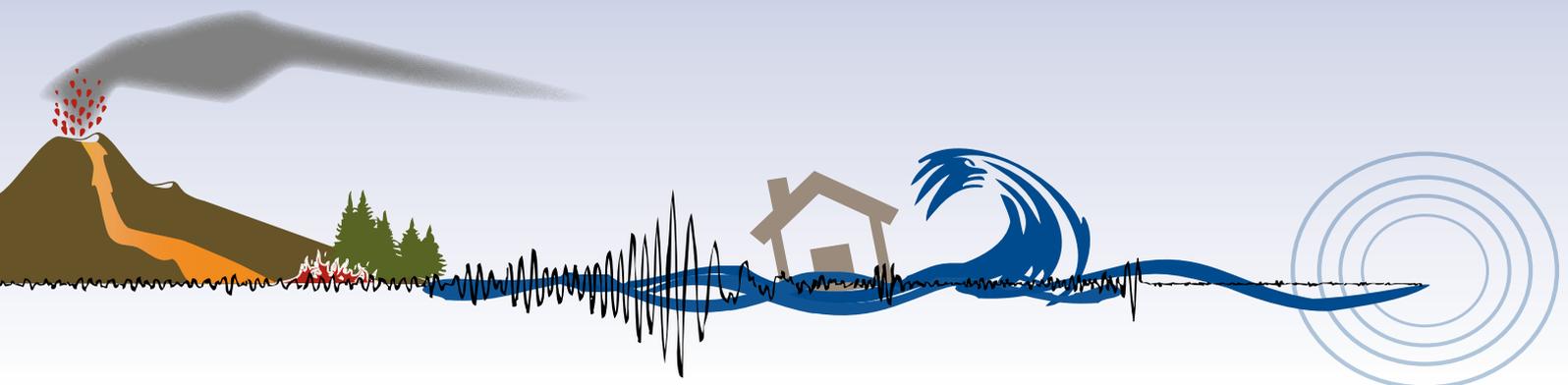




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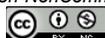
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Knowledge transfer between communities, practitioners, and researchers: A case study for community resilience in Wellington, New Zealand

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URL: http://trauma.massey.ac.nz/issues/2015-2/AJDTS_19_2_Doyle.pdf

Abstract

In 2014 the Integrated Research for Disaster Risk programme endorsed the establishment of the International Centre of Excellence in Community Resilience, Wellington, NZ. This Centre of Excellence is co-hosted by the Joint Centre for Disaster Research (Massey University/GNS Science) and the Wellington Region Emergency Management Office, with the objective of enhancing collaboration between researchers and individuals, organisations, and communities in the Wellington Region. Through a range of activities the International Centre of Excellence in Community Resilience aims to provide an evidence base for the Wellington Region Emergency Management Office's Community Resilience Strategy, act as a vehicle to share good practice in Community Resilience, and promote the Wellington Region as a living laboratory for research and learning. The current article reports on the recent International Centre of Excellence in Community Resilience trans-disciplinary workshop on knowledge sharing which aimed to investigate challenges to, and solutions for, enhanced collaboration. Over 50 participants attended this workshop, including practitioners, researchers, community leaders, and business representatives.

Participants identified a number of key issues that create challenges to collaborative knowledge sharing, ranging from adequate communication and resources through to political influence and partner equity. Solutions ranged from creative resourcing to personalisation of issues. Facilitation and the question of who should be the appropriate facilitator (internal or external) was identified as vital for knowledge transfer and community resilience building.

Keywords: community resilience, knowledge transfer, facilitation, research, practice, communities, disasters

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Introduction

A resilient society can be defined as one that can anticipate and adapt to the challenges and stressors encountered before, during and after a disaster occurs (Paton, 2007a). Research has identified factors that help build the capacity of individuals, communities and institutions to respond and adapt to a disaster (Paton & Johnston, 2006). For example, people must possess a 'self-efficacy' that they can do something about a problem, and believe that getting ready for a disaster will lead them to having a good outcome or 'positive outcome expectancy' (Becker, Paton & McBride, 2013; Lindell & Whitney, 2000; Paton & Johnston, 2006; Paton *et al.*, 2010). Elements of *social capital* such as community participation, sense of community, place attachment and collective efficacy also contribute to community resilience (Aldrich & Meyer, 2014; Becker, Paton, Johnston, & Ronan, 2014; Paton *et al.*, 2010; Norris *et al.*, 2008; Norris, Stevens, Pfefferbaum, Wyche & Pfefferbaum, 2008).

Institutions also have a role in building resilience by empowering communities to solve problems. According to McIvor and Paton (2007a) and Paton (2007b), this role depends on trust developed between the public and institutions. Other resilience factors include physical actions that protect people from harm (e.g. for earthquakes, retrofitting buildings), ensuring adequate resources are available (Cutter *et al.*, 2008; Norris Stevens, Pfefferbaum, Wyche & Pfefferbaum, 2008; Eiser *et al.* 2012), ensuring people have some psychological preparedness to cope with disaster disruption (Paton, Johnston, Mamula-Seadon, & Kenney, 2014), and placing learning at the centre of science and policy to encourage a paradigm shift for understanding and acting on resilience and transformation (Pelling, Visman, & Gibson, 2013).

Given the complexities of contemporary societies, achieving resilience requires an approach that recognises and accounts for interdependencies and interactions, which occur both on a daily basis and during emergencies (Kapucu, 2012; Rubin, 2012). Research has identified that building collaborative networks within communities, between communities and agencies, and between agencies, contributes to a resilient society where adaptation can take place post-disaster, by giving people a means of sharing knowledge and resources (Paton, Mamula-Seadon & Selway, 2013; Paton, Anderson, Becker & Petersen, 2015a).

Internationally, previous projects have attempted to establish strong collaborations with communities and to provide examples of good community resilience practice. These include the Project Impact initiative in the US in the early 2000's which encouraged the building of partnerships and empowerment of communities to build resilience (see Wachtendorf, 2000)¹, as well as collaborative initiatives applied to floods (White, 1994; 2009), earthquakes (the Earthquake and Megacities Initiative, 2015), in a post-hurricane context (NORC, 2014, Young *et al.*, 2014), and in a multi-hazard context (see Eisenman *et al.*, 2014). Some projects have considered specific frameworks and methodologies for integration of natural and social science research into community based planning and action for disasters and climate change (for example: Cardona, Bertoni, Gibbs, Hermelin & Lavell, 2000). In the Wellington Region of New Zealand, which is the focus of this paper, collaborative community resilience building was initiated in the early 1990s (Hopkins, Lumsden, & Norton, 1993; Gregory, 1995) with a focus on earthquake disaster recovery needs and lifeline engineering resilience. Now the region has established the International Centre of Excellence in Community Resilience and in 2014 Wellington City was named one of the 100 Rockefeller Resilient Cities.

Given the complexities and the number of stakeholders involved in disaster risk management (DRM), establishing effective collaboration can be challenging. Collaboration is required between diverse groups who may not be accustomed to working with each other, including national government agencies, local civil defence and emergency management (CDEM) groups, community organisations, NGOs, businesses and researchers (Kapucu, 2012). Therefore, effective relationship-building, planning, and implementation are vital.

New Zealand (NZ) legislation and guidance provides a pathway for collaboration to take place through its CDEM Act 2002 and National Strategy (CDEM, 2008), which both establish how emergency management should be undertaken. The latter articulates the vision: "to build a resilient and safer New Zealand with communities understanding and managing their hazards and risks" (CDEM, 2008, p. 1). These documents promote a comprehensive risk management approach in addressing the consequences of hazards across the four elements of emergency management, Reduction,

¹ For a review of Project Impact, see www.emergencymgmt.com/disaster/Project-Impact-Initiative-to.html

Readiness, Response, and Recovery (4Rs). Local CDEM Groups are required to follow these aspects and others of the CDEM Act and National Strategy. Collaboration is required between national and local CDEM, and communities, to ensure successful resilience-building efforts. Research, under such initiatives as the Natural Hazards Research Platform² (NHRP), needs to be collaborative to integrate research and funding across agencies and disciplines, together with research users, to achieve these aims.

