawke’s Bay to help understand the presence of such factors in the community in differing hazard contexts (Johnston et al., 1999; Paton Miller et al., 2001; Ronan et al., 2001; Paton et al., 2005; Johnston et al., 2003; McIvor & Paton, 2007; McIvor et al., 2009; Paton & Johnston 2008; Paton et al., 2010 a, b; Becker et al., 2012). Variables measured have included outcome expectancy (both positive and negative), community participation, articulation of problems, empowerment, trust and preparedness. Such variables were found to be present at low-to-moderate levels, along with moderate-to-low levels of preparedness, indicating potential for further development of these important facets in communities (Becker et al., 2013b). These studies applied comparable theoretical frameworks across a range of hazards throughout the Hawkes Bay region. This enhances the all-hazards applicability of the work and increases confidence in its applicability

in different locations and communities. Together, these factors increase confidence in the utility of the work and increase the cost-effectiveness of using interventions based on this work. In addition, such historical data can be used as a baseline for assessing change over time, meaning that any future survey work builds on a strong foundation of past data.

The survey work undertaken in Hawke's Bay is also similar to past work undertaken by Auckland CDEM, who have sought to understand what levels the CET variables are at in their community, by undertaking the surveys and using a ranking system to understand whether a variable is at a Low, Medium or High level (Paton, 2007).

4.0 RECOMMENDED SURVEY APPROACH AND QUESTIONS

Given that the factors in the CET model comprise an important part of the preparedness process we propose that survey questions include questions targeted at understanding people's beliefs, community participation and feelings of empowerment in the emergency management process, as well as more traditional measurements about awareness of hazards and any survival and structural actions people have taken, or plan to take. We outline some suggested survey questions below. These questions are grounded in research and based on previous East Coast and nationwide surveys. As mentioned previously, the benefit of utilising previous survey questions is that responses to questions can be tracked over time to measure changes in preparedness, and to direct any interventions (e.g. such as educational initiatives).

The challenge of measuring preparedness at a local level is the development of survey questions (and other tools) that are easily and affordably employed. A survey designed for research purposes will not necessarily fit the purpose required by a local Civil Defence Emergency Management group for example. Therefore, thought should be given to including questions that are evidence-based but fit for purpose for the agency running the survey and the audience receiving the survey. Auckland CDEM for example, use a simplified version of a previously tested research questionnaire (Paton 2007, as described above) for their People's Panel to collect information related to individual, community and societal facets found in the CET.

As highlighted previously, traditional ways of understanding and measuring preparedness have focussed on specific actions individuals should take, such as preparing food and water. However, measuring preparedness also needs to account for the different individual, community and societal components that contribute to the process of developing preparedness. Additionally people may be at differing stages of the preparedness process (e.g. some may not even be aware that a hazard exists, while others may be actively engaged in community participation on a hazard-related topic), and thus questions should capture those involved at different stages of the process (Becker et al., 2015). Given our understanding of what prompts preparedness, and contributes to effective response and recovery, we provide suggestions for future focuses of questions (Table 1).

Table 1. Suggestions for future survey questions focussed on understanding preparedness for disasters for the East Coast

Focus area	Justification	Question number	Suggested question and/or measures
Recommended			
Awareness of the hazard/threat	<p>Awareness about a hazard or threat is important because if people are not aware of the hazard/threat they cannot understand it or respond to it (Lindell & Perry, 2011). Hawke’s Bay CDEM currently already use a question in the Regional residential survey that helps elicit public awareness about local hazards. This question asks residents to list the top three hazards they think could affect their safety and livelihood. This question is a similar approach to that used in other research surveys, e.g. Dhellemmes et al. (2016). We suggest continuing to reuse the question in the Hawke’s Bay residential survey for comparisons across time. An alternative suggestion would be to use the Colmar Brunton (2019) approach (see A2.3). It asks the question: “Thinking about where you live, which type of disaster would have the most impact or cause the most disruption for your household?” and provides a list of hazards from which people can choose one. Again, this question could provide a comparison across time as data exists on this question back to 2016.</p>	1	<p>Thinking about the possible natural hazards that occur from time to time, if you were to list THREE possible hazards or threats specific to Hawke’s Bay [<i>or insert alternative location for East Coast</i>] that would affect your safety or create a risk to your livelihood, what would they be? (please specify) _____</p>
Awareness of how to prepare	<p>It is important to also understand how many people have seen information about how to prepare for emergencies, as lack of interaction with that information will limit the preparedness process (Lindell et al., 2012). We propose a simple question asking people about whether they have seen, heard or read information, followed up by a question (3) that asks about the sources and channels for that information.</p>	2	<p>Have you seen, heard or read information about how to prepare for emergencies? Yes No</p>

Focus area	Justification	Question number	Suggested question and/or measures
<p>Source and/or channel of preparedness material</p>	<p>This question is a combination of the source of information, and the channel of delivery. It has been adapted from questions in the Hawke’s Bay residential survey and the Colmar Brunton (2019) survey. Understanding preferred sources and channels is useful in the preparedness process as it can help direct educational efforts for protective action by providing information from sources and channels that are relevant to varying audiences (Lindell & Perry, 2011).</p> <p>This question could be further broken into two to elicit sources and channels more distinctly (and add more source/channel options as required), however we have left this question similar to those asked previously for comparative reasons.</p> <p>Additionally, another question could ask about the content of the material that people were exposed to, although this type of question might work better in a qualitative evaluations (e.g. focus group, hui, workshop or interview setting).</p>	<p>3</p>	<p>Where did you see, hear or read the information?³</p> <ul style="list-style-type: none"> • National Emergency Management Agency website https://getready.govt.nz/ • Hawke’s Bay Civil Defence Emergency Management website https://www.hbrc.govt.nz/services/civil-defence-emergency/ [or insert alternative CDEM group website] • Local council website • Facebook page for Hawke’s Bay Civil Defence or council [or insert alternative location] • Other online (social media) • Other online (non-social media) • Door-to-door visit by emergency services or emergency management staff • TV • Radio • Newspaper or magazine • Workplace • Flyers/pamphlets • School • Emergency Mobile Alerts • Red Cross Hazards App • Other (please specify)_____
<p>Awareness of how to respond</p>	<p>Awareness of how to respond to a threat, will influence how people actually respond in an event (Lindell & Perry, 2011). Question 4 asks people about the type of information they have specifically seen, heard or read related to different hazards. This will help give some indication of what people have access to, and whether more focus needs to be given on certain hazard areas when undertaking education programmes.</p> <p>We have also suggested some specific questions on people’s anticipated actions for certain perils considered high risk on the East Coast: specifically earthquake and tsunami. The phrasing for these questions has been used previously in the Colmar Brunton (2019) national MCDEM survey, and would</p>	<p>4</p>	<p>Have you seen, heard or read information about how to respond to a warning and/or emergency for any of the following events? (Tick all that apply)</p> <ul style="list-style-type: none"> • Earthquake • Tsunami • Volcanic eruption • Flood • Storm or cyclone • Fire • Other (please specify)_____
		<p>5</p>	<p>What actions should people take <i>during</i> a strong earthquake? (Tick all that apply)</p>

³ Ordered similarly to the Colmar Brunton (2019) survey but could be re-ordered.

Focus area	Justification	Question number	Suggested question and/or measures
	<p>make a useful comparison with that data. Alternative ways of asking these questions can be also found in prior ShakeOut (e.g. McBride et al., 2014; Becker et al., 2016a, 2017a; Johnston et al 2017 a,b,c; Lambie et al., 2019) and tsunami surveys (e.g. Dhellemmes et al., 2016). Questions on anticipated responses to other perils could also be added depending on the context (e.g. volcanoes, floods).</p> <p>Understanding people's knowledge of what to do during an event can help target educational initiatives to focus on areas where people's knowledge may be deficient.</p>		<ul style="list-style-type: none"> • Wouldn't know what to do • Take shelter under a desk / table / solid structure⁴ • Drop, Cover and Hold • Turtle • Get down low • Hold onto something • Take shelter in doorway • Move to a safe place / away from trees / falling objects • Go outside / go out into the open • Alert / check / help family / friends / neighbours • 'Get gone' / move inland / to higher ground / prepare to be evacuated • Stay indoors / don't go outside • Stay where you are / stay put • Don't panic / stay calm • Help others
		6	<p>Imagine that you are near the coast and a long or strong earthquake happened. What action should you take? 4(Tick all that apply):</p> <ul style="list-style-type: none"> • Wouldn't know what to do • Move inland / to higher ground / evacuate • Long or strong, get gone (or similar phrase) • Alert / check / help family / friends / neighbours • Move to a safe place • Check whether a tsunami warning has been issued • Check / grab emergency survival items • Implement survival plan • Listen to the radio / check cell phone for news
		7	<p>How would you evacuate? (Tick all that apply):</p> <ul style="list-style-type: none"> • Car • Walk / run • Pushbike • Motorbike / scooter • Whatever means possible • Other

⁴ Ordered similarly to the Colmar Brunton (2019) survey but could be re-ordered.

Focus area	Justification	Question number	Suggested question and/or measures
			<ul style="list-style-type: none"> • Don't know • Wouldn't know to evacuate
<p>Preparedness A variety of preparedness 'items' have been measured in the past from the context of several functional categories: structural, survival and community (Lindell et al., 2009; Russell et al., 1995; Paton et al., 2014; 2015). We suggest including questions on all these categories, as they are important for preparedness.</p>	<p>Structural Structural preparedness is often also referred to as mitigation (Spittal et al., 2008). Such preparedness is important as in the first instance during a disaster if your home or workplace is structurally sound (and heavy or moveable items are secured) then the likelihood of injury or death will be reduced. Several of the suggested question items have been used frequently in past research and practitioner surveys (e.g. Paton et al., 2001, 2015; Paton & Johnston, 2008; Becker et al., 2015; WREMO, 2019). The ones we suggest here are informed by such previous questionnaires, and slightly modified to suit the context.</p> <p>Survival Survival items have been a common focus of surveys for many years both internationally and within Aotearoa New Zealand. Survival items constitute important resources following an event but should be considered one part of preparedness. Question 9 has been adapted from the question used in the Hawke's Bay residential survey, to allow for comparison across time.</p> <p>Suggested adaptations include changing "family" to "household" to incorporate the fact that not all people who live together are families; and the addition of several extra questions. One question asks people if they know how to turn off essential services (this was used in WREMO (2019) but also other surveys in the past). Turning off essential services may be needed following a large event to reduce fire risk or contamination. Checking survival items is important as Paton et al. (2008) argues that sustained preparedness is an important part of the preparedness process. Creating and practicing household emergency plans is important for effective response, as is preparing a getaway bag for evacuation.</p> <p>As an aside, WREMO (2019) focusses on having seven days' supply of survival items but given that NEMA and previous local CDEM recommendations have been three</p>	<p>8</p> <p>9</p>	<p>Please indicate with a Yes or No, if you & your household have taken any of the following actions to prepare for natural hazards:</p> <ul style="list-style-type: none"> • I have secured my house foundations, or satisfied myself they are already secure (Yes / No) • I have secured items in my house (i.e. furniture, hot water cylinder) (Yes / No) • I have sufficient home insurance cover that will allow me to rebuild should my home be severely damaged. (Yes / No) <p>Please indicate with a Yes or No, if you & your household have taken any of the following actions to prepare for natural hazards:</p> <ul style="list-style-type: none"> • Enough food stored including food in your freezer for 3 days (Yes / No) • Enough water stored not including water in your hot water cylinder for 3 days (Yes / No) • Some way of cooking without electricity, such as a barbeque or gas cooker (Yes / No) • Know how to turn off essential services at my home such as electricity, water, gas (Yes / No) • Check emergency items at least once a year (Yes / No) • Have a household emergency plan completed and know how you will contact your family/household (Yes No) • Have practiced your household emergency plan (Yes / No) • If you live in a tsunami zone, you have a plan to get away if there's a long or strong earthquake (Yes / No) • Have a getaway bag with emergency items (Yes / No)

Focus area	Justification	Question number	Suggested question and/or measures
	<p>days' supply (https://getready.govt.nz/prepared/household/supplies/), we have left these questions as they are for comparison. A consideration might be to change the questions to ask about seven days' supply in future.</p> <p>Community As defined earlier community preparedness involves tasks that contribute to broader community resilience, for example, developing community/neighbourhood-wide plans for responding independently of societal assistance (Lindell et al., 2009). Participating in community activities such as training, drills or exercises is also a useful indication of community preparedness in a disaster-specific context. Such tasks also link with general community participation, although we suggest this is measured separately below.</p> <p>The suggestions here have been used in previous research surveys, as well as practitioner surveys (e.g. Paton et al., 2001, 2015; Paton & Johnston, 2008; Becker et al., 2015; 2017a; Colmar Brunton, 2019). The wording suggested for the first and last measures ("I attend meetings...; I have participated in training...") comes from the recent Colmar Brunton (2019) survey and has been suggested to allow for comparison between data sets.</p>	10	<p>Please indicate with a Yes or No, if you & your household have taken any of the following actions to prepare for natural hazards:</p> <ul style="list-style-type: none"> • I attend meetings with community groups about emergency planning (Yes / No) • I have helped develop a community readiness, response, resilience or recovery plan (Yes / No) • I have participated in training, drills, or exercises, so I can better respond to emergencies (e.g. ShakeOut earthquake drill and tsunami evacuation hikoi) (Yes / No)
Outcome expectancy	<p>Outcome expectancy is the perception of whether undertaking a specific action will mitigate the threat from a disaster and has an influence on whether individuals will get prepared for a disaster or not (Lindell & Whitney, 2000; Mclvor & Paton, 2007; Mclvor, et al., 2009; Mulilis & Duval, 1995; Mulilis & Lippa, 1990; Paton, 2003; Paton et al., 2010a,b; Paton & Johnston, 2008; Paton, et al., 2005; Paton, et al., 2003).</p> <p>People who hold a positive outcome expectancy (POE) (i.e. "I can do something to deal with hazards and as a result, my actions will improve my safety/lead to a good outcome") are more likely to undertake preparedness actions than those who hold a negative outcome expectancy (NOE) (i.e. "Whatever I do, disasters are too catastrophic and nothing can be done to make a difference") (Becker et al., 2016b).</p>	11	<p>Please indicate the extent to which you disagree or agree with each of the following statements:</p> <p>Preparing for a disaster will mean I can deal with emergency situations more easily.</p> <ul style="list-style-type: none"> • Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)

Focus area	Justification	Question number	Suggested question and/or measures
	<p>We suggest measuring these items separately (POE, question 11; NOE question 12), as they are separate processes, and require specific considerations. Positive outcome expectancy can be enhanced by encouraging discussion, developing people’s understanding of hazard issues and perceptions that disaster losses are selective and avoidable (e.g. undertaking practical preparedness has a widespread benefit beyond disasters themselves) (Becker, et al., 2011; Paton, 2007). Negative outcome expectancy can be reduced by highlighting that damage from an event is not universal and total, and that preparedness can bring some control over disasters (Becker, et al., 2011).</p>	12	<p>Any preparedness I undertake won’t make a difference in a disaster</p> <ul style="list-style-type: none"> Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)
Community networks/social capital	<p>Social capital has been found to be essential for effective response and recovery (Paton et al., 2014, Kwok et al., 2019; Aldrich 2012). Social capital can take the form of different kinds of networks including community-community, community-agency, and agency-agency networks (Paton et al., 2015), and is often described in terms of bonding, bridging and linking capital (Aldrich, 2012). Questions could cover a variety of these aspects; however, we have suggested one question focussed on community-community networks/bonding capital that could measure such connections over time.</p> <p>This data could be supplemented by data that reflects social capital (see A2.8) such as memberships, volunteer rates, collaboration between community-based organisations, presence of leaders and resource allocation. As a comparison, WREMO (2019) also has a question it uses to quantify social capital in a neighbourhood context (“How many of your neighbours first names do you know?”)</p>	13	<p>It is important to connect with my neighbours [or community] so that we are able to help each other out in an emergency</p> <ul style="list-style-type: none"> Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)
Community Participation	<p>Community participation has been found as key to developing many of the capacities and skills required for preparedness, response and recovery (Paton & Johnston, 2008) and contributes to developing social capital (Kwok et al., 2019). Community participation helps people find out new information, learn new skills, connect with others, personally buy-in to issues and problems, be actively involved in solving problems, and build a sense of pride (Becker et al., 2011). Participation in community affairs does</p>	14	<p>I participate regularly, on an on-going basis in community activities (i.e. belong to a group; attend monthly meetings)</p> <ul style="list-style-type: none"> Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)

Focus area	Justification	Question number	Suggested question and/or measures
	<p>not necessarily have to be disaster specific, as general community participation can develop the beliefs, resources and skills needed that help in a disaster situation too.</p> <p>We suggest a question used in previous research surveys (e.g. Paton & Johnston 2008; Paton et al., 2003; 2007) that measures general participation in community activities. This question could be supplemented by understanding the numbers of people who are participating in activities (recorded via attendance at events), the nature of participation and the types of people participating (e.g. recorded via qualitative research).</p>		
Collective efficacy	<p>Collective efficacy or the belief that collectively a community can do something to control the outcome of a disaster (e.g. "Together we can do something to mitigate the effects of a disaster") (Becker et al., 2011) has been shown to influence preparedness by building empowerment in community members to take action (McIvor, et al., 2009; Paton, 2007; Paton et al., 2010a,b, 2011). It also links with creating a social norm of preparedness in the community (Solberg et al., 2010).</p> <p>We suggest using a modified research question from the research above to measure this concept. Previous questions have used the wording "neighbours" but this could possibly be replaced by another word such as "community".</p>	15	<p>My neighbours [or community] and I know how to deal with problems together.</p> <ul style="list-style-type: none"> • Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)
Empowerment	<p>Empowerment has been found to influence whether people decide to prepare for disasters (McIvor, et al., 2009; Paton, 2007, 2008; Paton et al., 2010a,b, 2008). Empowerment is described by Paton (2007) as "citizens' capacity to gain mastery over their affairs and to deal with issues and opportunities using intrinsic resources". Empowerment can help people feel they are capable of getting prepared for a disaster, and that they are able to respond to a disaster when it occurs. (e.g. "I can call upon personal and external resources, and deal with issues that arise", Becker et al., 2011).</p>	16	<p>I feel I can influence what happens in my community.</p> <ul style="list-style-type: none"> • Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)

Focus area	Justification	Question number	Suggested question and/or measures
	<p>We suggest one measure used in previous research surveys (e.g. Paton, 2007) to help identify whether people feel empowered in their community.</p>		
Optional			
<p>Location and demographics</p>	<p>As highlighted earlier, different demographics need different approaches to preparedness and communication. An understanding of these will assist with targeting educational programmes and future research. Additionally, demographics can also be used to ensure that a representative sample of the population have answered a survey.</p> <p>We suggest some demographic categories which can be used in a questionnaire. Census categories can be used as a guide to create tick box answers, and to align data with national and regional statistics for comparisons of representativeness. Additionally, consideration could be given to the format of demographics in any local surveys (e.g. Hawke’s Bay residential survey) and these formats applied to future preparedness surveys if desired.</p>	<p>17a-f</p>	<p>Please identify the location of your house (Tick one) (Provide tick box options for local suburb or region)</p> <p>Please specify which gender you identify with (Tick one)</p> <ul style="list-style-type: none"> • Man • Woman • Transgender man • Transgender woman • Gender diverse • Prefer not to answer <p>Which ethnic groups do you belong to? (Tick all that apply)</p> <ul style="list-style-type: none"> • New Zealand European • Māori • Samoan • Cook Island Maori • Tongan • Niuean • Chinese • Indian • Other (e.g. Dutch, Japanese, Tokelauan. Please specify_____) <p>In what year were you born?</p> <ul style="list-style-type: none"> • Please specify_____) <p>Do you own or rent the dwelling you live in? (Tick one)</p> <ul style="list-style-type: none"> • Rent • Own • Other (please specify)_____

Focus area	Justification	Question number	Suggested question and/or measures
			<p>Which best describes the situation you are living in now? (Tick one)</p> <ul style="list-style-type: none"> • Family with children/dependents • Family without children/dependents • Alone • With non-family • Other (please specify)_____
Social Norms	<p>People may be more likely to prepare if they observe or believe that others have prepared, or if they believe that preparedness is considered important by others (Farley, 1998; Mileti & Darlington, 1997; Mileti & Fitzpatrick, 1992;). This suggests that societal norms (both descriptive and injunctive) have a part to play in disaster preparedness (Solberg et al., 2010; Vinnell et al., 2020) We propose two measures to cover these aspects (the second being modified from Colmar Brunton, 2019). A2.4 includes more examples that could be used where people are asked whether they have observed the council undertaking various preparedness actions (rather than friends/family).</p>	18	<p>My friends and family have undertaken actions to prepare for an emergency.</p> <ul style="list-style-type: none"> • Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5) <p>My friends and family think it's very important to be prepared for an emergency.</p> <ul style="list-style-type: none"> • Strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), strongly agree (5)

4.1 Complementary approaches to surveying

Quantitative surveying can provide a general snapshot of the status of the community in terms of preparedness. However, survey approaches rarely reach all sectors of the community. As highlighted earlier, reaching out to certain gender, ethnic, age, special needs and housing groups to understand what hazard awareness and preparedness means to those groups likely requires different approaches. Complementary qualitative approaches (e.g. interviews, Hui, workshops, focus groups, etc.) are useful to understand preparedness levels and the diverse needs of such groups.

