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## What about us? Reported experiences of disabled people related to the Christchurch earthquakes

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### Abstract

Internationally there is limited research on the experiences of people with disabilities during and following a major disaster. This research explores the reported experiences of disabled people related to the 2010-2011 Christchurch, New Zealand earthquake series. Methods: Qualitative inquiry involving purposive sampling and face to face interviews with 23 disabled people living in Christchurch during the earthquakes. The qualitative research was followed by a pilot quantitative survey involving 25 disabled people living in Christchurch during the earthquakes and 10 people who work in the disability sector. Qualitative interview material was analysed using thematic analysis while quantitative data was analysed using descriptive statistics. Results: Disabled people preferred to shelter in place as their homes are organised to suit their specific needs. Our research suggests that urban disaster risk reduction strategies are needed that enhance opportunities for disabled people to maintain autonomy in an emergency situation. Key factors identified by participants that increase earthquake vulnerability among disabled people include a lack of personal disaster preparedness, public information that is not disability accessible and social isolation. Resilience was enhanced through disaster preparedness planning and good support networks. Implications: Individuals, communities and responding agencies could learn from the experiences of disabled people in order to improve preparation and response to disasters for vulnerable groups. Disaster recovery should be seen as an opportunity to reduce risk through avoiding recreating the conditions of vulnerability that may have existed previously.

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## 1. Introduction

On September 4, 2010 a non-fatal 7.1 magnitude earthquake struck the Canterbury region of New Zealand followed by a fatal 6.3 earthquake centred under the city of Christchurch on February 22, 2011. Two more shallow earthquakes measuring magnitude 6.4 and 6 respectively were centred close to the city in June and December of 2011 causing further damage to city infrastructure. Two years after the first earthquake on the 4<sup>th</sup> of September 2010 the Government monitoring agency 'GNS Science' had recorded more than 11,200 aftershocks in the Canterbury region (Otago Daily Times, 4/09/2014). Internationally there is limited research on the experiences of people with disabilities during and following a major disaster. The overall aim of this research was to capture the experiences of disabled people living in Christchurch in order to identify their perceptions of vulnerability as well as factors that maintain resilience. Conditions identified in our research that increased earthquake vulnerability among disabled people included financial hardship, a lack of personal disaster preparedness planning, social isolation, disruption to infrastructure, inability to access support workers, responding agencies that were not set up to cater for the needs of disabled people as well as public information and temporary housing that was not disability accessible. Disabled people preferred to shelter in place as their homes are the one place that is organised to suit their specific needs. Resilience was enhanced through disaster preparedness planning, good support networks, employment, financial security, sharing experiences and spontaneous volunteering. This article reports on findings related to personal disaster preparedness planning, information needs and neighbourhood support. Individuals, communities and responding agencies could learn from the experiences of disabled people in order to develop emergency preparation and response initiatives that enhance opportunities for autonomy among vulnerable groups. Disaster recovery should be seen as an opportunity to reduce risk through avoiding recreating the conditions of vulnerability outlined above that may have existed previously.

## 2. Literature review

Most research to date on natural hazard events has a quantitative focus on the restoration of the community to pre-disaster levels (Chang, 2010) through recovery of infrastructure, (Le Masurier, Rotimi et al. & Wilkinson, 2006; Chang, 2000) the physical environment or the economy (Stevenson, Kachali, Witman, et al., 2011) at a macro level. Early research on disaster recovery has identified a major goal of recovery processes as the reconstruction and restoration of the community to pre-disaster levels (Chang, 2010). Alternative approaches to community recovery have suggested that disasters should be seen as opportunities to improve pre-disaster conditions through avoiding recreating conditions of vulnerability that may have existed previously (Chang, 2010). People who are sick, moderately physically disabled or otherwise vulnerable and/or who live in poverty are more likely to be impacted by a natural hazard event (Chou, Huang, Lee, Tsai, Chen et al., 2004; Klinenberg, 2002) and less likely to have access to the social and economic resources necessary for recovery (Klinenberg, 2002). There is limited research that documents the experiences and perspectives of disabled people who have lived through a disaster (Rooney & White, 2007). Prior to 2011, disaster research in the area of disability primarily focused upon identifying conditions of vulnerability (NACCHO, 2009; Eisenman, Kordasco & Ash, 2007; Klinenberg, 2002), developing recommendations for risk reduction (Wisner, 2002), improving disaster preparedness (Sullivan & Hakkinen, 2006; Wisner, 2007), or addressing gaps in education and training (Wingate, Perry & Campbell, 2007). Within this literature identified vulnerable populations include the elderly, children, medically dependent persons, homeless or shelter dependent people, physically or mentally disabled individuals and those who are rurally isolated (NACCHO, 2009). Existing research on vulnerable adult populations has tended to focus specifically on the experiences of the elderly (Tuohy, 2009) or their health needs (Aldrich & Benson, 2008; Lamb & O'Brien, 2008) or to be based upon quantitative studies (Sasry & VanLandingham 2009; Brodie, Weltzien, Altman, et al. 2006; Chou et al., 2004).