Introduction to Wellington's ICoE: Community Resilience. Internationally, the important role of collaboration between research and practice and the role of *local science*, reflecting a place-based approach to hazards. has been recently highlighted by the Integrated Research on Disaster Risk³ (IRDR) programme (see Rovins, Doyle, & Huggins, 2014). This programme has established a number of International Centres of Excellence (ICoE) to provide regional research foci for the IRDR. Each ICoE institutionalises an integrated approach to disaster risk reduction that directly contributes to the

global Integrated Research on Disaster Risk science plan objectives (see ICSU, 2008). In Wellington, NZ, an ICoE in Community Resilience (ICoE:CR), was launched in March 2014 by the Joint Centre for Disaster Research⁴ (JCDR) (Massey University/ GNS Science) and the Wellington Region Emergency Management Office⁵ (WREMO) as a region-wide initiative to answer the question: "How does a community make itself resilient to future disasters?" (ICoE:CR, 2014, p. 1). The key objectives of the ICoE:CR are to:

1. provide an evidence base for the Community Resilience Strategy (CRS) (WREMO, 2014a);
2. act as a vehicle to share international good practice in Community Resilience; and
3. promote the Wellington Region as a living laboratory for research and learning.

The CRS (WREMO, 2014a) forms the core of the ICoE:CR structure which is illustrated in Figure 1, with membership of the ICoE:CR open to all practitioners and researchers within the region. WREMO and the JCDR help facilitate engagement with the ICoE at regional, national and international levels, with the JCDR providing the link to active researchers in the ICoE, and WREMO providing the link to active practitioners. All

2 NZ's Natural Hazards Research platform is a multi-party research platform funded by the Ministry of Business, Innovation and Employment, that is "dedicated to increasing New Zealand's resilience to Natural Hazards via high quality collaborative research." (NHRP, para. 1).
 3 The IRDR programme is sponsored by the International Council for Science (ICSU), the International Social Science Council, and the UN-ISDR (IRDR, 2015).

4 <http://www.getprepared.org.nz/>
 5 http://www.massey.ac.nz/massey/learning/departments/school-of-psychology/research/disaster-research/disaster-research_home.cfm

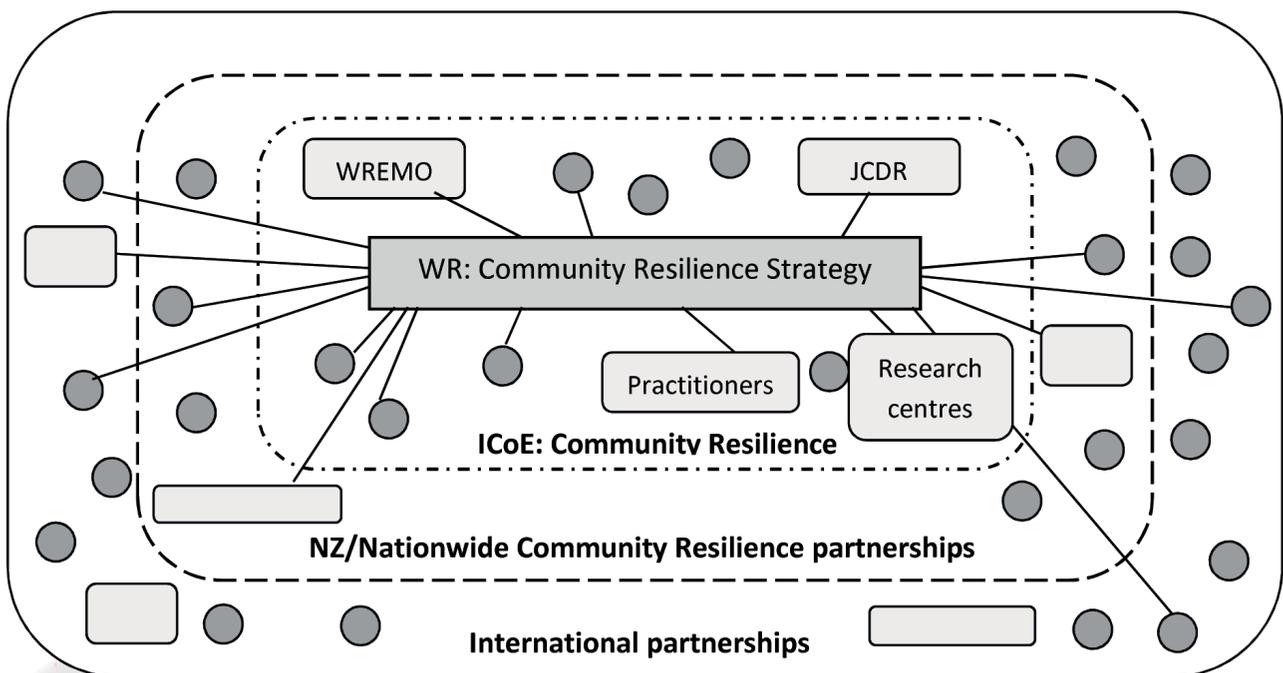


Figure 1. The structure of the ICoE: Community Resilience, Wellington, co-hosted by the JCDR and WREMO, with its foundation being the Wellington Region's Community Resilience Strategy (WREMO, 2014a).

Table 1

The Guiding Principles for Active Membership in the International Centre of Excellence in Community Resilience, Based upon the Guiding Principles of WREMO's Community Resilience Strategy (WREMO, 2014a).

Principle	Details
Listen first	Understand and abide by the interests and needs of stakeholders before offering options that can enhance resilience.
Local solutions	Communities generate innovative ideas to local and regional challenges. The ICoE:CR will encourage and support local solutions.
Ownership	Facilitate activities and research that enhance resilience in a manner that is adopted and owned by the user. Individuals, organisations and communities must be responsible for their own preparedness.
Purposeful outcomes	Each engagement with the community will have a clear purpose and measurable outcome. The ICoE:CR will make a point of encouraging all members to value the time and energy of individuals who make themselves available for research, or who make an effort to get themselves or their community prepared or connected through enhanced practice.
End-user focused	Preparedness solutions developed from international best practice and from empirical research findings will be easy for communities to adopt and use. Messaging will be delivered to convey positive outcome expectancies.
Evidence Informed	The ICoE:CR will draw upon current good practices in the implementation of research findings and either adopt or adapt these as appropriate. Where available, these good practices will be complemented by a robust suite of metrics in order to better understand cause and effect, thus aiding decision making.
Innovation	Seek out and try new ideas to enhance resilience where they are well reasoned, planned and meet the needs of the community.
Proactive engagement	Seek out stakeholders to work with and actively follow up on inquiries and opportunities to engage. Researchers must actively engage stakeholders from research inception to implementation and beyond.
Inclusiveness	Seek the input from a cross section of the community during the engagement process of any research or practitioner initiative, and ensure people affected by outcomes have the opportunity to participate in the process.
Transparency	Act as honest brokers with communities and any potential research participants or collaborators. The actions and intentions of members of the ICoE:CR will be transparent.
Relationship building	Foster relationships with community and organisational leaders with the aim of building trusting and honest partnerships between the community, practitioners, and researchers.
Ethics	Researchers will act in a way that is in line with the ethical codes for research with human participants as outlined by their universities or organisations.
Have fun	Treat every single engagement as an opportunity to have fun. Good energy creates great outcomes.
Reporting	At six monthly intervals (early February and August), members will report to the co-ordinating organisations with a 250-500 word summary of activities that fall under the ICoE:CR. A reporting template will be set up for this purpose, and will include a list of outcomes, findings and publications. These reports will help form a research, practice and network database for the ICoE:CR. Activities will be collated into an annual report (released in March), and highlights also reported in bulletins such as the JCDR newsletter.

active members are expected to follow the membership code described in Table 1. This collaborative framework has been utilised by a number of recent research projects to explore community resilience (for example, Huggins, Peace, Hill, Johnston, & Cuevas, 2015). To help facilitate a database of community resilience knowledge, the Community Resilience Toolbox⁶ has also been launched to facilitate the sharing of ideas, resources, and tools for collaboration within and beyond the ICoE.