Qualitative investigation can help explore why people might or might not prepare - information which cannot be gained through surveying alone. Therefore, we recommend that top-down survey approaches are complemented by bottom-up qualitative inquiry (Kwok et al., 2018). Such inquiry provides supplementary data, which helps provide a broader and more detailed understanding of the complex and iterative processes involved with improving community preparedness, including identifying the reasons that hinder and encourage the engagement of people with preparedness messaging and behaviour change.

Tools such as the View from the Frontline (VFL) survey (GNDR, 2019) use qualitative enquiry in a questionnaire-type format to capture nuances that are difficult to capture quantitatively. Interviews are undertaken with community representatives to help gather bottom-up data about resilience (Gibson & Scott, 2019). This approach has been trialled in the East Coast regions of Hawke's Bay and Wellington (J-C. Gaillard, pers. comm. and in prep., 2020) but more information is required about the outcome of this work before further recommendations can be made on the utility of this tool.

External data sources can also be used to complement our understanding of how prepared a community is. For example, this might include documenting the numbers of people attending community meetings or participating in exercises or analysing community data collected for other purposes. Appendices 2.7 and 2.8 provide some examples of external data sources that could inform preparedness. Supplementary external data sources could be accessed from a national level (Kwok, 2016; Stevenson et al., 2019), or local level (Kwok et al., 2019; Kay et al., 2019).

4.2 Survey timing

In terms of timeframes, a comprehensive preparedness survey of similar length to that suggested in Table 1 might be conducted every 2-3 years. Collection of other types of data (e.g. qualitative data, external data sources) could be undertaken in between these timeframes. We suggest only surveying comprehensively every few years to allow time for any preparedness-focused educational interventions to take effect during the time between surveys. However, if opportunities arise for a lesser number of questions to be included in a more frequent survey being run by another agency (such as the regular Hawke's Bay regional residential survey), then a smaller number of questions could opportunistically be included, as has been done previously.

4.3 Importance of intervention

As seen in longitudinal surveys, such as the 2007-2019 Colmar Brunton surveys for MCDiEM, improvements in preparedness over time can be challenging, with little or no shift in preparedness often seen from year to year. In some instances, preparedness can even decrease, for example if information provided by agencies leads communities to think preparedness is not their responsibility but the responsibility of the agency instead (Paton et

al., 2008b), if the effects of disaster experience dissipates over time (Colmar Brunton, 2018; 2019), or if normalisation and optimistic biases come into play (Spittal et al., 2005).

Therefore, it is important to remember that surveys only comprise a tool for measuring and evaluating the effectiveness of preparedness interventions. It is the interventions themselves undertaken in-between survey periods that will make the most difference in improving preparedness and community resilience. These interventions should be targeted at building the range of personal and community skills, attributes and resources required to facilitate preparedness (including survival, structural and community preparedness actions). Suggestions for appropriate interventions are beyond the scope of this report but can be found in supporting publications (e.g. Becker et al., 2015; 2016b; Paton et al., submitted 2020).

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6.0 REFERENCES

- Aldrich, D. P. (2012). *Building resilience: Social capital in post-disaster recovery*. Chicago, IL: The University of Chicago Press.
- Becker, J. S., Johnston, D. M., Daly, M. C., Paton, D., Mamula-Seadon, L., Petersen, J., ... & Williams, S. (2011). *Building community resilience to disasters: A practical guide for the emergency management sector*. GNS Science Report 2011/09, 44 p.
- Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (2012). A model of household preparedness for earthquakes: how individuals make meaning of earthquake information and how this influences preparedness. *Natural Hazards*, 64(1), 107-137.
- Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (2013a). Salient beliefs about earthquake hazards and household preparedness. *Risk Analysis*, 33(9), 1710-1727.
- Becker, J.S., McBride, S.K., & Paton, D. (2013b). Improving community resilience in the Hawke's Bay: a review of resilience research, and current public education, communication and resilience strategies. Lower Hutt: GNS Science. GNS Science report 2012/38. 72 p.
- Becker, J., Paton, D., & Johnston, D. (2015). Communication of Risk: A community resilience perspective, GNS Science Report 2015/66. 30 p.
- Becker, J.S., Coomer, M.A., McBride, S.K., & Lambie, E. (2016a). New Zealand ShakeOut 2015: an evaluation based on observer surveys. GNS Science report 2016/23. GNS Science, Lower Hutt (NZ), doi:10.21420/G2J92X. 94 p.
- Becker, J.S., Paton, D., Johnston, D.M., Kwok, A., & McClure, J. (2016b). Twenty years of resilience research: from models to measurement. In: Domingo, N.; Wilkinson, S. (eds) 6th International Conference on Building Resilience: building resilience to address the unexpected. Auckland, N.Z.: Massey University; University of Auckland, p. 1001-1011.
- Becker, J.S., Coomer, M.A., Potter, S.H. & McBride, S.K. (2017a). New Zealand ShakeOut 2012 : a survey evaluation one year on. Lower Hutt, N.Z.: GNS Science report 2016/52. GNS Science, Lower Hutt, NZ, doi: 10.21420/G2PS3C, 81 p.
- Becker, J.S., Paton, D., Johnston, D.M., Ronan, K.R. & McClure, J. (2017b). The role of prior experience in informing and motivating earthquake preparedness. *International Journal of Disaster Risk Reduction*, 22: 179-193.
- Becker, J., Patel, P., Ryan, E., Blackett, P., Schneider, P., & Robichaux L. (2018a). Understanding community perspectives on coastal issues: Hawke's Bay Coastal Survey 2017. Lower Hutt (NZ): GNS Science. GNS Science miscellaneous series 113. 36 p. + Appendices; doi:10.21420/ G25D2J.
- Becker, J.S., Coomer, M.A., Blake, D., Garden, E., Rampton, A., Newman-Hall, G., Van der Velde, M. & Johnston, D.M. (2018b). Impact of the 2016 Kaikōura Earthquake on Wellington CBD Apartment Residents: Results of a Survey. GNS Science report; 2018/45, GNS Science, Lower Hutt, NZ. 19 p. + Appendices (). doi:10.21420/RHOPMM18.
- Brown, N.A., Rovins, J.E., Feldmann-Jensen, S., Orchiston, C., and Johnston, D. (2019). Measuring disaster resilience within the hotel sector: An exploratory survey of Wellington and Hawke's Bay, New Zealand hotel staff and managers. *International Journal of Disaster Risk Reduction*, Vol. 33, 108 – 121.

- Brown, N.A., Orchiston, C., Rovins, J.E., Feldmann-Jensen, S. and Johnston, D. (2018). An integrative framework for investigating disaster resilience within the hotel sector. *J. Hosp. Tour. Manag.*, 36, 67-75.
- Blake, D., Johnston, D., Leonard, G., McLaren, L. & Becker, J. (2018a). A Citizen Science Initiative to Understand Community Response to the Kaikōura Earthquake and Tsunami Warning in Petone and Eastbourne, Wellington, Aotearoa/New Zealand. *Bulletin of the Seismological Society of America*, Vol. 108, No. 3B, pp. 1807-1817.
- Blake D., Tipler, K., Garden, E., Johnston, D.M., & Becker J.S. (2018b). Wellington Household Preparedness Survey. GNS Science report; 2018/23, GNS Science, Lower Hutt, NZ. 113 p. (). doi:10.21420/G2GH10.
- Charleson, A. W., Cook, B. & Bowering, G. (2003). Assessing and increasing the level of earthquake preparedness in Wellington homes. Paper Number 137 in Proceedings of the 2003 Pacific Conference on Earthquake Engineering.
- Coomer, M. A., Doyle, E. E. H., Johnston, D. M., Becker, J. S., Fraser, S. A., Johal, S., Leonard, G. S., Potter, S. H., McClure, J., & Wright, K. C. (2014). Cook Strait Earthquakes: Survey on reactions of Wellington residents to the Cook Strait earthquake sequence. GNS Science report 2014/41, GNS Science, Lower Hutt, NZ. 56 p. + appendix.
- Cutter, S. L. (2016). The landscape of disaster resilience indicators in the USA. *Natural Hazards*, 80(2), 741–758.
- Cutter, S. L., Burton, C. G., & Emrich, C. T. (2010). Disaster resilience indicators for benchmarking baseline conditions. *Journal of Homeland Security and Emergency Management*, 7(1), 1–22. <http://doi.org/10.2202/1547-7355.1732>
- Colmar Brunton (2007 - 2017). Research and evaluation of public education. <https://www.civildefence.govt.nz/cdem-sector/public-education/research-and-evaluation-of-public-education/> Access date: 12 February 20120.
- Colmar Brunton (2018). Disaster preparedness survey 2018. <https://www.civildefence.govt.nz/assets/Uploads/public-education/Civil-Defence-Disaster-Preparedness-report-2018.pdf> Access date: 12 February 2020.
- Colmar Brunton (2019). Disaster preparedness survey 2019. <https://www.civildefence.govt.nz/assets/Uploads/public-education/2019-Civil-Defence-Disaster-Preparedness-report.pdf> Access date: 12 February 2020.
- Dhellemmes, A., Leonard, G.S., & Johnston, D.M. (2016). Tsunami Awareness and Preparedness on the East Coast of New Zealand's North Island, GNS Science Report 2016/20, GNS Science, Lower Hutt, NZ. 81 p
- Doyle, E.H., McClure, J., Potter, S.H., Becker, J.S., Johnston, D.M., Lindell, M.K., Johal, S., Fraser, S.A. & Coomer, M.A. (2018). Motivations to prepare after the 2013 Cook Strait Earthquake, N.Z. *International Journal of Disaster Risk Reduction*, Vol. 31, pp. 637 – 649.
- Doyle, E. E., McClure, J., Potter, S. H., Lindell, M. K., Becker, J. S., Fraser, S. A., & Johnston, D. M. (2020). Interpretations of aftershock advice and probabilities after the 2013 Cook Strait earthquake, Aotearoa New Zealand. *International Journal of Disaster Risk Reduction*, 101653.

- Farley, J. E. (1998). Earthquake fears, predictions, and preparations in mid-America. SIU Press.
- Fraser, S. A., Doyle, E.H., Wright, K.C., Potter, S. H., McClure, J., Johnston, D. M., Leonard, G. S., Coomer, M. A., Becker, J. S., & Johal, S. (2016). Tsunami response behaviour during and following two local-source earthquakes in Wellington, New Zealand. *International Journal of Disaster Risk Reduction*, Vol.16, pp: 123 – 133.
- Gibson, T. D., & Scott, N. (2019). Views from the Frontline and Frontline methodology: critical reflection on theory and practice. *Disaster Prevention and Management: An International Journal*, 28(1): 6-19.
- Gowan, M. E., Kirk, R. C., & Sloan, J. A. (2014). Building resiliency: a cross-sectional study examining relationships among health-related quality of life, well-being, and disaster preparedness. *Health and Quality of Life Outcomes*, 12(1), 85.
- Global Network of Civil Society Organisation for Disaster Reduction (GNDR) (2019). Views from the Frontline 2019. <https://www.gndr.org/programmes/views-from-the-frontline/vfl-2019.html/>. Access date: 12 February 2019.
- Hare, J., (2010). Community Preparedness Survey 2010. Wellington Civil Defence Emergency Management Group. http://www.gw.govt.nz/assets/council-reports/Report_PDFs/2010_623_1_Report.pdf
- Hawke's Bay Regional Council (2013). 2013 Regional Residential Survey, prepared by SIL Research, May 2013.
- Hawke's Bay Regional Council (2015). 2015 Regional Residential Survey.
- Hawke's Bay Regional Council (2017). 2017 Regional Residential Survey.
- Hawke's Bay Regional Council (2019). 2019 Regional Residential Survey.
- Jang, L-J., Wang, J.J., Paton, D., & Tsai, N. (2016). Cross-cultural Comparisons between the Earthquake Preparedness Models of Taiwan and New Zealand. *Disasters*. 40(2): 327–345.
- Johnston, D., Bebbington, M., Lai, C-D., Houghton, B., & Paton, D. (1999). Volcanic hazard perceptions: comparative shifts in knowledge and risk, *Disaster Prevention and Management*, 8(2): 118-126.
- Johnston, D. M., Houghton, B. F., Neall, V. E., Ronan, K. R., & Paton, D. (2000). Impacts of the 1945 and 1995–1996 Ruapehu eruptions, New Zealand: an example of increasing societal vulnerability. *Geological Society of America Bulletin*, 112(5), 720-726.
- Johnston, D., Tarrant, R., Tipler, K., Coomer, M., Pedersen, S. & Garside, R. (2011). Preparing Schools for Future Earthquakes in New Zealand: Lessons from an Evaluation of a Wellington School Exercise. *Australian Journal of Emergency Management*, 26(1): 24-30.
- Johnston, D., Becker, J., McClure, J., Paton, D., McBride, S., Wright, K., Leonard, G., & Hughes, M. (2013). Community Understanding of, and Preparedness for, Earthquake and Tsunami Risk in Wellington, New Zealand. In: Joffe H., Rossetto T., Adams J. (eds) *Cities at Risk. Advances in Natural and Technological Hazards Research*, vol 33. Springer, Dordrecht, 131-148.

- Johnston, D., Tarrant, R., Tipler, K., Lambie, E., Crawford, M., Johnson, V., Becker, J., & Ronan, K. (2016). Towards tsunami-safer schools in the Wellington region of New Zealand: Evaluating drills and awareness programs. *Australian Journal of Emergency Management*, 31(3): 59-66.
- Johnston, D.M., Becker, J.S., Orchiston, C., Egbelakin, T., & Coomer, M.A. (2017a). Earthquake awareness and preparedness in Dunedin and Oamaru - a 2016 survey : data report. GNS Science report 2017/12, GNS Science, Lower Hutt, N.Z. 46 p. + appendix; doi: 10.21420/G21C7V.
- Johnston, D.M., Becker, J.S., Orchiston, C., Egbelakin, T., Thompson, M.A., & Coomer, M.A. (2017b). Earthquake awareness and preparedness in Auckland - a 2016 survey : data report, GNS Science report 2017/10, GNS Science, Lower Hutt, N.Z. 39 p. + appendix; doi: 10.21420/G28W29.
- Johnston, D.M.; Becker, J.S.; Orchiston, C.; Egbelakin, T.; Thompson, M.A.; Pace, B.; Coomer, M.A. (2017c). Earthquake awareness and preparedness in Hamilton - a 2016 survey: data report. Lower Hutt, N.Z.: GNS Science. GNS Science report 2017/11. 29 p. + appendix; doi: 10.21420/G2530P.
- Khan, S., Crozier, M.J., & Kennedy, D. (2012). Influences of place characteristics on hazards, perception and response: a case study of the hazardscape of the Wellington Region, New Zealand, *Natural Hazards*, 62: 501.
- Kwok, A. H. (2016). Measuring community resilience: Translation of BRIC indicators to the New Zealand context, GNS Science Report 2016/58, GNS Science, Lower Hutt, N.Z. 26 p. doi:10.21420/G2PP4Q.
- Kwok, A. H., Paton, D., Becker, J., Hudson-Doyle, E. E., & Johnston, D. (2018). A bottom-up approach to developing a neighbourhood-based resilience measurement framework. *Disaster Prevention and Management: An International Journal*.
- Kwok, A. H., Becker, J., Paton, D., Hudson-Doyle, E., & Johnston, D. (2019). Stakeholders' Perspectives of Social Capital in Informing the Development of Neighborhood-Based Disaster Resilience Measurements. *Journal of Applied Social Science*, 13(1): 26-57.
- Lambie E., Becker J.S., & Coomer, M.A. (2019). New Zealand ShakeOut 2018 Observation Evaluation Report: a summary of initial findings. GNS Science report; 2019/09, GNS Science, Lower Hutt (NZ). 25 p. doi:10.21420/XM8F-5E11.
- Lindell, M. K., & Whitney, D. J. (2000). Correlates of household seismic hazard adjustment adoption. *Risk Analysis*, 20(1): 13-26.
- Lindell, M. K., & Perry, R. W. (2012). The protective action decision model: theoretical modifications and additional evidence. *Risk Analysis: An International Journal*, 32(4): 616-632.
- Lindell, M.K., Arlikatti, S. & Prater, C.S. (2009), Why people do what they do to protect against earthquake risk: Perceptions of hazard adjustment attributes, *Risk Analysis*, 29(8): 1072-1088.
- McBride, S.K., Becker, J.S., Coomer, M.A., Tipler, K., & Johnston, D.M. (2014). New Zealand ShakeOut Observation Evaluation Report: a summary of initial findings. GNS Science report; 2013/61, GNS Science, Lower Hutt, N.Z. 41 p.

- McClure, J., Wills, C., Johnston, D. M., & Recker, C. (2011a). How the 2010 Canterbury (Darfield) earthquake affected earthquake risk perception: Comparing citizens inside and outside the earthquake region. *Australasian Journal of Disaster and Trauma Studies*, 2011–2: 3 – 10.
- McClure, J., Wills, C., Johnston, D. M., & Recker, C. (2011b). New Zealanders' judgments of earthquake risk before and after the Canterbury earthquake: Do they relate to preparedness? *New Zealand Journal of Psychology*, 40 (4): 7 – 11.
- McClure, J., Spittal, M. J., Fischer, R. & Charleson, A. (2015a). Why Do People Take Fewer Damage Mitigation Actions Than Survival Actions? Other Factors Outweigh Cost. *Natural Hazards Review*, 16(2): 04014018.
- McClure, J., Johnston, D., Henrich, L., Milfont, T. L., & Becker, J. (2015b). When a hazard occurs where it is not expected: risk judgments about different regions after the Christchurch earthquakes. *Natural Hazards*, 75(1): 635-652.
- McIvor, D., & Paton, D. (2007). Preparing for natural hazards: normative and attitudinal influences. *Disaster Prevention and Management: An International Journal*.
- McIvor, D., Paton, D., & Johnston, D. (2009). Modelling Community Preparation for Natural Hazards: Understanding Hazard Cognitions. *Journal of Pacific Rim Psychology*, 3(2): 39–46.
- Mileti, D. S., & Fitzpatrick, C. (1992). The causal sequence of risk communication in the Parkfield earthquake prediction experiment. *Risk Analysis*, 12(3): 393-400.
- Mileti, D. S., & Darlington, J. D. (1997). The role of searching in shaping reactions to earthquake risk information. *Social Problems*, 44(1): 89-103.
- Mulilis, J. P., & Lippa, R. (1990). Behavioral change in earthquake preparedness due to negative threat appeals: A test of protection motivation theory. *Journal of applied social psychology*, 20(8): 619-638.
- Mulilis, J. P., & Duval, T. S. (1995). Negative threat appeals and earthquake preparedness: A Person-Relative-to-Event (PrE) model of coping with threat. *Journal of Applied Social Psychology*, 25(15): 1319-1339.
- Paton, D. (2003). Disaster preparedness: A social-cognitive perspective. *Disaster Prevention and Management*, 12(3): 210 - 216.
- Paton, D. (2007). Measuring and Monitoring resilience in Auckland. GNS Science Report SR2007-018, GNS Science, Lower Hutt.
- Paton, D., & Johnston, D. (2008). A Means-End Chain Theory Analysis of Hazard Cognitions and Preparedness, Earthquake Commission Research Grant. GNS Science Report: ISSN 1177-2425.
- Paton, D., Johnston, D., Bebbington, M., Lai, C-D., & Houghton, B. (2001). Direct and vicarious experience of volcano hazards: Implications for risk perception and adjustment adoption. *Australian Journal of Emergency Management*, 15: 58 – 63.
- Paton, D., Millar, M., & Johnston, D. (2001). Community Resilience to Volcanic Hazard Consequences. *Natural Hazards*, 24(2): 157-169.