People with disabilities are more likely to be poor and to live in low income neighbourhoods both of which are identified as risk factors for earthquake vulnerability and for the erosion of resilience during the disaster recovery phase (Priestley & Hemingway, 2006). An epidemiological study by Chou et al. (2004), for example, identified that

people with moderate disabilities, those with mental disorders, or who had been hospitalised in the week prior to the 1999 Taiwan earthquake, were most at risk of injury with the degree of vulnerability increasing with decreasing monthly wage. Disabled people are also more likely to have high health care needs, to live alone (Office for Disability Issues., 2011; Spence, Lachlan, Burke & Seeger, 2007), to be unable to respond quickly during an emergency (Chou, et al., 2004) and to be reluctant to evacuate due to concerns that emergency shelters will not be able to meet their needs (Rooney & White, 2007). This research adds to the literature by documenting the experiences and perspectives of disabled people who have lived through a prolonged disaster period.

### 3. Methods

The research was reviewed and approved by the Massey University Human Ethics Committee. The research involved qualitative inquiry comprising purposive sampling and face to face interviews with 23 disabled people living in Christchurch during the earthquakes. Initial interviews took place with 12 vision impaired participants in January 2011. Eight of the vision impaired participants were re-interviewed in February 2012 to establish how a year of earthquakes had impacted upon their lives. In March 2012 the qualitative research was extended to people with impairments other than blindness resulting in a further 11 research participants being interviewed. In total, nine of the people interviewed were male and 14 female. Respondents ages ranged between 20 to over 80 years of age with the most common groupings in the 40-49 (n=9) and the 70-79 age brackets (n=6). Audio-taped interviews lasting up to 90 minutes took place in participants' own homes. The same interviewer (KW) conducted all of the interviews, reviewed the information sheet, explained to participants their rights and answered any questions. All participants signed a consent form. Interview transcripts were transcribed verbatim and participants given pseudonyms to ensure confidentiality.

The qualitative research was followed by a pilot quantitative survey conducted in May 2012 involving a further 25 disabled people living in Christchurch during the earthquakes and 10 people who worked in the disability sector. Surveys were accessible in large print format and electronically. A Christchurch-based reader/writer was available to help respondents to complete the survey with three disabled people taking up this option. Participants who used a reader/writer signed a consent form after reviewing the information sheet attached to the front of the survey. The survey included forced response, 5 point Likert scale and short answer questions. Thirteen of the survey respondents were male and 20 female. Two participants who completed the survey did not answer this particular question. The average age of the survey respondents was 48 with the range between 21 and 64 years of age. Qualitative interview material was analysed using thematic analysis (Braun & Clarke, 1996) while quantitative data was analysed using descriptive statistics. Comments written in the short answer sections of the survey, as well as notes written in the survey margins, were included in the analysis of results. Interview transcripts were manually coded and arranged into themes. Themes were then analysed in relation to relevant literature within the areas of disability and disaster response and recovery. The findings from this research are not generalizable to all disabled people affected by disasters, instead they illustrate themes at work among the people who contributed to this research.