The structure of WREMO is unique in that staffing and resources are weighted towards enhancing community resilience, in addition to the traditional approach of providing operational response capability. The core CRS aims to create a "structured pathway for the Community Resilience Team (CRT) to enhance resilience"

⁶ See www.resiliencetoolbox.org

(WREMO, 2014a, p.6), where the overarching aim of the CRT is to facilitate the ownership of preparedness and to increase social capital amongst the region's stakeholders. This aim concerns an effort to improve response and recovery outcomes, acknowledging that individuals, organisations and communities will engage with emergency management in ways that they find appropriate.

WREMO has coordinated a number of activities as part of the CRS, including public-private partnerships in the development of affordable and quality Preparedness Enablers⁷ such as Grab & Go emergency kits, 200 litre home rainwater tanks, 10 litre water bottles, and QuakeFlex brackets. Community activities have

⁷ See <http://www.getprepared.org.nz/prepare>

included redeveloping the CDEM community volunteers⁸ programme, emergency skills training, public education, establishing emergency text alerts, development of 'It's Easy' preparedness brochures⁹, helping to develop school response plans, and establishing the community driven Tsunami Blue Line project¹⁰ (See Leonard *et al.*, 2008; Johnston *et al.*, 2013; Johnston *et al.*, 2014; WREMO, 2014b) for hazard awareness, education and response.

In addition, WREMO has facilitated Community Response Plans¹¹, to help community leaders and residents build more connected, prepared, and empowered communities¹². Through community development methods and exercises, communities identify their known hazards, anticipate risks, develop a realistic expectation of what they can expect from emergency services, develop contact lists, assess critical needs, and ways to meet those needs. Arrangements include some communities being able to spend up to NZD5000 in a disaster with no need for prior approval. This kind of approach appears to have helped build more trusted relationships between these communities and local government, as well as empowering them with a sense of control over their outcomes in a disaster (McIvor & Paton, 2007; Paton, 2007b).

Procedures: The trans-disciplinary community resilience workshop

A fundamental goal of the ICoE:CR is to encourage strong relationships between researchers and practitioners, such that research informs practice and vice-versa. Thus, as part of the 7th Australasian Natural Hazards Management Conference (ANHMC), the ICoE:CR hosted the Community Resilience: Knowledge Sharing workshop at WREMO, in September 2014, to explore collaborative knowledge sharing and answer the question: How do we ensure that lessons from past disasters and day-to-day good practice in one region are implemented in future pre-disaster recovery plans in other regions. The main workshop agendas were: 1) to act as a network event, centred on *boundary objects* concerning knowledge transfer to enable discussions across diverse interests and experiences (Star & Griesemer, 1989); and 2) to identify community and

agency perspectives on challenges and solutions to collaborations and knowledge transfer. The current article reports on the procedures and outcomes of this workshop.

Recruitment, structure and participants. Participants were recruited via email through the ICoE:CR, WREMO and JCDR contact lists, and through ANHMC advertising. The 54 workshop participants came from universities, local and regional councils, government bodies, science agencies, local businesses and industry, and special interest and community groups. Figure 2 illustrates proportions of the primary roles of participants, grouped as practitioner (44%), community leader (19%), researcher (22%), and facilitator (15%). As shown in Figure 3, representation was from the Wellington Region (65%), national organisations (11%), elsewhere in NZ (11%), and overseas (11%).

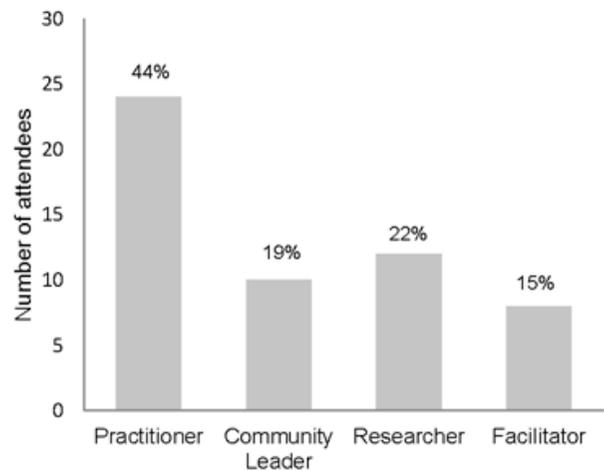


Figure 2. Primary role of workshop, where 'Community Leader' includes volunteers, trusts and neighbourhood support.

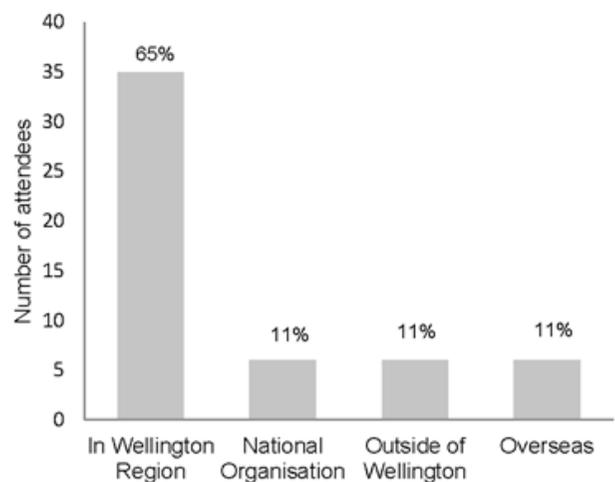


Figure 3. Location of origin for workshop participants.

8 See www.getprepared.org.nz/CDEM-volunteer
9 See www.getprepared.org.nz/publications/itseasy
10 See www.getprepared.org.nz/tsunami/what-to-do
11 See www.getprepared.org.nz/response-plans
12 See www.getprepared.org.nz/communityresponseplans



After an initial introduction to the ICoE, two presentations provided context for workshop discussions. The first presentation introduced WREMO and its Community Resilience strategy. The second outlined the current state of research in the field of Community Resilience, and alignment with WREMO's strategy, as shown in figure 4. In Activity One, entitled Collaboration, groups considered the question: What are the challenges to collaborating on activities that build more connected and prepared communities? Some of the challenges identified are shown in figure 5. Following this activity, each group considered the challenges of another group to debate: How do we solve some of these identified challenges? In Activity Two, called the Living Laboratory of Community Resilience, participants considered a hypothetical scenario called Suburbalicious to think more practically about these challenges and solutions. Groups were asked to imagine that a vacant lot had become available within their neighbourhood. They were asked: Using this opportunity, [discuss] how do we help Suburbalicious to build resilience to future disasters? As



Figure 4. Bruce Pepperell of WREMO and the ICoE:CR Wellington introduces participants to the workshop

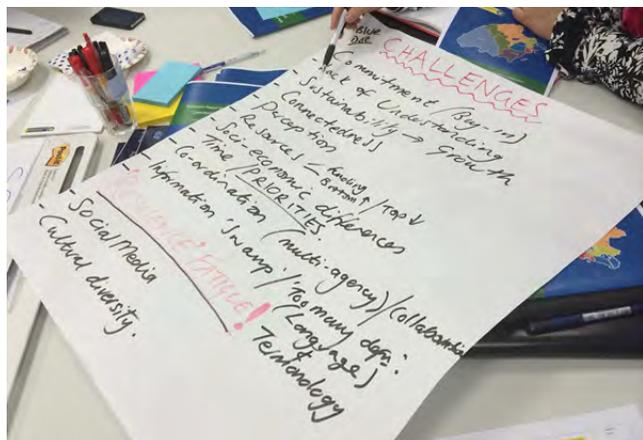


Figure 5. Challenges to research and practitioner collaboration were discussed in the workshop

part of this activity, participants were asked to consider collaboration, research informed practice, and practice informed research. Finally, participants considered how to improve digital collaboration tools, in Activity Three.