- Paton, D., Smith, L., Johnston, D., Johnston, M. and Ronan, K. (2003). Developing a model to predict the adoption of natural hazard risk reduction and preparatory adjustments. EQC Research Project No. 01-479.
- Paton, D., Parkes, B., Daly, M., & Smith, L. (2008a). Fighting the flu: Developing sustained community resilience and preparedness. *Health Promotion Practice*, 9(4_suppl), 45S-53S.
- Paton, D., Smith, L., Daly, M., & Johnston, D. (2008b). Risk perception and volcanic hazard mitigation: Individual and social perspectives. *Journal of Volcanology and Geothermal Research*, 172(3-4): 179-188.
- Paton, D., Bajek, R., Okada, N., & Mclvor, D. (2010a). Predicting community earthquake preparedness: a cross-cultural comparison of Japan and New Zealand. *Natural Hazards*, 54: 765 – 781.
- Paton, D., Sagala, S., Okada, N., Jang, L-J., Burgelt P.T. & Gregg, C. (2010b). Making sense of natural hazard mitigation: Personal, social and cultural influences, *Environmental Hazards*, 9(2): 183-196.
- Paton, D., Frandsen, M., & Tedim, F. (2011). Community preparedness for forest fire: Facilitating community engagement. In F. Pedrosa & D. Paton (Eds.), *A Dimensao Humana dos Incendios Florestais*. Porto, Portugal: Estrategias Criativas.
- Paton, D., Johnston, D., Mamula-Seadon, L. & Kenney, C.M. (2014). Recovery and Development: Perspectives from New Zealand and Australia, In N Kapucu & KT Liou, (Eds). *Disaster & development: Examining global issues and cases*. Springer, New York, NY, pp. 255-272.
- Paton, D., Anderson, E., Becker, J. & Petersen, J. (2015). Developing a Comprehensive Model of Earthquake Preparedness: Lessons from the Christchurch earthquake, *International Journal of Disaster Risk Reduction*, 14: 37-45.
- Paton, D., Becker, J.S., & Johnston, D.M. (2020 submitted). Using Community Engagement Theory (CET) to inform readiness interventions for natural hazard events in Aotearoa New Zealand. *Australasian Journal of Disaster and Trauma Studies*.
- Ronan, K. R., Johnston D, M., & Paton, D. (2001). Communities' understanding of earthquake risk in the Hawke's Bay and Manawatu-Wanganui regions, New Zealand. NZSEE 2001 Conference, Paper 1.03.01.
- Russell, L.A., Goltz, J.D. & Bourque, L.B. (1995). Preparedness and hazard mitigation actions before and after two earthquakes, *Environment and Behaviour*, 27(6): 744-770.
- Saunders, W., & Becker, J. (2009). Chapter 4: The Community's Experience of Recovery: Preliminary Findings for the 2007 Gisborne Earthquake Household Damage and Preparedness Survey. In: *Shaken Up: Proceedings of a Workshop on Recovery Following the Gisborne Earthquake, 7 December 2009*, Wellington (eds. A., Harding), Opus International Consultants Ltd.
- Solberg, C., Rossetto, T., & Joffe, H. (2010). The social psychology of seismic hazard adjustment: re-evaluating the international literature. *Natural Hazards and Earth System Sciences*, 10(8): 1663-1677.
- Spittal, M. J., McClure, J., Siegert, R. J., & Walkey, F. H. (2005). Optimistic bias in relation to preparedness for earthquakes. *Australasian Journal of Disaster and Trauma Studies*.

- Spittal, M. J., McClure, J., Siegert, R. J., & Walkey, F. H. (2008). Predictors of two types of earthquake preparation: Survival activities and mitigation activities. *Environment and Behaviour*, 40(6): 798-817. doi: 10.1177/0013916507309864.
- Stevenson, J.R., Kay, E., Bowie, C., & Ivory, V. (2019). The Resilience Indicators Bank and the New Zealand Resilience Index. https://www.resorgs.org.nz/wp-content/uploads/2019/06/Resilience_Indicators_Bank_NZRI_Jun2019.pdf. Access date: 29 June 2020.
- Tarrant, R. A. C., & Johnston, D. M. (2010). An investigation of the relationship between socio-economic status and hazards-preparedness in Intermediate school children. *GNS Science*.
- United Nations Office for Disaster Risk Reduction (UNDRR) (2015). Sendai Framework for Disaster Risk Reduction, <https://www.unisdr.org/we/coordinate/sendai-framework>: Access date: 22 September 2019.
- Vinnell, L. J. (2016). Earthquake Legislation Judgments. Examining the effects of message framing and social norms on judgments of earthquake legislation. A thesis submitted in fulfilment of the requirements for the degree of Master of Science in Psychology. Victoria University of Wellington.
- Vinnell, L.J., Wallis, A., Becker, J.S., & Johnston, D.M. (2020). Evaluating the ShakeOut drill in Aotearoa/New Zealand: Effects on knowledge, attitudes, and behavior. *International Journal of Disaster Risk Reduction*. 48, 101721.
- Walton, D., & Smith, K. (2009). Survival Confidence of New Zealanders in Outdoor and Post-earthquake Situations. *Australian Journal of Emergency Management*, (24)3: 38 – 43.
- WREMO (2019). Community Survey Results June 2019 (Undertaken by Premium Research). Joint Committee 23 August 2019.

Appendix 1.0 (A1.0) Bibliography of surveys with preparedness elements undertaken along the East Coast of the North Island

This bibliography in some cases uses small portions of text cited directly from reports or papers, with the sources listed on the left hand side. We direct the reader back to the original source to see the complete document.

A1.1 Local government surveys

Table A1.1. Local surveys that have included preparedness aspects (e.g. Hawkes Bay, Gisborne, Wellington)

Year	Location (region)	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2019	Wellington	Preparedness of community members in Wellington	<p>500 adult residents of the Wellington Region were asked to complete an online survey about emergency preparedness and awareness in mid-June 2019.</p> <p>All respondents randomly selected from an online respondent panel (270,000 New Zealanders)</p> <p>Sample quotas were used to ensure the sample is a close demographic match to the population (age, gender, area, ethnicity).</p>	<p>The survey examined levels of participant preparedness initially, with questions including:</p> <ul style="list-style-type: none"> - Right now, which of the following do you have for everyone in your household that would last for 7 days? - How often should you change your emergency water? - How many of your neighbours' first names do you know? <p>Other questions sought to understand community understandings of response methods, such as what the purpose of a Community Emergency Hubs is, where they are located and who opens and operates these.</p>	<p>In response to the question "what should you do immediately once you feel at earthquake", 89.50% of participants responded "drop cover hold" compared to 2% who responded that they'd run outside. This suggests that key preparedness messaging is having some influence within the community.</p> <p>However, when responding to the question, "what kind of warning do you expect to receive if you feel an earthquake that is longer than a minute or strong enough to knock you to your feet?", 40% stated they'd expect sirens to sound, 36% would expect a text alert and 29% would expect a radio announcement, whereas 50% of respondents stated that they'd expect no warning, as the earthquake was the warning itself.</p> <p>Key preparedness parameters:</p> <ul style="list-style-type: none"> - Almost a quarter (23.4%) are considered to be fully prepared. - 58.6% have enough water, 81.5% enough food to last 7 days. - Over two-thirds (69.3%) correctly identified a Community Emergency Hub as "A place in your suburb for the community to gather and support each other by sharing information, skills and resources during a disaster". - Over a third (37.9%) know a Hub is opened and run by the community. - Nearly half (43%) know the location of their nearest Hub. - Most (89.5%) know to Drop, cover and hold. 	Premium Research for WREMO, 2019

Year	Location (region)	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<ul style="list-style-type: none"> - Half (50%) identified that an earthquake is the warning for evacuation. Many still expect sirens (40%), text alerts (36%) and radio announcements (29%) to warn them. - More know where to evacuate to from their home (63%) compared to work (47%). - Half (51%) have a plan that everyone in their household knows about - Radio is still considered the most popular way (80%) to get information in an emergency - Most (87%) were aware of EM Alerts, with half (47%) receiving the test message in November. 	

Year	Location (region)	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2019, 2017, 2015, 2013	Hawke's Bay	HBRC Regional Residential Survey	<p>Preparedness questions were included in the Hawke's Bay regional residential survey, in a specific section on Civil Defence emergency preparedness.</p> <p>Telephone interviews were conducted across the Hawke's Bay Territorial area. Interviewees were 18 years and above. Sample sizes were several hundred participants, for example in 2013, 700 participants were interviewed.</p>	<p>Relevant survey questions from the 2019 survey included:</p> <ul style="list-style-type: none"> Thinking about the possible natural hazards that occur from time to time, if you were to list THREE possible disasters or threats specific to Hawke's Bay that would affect your safety or create a risk to your livelihood, what would they be? Please indicate with a Yes or No, if you & your family have taken any action to prepare for natural hazards <ol style="list-style-type: none"> Have a household emergency plan completed and know how you will contact your family. Enough food stored including food in your freezer for 3 days Enough water stored not including water in your hot water cylinder for 3 days Some way of cooking without electricity, such as a barbeque or gas cooker If you live in a tsunami zone, you have a plan to get away if there's a long or strong earthquake. What communication methods would you use to get the most up to date information during an emergency in Hawke's Bay? (select all that apply) 	<p>The threat or disaster of the highest concern for respondents was "Earthquake" at 86.1%, followed by "Flooding/Storm event" at 58.0%, and "Tsunami" at 44.8%.</p> <p>Across all respondents, high provision levels were recorded with 90.3% having "some way of cooking without electricity", followed by "enough food stored for 3 days" at 89.8%. The percentage of respondents who had "enough water stored" was lower, with 66.4% stating they did. More than a half of all respondents (57.6%) had a "household emergency plan" in the event of emergency. Only 49.2% of respondents that lived in a tsunami zone indicated they "have a plan to get away if there is a long strong earthquake".</p> <p>The results of household emergency plan and preparedness were similar across the last three survey years (2013, 2015, 2017 and 2019).</p>	HBRC, 2013; 2015; 2017, 2019.
2010	Wellington	Are we prepared?	<p>Preparedness level in Wellington. Wellington Region CDEM Group commissioned telephone surveys in 2010, 2007, 2006, 2005, 2004 among a random cross-section of residents to gather information that helps quantify the region's level of preparedness for a major civil defence emergency.</p>	<ul style="list-style-type: none"> Awareness of hazards Preparedness for disaster Information sources. 	<p>For the 2010 survey:</p> <ul style="list-style-type: none"> Residents were asked to recall at least one hazard that might affect the Region. Earthquakes was most often recalled (95%) followed by floods (42%) and tsunami (41%). The majority of the population in the greater Wellington Region is concerned about the possible impact of an earthquake; a substantial 	Hare, 2010

			<p>For the 2010 survey, the research was undertaken among a randomly selected sample of N=1,100 residents aged 16 years or older who live in the Wellington Region.</p>		<p>percentage believe that the other major hazards are less likely to affect them.</p> <ul style="list-style-type: none"> • 77% of residents in the Greater Wellington area currently consider themselves “very” or “quite well informed” about the major hazards that could affect their region. • Younger residents in the 16 to 29 years age group (61% well informed) continue to regard themselves as less well informed compared to older residents that consider their level of preparedness to be “good” or better, with two-thirds giving this rating. • Those aged 16 to 29 years consider themselves less prepared for an emergency (44% “good or better”) compared to older residents (67% 30 to 49 years, 82% 50+ years “good or better”). • Residents were asked whether they had each of the four main emergency survival items (food, water, other supplies and equipment, and a household emergency plan). Food (72%), water (71%) and other emergency supplies and equipment (77%) were most often identified as currently available in the household specifically for use in a major emergency. • The proportion of household emergency plans was higher for actual completion (39%) (residents have these plans in place), compared to spontaneous recall (12%). 	
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A1.2 National surveys led by government

Table A1.2: National surveys that have included preparedness aspects for the regions (e.g. Hawke’s Bay, Gisborne, Wellington, Manawatū-Whanganui)

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2019	Nationwide	MCDEM Disaster Preparedness Survey 2019	<p>The Ministry of Civil Defence & Emergency Management commissioned this research to understand the state of preparedness for a disaster amongst individuals and households in New Zealand. The specific objectives of the research were to:</p> <ul style="list-style-type: none"> Identify the level of preparedness amongst New Zealanders and their households. In particular if they’ve taken any steps to prepare or plan for emergencies in the last 12 months. Determine if New Zealanders know what actions to take during or following an earthquake or other disaster, particularly if they are near the coast. Find out the awareness and participation in ShakeOut and the TsunamiWalkOut (hīkoi). <p>1,031 telephone interviews were carried out, with New Zealanders aged 15 and over, from 14 May to 23 June 2019.</p>	<p>Questions were focused on understanding, preparedness, barriers and incentives for preparing, participation in events like ShakeOut, knowledge of what to do during an emergency and sources of information.</p>	<ul style="list-style-type: none"> 85% have a good understanding of what the effects would be if a disaster struck in their area 95% have done at least one action (e.g. have discussed or planned what to do in a disaster, have survival items, have a getaway bag) 24% are prepared at home and check that preparedness regularly Barriers to preparing include lack of knowledge (29%); optimism (23%), low likelihood of an event (45%), effort preparing takes (29%). Triggers for preparing include preparing is a social norm (67%) and family concern (52%). 64% know a correct action to take during an earthquake 85% know to evacuate if they are near the coast and a long or strong earthquake occurs. 27% have participated in ShakeOut overall and 26% participated in 2018 10% have participated in a ShakeOut related hīkoi. In general, younger New Zealanders, and/or those who identify as Asian are less likely to be prepared. 	Colmar Brunton for MCDEM, 2019

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2018	Nationwide	MCDEM Disaster Preparedness Survey 2018	<p>In 2016 the Ministry of Civil Defence & Emergency Management (MCDEM) reviewed and updated their disaster preparedness campaign. As part of the redesign the annual campaign monitoring and disaster preparedness tracking research was also updated in order to benchmark levels of preparedness among New Zealanders before the redeveloped public education campaign was launched. In 2017 and 2018 the research was rerun with the aim of tracking the successes of the revised campaign over time. The specific objectives of this research were to:</p> <ul style="list-style-type: none"> • measure levels of preparedness among New Zealanders. • identify barriers and triggers to preparedness. • report on MCDEM's KPIs, as required for the annual report. • segment results to enable analysis of demographics in relation to preparedness. <p>Random telephone interviewing of New Zealand residents aged 15 years and</p>	<p>Questions were focused on understanding, preparedness, barriers and incentives for preparing, participation in events like ShakeOut, disaster experience, knowledge of what to do during an emergency and sources of information.</p>	<p>A summary of key findings is as follows:</p> <ul style="list-style-type: none"> • Two thirds (67%) of New Zealanders knew at least one correct action to take during an earthquake (This is a notable decline from the 73% who knew what to do in 2017). • Almost all (90%) New Zealanders know to evacuate if they are near the coast and a long or strong earthquake happens (A significant improvement from the 83% who knew what to do in 2017) • New Zealanders' sense of urgency to prepare for a disaster has dropped following the heightened preparedness levels seen after the Kaikoura earthquakes – this is a similar pattern to that recorded following the Canterbury earthquakes. • What are New Zealanders' greatest barriers when it comes to being prepared? Lack of knowledge (affects 21%, high impact), optimism (affects 20%, high impact); likelihood of event (affects 44%, medium impact), effort (affects 22%, medium impact). • Effective triggers for preparedness – social norm; what friends and family think (impacts 63%, high effect), family concern (impacts 54%, medium effect). <p>RECENT EMERGENCIES AND THEIR IMPACT ON PREPAREDNESS</p> <ul style="list-style-type: none"> • In recent years we have seen preparedness peak following the Canterbury and Kaikoura earthquakes. Following these peaks, preparedness levels slowly erode as time passes • Far fewer New Zealanders now say they were prompted by the Canterbury and/or Kaikoura earthquakes. More New Zealanders now say they were prompted into action by their local council or 	Colmar Brunton for MCDEM, 2018

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
			<p>over was undertaken, and in total 1,000 interviews were carried out from 9 May to 7 June 2017</p>		<p>Civil Defence, recent cyclones and weather events, and power outages</p> <p>DO NEW ZEALANDERS KNOW WHAT TO DO IN AN EMERGENCY?</p> <ul style="list-style-type: none"> • Two in three New Zealanders know at least one correct action to take during a strong earthquake. This is a significant decline from levels seen in both 2016 and 2017 • Nearly all New Zealanders know to evacuate if they are near the coast and a long or strong earthquake occurs. There has been a significant improvement in knowledge in this area in the past 12 months • Just under two in three New Zealanders know what to do during an earthquake and know what to do following a long or strong earthquake • New Zealanders are becoming increasingly aware that they may need to use evacuation methods that do not involve a car. • Those aged 60 and over, retirees and those with a household income under \$70,000 are least likely to know what to do during an earthquake and during a tsunami threat. They are also least likely to know they may need an alternative evacuation method to a car <p>HOW PREPARED ARE NEW ZEALANDERS?</p> <ul style="list-style-type: none"> • Preparedness levels have begun to drop away again following the peak levels seen post the Kaikoura earthquakes • Younger New Zealanders (under 40), those who identify as Māori, renters, and those born overseas are most likely to be unprepared for a disaster • Fewer New Zealanders took steps to prepare themselves (or their household) for a disaster in the last 12 months than had done so this time last year • Since 2017 there has been a notable decline in the proportion of New Zealanders who have stored 	

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<p>sufficient water and other survival items for a disaster</p> <ul style="list-style-type: none"> • Among New Zealanders who are not already fully prepared, the majority say they are likely to take (further) action to prepare in the next six months. <p>COMMUNICATIONS</p> <ul style="list-style-type: none"> • In 2017 advertising awareness spiked to 57%. In 2018 recall fell back to levels seen in 2016 - one third of New Zealanders recall seeing advertising about preparing for a disaster • 'Long Strong Get Gone' and 'Happens' remain the most widely recalled takeout messages. However, recall of 'Long Strong Get Gone' advertising has declined since this time last year. <p>SHAKEOUT</p> <ul style="list-style-type: none"> • Even with the amount of time since the last ShakeOut, it remains well known. Half of New Zealanders say they have heard of it and around one in five have taken part at some stage in the past. <p>INFORMATION SOURCES</p> <ul style="list-style-type: none"> • Diverse sources of information, but more than half of all New Zealanders mentioned Civil Defence (MCDEM and CDEM) as a key source of information before a disaster. • Not quite half of New Zealanders mention Civil Defence as a source of information during or immediately after a disaster. This is a marked improvement from 2017 (up to 40% in 2018 from 28% in 2017) likely brought about, at least in part, by the launch of the Emergency Mobile Alert system. <p>ENSURING RESILIENT COMMUNITIES</p> <ul style="list-style-type: none"> • This year more New Zealanders think, to ensure resilient communities, we need emergency response arrangements and suitable infrastructure 	