### 4. Results and discussion

Disabled people who contributed to this research stated that they preferred to shelter in their own homes. Participants associated personal disaster preparedness, robust social networks, acts of service and having opportunities to talk about individual earthquake experiences with resilience as well as with independence. Lack of personal disaster preparedness, insufficient community support, social isolation, or unfamiliarity with neighbours made disabled people feel afraid and vulnerable should another earthquake occur. Barriers to accessing emergency information negatively affected disaster preparedness planning as well as knowledge about the emergency response.

#### 4.1. *Personal disaster preparedness among people with disabilities*

The maintenance of preparedness is essential to preservation of resilience following a natural hazard event (Paton & Johnston, 2001). People who self-rate their general health as fair or poor or had a serious mental illness are less likely to have disaster supplies or emergency communication plans and this may lead to increased vulnerability in a civil emergency (Eisenman, Zhou, Ong, et al., 2009). Quantitative data from our May 2012 survey also supports

international research that has identified a lack of disaster preparedness among disabled people (Rooney & White, 2007). Five of the 25 disabled people that filled out the survey indicated that they had adequate emergency equipment in place prior to the 7.1 earthquake on September 4, 2010, and three out of 25 people indicated that they had developed a workable emergency plan. As with many other people in Christchurch, very few of the people that we interviewed seemed to be prepared for a disaster before the September 2010 earthquake struck, or even considered that they would need to be. In the following interview extract one of our participants whose primary disability was Cerebral Palsy reflects on how vulnerable he was in the September earthquake due to a lack of personal preparedness for a civil emergency:

In hindsight what would have been more helpful [was] if I had of been more disaster prepared in the first earthquake... [if] I'd had that torch and that radio [when the September earthquake struck], I could have... especially given that it was dark, and that it was the first time I'd been in a major, major quake, it would have been helpful to have the comfort of a radio and with a torch I could have wandered around straight away and even then gone and offered that support to the neighbors as well. Um, I kind of felt a bit trapped, because I didn't have torch, I didn't have communication, I felt a bit vulnerable, but now I don't because I have those things (Barry, April, 2012).

Barry suggests that if he had been more prepared in September he would be in a position to help his neighbours. Acquiring emergency related equipment such as a radio and torch was associated with greater self-sufficiency as well as increased security. After the non-fatal September 2010 earthquake there was some change in individual preparedness among both interview participants and survey respondents. At the time of filling out the survey 32 of 35 participants reported that they felt more prepared for an earthquake than they were prior to September 2010. Table I provides an overview of the range and type of actions taken to prepare for an emergency following the September earthquake by disabled people who were surveyed in May 2012.

Table I. Action to ensure emergency preparedness following the September 4, 2010 earthquake

Action to ensure emergency preparedness	Number of disabled people who answered the survey (N =25)
Put together renewable emergency supplies	18
Organised people to telephone	18
Put together durable emergency related equipment	14
Placed important instructions in a prominent place	10
Put in place an emergency plan	9
Not done anything	3

Most disabled people surveyed indicated that they put together emergency supplies or equipment, organised people to telephone or put in place an emergency plan. These actions would foster resilience as well as increasing the likelihood of being able to shelter in place following a civil emergency (Rooney & White, 2007). The people that we interviewed also took action to ensure that they were better prepared following the September earthquake. In the following interview extract Barry talks about the actions that he had undertaken to ensure that he was prepared:

[Now] I have a torch I had a first aid kit, I have a radio, I have candles, I have water bottles full in the bottom of the pantry, I make sure my gas cylinder is topped up [for the] barbecue... I make sure that my cell phone is charged, I make sure that I've always got at least quarter of a tank of diesel in the truck, um, food was not important, I've got a good stash of food in the pantry, non-perishable cans and things like that... (Barry, April, 2012).

Barry speaks from the experience of having lived through four earthquakes of magnitude 6 or greater in the previous year. The emergency preparedness plans that he put in place following the magnitude 7.1 earthquake September 2010 were tried and tested in the fatal magnitude 6.3 earthquake in February 2011 and again in the 6.4 magnitude earthquake in June 2011. Severe disruption to infrastructure, including roads, shopping facilities and public transport, meant that most disabled people who participated in this research needed help to replenish their emergency supplies between earthquakes. Disabled people who answered the May 2012 survey reported that cost was the main barrier to accessing emergency supplies.