Early Observations from the Trans-Disciplinary Workshop

This section outlines our main observations from Activities One and Two of the resilience workshop, considering challenges and ideas to improve collaboration. During the workshop, each group took notes of their discussions on flip charts, and facilitating members of the ICoE also took notes. These notes were both transcribed and analysed, and a basic thematic analysis (Braun & Clarke, 2006; Ryan & Bernard, 2000) was conducted to find patterns using basic coding procedures. The final themes found for each activity are listed in Tables 2 and 3, discussed below.

Challenges to collaboration. As shown in Table 2, seven distinct themes concerning barriers to collaboration were identified from the group discussions. Theme titles are marked in inverted commas below, including:

1. The role of 'communication'. This must include accurate, easily understood information that is not too specialised and is translated into 'something coherent'.
2. A lack of 'capacity' or 'resourcing' (even if expectations of collaboration exist), due to lack of funding, personnel, and/or time.
3. The 'political aspect', where a community's desired projects may not match with an agency's priorities and vice versa. Addressing these competing priorities, and aligning agendas is a vital step prior to project implementation.
4. The need to 'understand the community context' prior to collaboration, as misunderstandings about diversity and desires can breakdown working relationships; as well as to understand who can be of best assistance in the project.
5. The need for 'personalisation' of the issue, such that a project has 'something in it for them' for individual engagement. Projects deemed to be of little relevance (due to a poorly defined context) would often result in low levels of engagement and support.

Table 2
Challenges to Collaboration between Researchers, Practitioners, and Communities, as Identified by Participants during Activity One of the Workshop.

Theme	Explanation
Communication	Not ensuring sufficient information is available. Not ensuring accurate information is available, and avoiding/correcting any mis-information. Not ensuring that information is easy to understand, including using accessible language and framing it in an accessible way.
Capacity and resources	Not ensuring adequate capacity building and resourcing required at a variety of levels including individual, community and organisational levels. Not ensuring a wide variety of resource types available e.g. Financial resources, people resources, time resources, etc. No maintenance of resourcing over time.
Priorities / politics / agendas	How to make resilience a priority given competing priorities and agendas? How to make better 'connections' between people/agencies, or encourage better integration, to facilitate resilience. Efforts need to be made to align agendas and ensure communities and agencies are in agreement over the treatment of disaster-related issues, before projects can be successfully implemented.
Community Characteristics	Not understanding the community context (e.g. community concerns, motivations, vulnerabilities, diversity, connections, desires, etc.) to allow connecting and working with them on resilience. Lack of understanding these characteristics can lead to a breakdown in working relationships. Need to understand wants and needs to prevent disillusionment due to projects that do not feel relevant or needed by the community. Not understanding who is located and active in the community, will often lead to agencies not working with people who can be of best assistance in the project.
Personalisation of the issue – relevance ('what's in it for me?')	Not finding out what is of benefit to the local community in building resilience, e.g. undertaking interesting activities, novelty and excitement, provision of relevant resources. Individuals need to feel that community resilience projects had "something in it for them". If a project seems to have little or no relevance (probably because the context has been poorly defined), individuals are unlikely to get involved and support that resilience building (or resilience research) project.
Transparency / trust	Ignoring the need to build trust both ways (practitioners/researchers vs community and vice versa). Placing an element of trust in communities, can empower them to run successful community resilience projects themselves. Not providing transparency on a particular project (including aims, objectives, goals and related outcomes or partner projects). Can be compromised by overpromising and under delivering, and not tackling conflicts of interest (linking to agendas listed above).
Partner equity / equity at the table	Not ensuring that partners are equal at the table in terms of being heard, recognised, and included in the process. Can impact trust and effective collaboration. Refers not to equity in knowledge and skills, but rather a recognition of everyone's unique contribution, skills and knowledge, and involving them fully in the process. If partner equity is not recognised, can lead to disenchantment and collaboration breakdown.

6. The role of two-way 'trust' and 'transparency' which can be a barrier to collaboration if not present. In particular, agencies needed to be transparent about their aims and objectives, and needed to place an element of trust in the communities for them to be empowered to drive community resilience projects themselves.
7. The need for 'partner equity' to further built trust and enable effective collaborations. This requires recognition of everyone's unique contribution, knowledge, and skills in a project and involving them fully in the process.

Ideas to improve collaboration. Different ideas were raised by participants on how collaboration could be improved in response to Activity One, concerning how we solve these identified challenges. This compared to Activity Two, which considered the hypothetical case study, Suburbalicious. The first activity brought up ideas around overall best practice approaches to collaboration, communication, and facilitation, while the second brought up ideas around detailed practical processes. The results from both were combined, and table 3 lists the 10 distinct themes that were identified concerning how to overcome collaboration challenges.

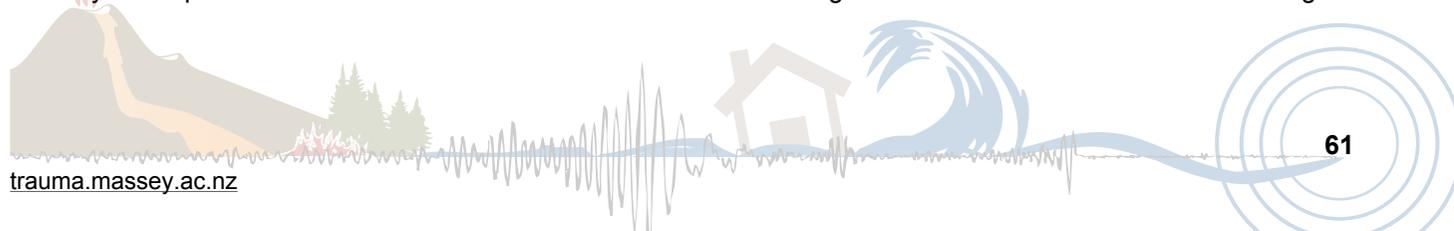


Table 3

Suggested Solutions to Collaboration Challenges that Exist between Researchers, Practitioners, and Communities, and Reasoning for those Solutions; as Identified by Participants during Activity One and 2 of the Workshop.