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2017	Nationwide	MCDEM Disaster Preparedness Survey 2017	<p>In 2016 the Ministry of Civil Defence & Emergency Management (MCDEM) reviewed and updated their disaster preparedness Get Ready Get Thru campaign. As part of the redesign the annual campaign monitor and disaster preparedness tracking research was also updated in order to benchmark levels of preparedness among New Zealanders before the redeveloped public education campaign was launched. In 2017 the research was rerun with the aim of tracking the successes of the revised campaign over time.</p> <p>The specific objectives of this research were to:</p> <ul style="list-style-type: none"> • measure levels of preparedness among New Zealanders, • identify barriers and triggers to preparedness, • report on MCDEM's KPIs, as required for the annual report, and • segment results to enable analysis of demographics in relation to preparedness. 	<p>Questions were focused on hazard understanding, preparedness, barriers and incentives for preparing, knowledge of what to do during an emergency and disaster experiences.</p>	<p>The 2016 survey showed that preparedness for disasters had risen sharply since the Kaikōura earthquake.</p> <ul style="list-style-type: none"> • 32% of people have emergency supplies which they regularly update, have stored sufficient water, and make plans for what to do in an emergency (up from 25% in 2016) • Eighteen percent of New Zealanders are fully prepared • 91% of New Zealanders believe they have a good understanding of the types of disasters that could occur in New Zealand • 85% of New Zealand residents have the necessary emergency items needed to survive a disaster • Two in five now have a getaway bag containing necessary emergency items (40%, cf. 34% in 2016). • 50% say they regularly update their emergency survival items (cf. 46% in 2016) • Barriers: lack of knowledge (24%); low likelihood of an event (38%); optimism (19%). 	Colmar Brunton for MCDEM, 2017

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
			Random telephone interviewing of New Zealand residents aged 15 years and over. In total 1,000 interviews were carried out from 20 April to 26 May 2017.			
2016	Nationwide	MCDEM Disaster Preparedness Survey 2016	To measure New Zealand residents' disaster preparedness, and to assess the effectiveness of the Get Ready Get Thru campaign over time using a quantitative survey (1,000 people). Identify barriers and triggers for preparedness. Questionnaire was redesigned in 2016 but included some comparable questions from previous Colmar Brunton surveys.	Questions were focused on understanding of hazards, preparedness, barriers and incentives for preparing, knowledge of what to do during an emergency.	<ul style="list-style-type: none"> • 92% believe they understand the types of disasters that could occur in NZ • 83% have some emergency items • 25% are prepared at home • 14% are fully prepared • Preparedness since the Canterbury earthquakes has dropped off. • Barriers: lack of knowledge (27%); low likelihood of an event (47%); optimism (22%), too much effort to prepare (27%) • Most at risk include those born overseas, Asian residents and fulltime students • Family concern is a trigger for preparing. 	Colmar Brunton for MCDEM, 2016
2015	Nationwide	MCDEM Disaster Preparedness Survey 2015	To measure New Zealand residents' disaster preparedness using a quantitative survey (1,000 people), and to assess the effectiveness of the MCDEM Get Ready Get Thru campaign over time (building on previous surveys).	Questions were focused on understanding of hazards, preparedness, barriers and incentives for preparing, knowledge of what to do during an emergency.	<ul style="list-style-type: none"> • Fifteen percent of all New Zealand residents are fully prepared for an emergency • Have emergency survival items: 84% • Prepared at home: 29% • Have a survival plan for at home: 58% • Have a survival plan that includes what to do when away from home: 26% • Since 2014 there has been a decrease in the proportion of New Zealand residents who have a good understanding of the effects if a disaster struck. Down to 82% in 2015 from 87% in 2014. • There has also been a decrease in the proportion who have an understanding of the types of disasters that could occur. Down to 82% in 2015 from 87% in 2014 	Colmar Brunton for MCDEM, 2015

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<ul style="list-style-type: none"> Most vulnerable: Auckland residents, those who have lived in New Zealand for less than 10 years, residents whose first language is not English, young people aged under 30, Asian residents, those with a low personal income under \$30k. 	
2014	Nationwide	MCDEM Disaster Preparedness Survey 2014	To measure New Zealand residents' disaster preparedness using a quantitative survey (1,000 people), and to assess the effectiveness of the MCDEM Get Reay Get Thru campaign over time (building on previous surveys).	Questions were focused on understanding of hazards, preparedness, barriers and incentives for preparing.	<ul style="list-style-type: none"> Fifteen percent of all New Zealand residents are fully prepared for an emergency Are prepared at home: 30% Have emergency survival items: 86% Have survival plan for at home: 59% Younger people, especially those aged under 30 years, are less likely to have emergency survival items or a plan. Nearly all residents are aware that earthquakes (over 90%) can occur in New Zealand. Awareness of tsunami (60% or over across New Zealand; 81% in Gisborne). There has been a gradual year on year decline since 2011 in the number of people who've taken steps to prepare for a disaster in the last 12 months. 	Colmar Brunton for MCDEM, 2014
2013	Nationwide	MCDEM Disaster Preparedness Survey 2013	To measure New Zealand residents' disaster preparedness using a quantitative survey (1,000 people), and to assess the effectiveness of the MCDEM Get Ready Get Thru campaign over time (building on previous surveys).	Questions were focused on understanding of hazards, preparedness, barriers and incentives for preparing.	<ul style="list-style-type: none"> Seventeen percent of all New Zealand residents are fully prepared for an emergency Are prepared at home: 32% Have emergency survival items: 85% Have survival plan for at home: 58% Younger people, especially those aged under 30 years, are less likely to have emergency survival items or a plan Nearly all residents are aware that earthquakes (over 90%) can occur in New Zealand. Awareness of tsunami (60% or over across New Zealand; 90% in Hawkes Bay). 	Colmar Brunton for MCDEM, 2013
2012	Nationwide	MCDEM Disaster	To measure New Zealand residents' disaster	Questions were focused on understanding of hazards,	<ul style="list-style-type: none"> Sixteen percent of all New Zealand residents are fully prepared for an emergency. 	Colmar Brunton for MCDEM, 2012

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
		Preparedness Survey 2012	<p>preparedness using a quantitative survey (1,000 people), and to assess the effectiveness of the MCDEM Get Ready Get Thru campaign over time.</p> <p>This survey builds upon a previous 2006 pre-campaign benchmark survey, and five annual tracking surveys conducted from 2007 to 2011. All surveys are carried out in April and May each year, with the exception of the 2011 survey which was delayed by four weeks due to the February 2011 Christchurch earthquake.</p>	preparedness, barriers and incentives for preparing, disaster experiences and their impact on preparing.	<ul style="list-style-type: none"> • Preparedness has decreased since 2011 for those living outside Christchurch – 14% of those living outside Christchurch are fully prepared for an emergency (down from 18% in 2011). Although there has been a decrease in preparedness for those living outside Christchurch, this result is still higher than in 2010, when just 11% of all New Zealand residents were fully prepared. • Christchurch residents’ preparedness has increased markedly since they were last interviewed for this research in 2010 – 40% of Christchurch residents are now fully prepared for an emergency (up from 15% of Christchurch residents in 2010). • Nearly a third (32%) of all New Zealand residents are prepared for an emergency when at home. Being prepared at home means having an emergency survival plan, having emergency survival items and water, and regularly updating these items. • 55% of all New Zealand residents say they have taken steps to prepare themselves or their household in the last 12 months. This is lower than last year’s result (60%), but significantly higher than in 2010 (45%), before the Christchurch earthquakes struck. The main prompt for preparing was the Christchurch earthquakes • 60% of all New Zealand residents have a survival plan • 27% of New Zealand residents have a plan that includes what to do when away from home. • Four out of five New Zealand residents (81%) have emergency survival items • Those more at risk when disaster strikes are young people, those who identify with ethnic 	

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<p>groups other than New Zealand European or Maori, and those who have lived in New Zealand for ten years or less</p> <ul style="list-style-type: none"> Barriers to preparedness: We asked those who believe preparedness is important for the reasons why they have not prepared. Low motivation (31%), perceptions that the likelihood of a disaster is low (25%), and cost (18%) are the main barriers. 	
2011	Nationwide	MCDEM Disaster Preparedness Survey 2011	The aim of this survey is to continue to measure disaster preparedness using a quantitative survey (1,000 people), and to track the effectiveness of the Ministry of Civil Defence & Emergency Management Get Ready Get Thru communications campaign. As such, this survey builds upon a previous April-May 2006 benchmark survey, and four annual tracking surveys conducted in April-May 2007 to 2010. (Christchurch residents not interviewed this year)	Questions were focused on understanding of hazards, preparedness, barriers and incentives for preparing, disaster experiences and their impact on preparing.	<p>The survey was undertaken post-Canterbury earthquakes. Results suggest these recent events had a significant impact on disaster awareness and preparedness.</p> <ul style="list-style-type: none"> Sixty percent say they have taken steps to prepare themselves or their household in the last 12 months, up from 44% last year. The main prompt for doing so was the Christchurch earthquakes (65% of those who said they did something to prepare themselves or their household said (unprompted) that this was due to the Christchurch earthquakes). After prompting, 60% said they did something to prepare as a direct result of either the September or February earthquake – 38% prepared emergency survival items and one quarter (25%) formulated a survival plan. People are more aware that earthquakes (up from 92% to 97%) and hurricanes, cyclones, or storms (up from 31% to 53%) could happen in New Zealand in their lifetime. More people agree that in a disaster there will be someone there to help you (up from 65% to 74%) and that in a disaster, emergency services would be there to help you (up from 65% to 75%). They are less likely to agree that there will always be adequate warning before disaster hits (down from 37% to 28%). 	Colmar Brunton for MCDEM, 2011

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<ul style="list-style-type: none"> • People are more likely to say their local or regional council (up from 38% to 48%), the ambulance service (up from 67% to 71%) and their neighbours (up from 80% to 84%) will be there to help them following a disaster. • More people believe that sewerage services (up from 82% to 88%) could be disrupted following an earthquake. The proportion of people who believe that mobile services could be disrupted has increased gradually throughout the course of the campaign, from 56% in 2007, to 59% in 2008, to 62% in 2009, to 69% in 2010, and to 73% in 2011. • There is greater awareness of the need to have an emergency survival plan. Nearly half (47%) said unprompted that households should prepare an emergency survival plan for when disaster strikes (up from 39% in 2010). • New Zealand's state of preparedness has increased substantially. Nearly one fifth (18%) are fully prepared for an emergency, up from 11% in 2010. Being fully prepared means having an emergency survival plan that includes what to do when away from home, having emergency survival items and water, and regularly updating these items. • Nearly a third (32%) are prepared for an emergency when at home – 23% were prepared at home in 2010. Being prepared at home means having an emergency survival plan, having emergency survival items and water, and regularly updating these items. • More than four out of five (84%) now have emergency survival items (up from 79% in 2010), just under two thirds (63%) have a survival plan (up from 47% in 2010), and 30% have a plan that 	

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<p>includes what to do when away from home (up from 21% in 2010).</p> <ul style="list-style-type: none"> Those more at risk when disaster strikes include students, those who identify with ethnic groups other than New Zealand European or Māori, and those for whom English is not a first language 	
2010	Nationwide	MCDEM Disaster Preparedness Survey 2010	The aim of this survey was to continue a measure of the state of preparedness of New Zealanders and to track the effectiveness of the Civil Defence and Emergency Management communications campaign. As such, this quantitative survey (1,000 people) built upon a previous April-May 2006 benchmark survey, and three tracking surveys conducted in April-May 2007 to 2009.	Questions were focused on understanding of hazards, preparedness, barriers and incentives for preparing, disaster experiences and their impact on preparing, and help expected during an emergency.	<ul style="list-style-type: none"> Fieldwork occurred during the Eyjafjallajökull volcanic eruption, and in the time since the New Zealand tsunami warning following the Chile earthquake. Results suggest these recent events have had an impact on disaster awareness and preparedness. Forty five percent of New Zealanders say that in the last 12 months they have taken steps to prepare themselves or their households for disaster, this is up from 40% last year. The main prompts to prepare are advertising and disasters that have occurred overseas and in New Zealand. When asked what disasters could occur in their lifetime, more New Zealanders this year mentioned tsunami (up from 59% in 2009 to 76% this year) and volcanic eruption (up from 42% in 2009 to 51% this year). Overall, New Zealand's state of preparedness increased marginally, and there had been an upward trend since the start of the campaign. One in every nine New Zealanders (11%) are fully prepared for an emergency, up from one in fourteen (7%) just prior to the start of the campaign. Being fully prepared means having an emergency survival plan that includes what to do when away from home, having emergency survival items and water, and regularly updating these items. One in every four New Zealanders (24%) are prepared for an emergency when at home – 21% 	Colmar Brunton for MCDEM, 2010

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<p>were prepared at home just prior to the start of the campaign. Being prepared at home means having an emergency survival plan, having emergency survival items and water, and regularly updating these items.</p> <ul style="list-style-type: none"> • Four out of five New Zealanders (79%) have emergency survival items. Nearly half of New Zealanders (47%) have a survival plan. One in five New Zealanders say they have a plan that includes what to do when away from home (up from 19% in 2009 to 21% this year). • Four out of five New Zealanders say they have awareness and understanding about disasters. When asked what households should do to prepare, 81% of New Zealanders say that households need to maintain supplies of food or water, and 39% say households need a survival plan. • Those less aware, and more at risk when disaster strikes, are younger New Zealanders, those who identify with ethnic groups other than New Zealand European or Māori, those who have lived in New Zealand for less than 10 years, those who are not proficient at speaking English, and those who live in larger households. • Attitudes toward disasters - There has been a “healthy shift” in New Zealanders’ attitude toward disasters this year. Fewer now agree that “in a disaster there will be someone there to help you” (down from 76% in 2009 to 64% this year) and that “emergency services will be there to help you” (down from 77% in 2009 to 65% this year). • More New Zealanders are saying they are not well prepared due to complacency (up from 5% at the benchmark to 23% this year), while fewer New Zealanders are saying they are not well prepared because they “don’t expect it to 	

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					happen/it is unlikely to happen" (down from 36% at the benchmark to 17% this year).	
2009	Nationwide	Ministry of Civil Defence & Emergency Management Campaign Monitoring Research 2009	Quantitative survey (1,000 people) to measure the state of preparedness of New Zealanders and to track the effectiveness of the Civil Defence and Emergency Management "Get Thru" communication campaign.	Preparedness and public awareness of hazards and awareness of the MCDEM campaigns.	New Zealanders who had taken steps to prepare in the last 12 months were mainly prompted by advertisements they saw/heard/read (29%). Four out of five New Zealanders who had seen the ads (80%) had been prompted to think or take action to prepare for a disaster (up from 74% in 2008).	Colmar Brunton for Ministry of Civil Defence & Emergency Management, 2009
2008	Nationwide	Ministry of Civil Defence & Emergency Management Campaign Monitoring Research, June 2008	Quantitative survey (1,000 people) to measure the state of preparedness of New Zealanders and to track the effectiveness of the Civil Defence and Emergency Management communication campaign	Preparedness and public awareness of hazards and awareness of the MCDEM campaigns	Awareness of the advertising remained high and the advertisements continued to be effective at getting people to either think about taking action, or taking action to be more prepared.	Colmar Brunton for Ministry of Civil Defence & Emergency Management, 2008
2007	Nationwide	Ministry of Civil Defence & Emergency Management Campaign Monitoring Research, June 2007	Quantitative survey (1,000 people) to measure the state of preparedness of New Zealanders and to track the effectiveness of the Civil Defence and Emergency Management communication campaign	Preparedness and public awareness of hazards and awareness of the MCDEM campaigns	Public awareness of the Civil Defence advertising remained high (66%). Ads continued to be effective at getting people to think or take action. Only 24% had done nothing after seeing the ads.	Colmar Brunton for Ministry of Civil Defence & Emergency Management, 2007

A1.3 Research surveys

Table A1.3 Research surveys that have investigated preparedness aspects for the regions (e.g. Hawkes Bay, Gisborne, Wellington)

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2019	Hawke's Bay and Wellington	Disaster resilience within the hotel sector	<p>A quantitative survey was used to understand levels of disaster resilience in the hotel sector in Hawke's Bay and Wellington. Participants included general managers and hotel employees.</p> <p>The survey included 72 questions for staff and GMs, and an additional 12 unique questions for GMs concerning organisational details. Both surveys included a suite of thirteen organisation resilience questions. The remainder of questions were developed from other measures suggested in Brown et al. (2018), which were developed from the literature and from hotel industry experience.</p>	<p>Various predictors were used to define the forms of capital. For example, predictors for economic capital included diversification of income, financial strength, availability of resources and staff economic resilience.</p> <p>To determine the DRFH physical capital predictors of life safety and other business continuity topics related to physical structures, questions regarding building code compliance and evacuation paths were asked. Additional questions regarding key system redundancies, like power generation, and staff understanding of the systems were also investigated.</p> <p>The survey addressed the DRFH's natural capital predictors of environment-based risks and hotel impacts on the local environment through questions regarding environmental policies and processes. Questions were also asked about organisations empowered to act as watchdogs for the local environment.</p> <p>The last predictor category is Cultural capital. Cultural knowledge and cultural influence on the social system were the cultural capital predictors.</p>	<p>Overall, hotels demonstrated good levels of a range of capitals including: economic, social, human, physical, natural and cultural. Strengths included insurance and financial resources, team approaches, and compliant infrastructure. The authors make several suggestions to increase resilience within these hotels, including budgeting disaster management and creating systems that will allow for off-site data retrieval and power generation.</p>	Brown et al., 2018, 2019

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2018	Wellington preparedness survey	Understanding preparedness of Wellington households after the Kaikōura earthquakes.	The Joint Centre for Disaster Research (JCDR) and the Wellington Region Emergency Management Office (WREMO) conducted a quantitative survey of households across the Wellington region to investigate emergency preparedness levels, to identify strengths, weaknesses, and gaps in current efforts to promote and support emergency preparation.	Questions focussed on preparedness levels including survival items, structural mitigation and community preparedness.	The survey found that respondents' households undertook a range of planning, preparation and risk reduction activities, including preparing a household emergency plan, identifying whether the home is located in a tsunami zone, planning how to get home if road and rail links are impassable and learning how to switch off utilities. In addition, the majority of households have emergency supplies on hand such as a working torch, first aid kit, and enough food stored for a week. Respondents sought preparedness information from many sources, and in most cases, were able to access the advice they needed to answer their emergency preparation questions. Many of the respondents reported having engaged with others to increase awareness of, and preparedness for, earthquakes and other emergencies in their communities.	Blake et al., 2018b
2018	Wellington (Petone and Eastbourne)	Using citizen science to understand community response to the Kaikōura earthquake and tsunami warning	To understand community response to the Kaikōura earthquake and tsunami warning a total of 409 surveys were collected, with 245 respondents from Petone and 164 from Eastbourne. The project employed a self-administered, electronic survey, produced through SurveyMonkey. The survey design was developed and reviewed by emergency management researchers and practitioners from JCDR and WREMO. A total of 21 quantitative and qualitative questions were included in	Three preparedness themes were addressed in the survey questions: <ol style="list-style-type: none"> 1. Emergency preparedness; 2. Household preparedness — planning and preparation activities for earthquakes and other emergencies, such as developing family emergency plans, undertaking risk reduction activities, and collecting emergency supplies for everyone in the household including those with special requirements and pets; 3. Emergency preparedness Information — seeking information to help prepare for emergencies and whether such information is beneficial; and 	This study reports findings from a survey conducted with Petone and Eastbourne residents approximately one month after the 2016 Kaikōura earthquake to determine behaviours relating to the tsunami threat following that event. This study used a citizen science approach, recruiting community members to assist with data collection. In line with a previous study testing intention to evacuate, over two-thirds of respondents did evacuate following the earthquake. However, only 11% evacuated because of the shaking and only a third evacuated within the first 10 minutes after the shaking, despite most respondents reporting that the earthquake felt strong and lasted over a minute. These findings indicate a lack of awareness of when to evacuate. Similarly, many people evacuated in cars, inconsistent with recommendations. The authors recommend further community education, including about recognizing and acting on natural	Blake et al., 2018a