#### 4.2. *Information needs*

Spence, et al. (2007) claim that the information, and disaster preparedness needs for people with a disability has been over looked in the literature. Disaster preparedness and emergency response systems, public warning systems and advice tend to be designed for people who are able-bodied (Priestley & Hemingway, 2006; Sullivan & Hakkinen, 2006). For those people who did respond to the September earthquake by thinking about how to prepare themselves for future emergencies, some found that the advice provided by Civil Defence was not appropriate to their situation as it was too general or made assumptions about people's bodies or lives that did not apply to them. Shane, who has profound hearing loss, made the following comment about Civil Defence emergency preparedness information: "...Round about November [2010] we started preparing ourselves... I found Civil Defence completely useless... because it's not designed for people with a disability" (Shane, 2012).

Following the February 22, 2011 earthquake 17 of 32 survey respondents agreed that adequate information was provided by Civil Defence with 15 of the 35 indicating that the information was inadequate. Twenty of the 34 people agreed that emergency information was easy to access however responses to a different survey question suggested that this information was not disability accessible. Twenty-six out of 33 people who answered the pilot survey either strongly disagreed (10) or disagreed (16) that emergency information took into account the needs of disabled people. Survey respondents were motivated to write additional comments relating to this question in the margins of the survey including: "Too many phone numbers, no emails" (Disabled Person); "Lack of information written in accessible format" (Disabled Person); "Not easy to access written material" (Disabled Person); "It is OK if you can use a computer" (Agency Representative); "Information on back of phone book for normals" (Disabled Person); "Found it hard to received advice from someone who understands my mobility issues" (Disabled Person). Table II summarises the main barriers to accessing information following the February 22 Christchurch earthquake.

The range and type of barriers to accessing emergency information is instructive for people involved in public information management following a disaster. Disruption to electricity supply, resulting in an inability to watch television or charge cell phones were cited as key reasons for not being able to access emergency information. Text messaging was a key source of information for people who were deaf while vision impaired people needed to be able to access up-to-date auditory information. Response categories relating to the format and type of information that was made available to the general public were cited as the next most common barriers to accessing emergency information. Disabled people found it hard to find disability accessible local information about changes to bus routes, shop closures or public meetings in which sign language interpreters would be present. While only a small number of disabled people indicated that they were unable to read or understand printed material, this statistic also needs to be placed in the context of the 40% of New Zealanders between the ages of 15-64 years that have low literacy skills (Department of Labour, 2010).

#### 4.3. *Neighbourhood support*

Community members are effective first responders in a civil emergency providing early assistance to those in need and helping to organise local response and recovery initiatives (Krolik, 2013). In our research, good neighbourhood support was associated with resilience while poor neighbourhood support was associated with vulnerability. Disabled people preferred to shelter in place as their homes are places that are organised to suit their specific needs. A robust support network was a key factor in enabling disabled people to have the confidence to

remain at home with neighbours playing a key role in ensuring safety. After the September earthquake Maria, who has Cerebral Palsy, described how her neighbours set up a regular system to check on each other:

Before the [September] earthquake we always kept an eye on each other, but during the earthquake[s] ... one of the neighbours without an impairment would go around at night to check on everyone just to see that we were all okay. So yeah, they'd knock and see if we needed anything, which was quite good and we basically started that right through [from September 2010 until February, 2011] (Maria, April 2012).

It is important to note that a system for 'checking on each other' was in place before the September, 2010 earthquake. Following the earthquake this informal support network was strengthened to include nightly visits to ensure the safety of disabled community members. In using the phrase "we basically started that right through" [*italics our emphasis*] Maria indicates that she was involved in setting up the support network and felt in control of its form and content. Assistance from the local community was more effective and enduring if disabled people had set up their support networks prior to the February earthquakes. Disabled people who answered the survey also emphasised the importance of support from neighbours. Survey responses included practical advice for ensuring good neighbourhood support: "Build up your support systems, get to know your neighbours and make sure they know how to help in an emergency" (Disabled Person). "Have a list of 2-3 people that you can contact to get the immediate support that you need and make sure that you have the contact numbers of those in your immediate area" (Disabled Person).