Theme	Explanation
Adopt a community-driven approach	<p>A community-led and community-owned approach enhances understanding of the context of the community, including the diverse problems they face, what they wanted to solve and how they wanted to solve it.</p> <p>Assists with buy-in to community resilience projects and helps answer the question of “What’s in it for me”.</p> <p>Makes use of people’s skills, and assists in developing a creative approach to capacity buildings and resourcing.</p> <p>Could include methods such as citizen science, advocates, local science, and identifying and acknowledging community expertise.</p>
Ensure facilitation is available	<p>Facilitation is needed to provide support for communities.</p> <p>Facilitators should provide guidance, rather than drive entire projects.</p> <p>Facilitators could work with groups to help set up project outlines and boundaries, work to reduce conflicts and agendas, help develop networks and connections for collaboration, assist with coordinating activities across groups and agencies, provide assistance to access resourcing (e.g. funding, locations for meetings, access to skills, etc.), and provide assistance with translating complex information into accessible information.</p> <p>Facilitation should be seen as an on-going investment, rather than just a one-off input, for example, at the set-up of a project.</p>
Ensure the scope and process of projects are well defined	<p>If the initial planning process is done correctly, then collaboration will be easier, and the project will be more effective. Scoping will assist in identifying the community context often seen as an issue. It will help develop a vision, activities that fall under that vision, a timeframe for activities, and identify people to be involved in those activities.</p> <p>Proper planning will allow diverse and innovative community resilience activities to be developed rather than just the usual, standard activities. It will also account for sustainability of the process, with the identification of on-going commitments and required maintenance.</p>
Enable diverse methods of collaboration	<p>A wide range of methods of collaboration should be considered and implemented, such as co-production of knowledge, engagement, use of social media, working groups, cost-sharing arrangements, use of advocates, use of facilitators, creating spaces for community exchanges or workshops, empowerment, use of small committees, using everyday activities to build collaborative networks, local science, citizen science, and including researchers in every aspect of a community resilience project.</p>
Enable diverse methods of communication	<p>Communications should be accessible and in language and formats that are easy to understand.</p> <p>Communications should be contextualised in a way that made sense to community members (e.g. relevant to their local situation), which again links with people’s desire to understand “What’s in it for me?” (see also “personalisation” below).</p> <p>Channels and methods could include: social media, a resilience toolbox, e-solutions, regular workshops (face-to face), exchange visits, email networks, exercises, making use of <i>translators</i> who can translate complex technical information into accessible information, and establishing prior agreements about what certain terms mean.</p>
Adopt a creative approach to capacity building and resourcing	<p>Need to address the limited amount of resources available to develop community resilience.</p> <p>Ideas include: financial cost-sharing, knowledge sharing, tapping into local experts and expertise, and integrate resilience-building projects into “business-as-usual” activities (e.g. work with existing community or school groups, other existing networks, social capital, etc.).</p>
Ensure the “What’s in it for me?” question is addressed (personalisation)	<p>Participants felt that if community members didn’t see that there was any real benefit for them in a project, then they would be reluctant to take part.</p> <p>Benefits will differ from community to community, but may include ensuring that any project matches any achievements or outcomes the community wants to make.</p> <p>The concept of ‘socialisation and fun’ is seen as an important part of answering people’s question about “What’s in it for me?”. From a science community perspective the “What’s in it for me?” question applies also, and should be addressed as part of project development.</p>
Ensure trust, equity and fairness	<p>Needed for successful projects, and can be engendered by ensuring that local authorities leading projects openly listened to community members’ ideas about their needs and desires, and practiced true collaboration in the development and implementation of those ideas.</p> <p>It is key to identify existing stakeholders and groupings, and involve them in the process, as well as identifying and building relationships with new stakeholders.</p>
Long term and sustainable project	<p>Community projects need to have a future vision to enhance buy-in from community members in the short term.</p> <p>In a practical sense, sustainable projects need to ensure resourcing (e.g. funding, personnel, agency support) is also available in the long term.</p> <p>In a research sense, sustainability may mean a long term commitment from researchers to work with a community in an area.</p>
Flexibility	<p>Community resilience projects need to evolve and adapt to needs as the project progresses.</p> <p>They need to be flexible enough to “capitalise on ripple effects”, make use of any benefits or activities that are developed from the community resilience project, and develop those benefits further.</p>

Identified themes include the need to adopt a 'community-driven approach' that would help address the challenging question of: What's in it for me? Ideally, this approach would make use of individual and collective skills in the community. Other themes concerned: the need for available 'facilitation' to provide support and guidance for communities, while ensuring that the 'scope and process of projects are well defined'. Participants also highlighted that 'diverse methods of collaboration' and 'communication' would enable success, such as co-production of knowledge, use of social media, and working groups. It was highlighted how these should all be conducted in a language and format that were easily accessible and which will also encourage a 'creative approach to capacity building and resourcing' such as cost-sharing arrangements between community, business and government groups. Other important solutions included 'personalisation' to address the question: "What's in it for me?" Another solution included ensuring there is 'trust, equity and fairness' between partners; and that the project is developed with a 'long term and sustainable' framework that has 'flexibility' to 'capitalise on ripple effects'.

characteristics, and the need for personalisation, trust, transparency and partner equity. Solutions suggested by participants included a community-driven approach, facilitation, well defined scope and process, diverse methods of collaboration and communication, creative resourcing, personalisation, trust, equity, fairness, and flexibility and sustainability of the project. These participant- and practitioner-identified challenges and solutions are in line with those highlighted in academic research literature, and with the associated resilience models illustrated in figures 6 and 7. In sum, research literature and the resilience models outlined have identified the important role of empowerment, trust, collective and self-efficacy, community participation, sense of community, place attachment, and adequate resources for enhancing community resilience and engagement in the process (Lindell & Whitney, 2000;

Discussion and Conclusions

Through the trans-disciplinary workshop conducted by the ICoE:CR, we identified issues that create challenges and barriers to collaboration including: communication, capacity, resourcing, political influences, community



Figure 6. Multi-level resilience model showing selected resources at each level and selected transactional resources. Reproduced from *Disaster resilience: Integrating individual, community, institutional, and environmental perspectives* (p. 311) by D. Paton, 2006, In Paton, D., & Johnston, D. (Eds), *Disaster Resilience*. Springfield, Illinois, USA: Charles C Thomas Ltd. Copyright 2006 by Charles C Thomas Ltd. Reproduced with permission.

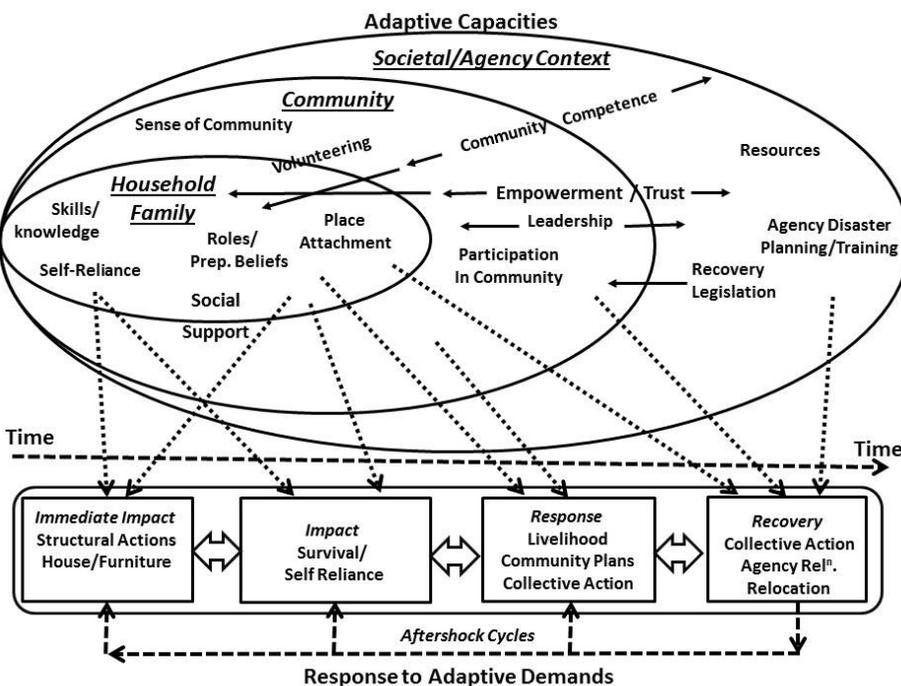


Figure 7. Summary of how adaptive capacities at person, family, household and societal levels interact to influence earthquake recovery. Reproduced from *Community recovery following earthquake disasters* (p. 2) by D. Paton, S. Johal, & D. Johnston, 2014, In Beer, M., Kougioumtzoglou, I.A., Patelli, E., Au, I.S.-K. (Eds.), *Encyclopedia of Earthquake Engineering*. London, UK: Springer. Copyright 2014 by Springer. Reproduced with permission.