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
			the survey.	<p>4. Community preparedness — engaging with neighbours and the wider community.</p> <p>Demographic data was also collected from respondents. This included age, sex/gender, ethnicity and living situation</p>	warnings, research on how and where people seek information, and impacts of the event on preparedness.	
2017	Hawke's Bay (Napier, Hastings)	Hawke's Bay Coastal Survey 2017	<p>A survey was undertaken in April 2017 to provide a snapshot of the views of the wider Hawke's Bay public on coastal hazard and management issues.</p> <p>The survey was undertaken in Napier and Hastings in April 2017. It was conducted face-to-face with people at public locations and via the internet on Survey Monkey. A total of 338 people answered the survey.</p>	<p>Eight key themes were investigated, which translated into a set of 24 questions. The key themes included:</p> <ol style="list-style-type: none"> 1. Coastal values; 2. Experiences of coastal hazards; 3. Perceptions of local coastal hazards and risks; 4. How people understand coastal processes; 5. People's level of understanding of how various coastal management options work; 6. Preferred coastal management options; 7. Opinions on responsibility for managing coastal hazards and funding management options; and 8. Knowledge of the Clifton to Tangoio Coastal Hazards Strategy 2120. 	<p>16% percent of people reported that they had personally experienced coastal erosion and 35% said they knew someone else who had experienced coastal erosion. Similarly, 12% of people had experienced coastal flooding, with 33% of people knowing someone else who had been affected.</p> <p>Seventy percent of respondents reported thinking about coastal hazards and risk "much" or a "great deal". Fewer numbers of people indicated they talked about coastal hazards and risk (47% reporting at least "much") or sought information about coastal hazards and risk (42% reporting at least "much").</p> <p>Key coastal issues in Hawke's Bay were identified as coastal erosion (mentioned most often), followed by environmental issues (e.g. pollution, over-development, ecological diversity), and other natural hazards such as tsunami, climate change and sea-level rise.</p> <p>The majority of Hawke's Bay respondents thought that changes in coastal hazard impacts were already happening (69%). Some considered changes in coastal hazard impacts were more likely to happen over the next 20 years (11%), and a small group of people thought changes would happen over the longer term beyond 20 years (6%).</p> <p>From the survey, it was apparent that the general public</p>	Becker et al., 2018a

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<p>have a limited understanding of the purpose and function of different coastal management options.</p> <p>People were relatively critical of past and current management for coastal issues in Hawke’s Bay and believe there is opportunity to improve on past efforts. To manage future coastal hazard risk there seems to be support for a mix of options over time (54%). These include making use of seawalls (30%), groynes (35%), dune restoration (36%), planning rules (31%), planned retreat (26%) and beach nourishment (26%). There was least support for maintaining existing protection (12%) and virtually no-one wanted to do nothing (4%).</p>	
2018	Wellington	Impact of the 2016 Kaikōura Earthquake on Wellington CBD Apartment Residents: Results of a Survey	During September and October 2017, a survey of apartment dwellers in the Wellington Central Business District (CBD) was conducted to investigate the impact of the November 2016 Kaikōura earthquake on residents. Questions were focused on knowing people’s experiences of the earthquake, including the immediate impacts, the need for evacuation, alternative accommodation arrangements, disruption to services, and preparedness behaviour. The survey was conducted online and received 803 responses from self- selected participants.	The survey questions focused on the physical impacts of the Kaikōura earthquake, evacuation experiences, alternative accommodation and associated needs of residents, disruption to services, and apartment dwellers’ preparedness for an emergency event. Specific sections were included on “Evacuation process/experience”, “Reasons for evacuation”, “Communication and information”, “Risk Perception”, “Community Connectedness”, “Preparedness”, and a standard “Demographic” section where information was gathered on participants’ age, gender, ethnicity, household income, and living situation. An open comment box was provided at the end of the survey to elicit any further comments.	<p>The findings identified that of the respondents that were aware of the potential tsunami risk, 43% stated they made the decision to evacuate because of experiencing a “long or strong” earthquake which implied the possibility of a tsunami. However, there were also significant numbers who reported that they evacuated for reasons other than an expected tsunami or were not worried about a tsunami.</p> <p>The Kaikōura earthquake enhanced baseline levels of preparedness in apartment dwellers. People reported they were more likely to undertake easier preparedness actions like collecting survival items but were not as likely to participate in earthquake-related community-based activities, securing furniture or avoiding earthquake-prone buildings. There were some differences between CBD dwellers who owned apartments versus those who rented. Apartment renters were more likely to evacuate following the earthquake, compared with owners, due to official evacuation, building damage, response to tsunami, or fear. Owners were more likely to agree or strongly agree that they had the information or knew instinctively what to do to</p>	Becker et al., 2018b

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					make decisions about evacuation after the earthquake. Renters were significantly more likely to agree/strongly agree that they were more confused about whether to stay in their apartment or leave the city centre. Owners received information updates after the earthquake mostly from unofficial sources such as body corporates and other residents, whilst renters mostly received theirs from official sources e.g. Earthquake Commission (EQC), Wellington Regional Emergency Management Office (WREMO), Wellington City Council (WCC) and their employer. Renters noted limitations for strengthening and securing furniture (e.g. rental contracts prohibit “making holes in walls”). Apartment dwellers in general also noted that they had limited space to store survival items, making preparedness a challenge.	
2018	Wellington	Motivations to prepare after the 2013 Cook Strait earthquake	Quantitative surveys were used to examine natural hazard preparedness in Wellington. 204 residents of Wellington were surveyed about their experience during two recent earthquakes, Cook Strait and Lake Grasmere. Participants were asked who they were with, how they reacted and how they felt.	The survey questionnaire included items from studies of immediate behavioural response and emotional reactions to the 2011 Christchurch, New Zealand, and 2011 Great East Japan earthquakes, earthquake preparations, aftershock communications, new questions exploring levels of concern after each earthquake, and potential damage and casualties due to tsunami and tsunami evacuation response. Respondents were also asked what supplies and plans they had to hand at the time of each earthquake, the injuries and infrastructure damage they experienced, and whether they took any preparedness actions after the earthquake (including getting basic supplies and equipment,	The results demonstrated a range of factors relating to preparedness, including gender, earthquake characteristics, problem-focused action coping, and beliefs in negative outcomes of natural hazard events. Evidence of increased concern and action following the first earthquake suggests that such events offer a limited window to run preparedness campaigns. The authors make some recommendations for tailoring information provided during such post-event windows, such as using unique aspects and impacts of the event. The influence of phrasing of time-windows is also explored in Doyle et al. (2020).	Coomer et al., 2014 Doyle et al., 2018, 2020

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
				logistics/planning, and damage mitigation). Participants were asked to rate their level of concern about future aftershocks or earthquakes in the Wellington region. The survey questionnaire included demographic items, and space for open-ended comments.		
2012-2018	National	ShakeOut Earthquake Drill Evaluation surveys	Observer surveys (quantitative surveys filled out by volunteers) were undertaken in 2012, 2015, 2018. Follow-up surveys of New Zealand communities (quantitative online and hand-delivered paper surveys) were undertaken in 2013 and 2016.	Questions included whether people participated in the drills, whether they undertook the actions Drop, Cover and Hold and how long for, whether people participated in a tsunami evacuation hīkoi, beliefs about earthquakes, whether people discussed earthquakes and tsunamis, whether they undertook preparedness actions (and home and work) and how they responded in a real earthquake.	In the 2015 ShakeOut drill, less than a quarter of people surveyed by Johnston et al (2017 a,b,c) undertook the drill. Additionally, of those surveyed doing the drill in 2018, only about 16% practiced a tsunami hīkoi. The 2018 Shakeout drill did, however, provide benefits for types of preparedness (i.e. collecting survival items 33%; securing items 14%; and developing an emergency response plan (37%) with participants consistently more likely to undertake these actions before the drill rather than after the drill (Lambie et al., 2019; Becker et al., 2016a), highlighting that timing of preparedness activities is a key consideration.	McBride et al., 2014 Becker et al., 2016a Becker et al., 2017a Johnston et al., 2017 a, b, c Lambie et al., 2019 Vinnell et al., 2020
2016	Coastal Wellington	Tsunami response behaviour and judgements in coastal suburbs of Wellington	Questionnaires were distributed to residents of coastal suburbs in Wellington following two 2013 earthquakes to investigate their actions following with respect to tsunami risk.	The questionnaire asked respondents where they were located at the time of the earthquake, their perceptions of shaking intensity, and which one action best described their first behavioural response during the shaking. Respondents also reported their affective reactions to earthquake shaking. Next, respondents reported what they did in the first 30 min after the shaking stopped. In addition, they reported the communication channels they used during that time. Respondents were asked to report their earthquake experience. They	Less than 10% of respondents evacuated out of concern that a tsunami would strike following these earthquakes despite the majority thinking there was a moderate likelihood of a tsunami occurring. Respondents reported an increase in concern about future tsunami following the earthquakes, but 80% also rated their likelihood of evacuating in future tsunami being between “not at all likely” and “medium likelihood”. Being in a tsunami evacuation zone increased this likelihood of future evacuation. Previous education about tsunami had little impact on perceived tsunami impact, though respondents were accurate in their perceptions of safety in respect to the tsunami hazard zone. At-risk communities should be involved in	Fraser et al., 2016

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
				<p>were also asked to indicate if they had, previous to the earthquake being studied, obtained earthquake information by attending a meeting on the earthquake hazard or receiving a brochure about earthquake hazard. Next, they were asked to report their level of household emergency preparedness. In addition, they were asked to report whether anyone in their household was killed or injured, how much damage their home experienced, and what types of infrastructure were interrupted. Finally, respondents were asked to report demographic characteristics.</p>	<p>risk management procedures and educated about how to respond to tsunami warnings.</p>	
2016	Wellington	<p>Evaluation of tsunami drills and preparedness actions in at-risk schools in the Wellington region.</p>	<p>Six weeks after the 2015 ShakeOut drill, 42 of the 46 schools in the Wellington tsunami inundation zone were visited to hand out questionnaires. Seventeen school representatives filled out the quantitative survey which was focussed on understanding tsunami preparedness in schools. Distributing the surveys in person provided an opportunity to increase hazard awareness dialogue.</p>	<p>The survey questionnaire was divided into two main parts. Part 1 focused on school engagement in tsunami activities in the 2015 ShakeOut campaign, including questions concerning recognition of the tsunami zone, evacuation practice, classroom teaching, resources for teachers, and planning at home. Part 2 focused on general tsunami preparedness activities, including response plans, stakeholder involvement, drill practices, family reunification plans, classroom teaching and resources, and challenges to preparation. The nine tsunami-related preparedness activities were developed through a review of school preparedness literature and in consultation with emergency</p>	<p>This survey investigated and evaluated general tsunami preparedness actions undertaken by at-risk Wellington schools. All 17 schools that were surveyed reported undertaking some tsunami preparedness actions. Not all schools were fully prepared though, despite being within the tsunami inundation zones and therefore creating a high life-safety risk for students. In conjunction with exercises such as the ShakeOut drill, the necessity of tsunami planning and preparedness activities in at-risk schools needs emphasizing.</p>	<p>Johnston et al., 2016</p>

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
				management practitioners working with schools.		
2016	Wellington	Examining the effects of message framing and social norms on judgments of earthquake legislation	This study used a 2 (location: Wellington and Palmerston North) by 4 (condition: descriptive, injunctive, combined, and risk-prone) between-groups experimental design which presented each participant with a questionnaire containing one of four conditions.	Participants were randomly allocated one of four experimental passages (descriptive, injunctive, combined, or risk-prone) followed by the corresponding manipulation check questions. These were then followed by a question asking where the participant lived. They could select Wellington, Palmerston North, or Other. This question allowed the presentation of subsequent questions tailored to the specific participant. For example, a question was added which asked the participant, "How concerned are you about the danger of earthquakes [in Wellington/in Palmerston North/where you live]", with the response scale ranging from 1 (Not at all) to 7 (Extremely). The same customisation was used for the ICS scale question and the question asking how long they had lived in their current city (see Appendix H of thesis for the full question table).	Reports three surveys on Wellington residents' judgments of earthquake strengthening legislation, including predictors of support. Consistently, the belief that the strengthening work will reduce damage and injury in a future earthquake strongly and positively predicted support for the legislation. Implications for policy communication are discussed.	Vinnell, 2016
2016	East Coast	Investigate the public's understanding of the risk they are exposed to and their preparedness for a tsunami on the East	In June 2015, a quantitative survey was undertaken in a collaborative effort between GNS Science and the Joint Centre for Disaster Research at Massey University (JCDR). The goal was to investigate the public's understanding of the tsunami risk they are exposed to and	Survey questions focussed mainly on tsunami risk awareness, preparedness and evacuation intentions in case of a major event (see Appendix 2.6 for the full set of questions).	<ul style="list-style-type: none"> • Some of the findings included: • Across the East Coast, the two natural hazards respondents thought were most likely to affect his/her community were earthquake (57.5%) and tsunami (71.1%). • Origins of tsunami generation were not well understood. • There was generally a good understanding of earthquakes that could cause a tsunami severe enough to evacuate including: an earthquake 	Dhellemmes et al., 2016

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
		coast of the North Island.	their preparedness for a tsunami on the East coast of the North Island.		<p>lasting more than 1 minute (75.1% of respondents), an earthquake strong enough to collapse buildings (82.6%), and an earthquake too strong to stand during (88.9%). However, only 37.1 % of respondents were aware that they may not feel the earthquake that triggers a tsunami.</p> <ul style="list-style-type: none"> • Across the East Coast the ways people find out about their property’s location within or outside of a tsunami zone were diverse. However, advertisement by Civil Defence/Council, evidence in public areas, newspapers and local media, school-based programmes gained the most reach. • Perceptions of tsunami risk were highly variable. Respondents received information about preparing for tsunami from a diverse range of sources. In general, the most valuable sources were neighbours and friends, as well as Central Government agencies, regional and local councils and Civil Defence Groups, workplaces and schools. • The percentage of respondents who have seen tsunami hazard zone maps for their community varied, and ranged from 35.6% of respondent in Westshore (Napier) and 85.7% of respondents surveyed in Riversdale. Flyers/booklets and online were the most common locations where residents were accessing information of tsunami hazard zones. • 42.8% of respondents considered that they have ‘a few minutes’ to move to safety and 36% of respondents believed that they have ‘10 minutes to half an hour’ to evacuate to safety from tsunami. • Regarding hazard preparedness measures: • 46% of 874 respondents and their households think that they are prepared enough to deal with a tsunami, 50% didn’t believe they were prepared 	

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					<p>enough, and 2.8% didn't believe they need to be prepared for tsunami (Table 31).</p> <ul style="list-style-type: none"> • 59.6% of respondents had a "getaway kit" or items ready to evacuate with (Table 32). • 87.1% of respondents had a specific location in mind if they needed to evacuate. • 32.8 % of respondents expect to be evacuated from between one and three days; and, 38.7% expect to be evacuated for more than three days. 	
2015	Wellington	Examining attributions for preparedness and comparing frequency of mitigative actions with frequency of survival actions	This was a quantitative survey of businesses and households in Wellington asking about earthquake preparedness and mitigation survey.	Wellington business and households were questioned about their earthquake preparation and attributions for not having prepared.	Mitigative actions (e.g., strengthening building foundations) were undertaken less frequently than survival actions (e.g., having water supplies). Expensive actions were undertaken less frequently than inexpensive actions but cost was not the top-ranked attribution for failing to prepare. Higher-ranked attributions included not having thought about it, the belief that the action would make no difference, and low priority of the action. Cost is therefore not the only relevant criterion when it comes to the decision to prepare and cannot fully explain why mitigative actions are under-performed.	McClure, et al., 2015a.
2014	Wellington	Relationships among quality of life, well-being, and disaster preparedness.	This study was based on a hypothesis that Quality of Life (QoL) and well-being affect household evacuation preparedness, and that adults with a higher QoL would exhibit higher levels of household preparedness. The authors developed measurable attributes of resilience by examining QoL constructs and selected indicators of multidimensional well-being and disaster preparedness, which were developed into a	The survey contained 56 questions obtained or derived from validated psychometric scales and QoL instrument databases, social science surveys on disasters in New Zealand, Australia, and the United States, and questions developed specifically for this study; demographic questions from the New Zealand census also were included. Multidimensional QoL variables were measured using validated psychometric scales and analyzed for associations with evacuation preparedness, and we determined	Used a quantitative survey of Wellington adults to measure health protective behaviours and attitudes and examined their associations with preparedness to evacuate in a disaster. Several significant correlations were found between dimensions of well-being and evacuation preparedness, including emotional well-being and life satisfaction. Regression analyses demonstrated a small but significant proportion of variance in evacuation preparation explained, however spiritual well-being was the only unique predictor. Further, the research explored intangible aspects of readiness such as perceived disaster risk and consequences, which, along with well-being, should be included in conceptualizations of preparedness.	Gowan et al., 2014.

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
			quantitative epidemiologic survey (cross-sectional design) of Wellington adults.	whether age and gender affected these relationships.		
2013	Hawke's Bay	Community resilience	This study constituted a literature review of previous projects in Hawke's Bay that had investigated resilience, and recommendations for future resilience-building and evaluation	This report provides a summary of survey results from previous reports, as well as a summary of other qualitative research in Hawke's Bay. No new questions were asked.	GNS Science was engaged to undertake a review of resilience and current public education, communication, and resilience strategies in the Hawke's Bay. As part of this review they summarised the main factors that contribute to individual and community resilience, provided a "state of the nation" report on resilience in Hawke's Bay, and provided recommendations for how to further develop resilience in the region. An evaluation was also undertaken of current activities that are already taking place that may contribute to resilience (e.g. communication, public education, engagement). Recommendations were provided on future potential activities that could be employed to build resilience, as well as on how these could be accommodated within organisational structures. Findings of the resilience review identified a range of individual, community and institutional factors that contribute to resilience both individually and collectively (community level).	Becker et al., 2013b
2013	Wellington	Community understanding of, and preparedness for, earthquake and tsunami risk in Wellington.	This paper provides a review of previous surveys in the Wellington context, what these mean in terms of motivating preparedness, and some examples of interventions designed to enhance preparedness.	The paper provides a summary of previous survey-based research. It does not have any new questions associated with it.	The authors explain the Wellington hazard context, and the current tendency of public education campaigns to focus on providing risk information. Survey findings demonstrate that risk awareness is high but preparedness levels are low. Based on these findings, the authors suggest that individual, psychological, and community factors contribute to the relationship between perception and preparedness, and that future campaigns should consider these factors.	Johnston et al., 2013
2012	Napier, Wanganui and Timaru	Understanding how individuals make meaning of earthquake	This research explored the earthquake information meaning-making and preparedness processes. Interviews explored	This study interviewed residents to understand earthquake preparedness. Questions focussed on information received about earthquake preparedness,	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	Becker et al., 2012, 2013a, 2017b

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
		information and how this relates to preparedness	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. This was done by undertaking 48 qualitative interviews with residents in Napier, Timaru and Whanganui.	interpretation of that information, earthquake and other hazard beliefs, preparedness undertaken, disaster experience and community factors of preparedness.	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.	
2012	Wellington	The relationship between perceived susceptibility to earthquakes and tsunamis and response in Wellington	Used quantitative survey questionnaires and interviews with Wellington citizens to ask about earthquake hazards and preparedness.	Questions focused on hazard and risk perceptions in Wellington, beliefs, and preparedness.	There is close alignment between physical and perceived susceptibility to earthquakes in Wellington which produces a high response rate to these hazards (e.g., having a survival kit). This relationship is not linear, however, given that preparedness for tsunami is low despite awareness of susceptibility. It is suggested that other characteristics relating to place and person (e.g., fatalism or blasé effect) impact these relationships. The authors conclude that understanding the gap between perceived and physical susceptibility to hazards, and narrowing this gap, can lead to better hazard management in Wellington.	Khan et al., 2012
2011	Wellington	Judgements of earthquake	This quantitative survey (294 participants) examined	Questions focussed on the earthquake context (post-	The research examined the relation of participant city to risk assessments for before (recall) and after the	McClure et al., 2015b