Table II. Reported barriers to accessing information following the February 22, 2011 Christchurch earthquake

Barriers to accessing information	Total number of people who answered the survey (N=35)
No electricity	24
Unable to charge cell phone	20
Conflicting information provided to the public	19
No access to a television	18
Emergency help lines were overloaded	13
Unable to find key information related to area of residence	10
Financial hardship	9
Disability information services were not up to date	9
Ran out of credit on my phone	7
Did not know where to find information	4
Unable to hear broadcasts	4
Unable to read printed information	4
Unable to understand printed information	3
Did not encounter any barriers	2

Social isolation and lack of contact with neighbours was associated with increased vulnerability. Being forced to move post-disaster to a new community could mean that disabled people suddenly lost key forms of social support. In the February earthquake Maria's home was destroyed; she was immediately dependent on neighbours to rescue her from her damaged house and to provide shelter until alternative accommodation could be arranged. A lack of disability accessible social housing in Christchurch following the earthquakes meant that Maria was forced to move to the other side of town to access suitable accommodation. After she moved Maria felt scared by her isolation and vulnerable should another earthquake occur:

I was scared out of my wits, because I didn't know any of my neighbours on this side of town, I didn't know them well enough to let them inside my house, because I was still fairly new to the area... (Maria, April, 2012).

Some disabled people who were able to shelter in place found that key support people in their neighbourhood left due to damage to their homes or to a desire to escape the on-going earthquakes. Forced movement following the Christchurch earthquakes, with large sections of the city abandoned, underscores the importance in ensuring that in a civil emergency more than one person in the local community is able to provide temporary support for up to five days to disabled people who choose to shelter in place. Ideally these people will have knowledge of how to assist the disabled person with their daily needs and/or activities.

Establishing good support networks can be a challenge as disabled people are more likely to be socially isolated and to experience discrimination. Socially excluded people are more likely to have poor mental health and are less likely to access health and other social services (World Health Organisation, 2003). In the following extract Penny, who is vision impaired, talks about how the earthquakes brought home to her how lonely and isolated she was:

I had no contact, absolutely no contact at all. ... I was lonely; I still am lonely now... Being down here by myself, I actually keep to myself quite a bit anyway, but yeah, I would have liked anybody to say, 'Hey are you okay?' Just to have that contact, but... nah (Penny, January, 2011).

Socially isolated people may lack the relational skills necessary for obtaining support from the local community exposing them to potential hazards at home as well as declining mental health. Vision impaired respondents, for example, were reliant on sighted people to check that their homes were still safe to occupy. Following each major aftershock family members, friends or neighbours provided this form of assistance. However as the earthquakes continued even disabled people with good social networks talked about feeling unable to ask stressed and traumatised friends or family members to provide help yet again. Social isolation also has important implications for disabled peoples' ability to evacuate, access welfare response services and/or emergency information particularly if they needed help from able-bodied people to do so. Lack of community support, social isolation, or unfamiliarity with neighbours made disabled people feel afraid and vulnerable should another earthquake occur.

## 5. Conclusion

Disabled people living in Christchurch were largely unprepared for a civil emergency prior to September 2010. Most disabled people engaged in emergency preparedness planning prior to the second fatal magnitude 6.3 earthquake in February 22, 2011, however for some preparations proved to be inadequate. In a period of multiple disasters barriers to maintaining emergency preparedness are significant. Most disabled people needed help to restock emergency supplies and cost often limited this action. Several factors have been identified as increasing earthquake vulnerability for disabled people. These include a lack of personal disaster preparedness, public information that is not disability accessible and social isolation. Resilience was enhanced through disaster preparedness planning and good support networks. Limitations of the study relate to the small sample size and the possibility that respondents may have been motivated to contribute to the research because they had been severely impacted by the earthquakes. Limitations notwithstanding, individuals, communities and responding agencies could learn from the experiences of disabled people in order to improve preparation and response to disasters for vulnerable groups. Our research suggests that urban disaster risk reduction strategies are needed that enhance opportunities for disabled people to maintain autonomy in an emergency situation. Disaster recovery should be seen as an opportunity to reduce risk through avoiding recreating conditions that increase vulnerability which may have existed previously.

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