Norris *et al.*, 2008; Paton & Johnston, 2006; Paton 2006; Becker *et al.*, 2013; Becker *et al.*, 2014; Paton *et al.*, 2010; Paton *et al.*, 2014; Paton *et al.*, 2015b).

Facilitation was identified as very important for collaboration and knowledge transfer when developing community resilience, as a way to coordinate activities and discussions, help develop networks, to assist with resourcing and project goals, timelines and boundaries, and to reduce conflicts and the development of divergent agendas. Discussions highlighted that this facilitation should provide guidance to communities, and not drive the entire project, so that the result is a community-driven initiative that helps to ensure the elements listed above are developed and maintained. This reflects the current WREMO approach outlined in the CRS (WREMO, 2014a). Workshop participants highlighted that facilitation should be less top-down and stated that it should be more “facilitating at an equal level” due to potential power balance issues between leadership and facilitation (see also Paton & Johnston, 2006; Paton 2006). However, both leadership and facilitation are often needed to start community resilience processes.

The participant suggestions outlined above also reflect findings from research on the effective use of facilitation for community development which, according to Vidal (2009), should empower communities to identify and solve their own problems. The facilitator should be skilled enough to drive the process, engender trust, and encourage group dynamics in a positive way to achieve a desired outcome (Vidal, 2009; Diaz-Puente, 2014). Additionally, a facilitator’s level of commitment with a group will be greater when he or she shares the same interest in the activity or outcome (Fetterman & Wandersman, 2005). Based upon participants’ desires for effective facilitation, we suggest future resilience work in the Wellington region should investigate the relative merits of external and internal facilitation, and the practicalities of having a non-governmental facilitator to address issues of politics, equity, trust, justice, transparency, and policy.

Other solutions of particular note for future research and practice include the role of creative resourcing and non-traditional ways of working together (such as WREMO Community Response Plans linking to other community development projects). Another solution concerns the need for hypothetical scenarios within networking and workshops, to encourage participants to think about these issues from multiple angles and explore processes practically. Such tools appear to allow people to think

more strategically, to challenge existing assumptions (Paton & Auld, 2006). They also appear to provide a novel way of extending response-driven simulations into a resilience planning and networking environment, to help enhance relationships, a shared understanding of the issues, and novel problem solving (Davies *et al.*, 2015; Doyle, Paton & Johnston, 2015).

In conclusion, the ICoE:CR Knowledge Transfer workshop aimed to act firstly as a networking event as part of the growing ICoE, and secondly to investigate the challenges and solutions to knowledge sharing and collaboration across communities, researchers and practitioners in the Wellington region. Effective facilitation was identified as particularly critical to such knowledge transfer. Workshops such as this are vital for enhancing community-driven approaches and creating opportunities for individuals from disparate backgrounds to work together. By conducting such events, we hope to enhance these networks and enable the engagement of local science (see Pelling *et al.*, 2013; Rovins *et al.*, 2014) in local community resilience practice.

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Did dog ownership influence perceptions of adult health and wellbeing during and following the Canterbury earthquakes? A qualitative study

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Abstract

The Canterbury earthquakes impacted upon the health and wellbeing of Christchurch residents. Although companion dogs can positively affect human health, there is little research exploring how dog ownership influences human health and wellbeing during and following natural disasters. We asked whether dog ownership influenced perceptions of health and wellbeing in humans during and following the Canterbury earthquakes. A general inductive approach guided analysis of our qualitative data. Seven adult women who owned dogs during and following the Canterbury earthquakes participated in semi-structured interviews that were audiotaped and transcribed verbatim. We identified three themes: 'Companionship' demonstrated how a close bond was experienced between all participants and their companion dogs. 'Support' highlights how the difference in nature of a close bond influenced the mental, physical and social support gained from a dog-owner relationship. 'Changing priorities' showed how the themes of 'companionship' and 'support' were interwoven in the way participants re-prioritized important aspects of their lives. Dog ownership influenced perceptions of health and wellbeing of our participants during the Christchurch earthquakes. We recommend that health practitioners

continue to develop their understanding of companion animals as a potential source of psychological support outside the health system. We also recommend that, where possible, emergency management practitioners and policy makers help ensure that humans and their canine companions stay together following natural disasters.

Keywords: *Canterbury Earthquake, Dog Ownership, Health, Wellbeing*

Introduction

Christchurch, which has been referred to as the Garden City, has a population of approximately 367,700 and is New Zealand's second largest city (Sibley & Bulbulia, 2012). On September 4th, 2010, an earthquake of magnitude 7.1 shook the Canterbury region in which Christchurch is located. A further earthquake occurred on 22nd February 2011 (Kemp, Helton, Richardson, Blampied & Grimshaw, 2011; Kuijjer, Marshall, & Bishop, 2013), generating the largest ground acceleration forces recorded globally to date, and marking the country's most deadly natural disaster in eighty years (Mulligan, Smith & Ferdinand, 2014; Sibley & Bulbulia, 2012). By November 2013, 12,774 aftershocks causing further damage and physical loss had been recorded (Kemp, Chan, & Grimm, 2013). Human lives had been lost, injuries sustained and buildings and infrastructure had been damaged. Further impacts emerged with reports detailing the significant impact of the quakes on psychological health.

Research by Fergusson, Horwood, Boden and Mulder (2014) indicated that exposure to the Canterbury earthquakes increased symptoms of mental disorders by 140% in comparison to a cohort not exposed to these events. Reported effects included heightened anxiety, fatigue, guilt, anger and hyper-vigilance, along with a decline in quality of life (Canterbury Earthquake Recovery Authority, 2014; Canterbury District Health Board, Healthy Christchurch & Mental Health Foundation of NZ, 2013). Despite these negative impacts, Cantabrians reported: pride in their ability to cope; increased support from friends and family; a

renewed appreciation of life and, a heightened sense of community (Canterbury Earthquake Recovery Authority, 2014).

Companion dogs can have a positive impact upon human psychological health and wellbeing, outside of the context of a natural disaster (El-Alayli, Lystad, Webb, Hollingsworth & Ciolli, 2010). These benefits were described by El-Alayli *et al.* (2010) as experienced through: 1. the presence, behaviour and touch of pets (either 'owned' or not 'owned' i.e. a visiting animal); and 2. the activity of dog-walking. Relevant benefits for humans include lowering of self-reported stress levels (Hall *et al.*, 2004), mitigation of mental health symptoms (Peacock, Chur-Hansen & Winefield, 2012) and increased physical activity levels with associated feelings of positive wellbeing (Peel, Douglas, Parry & Lawton, 2010; Christian *et al.* 2012). A study conducted by Raina, Waltner-Toews, Bonnett, Woodward and Abernathy (1999) found that the presence of companion pets, including dogs, led to a small increase in quality of life in non-institutionalised adults aged 65 years old or over ($n = 995$). In a recent qualitative study, researchers found that companion animals (both cats and dogs) contributed to a more meaningful life by positively influencing physical, psychological and psychosocial aspects of 17 elderly male and female participants' lives (Johansson, Ahlstrom, & Jonsson, 2014). Recent literature, focussing primarily on physical benefits of dog walking, has also uncovered potential psychological benefits (Epping, 2011). In a qualitative study by Wharf-Higgins, Temple, Murray, Kumm and Rhodes (2013), participants reported health benefits of dog-walking that included relaxation and stress relief. Some studies also highlight the integral role of the dog in maintaining the positive health and wellbeing of the family unit (Wharf-Higgins *et al.*, 2013; Peel *et al.*, 2010).