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
		risk and preparedness following the 2011 Christchurch earthquake.	<p>preparedness and judgments of earthquake risk after the 2011 Christchurch earthquake in three New Zealand cities: Christchurch, Wellington, and Palmerston North.</p> <p>Christchurch was selected because its citizens did not expect an earthquake (but it occurred there); Wellington, because its citizens expected an earthquake (but it did not occur there); and Palmerston North, because its citizens did not expect an earthquake (and it did not occur there) and is thus comparable to Christchurch before the earthquakes.</p>	Christchurch earthquake) and included risk judgment, optimism, personal experience, outcome expectancy, and preparedness.	earthquakes, participants' attributions for their risk judgments and for (not) preparing, and earthquake damage for Christchurch participants. Participants reported that prior to the earthquakes, they saw an earthquake as more likely in Wellington than in Christchurch and Palmerston North. In all three samples, expectations of another earthquake in Christchurch were significantly higher after the Christchurch earthquakes. Palmerston North expectancies of a local earthquake were also higher after the earthquakes, whereas Wellington citizens' expectancies of a local earthquake were only marginally higher. Preparations increased after the earthquakes, particularly in Christchurch. These findings suggest that prior expectancies and disaster experiences affect earthquake risk judgments and preparation inside and outside the affected region.	
2011	Wellington	Earthquake risk judgements and preparedness before and after the 2010 Darfield earthquake	A quantitative questionnaire about earthquake perceptions and preparedness was administered following the 2010 Darfield earthquake. Participants completing the questionnaire were 380 residents from three cities in New Zealand (Christchurch, Wellington and Palmerston North).	The questionnaires measured the perceived likelihood of an earthquake occurring. The first version of the questionnaire was constructed for Christchurch and took account of the fact that this sample had recently experienced a major earthquake. The second version of the questionnaire, designed for Wellington and Palmerston North, was adapted from the Christchurch questionnaire. Questions that were not appropriate for those cities, such as "Did you incur a lot of damage in the earthquake?" were excluded, and additional questions such as "Has the risk of an	Using questionnaires, this study found that Wellington citizens' thought an earthquake was likely to occur in Wellington prior to the 2010 earthquake, and this judgment of likelihood did not increase following the earthquake. They did, however, report increased likelihood for another earthquake to occur in Christchurch compared to their judgments of likelihood before - more-so for those that had friends, family, or close acquaintances in Christchurch. This study concludes that New Zealanders may be incorrectly fixated on Wellington as the only earthquake-prone city. It also reviews three methods of preparedness for earthquakes: legislation, incentives, and personal readiness.	McClure et al., 2011a

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
				earthquake become more real or plausible to you since the Canterbury earthquake?" were added. The questions in the Wellington and Palmerston North version of the questionnaire were identical, except that in questions that specifically referred to the city where the participants lived, the name of the city was changed to that of the resident.		
2011	Christchurch, Wellington, Palmerston North.	Earthquake risk perception inside and outside the affected region	This is part of the study above carried out after the first Canterbury earthquake, the Darfield earthquake in September 2010. The authors were interested in how people in Christchurch, Wellington and Palmerston North changed in their perception of risk of a future earthquake after a significant local earthquake. Participants completing the questionnaire were 380 residents from three cities in New Zealand (Christchurch, Wellington and Palmerston North).	The questionnaire asked for Christchurch citizens' recall of their pre-earthquake risk perception: "Before the Darfield earthquake, how probable did you think it was there would be a big earthquake in or near Christchurch?" A second question asked: "Since the Darfield earthquake, how probable do you rate a future earthquake in Christchurch?" The same questions were asked in Wellington and Palmerston North. Questions also asked Wellington and Palmerston North participants for their recall of the likelihood of an earthquake in their own city – and in any other part of New Zealand (NZ). Questions then asked for their judgments of the likelihood of a future earthquake in each of these three areas (Christchurch, their own city, and another part of NZ). Judgments were given on Likert scales. A related question asked "If you've previously thought an earthquake in or near Christchurch was unlikely, why was	Reports findings of surveys in three NZ cities, Christchurch, Wellington, and Palmerston North following the 2010 Darfield earthquake. People in Wellington had a higher expectancy of an earthquake in their own city than in the other two cities before the earthquake, and judgments of likelihood did not increase following the 2010 event. In contrast, residents of both Palmerston North and Christchurch had higher expectations of an earthquake in their own cities after the earthquake. The authors suggest that prior expectancies and earthquake experience are important factors to consider when testing risk judgments.	McClure et al., 2011b

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
				that?" with space for open ended responses. Questions on other issues asked "Were you aware of information and warnings to prepare prior to the earthquake?" and "did you see this information as relevant to you?" and for Christchurch citizens "Did you suffer serious damage to your home or not"; and for Wellington and Palmerston North citizens, whether they had friends, family or close acquaintances in Christchurch. Christchurch participants were also asked about their preparedness for an earthquake.		
2010	Wellington	An investigation of the relationship between socio-economic status and hazards-preparedness in intermediate school children	The information in this report was gathered through direct observation of one primary school (i.e., Years 1-8) as they conducted their annual emergency response practice and evacuation exercise. The study used self-report questionnaires in five Wellington-region intermediate schools with a range of decile rankings, which reflects the socio-economic status (SES) of the community, to examine whether SES relates to knowledge of and preparedness for natural hazards	Questions focused on knowledge of natural hazards such as earthquakes and tsunami, perceptions of risk, response actions, preparedness and affective responses, linked with demographics (e.g. SES).	Overall, the authors found support for the hypothesis that students from lower decile schools, reflecting lower SES, have less knowledge of the causes of earthquakes and tsunami and lower preparedness for such events. Similar patterns are reported for related cognitions, including fear (which decreased with higher SES) and realistic perceptions of risk (which increased with higher SES). The authors conclude that SES is associated with hazard knowledge and preparedness, but suggest that future studies could examine a larger number of schools and consider other relevant factors, particularly ethnicity. Other key lessons learnt include the following: frequent, well-learned emergency practices are likely to increase the probability that in a real emergency at school, staff and pupils will respond in an informed and predictable manner, and engage in behaviours that are recognised as best practice, and; schools that have well developed and regularly practised emergency preparedness plans in place send a message to pupils and caregivers alike	Tarrant & Johnston, 2010 Johnston et al., 2011

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
					that in the case of an emergency, the school is prepared to protect the safety of the children.	
2009	Nationwide	Survival confidence of New Zealanders in outdoors and post-earthquake situations.	This research surveyed 233 New Zealanders and 130 people from overseas on their preparedness and confidence at performing tasks post-earthquake and in the bush.	Questions focussed on self-assessments of abilities to deal with response situations in the bush and in natural hazard (earthquake conditions).	Participants compared their abilities to those of the average person from their own country: in the bush scenario, 67% of New Zealanders and 69% of those from overseas showed an optimism bias by rating themselves better than average in the earthquake scenario 72% of New Zealanders and only 33% of those from overseas showed this bias. The difference in confidence between scenarios can be explained by the likelihood of having experienced the scenario examined, and it is suggested that New Zealanders may be overconfident in their abilities in a scenario they have not experienced.	Walton & Smith, 2009
2009	Gisborne	The community's experience of recovery: preliminary findings for the 2007 Gisborne earthquake household damage and preparedness Survey	<p>A quantitative survey was undertaken to:</p> <ul style="list-style-type: none"> • Understand the impacts of the 2007 earthquake on Gisborne residents. • Estimate damage and losses • Estimate awareness of the earthquake hazard • Estimate preparedness for earthquakes. <p>One thousand households were randomly selected from census mesh blocks and the survey was delivered by post to a mix of households; some at risk from tsunami as well as some who were not, to see how people responded to tsunami threat.</p>	Questions focussed on earthquake impacts and experiences from the 2007 Gisborne earthquake (including damage/loss), awareness of earthquakes and tsunami hazards, responses in the earthquake (including tsunami evacuation), preparedness, and community engagement.	<p>Survey findings indicated relatively high rates of general preparedness (like water, torches, and radios, some of which was triggered by the event), but low rates of more complex preparedness measures (such as securing furniture). Results also identified low rates of participation/engagement in wider scale, collective community preparedness and readiness initiatives, which was typical of many settlements across NZ at the time. For example, when the Gisborne earthquake occurred, 11% of people considered the tsunami risk and evacuated, whereas 40% considered the tsunami risk but did not evacuate, and 33% did not consider the tsunami risk and did not evacuate. Recommendations included:</p> <ul style="list-style-type: none"> • Using smaller events to harness people's experience as a prompt to prepare. • Focus on triggers that make people prepare. For example, what the personal attributes are that people need? What the community attributes are that communities need? And, what needs to be present in terms of institutional support to get people preparing for disasters? 	Saunders & Becker, 2009

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2008	Napier	Modelling Community Preparation for Natural Hazards: Understanding Hazard Cognitions. EQC 06 / 525	<p>A quantitative survey was undertaken in November 2006 to investigate predictors of preparedness and contribute to development of a model of natural hazards preparedness. Data were collected from 255 respondents in Napier.</p> <p>The outcomes of this research were intended to assist Napier City Council, Hawke's Bay Regional Council and the Earthquake Commission to enhance the effectiveness of public information programmes, enhance household preparedness for earthquakes, and help ensure that information programmes meet the needs of the community.</p>	<p>This study built on the findings of EQC Project 01-479 (Paton, et al., 2005) in which three issues requiring additional research were identified, the overall objectives of this project were to:</p> <ol style="list-style-type: none"> Examine how people interpret preparedness scale items; Clarify the relationships between predictor variables and decisions whether to prepare or to not prepare; and Conduct an exploratory investigation of the cognitions that underpin people's preparedness decisions. <p>A questionnaire was compiled based on preparedness measures obtained as part of a detailed review of literature. Measures incorporated into the survey included: Positive and Negative Outcome Expectancy; Community Participation; Collective Efficacy; Empowerment; Trust, Intentions, demographics and preparedness items.</p> <p>The preparedness items comprised 22 items derived from Spittal's (2003) scale and 8 items derived from an earlier study of earthquake preparedness (Paton et al., 2005). Items were scored as 'have adopted (3), may adopt (2), and will not adopt (1).</p> <p>It also included questions that were designed to ascertain what was influencing the effectiveness of public</p>	<p>The authors sought to further develop a model of natural hazard preparedness by examining the role of attitudes to natural hazards and their mitigation and social norms (McIvor & Paton, 2007). The research examined whether social-cultural factors influenced the decisions people make regarding natural hazards.</p> <p>The research found that positive attitudes to hazard mitigation, existing in a social context that advocates adopting protective behaviours, belief in the effectiveness of personal mitigation (outcome expectancy) and good problem solving (action coping) skills increase the likelihood of adopting protective measures for earthquakes. The research identified how attitudes and social norms influence the perception of hazards and how people make preparedness decisions.</p> <p>In terms of practical implications, the findings argue for a move away from reliance on the passive presentation of information to people and communities that dominates risk communication. Rather, strategies for encouraging and sustaining positive discourse about hazards and their mitigation within a community should be prioritized in future risk communication work.</p>	<p>Multiple publication outputs as follows: Paton & Johnston, 2008 McIvor & Paton, 2007. Paton & Johnston, 2008 McIvor et al., 2009 Paton et al., 2010a Paton et al., 2010b</p>

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
				information campaigns designed to enhance preparedness to natural hazard effects.		
2003	Blenheim, Gisborne, Pahiatua, Wanganui	Developing a model to predict the adoption of natural hazard risk reduction and preparatory adjustments. EQC Project 01-479	This study asked about factors that influence preparedness and was focused on developing a social cognitive model of disaster preparedness. A phase 1 quantitative survey was undertaken in September 2001 in Blenheim, Gisborne, Pahiatua and Wanganui with 2,400 surveys distributed by post and 660 returned. A phase 2 survey was undertaken in February 2002, with 2,400 distributed to the same people and 640 returned.	Questions included critical awareness, hazard perceptions, outcome expectancy, control, responsibility for preparing, action coping, community participation, trust, preparedness actions taken, demographics.	The project developed and tested a social cognitive model of disaster preparedness. This model provides insights into the complexity of the preparedness process and identifies a need for risk communication and risk reduction strategies undertaken to facilitate earthquake preparedness to address a wider range of variables than previously. The model describes the developmental process that commences with factors that motivate people to prepare, progresses through the formation of intentions, and culminates in decisions to prepare. The model describes how three factors, critical awareness of earthquake issues, risk perception, and earthquake anxiety, motivate people to think about earthquake preparedness. If these variables are present at adequate levels, a person will progress to the next phase, forming intentions to adopt preparedness measures. The formation of intentions to prepare is influenced by the prevailing set of variables, including outcome expectancy, self-efficacy and action coping. An unexpected outcome of the research was the finding of two intention factors, "intention to prepare" and "intention to seek information". Only the former predicted actual adjustment adoption. Two moderator variables were identified. The perceived timing of the next damaging earthquake moderated the intention to prepare – adoption link. Perceived trust moderated the intention to seek information – adoption link.	Paton et al., 2003 Plus other additional papers.
2003	Wellington	Earthquake preparedness in Wellington homes.	A door-to-door household audit was undertaken to better understand preparedness for earthquakes, The audit involved visits by	The researchers asked the householders if they would agree to a "quake safe check" to (a) help the Earthquake Commission understand the incidence and nature of mitigation,	The paper presents the methodology and findings of two earthquake preparedness pilot surveys conducted in parallel and compares their results with those from previous surveys. The first survey, a door-to-door audit of 100 homes in Wellington City, ascertained the extent to which	Charleson et al., 2003

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
			<p>researchers to houses in areas selected to provide a spread of demographics. Houses were visited in each of the following Wellington suburbs: Island Bay, Miramar, Karori, and Newlands</p> <p>To increase the public's participation, each survey participant was written to in advance to prepare them for the visit.</p>	and (b) provide householders with an assessment specific to their home.	householders had seismically restrained tall furniture and other chattels. In the second and parallel survey, 50 homes located in the same suburbs as the door-to-door audit were telephoned. An adult occupant was questioned about what mitigation actions had been taken.	
2003	National	Tabulated Results of the 2003 National Coastal Community Survey	<p>From January to June 2003 a national survey (9,000 questionnaires) was conducted to build a picture of the social dynamics at work in coastal communities in relation to coastal hazards. This report presents the method and tabulates the 3548 responses to approximately 50 questions from 42 coastal New Zealand communities. The aims of the survey were to: (1) assess perceptions of coastal risk in the context of other risks; (2) assess levels of preparedness for emergencies; and (3) assess views on management options and willingness to pay for hazard mitigation.</p>	<p>The questionnaire contained nearly 50 questions covering perceived threats from a range of natural hazards, specific awareness of and preparedness for tsunami, perceptions of coastal erosion and mitigation strategies, general emergency preparedness, willingness to pay for coastal management options, and socioeconomic information about respondents.</p>	<p>Findings highlighted general low awareness/risk perception of potential coastal hazards. For example, residents and visitors were asked which two natural hazards were most likely to affect their community ("affect this community" for visitor respondents). Percentages of respondent concerned about tsunami occurring at their location, ranged from 0% at Waipu Cove to 35.6% at Lyall Bay.</p> <p>In most places over the majority (i.e. 50-70%) of people hadn't received any information about preparing, and the majority had not, or were not planning to seek any information about preparing.</p>	Johnston et al. 2003

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
2001	Hawke's Bay and Manawatū	Communities' understanding of earthquake risk in the Hawke's Bay and Manawatū-Whanganui regions, New Zealand.	A quantitative survey was undertaken of residents in the (a) Manawatū-Whanganui and (b) Hawke's Bay regions on levels of risk perception, preparedness and other human factors related to a future large magnitude earthquake.	Questions were focussed on risk perception, preparedness and other personal and community factors that influence preparedness.	The findings indicated that the majority of respondents in Manawatū-Whanganui and over one third in Hawke's Bay reported not hearing any general or specific information related to the next large magnitude earthquake in the region. The study found that levels of risk perception were generally lower than expected, though Hawke's Bay residents appeared to have more realistic views. It therefore comes as no surprise that low levels of preparedness were generally indicated with some exceptions in Hawke's Bay. Those exceptions notwithstanding, the vast majority of residents in both regions reported not being prepared with regard to some major hazard adjustments (e.g., structural changes to homes).	Ronan et al., 2001
2001	North Island, East Coast	Community resilience to volcanic hazard consequences	A quantitative survey was undertaken to understand preparedness and resilience in the wake of the 1995-96 Ruapehu eruptions.	Questions included self-efficacy, problem-focused coping, sense of community, preparedness and demographics.	The use of risk management principles to promote community resilience to a range of potential hazard effects is increasingly important for emergency management. Realising this goal requires that the community and personal characteristics that facilitate the ability to "bounce back" from adversity are identified and modelled. This paper describes the role of self-efficacy, problem-focused coping, sense of community and age in predicting resilience to the social consequences of volcanic hazard activity following the 1995 and 1996 eruptions at Ruapehu volcano. The nature of the relationships observed suggest that resilience should be conceptualised and managed in a contingent rather than a prescriptive manner. The implications of the findings for community risk perception, predicting resilience within an all-hazards management framework, community hazard reduction planning, resilience assessment and evaluation, and risk communication is discussed.	Paton et al., 2001

Year	Location	Nature of study	Methodology	Summary of relevant questions	Key findings	Reference
1997	Hastings and Whakatane	Volcanic hazard management	<p>Mixed methods study was undertaken to investigate risk perception and preparedness for volcanic eruptions (including a quantitative survey undertaken both before and after the 1995-96 Ruapehu eruption)</p> <p>Residents of two North Island, New Zealand, communities were surveyed in March 1995 to measure their understanding of volcanic hazards. This was repeated in November 1995, following the Ruapehu eruptions of September-October 1995.</p>	<p>Questions focussed on themes of risk perception, risk assessment, lifeline vulnerability and impacts of the Ruapehu eruption</p>	<p>In terms of findings, Whakatāne was spared any direct effects, whereas Hastings experienced the hazard directly, in the form of ash falls. Only Hastings respondents showed a significant change in threat knowledge and perceived volcanic risk. While experiencing the direct and indirect impacts of the 1995 Ruapehu eruption may make subsequent warnings and information releases more salient, thereby enhancing the likelihood of engaging in successful protective actions or other forms of response, the characteristics of hazard impacts may increase susceptibility to a “normalisation bias”, reducing future community preparedness.</p>	<p>Johnston et al., 1999, 2000</p>

Appendix 2.0 (A2.0) Examples of preparedness questions used previously

Appendix 2 provides some examples of survey questions that have been used previously and could be considered for future surveys.

A2.1 Hawke’s Bay Regional Council residential survey questions

Hawke’s Bay regional residential 2019 survey

THREE: READY FOR AN EMERGENCY

- Thinking about the possible natural hazards that occur from time to time, if you were to list **THREE** possible disasters or threats specific to Hawke’s Bay that would affect your safety or create a risk to your livelihood, what would they be?

- Please indicate with a Yes or No, if you & your family have taken any action to prepare for natural hazards

Yes No

1. Have a household emergency plan completed and know how you will contact your family.	1	2
2. Enough food stored including food in your freezer for 3 days	1	2
3. Enough water stored not including water in your hot water cylinder for 3 days	1	2
4. Some way of cooking without electricity, such as a barbeque or gas cooker	1	2
5. If you live in a tsunami zone, you have a plan to get away if there’s a long or strong earthquake.	1	2

- What communication methods would you use to get the most up to date information during an emergency in Hawke’s Bay? (select all that apply)

1 <input type="checkbox"/> Hawke’s Bay Emergency website - hbemergency.govt.nz	8 <input type="checkbox"/> Local Council website
2 <input type="checkbox"/> Facebook page for Hawke’s Bay Civil Defence or council	9 <input type="checkbox"/> Radio announcement
3 <input type="checkbox"/> Emergency alerts on mobile	10 <input type="checkbox"/> TV announcements
4 <input type="checkbox"/> Red Cross Hazards app	11 <input type="checkbox"/> Word of mouth
5 <input type="checkbox"/> Hawke’s Bay app	12 <input type="checkbox"/> Social media
6 <input type="checkbox"/> Door-to-door visit by emergency services or Civil Defence staff	13 <input type="checkbox"/> Don’t know
7 <input type="checkbox"/> Other - Please specify: _____	

A2.2 WREMO survey questions (WREMO, 2019)

- Right now, which of the following do you have for everyone in your household that would last for 7 days? (water 3L/person/day, food for 7 days, medications, pet supplies, baby supplies, supplies to keep you warm and dry outside your house, BBQ/camp stove/wood burner with cooktop, a way to safely go to the toilet, a way to receive communications not needing electricity, a way to send communications not needing electricity)
- How often should you change your emergency water? (monthly, yearly, every couple of years, doesn't need changing, other).
- How many of your neighbours first names do you know?
- If you had to create an emergency toilet, what option would be most suitable for your property? (long drop, two bucket emergency toilet, chemical camp style, no toilet options are available, other)
- What is the purpose of a Community Emergency Hub?
- Who opens and operates a Community Emergency Hub?
- Do you know where your nearest Community Emergency Hub is located?
- Which of the following do you know how to turn off at your home? (electricity, water, gas)
- Do you have access to a fire extinguisher at home? (and knowledge of how to use it)
- What should you do immediately you once you feel an earthquake?
- What kind of warning do you expect to receive if you feel an earthquake that is longer than a minute or strong enough to knock you to your feet? (sirens, none/the earthquake, text alerts, radio announcements, other).
- Do you know the safe places near home to evacuate to by foot if you need to evacuate after an earthquake?
- Do you know the safe places near work to evacuate to by foot if you need to evacuate after an earthquake?
- Does your place of employment/study have a business continuity plan?
- Do you have an emergency plan to reconnect with everyone in your household after an emergency event that everyone in your household knows about?
- Have your home's foundations have been secured so that your home is safer in an earthquake?
- Is large furniture around your house secured so that it is safer in an earthquake?
- In an emergency, where are you likely to go for emergency information? (Includes options for radio, Facebook, Twitter, Instagram, News websites, WREMO website, other)
- Have you heard of Emergency Mobile Alerts?
- Did you receive the Emergency Mobile Alert test message in November 2018?

A2.3 MCDEM survey questions (Colmar Brunton, 2019)

Actions taken (broken down into at least one action; or fully prepared at home):

- Have a good understanding of the types of disaster that could occur, and the chances of them occurring
- Have a good understanding of the effects of a disaster in my area
- Have discussed or planned with household what to do
- Household discussion or plan includes what to do when not at home
- Have stored 9L of water for each household member
- Have emergency supplies
- Have a getaway bag with emergency items
- Check survival items at least once a year
- Attend meetings with community groups about disaster planning

Timeframes

- In the last 12 months, have you taken any steps to prepare yourself or your household for a disaster?
- How likely or unlikely are you to take [further] steps to prepare for a disaster in the next twelve months?
- How likely or unlikely are you to take [further] steps to prepare for a disaster in the next six months?

What do you think is the single most important thing you could do, in order to be prepared for a disaster?

Earthquake and tsunami-specific actions

What actions should people take during a strong earthquake? Choose from:

- Take shelter under a desk / table / solid structure
- Drop, Cover and Hold
- Turtle
- Get down low
- Hold onto something
- Take shelter in doorway
- Move to a safe place / away from trees / falling objects
- Go outside / go out into the open
- Alert / check / help family / friends / neighbours
- 'Get gone' / move inland / to higher ground / prepare to be evacuated
- Stay indoors / don't go outside
- Stay where you are / stay put
- Don't panic / stay calm
- Help others

Imagine that you are near the coast and a long or strong earthquake happened. What action should you take? Choose from:

- Move inland / to higher ground / evacuate
- Long or strong, get gone (or similar phrase)
- Alert / check / help family / friends / neighbours
- Move to a safe place

- Check whether a tsunami warning has been issued
- Check / grab emergency survival items
- Implement survival plan
- Listen to the radio / check cell phone for news
- Wouldn't know what to do

How would you evacuate? Choose from:

- Car
- Walk / run
- Pushbike
- Motorbike / scooter
- Whatever means possible
- Other
- Don't know
- Wouldn't know to evacuate

Barriers

- Lack of knowledge: How much, if anything do you know about preparing for a disaster? (Likert scale of a fair amount to little/nothing at all)
- Likelihood of event: I don't often think about what disasters could happen in my area (Likert scale of agree-disagree)
- Optimism: It's unlikely I'll ever be in a disaster... (Likert scale of agree-disagree)
- Effort: How easy or difficult do you think it is to prepare for a disaster? (Likert scale of Easy-Difficult)
- Low priority: How important is it that New Zealanders' prepare for a disaster? (Likert scale of Important-unimportant)
- Control: What I do now will help to keep me and my household safe during a disaster (Likert scale of agree-disagree)
- No personal responsibility: People will be there to help following a disaster, so I don't really need to prepare in advance (Likert scale of agree-disagree)
- Time: There will always be adequate warning before a disaster strikes (Likert scale of agree-disagree)

Triggers to get people to act

- Social norm: My friends and family think it's very important to be prepared for a disaster (Likert scale of agree-disagree)
- Family concern: I often worry about what might happen to me or my family if there's a disaster (Likert scale of agree-disagree)
- Family responsibility: It is my responsibility to look after myself and my family in a disaster (Likert scale of agree-disagree)

Advertising

Have you recently seen, heard or read any information or advertising about preparing for a disaster?

Where did you see, hear or read the information or ads?

- TV Newspaper or magazine
- Online (social media)
- Radio Online (non social media)
- Workplace
- Outdoor posters (on bus shelters or in the street)
- Flyers/pamphlets
- Yellow Pages
- School
- Emergency Mobile Alerts

What do you remember about the ads?

- Being prepared or other campaign about preparing in advance
- Long Strong Get Gone / action to take in a tsunami
- Drop Cover Hold / action to take in an earthquake
- Information about what to do when disaster strikes
- Local Civil Defence initiative
- Event-specific advertising (e.g. helplines for people affected by the Kaikōura earthquake)
- Emergency Mobile Alerts
- Nothing / don't know / can't remember

Shake Out and Tsunami Hīkoi

- Before today have you heard of a national earthquake drill called ShakeOut? During the drill New Zealanders are asked to Drop, Cover, and Hold at a specific time on a specific day
- Have you personally taken part in a ShakeOut drill by doing the Drop, Cover and Hold action at any time in the past?
- Aside from you, did anyone else in your household take part in last year's ShakeOut drill?
- Do you live or work in a Tsunami Evacuation zone?
- Did you take part in a tsunami evacuation hīkoi or walk as part of ShakeOut last year?

Information sources

Before a disaster, where can you get information about how to prepare?

- Ministry of Civil Defence website
- Civil Defence (unspecified)
- Local Civil Defence
- Get Thru website
- Phone Civil Defence
- Local / Regional Council
- Google search
- Yellow Pages
- Radio
- TV
- Internet / website (unspecified)
- Other online (unspecified)

- Brochures
- Public libraries
- Cellphone / app
- Word of mouth - neighbours/friends
- Don't know

During or immediately after a disaster, where can you get information about what to do?

- Ministry of Civil Defence website
- Emergency Mobile Alerts / text alerts
- Civil defence centres / designated emergency centres
- Civil Defence (unspecified)
- Local Civil Defence
- Civil defence co-ordinators / personnel
- Phone Civil Defence
- Get Thru website
- Radio
- TV
- Local / Regional Council
- Police
- Word of mouth
- Facebook
- Internet / website (unspecified)
- News / local media
- Cell phone / app on phone
- Google search
- Don't know

Community resilience

What do you think is the single most important thing that we, as a nation, need to do to ensure our communities can withstand and recover from a disaster?

- Public education about hazards, risks and preparedness
- Household preparedness
- Looking out for each other / being good neighbours etc.
- Preparation at a community level
- Emergency response arrangements
- Good/better communication
- Infrastructure e.g., improved roads, utilities, building standards
- Other
- Don't know

Thinking about where you live, which type of disaster would have the most impact or cause the most disruption for your household?

- Earthquake
- Tsunami
- Volcanic Eruption
- Flood
- Hurricane/cyclone/storm
- Fire
- Other
- Don't know

What things do you think could happen if that type of disaster occurred?

Demographics (ethnicity, language, age, homeowner/renters, born/not born in NZ)

A2.4 Community Engagement Theory/community resilience indicators

Variations of these questions have been used in different publications (e.g. Paton et al., 2010 a, b; 2015; 2017, Becker et al 2011; 2015). The questions below are framed in an earthquake context but could be altered for other hazards or to be more general.

CRITICAL AWARENESS

In regard to what happens in your community, please describe the extent to which you agree or disagree with each of the following statements: (please tick one per line)

	Once a week or more	A few times a month	Once a month	A few times a year	Rarely	Never
I think about earthquake issues and problems in my community	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I talk about earthquake problems and issues with others in my community	<input type="checkbox"/> 6	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

COPING STYLE

In regard to how you normally deal with any problem in your life, please describe the extent to which you agree or disagree with each of the following statements: (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I try to come up with a strategy about what to do	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I make a plan of action	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I think hard about what steps to take	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I think about how I might best handle the problem	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

SENSE OF PLACE

In regard to living in this community, please indicate the extent to which you agree or disagree with the following statements: (please tick one per line)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I feel like I belong in this community.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I believe my neighbours would help me in an emergency.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Even if I had the opportunity I would not move out of this community.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I feel loyal to the people in my community.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I often have friends from the neighbourhood over to see me.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I plan to stay a resident of this community for a while to come.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

NEGATIVE OUTCOME EXPECTANCY

Please describe the extent to which you agree or disagree with each of the following statements: (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Earthquakes are too destructive to bother preparing for	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
A serious earthquake is unlikely to occur during my lifetime	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Preparing for earthquakes is inconvenient	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
It is difficult to prepare for earthquakes	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

POSITIVE OUTCOME EXPECTANCY

Please describe the extent to which you agree or disagree with each of the following statements: (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Preparing for earthquakes will significantly reduce damage to my home should an earthquake occur	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Preparing for earthquakes will improve my everyday living conditions	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Preparing for earthquakes will improve the value of my house/property	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Preparing for earthquakes will improve my ability to deal with disruptions to family/community life following an earthquake	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

SELF EFFICACY

In regard to the issues and problems you deal with in your everyday life, please describe the extent to which you agree or disagree with each of the following statements: (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel I have control over the things that happen in my life	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
There is no way I can solve some of the problems I have by myself	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I can't do much to change what happens in my life	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Somehow problems in my life usually solve themselves	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

In the next month or so, do you intend to: (please tick one per line)

	No	Possibly	Definitely
Check your level of preparedness for earthquakes	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Increase your level of preparedness for earthquakes	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Become involved with a local group to discuss how to reduce earthquake damage or losses	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Seek information on earthquake risk	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Seek information on things to do to prepare	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3

BELIEFS / KNOWLEDGE

Please read each of the following statements and describe the extent to which you agree or disagree with each. (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
There may be earthquakes, but they won't be that bad	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The location of the earthquakes will be far away from here and have little impact on us	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The likelihood that major earthquakes will occur here has been greatly exaggerated	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have been fine during the earthquakes we have had and I will be fine in the next one too	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
An earthquake could pose a threat to my personal safety	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
An earthquake could pose a threat to my daily life (e.g., work, leisure)	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
An earthquake could pose a threat to my property.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

COMMUNITY PARTICIPATION

In regard to participating in life in this community, please describe how often you undertake each of the following. (please tick one per line)

	Often	Sometimes	Rarely	Never
I have worked with others on something to improve community life	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I participate in local activities or events (e.g., festivals, fetes, fairs)	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have contributed money, food or clothing to local causes, charities, or to others in my community	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have attended a public meeting on a community issue	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have been involved in volunteer activities intended to benefit my community (e.g., fundraising, clean-up days, local groups, Scouts/Brownies).	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

LEADERSHIP

In regard to your general feelings about living in this community, please describe the extent to which you agree or disagree with each statement. When responding to this question, community refers to a group of which you are a member and which is important to you. This could be your neighbourhood, church, neighbourhood watch, social or sporting group etc. (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
People around here will express an opinion even though they know it will be unpopular	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
When it comes to saying something in front of a group, most people in this community will do it	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
When people are needed to stand before a group of outsiders to tell them what this community needs, most people here could do it	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
In community meetings, I am often a leader	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
In community meetings I prefer to be a leader rather than a follower	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
In community meetings, I prefer others to take over the leadership role	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

What a community talks about depends on what residents are interested in	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Struggles always occur to determine what issues this community should focus on	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Community perceptions of issues depend on the quality of the individuals in that community	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
How people think about community problems controls what is done about those problems	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

COLLECTIVE EFFICACY

With regard to your general feelings about living in this community, please indicate the extent to which you agree or disagree with each of the following statements (please tick one per line)

	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
We can greatly improve services in the community even when not everyone agrees.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
We can improve the quality of life in the community, even when resources are scarce.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Our community can cooperate in the face of difficulties to improve the quality of community facilities.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The community can present a united vision to outsiders.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The people in this community can work together even when it requires more effort than normal.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
We can resolve crises in this community without any negative after effects.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Our community can improve services for citizens without help from the council or other government agencies.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The members of this community talk about issues they are interested in.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
How this community thinks about problems determines what we do about them.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

EMPOWERMENT

In regard to what happens in the wider community, in general, to what extent do you think that: (please tick one per line)

	Always	A great deal	Sometimes	Not very much	Not at all
Voting in local elections influences what happens in my community	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Voting in local elections helps solve local problems	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Community groups can get something done about local problems	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I feel that I can influence what happens in my community	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I feel that I see positive results from participating in community activities	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I feel that I have an active part in keeping this community going	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I care about my community's appearance	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I feel that what happens in this community can affect my life	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have strong opinions about the way things are done by elected representatives	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I think that elected representatives seriously consider my opinions	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I think that elected representatives try to influence what goes on in my community	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

TRUST

In regard to your general feelings about living in this community, please describe the extent to which you agree or disagree with each statement. (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I trust my Local Council to respond to meet the needs of its residents	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I trust the community leaders in my community	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I trust the media (newspapers, TV, radio) to report fairly	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I trust my Local Council to do what is right for the people they represent	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have confidence in the law to protect and maintain order in my community	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

RESPONSIBILITY

In regard to responsibility for earthquake preparedness, please describe the extent to which you agree or disagree with each of the following statements. (please tick one per line)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel responsible for preparing for a major earthquake	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The Council/Civil Defence is responsible for making sure that I am prepared for the occurrence of a major earthquake	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

PREPAREDNESS ACTIONS

The following are things that can be done to minimise damage and disruption if an earthquake occurs. In regard to your household, please record whether you have done this, whether you may do this, or whether you will not do this. (please tick one per line)

	Have done this	May do this	Will not do this
I check the contents/operation of my emergency supplies at least every six months	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have access to an alternative cooking source (e.g. gas barbeque)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have retrofitted the non-structural elements of my house to increase its earthquake resistance (i.e. knocked down or strengthened a chimney, upgraded pipes)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Each family member has an emergency get away kit in case we have to evacuate quickly	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have undertaken training that might assist in a disaster – i.e. First Aid	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I know my house is covered by the Building Act of 2004	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
My family has discussed and clearly outlined what would happen in the event an earthquake occurred while we were at work/school	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have spare batteries for appliances I might need to use	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have a household emergency plan	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have a supply of essential medicines for illness or allergies	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I pass on information about hazards and preparing to other community members	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I know where the evacuation centre for my area is	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I know the contact details of people with equipment (i.e. generators) and/or important skills (i.e. Tradespeople, medical training)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have worked with others in my neighbourhood or community to develop an earthquake response plan	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

I encourage other people in my community to get prepared for earthquakes	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I regularly check for updated information about earthquake preparation	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I am confident my home is as safe and secure as it can be	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have at least three litres of water (in plastic containers) per person, per day for three days	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have set aside three days or more worth of food, for all my family, that is specifically for an emergency	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have consulted with the local council about previous earthquake damage and other hazards before living/building in the area I currently reside	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have the means to boil water if necessary or to treat it with purifying tablets	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have purchased or put together a first aid kit	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have a working battery torch (or solar/dynamo equivalent)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have additional supplies at work and/or in my car in case I am away from home when an earthquake hits or I cannot get to my home supplies	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I participate for specific reasons or events (e.g. attend a one-off community meeting; be involved in a preparedness fair)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have ensured that moveable items are stored safely in cupboards secured with latches (i.e. Heavy items down low, water bowls not over electrical equipment)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I am aware of the Canterbury Home Repair Scheme	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have a working battery radio (or solar/dynamo equivalent)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have secured items in my house (i.e. furniture, hot water cylinder)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I have worked with a community group to increase earthquake awareness and preparedness	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I and all my family, know how to, and have the means to turn off essential services (i.e. water, gas, electricity)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
I participate regularly, on an on-going basis in community activities (i.e. belong to a group; attend monthly meetings)	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

The following are things that can be undertaken by the community and agencies to limit the potential damage and disruption if an earthquake occurs. In regard to your community, please record whether the community you live in, has done this, should do this, or does not need to do this. (tick one per line)

	Has done this	Should do this	Does not need to do this
The council and CERA have worked with the community to establish priorities for recovery	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The community is kept informed of decisions and proposals of the council	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The council has strong links with the agencies involved in earthquake preparation and recovery	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
There are clear expectations for emergency and community agencies	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The local council/government has responded to community groups input by providing relevant information and training	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Emergency and community agencies have engaged with community groups to establish expectations/priorities for preparedness and recovery	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Hazard planning in the community has been built around community members	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The community has an earthquake response and recovery plan	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Council conducts regular inspections of public buildings including hospitals, schools, nursing homes to ensure earthquake safety	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Council and government buildings have been retrofitted for earthquakes	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The expectations of earthquake mitigation and response agencies have been established through consultation with community groups and council	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The roles of the different mitigation/response agencies are clearly defined	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
The local council/government has worked with the community to build skills and resources	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
Training has been provided to community members so they are better able to disseminate information and implement people's suggestions	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

A2.5 Auckland People's Panel Indicators (Reduced versions of the indicators in A2.5)

These were developed and intended for use by Auckland Council as a regular resilience measurement since 2016.

Positive outcome expectancy

Preparing for a disaster will mean I can deal with emergency situations more easily

Negative outcome expectancy

Whatever I do won't make a difference to how prepared I am for a disaster

Social Responsibility

I know we are all in the same boat and need to work together to respond in a disaster

Community participation

I actively participate in community activities, or...

I think that it is important to connect with my neighbours so that we are able to help each other out in an emergency

Articulating problems

I can discuss problems with my neighbours and work with them to find a solution

Leadership

In an emergency, it is important that our actions are coordinated by someone who knows our community

Collective efficacy

My neighbours and I know how to deal with problems together

Place attachment

I love where I live and want to maintain my lifestyle here

Community empowerment

I feel I can influence what happens in my community

Trust

I know and trust the people who are leaders in my community

A2.6 Tsunami questions (Dhellemmes et al., 2016)

In terms of public survey design, a range of useful questions are outlined below, relating to:

Knowledge on natural hazards and previous experience

- What **two** possible natural hazards cause a concern for your safety or create a risk to your livelihood in this community?
- According to you, what are the most likely causes of a tsunami along the North Island East Coast? **Please rank the following in the order in which you think they are most likely to cause a tsunami by writing a number from 1 (most likely) to 5 (least likely) for each option.**
- What qualities of an earthquake do you believe could cause a tsunami severe enough to evacuate?
- Have you ever (a) **personally experienced** any of the following natural hazard events in the past, (b) **if you have**, did you experience loss or damage as a result and (c), what was the **location** and **date** of the **worst/most damaging** of these events you experienced? (please specify the location: country, city and year)

Risk perception at current location

- Is your house in a tsunami evacuation/hazard zone?
 - Yes
 - No
 - Don't know
- How did you find out you were, or were not, in a tsunami evacuation/hazard zone?
- When did you first find it out? (Please state):
 _____(day/month/year)
- For each statement, tick the box (**one** per line) which best describes your response:

	Never	Once per year or less	At least once per month	At least once per week	Everyday
I think about tsunami	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
I talk about tsunami	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
I get information on tsunami	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

- Have you **heard or received** any information about preparing for tsunami hazards from any of the following?
- How do you expect to be warned that a tsunami is coming **within the next 12 hours**?
- How do you expect to be warned that a tsunami is arriving **within an hour**?
- Have you seen any tsunami hazard zone maps for this community?
 - **If yes, where** did you find them?
- Are there official tsunami evacuation routes for this community?
 - **If not**, do you think that an official evacuation route should be established?
- Please rank the following in the order in which you think responsibility for earthquake and tsunami preparedness in this community should lie, **by writing a number from 1 (most) to 4 (least responsible) in the space provided for each option.**

- What is the likelihood of a tsunami occurring that would cause major damage to this community?
- What place or places do you think a tsunami that threatens this location would originate from? (Please write here any specific locations – countries or regions - you may think of)
- If you feel a strong earthquake while at the beach, how much time will you have to move to safety from any approaching tsunami it may cause?