In contrast to the predominantly positive effects of dog ownership in times of stability, there is evidence that the emotional bond between humans and dogs could also be harmful for human health and wellbeing in the context of a natural disaster (Zottarelli, 2010; Hunt, Otto, Serpell & Alvarez, 2012). Furthermore there has been a call for national disaster plans to include more coordinated management of companion animals following these events (Garde, Perez, Acosta-Jamett & Bronsvort, 2013). Hunt *et al.*, (2012), found that the psychological states of both human and canine Search and Rescue workers following the 2001 terrorist attacks in New York and Washington were so inter-linked that

the death of a dog, or post-traumatic stress disorder in the human, could strongly influence the psychological state or behaviour of the other. Following Hurricane Katrina, the 1977 flood of Yuba County and the 2010 Haiti earthquake, it has been suggested that significant social harm and emotional trauma could have been avoided had pets been allowed to evacuate with their owners (Zottarelli, 2010; Glassey & Wilson, 2011). Zottarelli, (2010) outlined how "animals are part of the human family" (p. 119). Families tend to evacuate as a unit and thus people will endanger their own safety to save their animal companions during disaster events (Glassey & Wilson, 2011). Separation between pets and their owners during a disaster can result in significant stressors, resulting in symptoms of depression, grief, disruption of daily routine and reduced or delayed ability to cope and recover (Zottarelli, 2010; Glassey & Wilson, 2011). Animals traumatized as a result of natural disasters also contribute to owner stress and this was reported following the Christchurch earthquakes (Glassey & Wilson, 2011).

A body of research identifies companion animal ownership as a risk factor for disaster survival as well as a source of psychological distress (Thompson, Every, Rainbird, Cornell, Smith & Trigg, 2014). Alternatively, if pets were to be kept with their owners, these adverse outcomes during and following natural disasters could be mitigated (Lowe, Rhodes, Zwiebach & Chan 2009). This seems particularly important considering how Lowe *et al.* (2009) reported that pets provide their owners with non-judgemental support, buffering against physical and mental health problems, and decreasing reactivity to stress.

Minimal research has been conducted to explore the impact of the Christchurch earthquakes on the health and wellbeing of companion dog owners in the region. Glassey and Wilson (2011) described how these events caused considerable distress and disruption to both people and animals. As a result, health practitioners such as GP's and physiotherapists played a significant role to address mental health issues outside of their usual scope of practice, (Johal, Mounsey, Tuohy & Johnston, 2013). Pre-existing research and reports concerning the relationship between human health and dog ownership have given us a better understanding of how dogs might offer psychological support outside of the health system. However, the processes involved in these human-canine relationships warrant further investigation. The current study asked the research

question: Did dog ownership influence the perceptions of adult health and wellbeing of healthy adult humans during and following the Canterbury earthquakes? This study is part of a wider research programme led by the corresponding author, which explores the influences of dog walking and dog ownership on the health and wellbeing of both healthy adults and those living with chronic health conditions.

Method

Design. We used a qualitative study design to explore the perceived influences of dog ownership on health and wellbeing. Ethics approval was obtained through the University Of Otago Human Ethics Committee. We recruited volunteers who could offer personal accounts relating to the research question through purposive sampling (via word of mouth). Pre-developed open-ended questions were used in order to maximise rich descriptions. The General Inductive Approach (Thomas, 2006) guided our thematic analysis. The General Inductive Approach was proposed by Thomas (2006) as a straightforward, yet rigorous set of procedures for analysing raw data for a set of categories and/or themes relevant to a specific research question. Unlike many other qualitative approaches, the General Inductive Approach is not situated within a specific philosophical framework, but could be considered a pragmatic approach to thematic analysis (Thomas, 2006)

Participants. We recruited seven self-reportedly healthy adults over the age of 18 by word of mouth. Participants were sampled from Christchurch central city and townships of Kaiapoi and Rangiora which were affected by the earthquakes. Participants were included if they owned at least one dog during and following the Canterbury earthquakes of September 2010 or of February, June or December, 2011. The only exception was participant five, who acquired their dog a few days after the second of four large aftershocks. Interviewees were emailed an information sheet and written consent was gained prior to interviewing. All participants were women aged between 44 and 75, from either health or educational professional backgrounds.

Data collection. Interviews were conducted at mutually agreed locations: five in participant's homes, one at a local café, and one through Skype. Interviews lasted between 60-90 minutes. Two interviewers were present during each interview; one leading the interview and a second taking notes. Questions included: "Can you tell me a little bit about your dog and your relationship with

your dog?"; "Can you tell me about the experiences of you and your dog during the Canterbury earthquakes?"; "I have read in the literature that some dog owners have feelings of anxiety and worry for their dogs after such an experience. Is this something you can relate to?"; "What do you perceive to be important for your health?"; "How did you feel that having [insert dogs name] influenced your feelings of health and well-being during and following the Canterbury earthquakes?"; and "Did the Canterbury earthquakes affect your routine with your dog? How so?". Prompts such as, "that is a very interesting point, can you tell me a little more about that..." were used to expand on participants' descriptions. Each interview was recorded using two digital audio-recording devices and recordings were transcribed verbatim. No rewards were offered for participation.

Data analysis. The General Inductive Approach, as described by Thomas (2006), guided the analysis of our qualitative data. The General Inductive approach guides the identification of themes from raw data in response to a specific research question without depending on the complexity of philosophical underpinnings (Thomas, 2006). Four members of the research team were involved in the systematic reading of transcripts with coding undertaken during transcription of each text segment.

Four verification strategies were used to help strengthen the trustworthiness of our analysis. Firstly, prior to the interviews, the research team discussed and noted preconceptions about the research question they had formed through a literature and media search. This technique is called bracketing and enables the researcher to differentiate between their own preconceptions and the experiences of the participants in order to prioritise participant experiences during analysis (Tufford & Newman, 2012).

Secondly, an additional member of the research team reviewed the blank transcripts of the first two interviews and coded these in parallel with student members of the research team. Codes from the parallel coding process were then compared and this helped to establish a coding framework for subsequent transcripts. This process also helped us to refine and add questions to our interview guide. Initial codes from all transcripts were then compared for overlap and consistency before these codes were grouped into initial categories. Our third step was to constantly revise, condense and refine these categories and compile tentative themes.

Our last step involved a member checking process where we asked an individual who had owned a dog during and following the Canterbury earthquakes and was no longer resident in Canterbury to review and comment on our analysis. This person felt that our analysis reflected her own experiences during the Canterbury earthquakes and did not raise any new considerations. Our overall timeframe for data collection and analysis was limited to a six-week period and it was therefore difficult to determine whether saturation was reached. Nonetheless, by the seventh interview we were no longer able to identify new questions or topics that could have been addressed by further interviews.

Results

Three themes were identified relating to our study question: Did dog ownership influence the perceptions of adult health and wellbeing of healthy adult humans during and following the Canterbury earthquakes? Theme one, 'companionship' demonstrated how a close bond was experienced between all participants and their companion dogs. Theme two, 'support' highlighted how differences in the nature of these close bonds influenced the mental, physical and social support gained from a dog-owner relationship. Theme three, 'changing priorities' showed how 'companionship' and 'support' were interwoven as participants re-prioritized important aspects of their lives. This reprioritization changed participant behaviours in ways that both positively and negatively influenced health. Each theme is further detailed below.