Personal community involvement

- Thinking of the house in this community where this questionnaire was delivered to, which option best applies? (Tick **one** only)
 1. I/we own and live in this house
 2. I/we rent and live in this house
 3. I/we own a house somewhere else, and are visiting [city name]
 4. I/we rent a house somewhere else and are visiting [city name]
 5. Other (please specify):
- The following questions are specifically addressed to **residents**.
 - How long have you lived in this community? _____(years)
 - How long have you lived in your current home? _____(years)
- The following questions are specifically addressed to **visitors**.
 - How long are you staying in this community? _____(weeks)
 - Where is your usual place of residence? (Please give details)
 - How often do you visit this community?

Hazard preparedness

- Do you think that you and your household are prepared enough to deal with a tsunami?
- Do you **have a 'getaway kit' or items** ready to evacuate your home quickly?
- What is in that kit / what are those items? (Tick **all** that apply)
 - First aid kit/supply of any medicines needed
 - Food
 - Water
 - Torch
 - Portable radio
 - Spare batteries
 - Change of clothes (wind/waterproof clothing)
 - Comfortable outdoor shoes
 - Important documents (or copies)
 - A household plan
 - Other (please specify):
- Do you have a specific evacuation destination in mind if you had to evacuate after a tsunami warning?
- How long do you expect to be evacuated for after a tsunami hits the coast?

Scenario-based questions

SCENARIO NUMBER ONE - Imagine a severe earthquake occurs (lasting longer than a minute or during which it is hard to stand) at 3pm on a weekday.

- What would you do?
- Would you evacuate?
 - **If not**, what are your reasons for not evacuating? (Please give details)
- **If you decided to evacuate...** (Please answer the following questions **even if you do not think evacuation is needed**)

- What would you do before evacuating? (Tick **all** that apply)
 - Nothing (evacuate immediately)
 - Gather family
 - Get life essentials (Food, water...) or grab your getaway kit
 - Collect valuables (jewellery, money, etc.)
 - Call family or friends
 - Assist others in evacuation (e.g. friends or neighbours)
 - Seek further information (from radio, TV, internet, other people etc.)
 - Other (please specify): _____

- About how long would all of this take? (Tick only **one**)
 - One minute or less
 - 1-10 minutes
 - 10-30 minutes
 - 30 min – 1 hour
 - 1 – 3 hours
 - Longer than 3 hours

- Where would you evacuate to? (Please be very specific)
- How would you travel to your intended destination?

SCENARIOS NUMBER TWO AND THREE: Now imagine you hear an official warning at 3pm on a weekday of a tsunami arriving in the following timeframe...

- What would you do?
- Would you evacuate?
- If not, what are your reasons for not evacuating?
- If you decided to evacuate... (Please answer the following questions even if you do not think evacuation is needed)
 - (Initial questions similar to above – refer scenario 1)

Additional questions include:

- What would you wait for before coming back into the tsunami hazard zone? (please give details)
- Would you consider vertical evacuation if there was no time to travel to a safe elevated area? (e.g. evacuating into a tall building)
 - Yes, without hesitation

Yes but with some conditions

No, I would not consider vertical evacuation at all.

- What conditions would you require to consider vertical evacuation? (Tick only one)

Only if the building looks safe and resistant to earthquakes and tsunami

Only if I knew the building has been specifically designed for that purpose

Only if authorities ask me to do so

Other (please specify): _____

Demographic Questions

- What is your gender?
- What is your ethnic group?
- In what year were you born?
- What is your home address? (or nearest intersection)
- Which best describes the situation you are living in now?
- How many people are living with you?
- How many people in your household are:
 - Over 65 years old
 - Disabled
 - Under 10 years old
- What is your profession?
- What is the highest level of education you have completed?

What is your household income category?

A2.7 Measuring Community Resilience: Translation of BRIC Indicators to the NZ context

Potential alignment of the Benchmarking Resilience Indicators for Communities (BRIC) – a U.S.-based resilience assessment tool (Cutter, 2010; et al., 2016) with NZ data, which could be considered for indicators from Kwok (2016, pp. 11-14).

Table 2. Translation of BRIC variables for the New Zealand context based on data availability (X implies a modification needed (for column 4) or that data is available (columns “Mesh block” to “District Health Board”).

Item	Resilience Domain	Variable	Modification Needed?	Source of data in New Zealand	Variable	Spatial Scale of Availability							Notes/issues
						Mesh block	Area Unit	Ward	Territorial Authority	Region	National	District Health Board	
Social Resilience													
1	Educational attainment equality	Negative difference between % of population with college education and % with less than high school education	--	Census	Negative difference between % of population with tertiary education and % with less than high school education	X	X	X	X	X	X		
2	Pre-retirement age	% population below 65 years of age	--	Census	% population below 65 years of age	X	X	X	X	X	X		
3	Transportation	% households with at least one vehicle	--	Census	% households with at least one vehicle	X	X	X	X	X	X		
4	Communication capacity	% households with telephone service available	--	Census	% households with telephone service available	X	X	X	X	X	X		Census data also capture information on household's access to the internet
5	English language competency	% population proficient English speakers	X	Census	% population who speak English	X	X	X	X	X	X		Census data do not differentiate fluency levels
6	Food provisioning capacity	Food security rate	--	NZ Adult Nutrition Survey	Food security rate	--	--	--	--	--	X		Survey last conducted in 2008/2009
7	Health insurance	% population under age 65 with health insurance	X	Not applicable	Not applicable	--	--	--	--	--			NZ residents have access to primary health care; anyone who is legally in NZ (including tourists) is covered by the Accident Compensation Corporation
8	Non-special needs	% population without sensory, physical, or mental disability	X	NZ Disability Survey	% population without sensory, physical, or mental disability	--	--	--	--	X	X		Disability survey is a self-reported instrument
9	Mental health support	Psychosocial support facilities per 10,000 persons	X	Medical Council of NZ	Psychologists per 10,000 persons	--	--	--	X	X	X	X	Data based on DHB's geographic boundaries
10	Physician access	Physicians per 10,000 persons	X	Medical Council of NZ	Physicians per 10,000 persons	--	--	--	X	X	X	X	Data based on DHB's geographic boundaries
Community Capital													
11	Place attachment-not	% population not foreign-born persons who came to US within previous five years	--	Census	% foreign-born population who arrived in New	X	X	X	X	X	X		

	recent immigrants				Zealand for more than five years								
12	Place attachment-native born residents	% population born in state of current residence	X	Census	% population born in New Zealand	X	X	X	X	X	X		NZ census captures place attachment nationally and at the individual level
13	Political engagement	% voting age population participating in presidential election	X	Department of Internal Affairs	% of voting age population participating in 2014 general election	--	--	X	X	X	X		Instead of presidential election, the use of parliamentary election is used
14	Social capital-civic organisations	Number of civic organizations per 10,000 population	X	Charities Register	Number of civic organizations per 10,000 population	--	--	--	X	X	X		Physical location may be different than postal address; organisations may have multiple functions
15	Social capital-advocacy	Number of social advocacy organizations per 10,000 population	X	Charities Register	Number of social advocacy organizations per 10,000 population	--	--	--	X	X	X		
16	Social capital-religious organisations	Persons affiliated with a religious organisation per 10,000 persons	X	Census	Persons affiliated with a religion per 10,000 persons	X	X	X	X	X	X		Religious beliefs not necessarily the same as affiliation with a religious organisation
17	Social capital-disaster volunteerism	Red Cross volunteers per 10,000 persons	--	NZ Red Cross	Red Cross volunteers per 10,000 persons	--	--	--	X	X	X		Not all NZ Red Cross volunteers are involved in disasters-related volunteerism
18	Citizen disaster preparedness and response skills	Red Cross training workshop participants per 10,000 persons	X	CDEM	CDEM training workshop participants per 10,000 persons	--	--	--	X	X	--		Selected CDEM groups (e.g., Wellington) offer training opportunities
Economic resilience													
19	Homeowner-ship	% owner-occupied housing units	--	Census	% owner-occupied housing units	X	X	X	X	X	X		
20	Employment rate	% labour force employed	--	Census	% labour force employed	X	X	X	X	X	X		
21	Gender income equality	Negative absolute difference between male and female median income	--	Census	Negative absolute difference between male and female median income	X	X	X	X	X	X		
22	Race/ethnicity income equality	Negative Gini coefficient	--	Census	Negative Gini coefficient	X	X	X	X	X	X		
22	Non-dependence on primary/tourism sectors	% employees not in farming, fishing, forestry, extractive industry, or tourism	--	Census	% employees not in farming, fishing, forestry, extractive industry, or tourism	X	X	X	X	X	X		
23	Business size	Ratio of large to small businesses	--	MBIE	Ratio of large business (employing greater than 20 people); number of small businesses (employing fewer than 20)	--	--	--	X	X	X		
24	Large retail-regional/national geographic distribution	Large retail stores per 10,000 persons	--	http://www.indexnz.com/Top/Shopping/Retail-Chains ; MBIE	Large retail stores per 10,000 persons	--	--	--	X	X	X		

25	Federal employment	% labour force employed by federal government	X	Census	% labour force in the following NZSCO99 major employment groups: legislators, administrators and managers; professionals; and technicians and associate professionals	X	X	X	X	X	X		NZ census data capture employment type by individuals, but do not differentiate whether they are employed in the government or private sector
Institutional resilience													
26	Mitigation spending	Ten-year average per capita spending for mitigation projects	X	CDEM Resilience Fund	Five-year average per capita spending for mitigation and capability building projects	--	--	--	--	X	--		
27	Flood insurance coverage	% housing units covered by National Flood Insurance Program	X	General Social Survey	% housing units with private insurance (house or content) that covers fire	--	--	--	--	X	X		Earthquake insurance (through EQC) is included when private insurance with fire coverage is purchased. An issue relates to homes that are under-insured.
28	Jurisdictional coordination	Governments and special districts per 10,000 persons	X	Not applicable	--	--	--	--	--	--	--		Each jurisdiction's disaster management activities are managed by respective regional CDEM group. Mutual aid between CDEM groups is exercised for both regional and national hazard events.
29	Disaster aid experience	Presidential disaster declarations divided by number of loss-causing hazard events from 2000-2009	X	CDEM groups	The number of CDEM responses at the incident to national level events between 2005-2015	--	--	--	X	X	X		
30	Local disaster training	% population in communities with Citizen Corps program	X	Not applicable	--	--	--	--	--	--	--		CDEM groups develop specific programmes for local communities.
31	Performance regimes-state capital	Proximity of county seat to state capital	X	Not applicable	--	--	--	--	--	--	--		Decision-making rests on respective CDEM group under the Ministry of Civil Defence.
32	Performance regimes-nearest metro area	Proximity of county seat to nearest county seat with a Metropolitan Statistical Area	X	Not applicable	--	--	--	--	--	--	--		This variable does not apply to the political system of New Zealand. CDEM groups/local councils oversee disaster management functions in partnership with other local agencies.
33	Population stability	Population change over previous five-year period	--	Census	Population change over previous five-year period	X	X	X	X	X	X		
34	Nuclear plant accident planning	% population within 10 miles of nuclear power plant	X	Not applicable	Not applicable	--	--	--	--	--	--		New Zealand is nuclear-free
35	Crop insurance coverage	Crop insurance policies per square mile	--	Not applicable	Not applicable	--	--	--	--	--	--		Farm policies in New Zealand are different than those in the U.S. (McLeman & Smit, 2006)

Housing/infrastructural resilience													
36	Sturdier housing types	% housing units not mobile homes	X	RiskScape	% of 'sound' residential buildings% of houses with secured foundations	X	X	X	X	X	X		
37	Housing stock construction quality	% housing units build prior to 1970 or after 2000	X	RiskScape	% of non-residential buildings built after 1976	X	X	X	X	X	X		
38	Temporary shelter availability	Hotels/motels per 10,000 persons	X	Accommodation Survey – Statistics NZ/MBIE	Hotels, motels, backpackers, and holiday parks per 10,000 persons	--	--	--	--	X	X		
39	Temporary housing availability	% vacant units that are for rent	X	Department of Building and Housing	% vacant units that are for rent	--	--	--	--	X	X		No existing database. Data can be derived using tenancy bond datasets (http://www.nzae.org.nz/wp-content/uploads/2012/08/Estimating-Rental-Vacancy-NZAE-conference.pdf)
				Housing NZ	% vacant Housing New Zealand (social housing) for rent	--	--	--	X	X	X		Social housing vacancy does not include units owned by local councils
40	School restoration potential	Public schools per 10,000 persons	X	Ministry of Education	Public and private schools per 10,000 persons	--	--	--	X	X	X		
41	Medical care capacity	Hospital beds per 10,000 persons	--	District Health Boards	Hospital beds per 10,000 persons	--	--	--	X	X	X		District Health Boards have different geographic boundaries.
42	Evacuation routes	Major road egress points per 10,000 persons	X	Land Information NZ	Distance to major road egress points	X	X	X	X	X	X		
43	Industrial re-supply potential	Rail miles per square mile	X	Ministry of Transport	Rail miles per square kilometres	--	--	--	--	X	X		
44	High speed internet infrastructure	% population with access to broadband internet service	X	Census	% population with access to internet service	X	X	X	X	X	X		NZ census data do not differentiate whether internet service is broadband or not
Environmental resilience													
45	Local food suppliers	Farms marketing products through Community Supported Agriculture per 10,000 persons	--	Not applicable	--	--	--	--	--	--	--		Farm policies in New Zealand different than those in the U.S. (e.g. NZ's lack of subsidies for farms) (McLeman & Smit, 2006)
46	Natural flood buffers	% land in wetlands	--	Statistics NZ/ LINZ/Landcare Research	% land in wetlands	--	--	--	--	X	X		
47	Efficient energy use	Megawatt hours per energy consumer	X	BRANZ – HEEP	Kilowatt hours per occupant per year	--	--	--	--	X	X		Only selected cities and regions are detailed. Otherwise, energy use is clustered between warm and cool weather regions.
48	Pervious surfaces	Average percent perviousness	--	Landcare Research	Average percent perviousness	--	--	--	X	X	--		Only selected cities and regions have data mapped

49	Efficient water use	Inverted water supply stress index	X	Statistics NZ	Water physical stock account	--	--	--	--	X	X		
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A2.8 Social capital indicators from a Wellington-based study

Social capital indicators from Kwok et al. (2019), a study which focussed on understanding stakeholders’ perspectives of social capital to inform the development of neighbourhood-based disaster resilience measurements.

Table 3. Proposed common indicators and contextual questions for measuring neighbourhood-based social capital

Social Capital				
Indicators (denoted by “I”) and contextual questions (denoted by “Q”)				
	Bonding	Bridging	Linking	
Structural	<p>Neighbourhood-based organisations and groups</p> <ul style="list-style-type: none"> I Number and type of associations I Memberships – rate of participation I Volunteer rate <p>Q What are the key community-based organisations?</p> <p>Q Which of those are essential to assisting vulnerable residents?</p>	<p>Coordination between community-based organisations</p> <ul style="list-style-type: none"> I Number of agencies collaborating on government-funded services I Presence of interagency group I Frequency of neighbourhood-wide programmes/events <p>Q What mechanisms, either through policies or government funding, could enhance collaborations between community-based organisations?</p> <p>Q What barriers (e.g., time, personalities, funding) exist that prevent community-based organisations and groups from collaborating?</p>	<p>Effective neighbourhood leaders and CBOs</p> <ul style="list-style-type: none"> I Number of neighbourhood leaders I Amount of resources (e.g., financial, goods or services) secured for communities by leaders/CBOs <p>Q Who are the key neighbourhood leaders and which segment(s) of the neighbourhood do they represent? Which communities are not represented by these leaders?</p> <p>Q What neighbourhood challenges have yet to be addressed by local government agencies or community-based organisations?</p> <p>Q What programmes are in place or can be developed in cultivating the capacities of neighbourhood leaders and engaged residents?</p>	
	<p>Population stability</p> <ul style="list-style-type: none"> I Length and changes in residential tenure I Ratio of renters/homeowners I Changes in demographics (e.g., ethnic and racial makeup, age, and income) over a five-year period <p>Q What factors are driving people in/out of the neighbourhood?</p>	<p>Linkages to cultural and ethnic minority communities</p> <ul style="list-style-type: none"> I Number of groups and associations serving racial and ethnic minorities 		

	<p>Q How have demographic changes impacted community cultures and social connections of residents, especially vulnerable residents?</p> <p>Q How effective are current policies (e.g., affordable housing legislations) in maintaining the stability of low-income and minority residents?</p>	<p>I Racial and ethnic composition of DRR groups</p> <p>I Extent of cultural practices is integrated in neighbourhood-based DRR planning process and plans?</p> <p>Q How frequently do groups serving racial minorities and non-racial minorities work together?</p>	<p>Q What mechanisms are in place or can be developed to make neighbourhood leaders accountable in representing neighbourhood priorities in local governments?</p> <p>Inclusive and transparent government processes</p> <p>I Existence of community outreach plans within local government agencies</p> <p>I Frequency of community-wide meetings</p> <p>I Extent of integration (e.g., low, medium, high) of community needs and priorities in city-wide emergency plans.</p> <p>Q How engaged are community members in government's decision-making processes? What factors are preventing the engagement of community members?</p> <p>Q What programmes or incentives can be developed to promote community engagements?</p> <p>Q How are cultural values and practices being integrated in DRR planning and implementation processes?</p>
--	--	--	---

Cognitive	<p>Cultural beliefs and expectations</p> <ul style="list-style-type: none"> I Number of languages spoken in neighbourhood I Percent of racial and ethnic residents in neighbourhoods <p>Q What different cultural beliefs and practices are prevalent within a neighbourhood?</p> <p>Q How can existing cultural beliefs and practices be promoted and celebrated within the wider community?</p> <p>Q What existing cultural conflicts, if any, exist between communities? How could such conflicts be resolved?</p>	<p>Social support</p> <ul style="list-style-type: none"> I Frequency of giving/receiving help I Percent of perceived social support <p>Q What social networks provide support in times of stress?</p> <p>Q What experiences have strengthened or eroded such support?</p> <p>Q What impact do existing community programmes have on increasing perceived levels of social support?</p>
	<p>Trust</p> <ul style="list-style-type: none"> I Levels of trust (e.g., low, medium, high) between neighbours, toward community-based organisations, and toward government processes <p>Q What experiences have cultivated or eroded trust between communities, toward community-based organisations, and toward government agencies?</p> <p>Q What needs to occur to mend relationships where trust has been eroded?</p> <p>Q What steps could be taken to develop stronger trust between people and organisations?</p>	<p>Empowerment through collective action</p> <ul style="list-style-type: none"> I Frequency of collective experiences in dealing with neighbourhood-wide challenges and hazard events I Percent of perceived belief that community members will come together to resolve neighbourhood-wide problems <p>Q What are some of the key issues that bring community members together?</p> <p>Q What factors enhance or hinder the ability of community members to come together?</p> <p>Q How could barriers to collective actions be reduced?</p>