Companionship. Dogs, as companion animals, appear to often share a close bond with their owner. In our sample, the nature of this bond differed between participants. All of our participants referred to their dogs as a friend or family member. Where five of seven participants described a mutually supportive relationship in anthropomorphic terms, one participant two's interview described themselves as being the "top dog". Whilst this participant did not describe any emotional attachments to her dogs, it was evident that she provided a high standard of care and took precautions to protect her dogs from earthquake related harm. Most participants considered their companion dog as someone they could talk to or spend quality time with. Participant six described this talking as "therapeutic".

Participants expressed that the unconditional love from their companion dog contributed to the strength of their bond. This was reflected through consistent

greetings from the dog and non-judgmental actions of the dog when the owner had experienced an "awful shift" (participant four). Some owners felt they could see unconditional love expressed through their dog's eyes, as well as through the dog's desire to be constantly by their side. This love induced feelings of guilt in the owners when leaving their dog(s) home alone. For example, participant three stated that their dog was, "So buoyant, always joyful to meet you, if you come home and you have had a bad day or whatever, there is no judgement or anything, you know how dogs are, it's just unconditional love."

Participants often described positive, happy characteristics of their dog whereas negative characteristics were brushed off, given excuses for, or even laughed about.

She's wicked, and people often say that dogs don't plan things, but she does. Um for example, she doesn't like when we go out at night. She gets cross with us. So she'll go and get anything of ours that she can find and she'll bring it and she'll plonk it right in front of the sliding door... She just likes sort of pushing the limits in a funny sort of way.

(participant seven)

Having a companion dog was generally described as having a positive impact on the health of owners during the Canterbury earthquakes, particularly in the form of providing comfort. A strong emotional bond appeared to act as a de-stressing mechanism facilitated through the distraction of caring, comforting and securing safety of the dog. This companionship also enabled the owner to "spread their emotional load" (participant three) during the quake events. Participants were able to express affection and be comforted by their dog with no pressure of judgement on their reactions to the earthquakes. In this way it is possible that dog owners experienced less perceived negative psychological impacts than those without a companion dog. This was highlighted by participant three:

Um...I suppose in a sense she has a certain stress component to her. Like you come home and you've had a difficult client, or, pressured with ACC to get a report in or something like that, you know. Here she is, not a care in the world, haha see (acting out dogs mannerisms). I suppose in a way, even though I don't think about it, it probably does diminish it a little bit. However because you do have to think about someone else and not yourself, you know, she's a distraction...you've got the dog there you

can spreads the load a little bit more, you know...a little bit more normality.

The close companionship described by participants also resulted in perceived negative health impacts for some owners. These impacts were characterised by reported worry, stress and anxiety for their dog's psychological and physical welfare when separated from owners during the quake. For example, participant six appeared to worry more about the needs of her older dog following the February 2011 earthquake: "She is so vulnerable, so dependent on you and that you would worry about getting her medications, her tablets, her food and because we had to run didn't we, we had to run to the door quickly because the water was coming higher."

Participant two, who sent her dogs to live temporarily in a farm outside Christchurch city following the February 2011 earthquake, did not express this concern. They felt that the security of a cage and the company of each other was enough once they returned home. Where dogs were part of a family unit, participants felt that although they loved their dogs as a member of the family, that human children took priority and that dogs were "always at the bottom of the pecking order" (participant three). Our analysis indicated that the strength of the emotional bond somewhat influenced the nature of perceived 'support' between dog and human. This influence is further outlined in the following section.

Support. Participants experienced support from various sources. Family and friends were the most highly valued source of support and participants reported that spending time together with friends and family gave a sense of security and a temporary opportunity to relieve stress and anxiety. Often considered part of the family, dogs gave support through provision of company, through dependence on their human owner, and through their role as a social catalyst.

Companion dogs were described as a distraction from the stressors surrounding participants. Most participants acknowledged that the loving, non-judgmental and almost naive nature of their pet dog was an undeniable way in which they forgot about their stress and anxiety related to the earthquakes. Participant three stated that, "As I said she is aware of whatever is happening. It wasn't like she was a dedicated member that reduced stress, she was just a part of family overall."

All participants stated that dogs supported them through established routines and responsibilities. There was a shared view that participant's dogs were dependent on

them for food, general care and walking. Participants recognised that dog-related routines provided both the owner and the dog with a sense of normality following the earthquakes. Owners often reported a need to stay positive to reassure their anxious dog and to prevent the dog from developing negative associations with aftershocks. Participant two felt that she had to maintain a strong and confident exterior, stating that, "Because I am boss, so I know what to do." Participant seven described how having a dog provided motivation to continue with usual activities: "You just gotta get on and do it, you got to feed her and look after her, you know you can't just, if you were someone that just felt you had to curl up the bed or whatever you can't when you have got a pet. You have got to think of them."

Some participants described their dogs as social catalysts and as such, a means of social support. As a social catalyst, their dogs facilitated interactions with friends, brought families closer together, or created a perception of normality while walking within the community. This timely enhancement of social support at the time of the earthquakes may have resulted in more positive feelings of social wellbeing.

The perceived support from a companion dog during and following the earthquakes appeared to vary according to the nature of the bond shared. For example, participant four was particularly worried about her family. She admitted that she had not given her dog much thought during the February earthquake. However, this participant noted that the dog "hung around me more" (participant four). Participant two, despite providing care and leadership for her dogs, did not describe an emotional bond during the interview. Descriptions provided by these two participants suggest that they did not identify their companion dogs as a strong source of support during the Canterbury earthquakes.

Both participants two and four reported how one of their priorities as front line health care professionals was to make their way into work, to look after the sick and wounded. This will be discussed further in the theme, 'changing priorities'. Participant two, who described herself as a means of support for others, reflected this best by saying, "Even if it's what I did that first day, with only starting someone on that step (talking to people). It would of helped... . I probably helped a huge number of people that I'm not even aware of... . and I helped myself at the same time".

Changing priorities. Following the Canterbury earthquakes, participants experienced a process of re-prioritization concerning what they considered most important in their lives. For some participants, this process was influenced by the nature of their human-canine bond and by the support they were able to give and receive from their dog. For others, new priorities involved giving support to, and receiving support from, other humans. This process of re-prioritization had both positive and negative impacts on health and wellbeing and reflected the place of the dog within the family.

It appeared that participants who expressed a strong emotional bond with their dog became increasingly worried about how the stress of the earthquakes was affecting the psychological and physical health of their dog. Prioritizing concern for their dog at times led to higher levels of stress. Many described separation anxiety for their loved ones; wanting to connect and remain in constant touch with family members, including their dog. Some participants spoke about feelings of guilt for having to leave the dog at home alone and one considered buying a second dog for company. During one of the major earthquakes, the first thing participant one did was grab her dog. Participant seven spoke of how she felt more responsible for her dog and wanted to constantly check on her welfare:

I probably felt more responsible for her than I did before, because before, I knew that she was fine and happy at home by herself at home and all that sort of thing but I worried about her more post-earthquakes... And I know it sounds ridiculous but I used to say to [husband]... "I just wish I could text her and say 'it's okay, you're okay, I'll be home'" or something like that. Because it was to reassure her, even though she probably wasn't even that worried, that was she was okay. So I felt more responsible for her... being happy, being okay... And not being confused about what was going on.

Re-prioritization of what was considered important appeared to increase a sense of mindfulness and gratitude while leading to a disregard for material possessions. A heightened appreciation for one's life, relationships (including human-canine) and community was described by participants. Many participants identified a balance between work and leisure as an important priority. This often involved taking the dog for a walk. Participant four's interview summarises this experience, shared by most participants in our study: "dogs are good for the soul because they make you

get out and exercise". Participant two did not describe a heightened relationship with her dogs following the earthquakes. However, during this period one of her dogs died of old age and she acquired a new dog. She did indicate that the nature of her walks had changed but also that this appeared due to the new dog rather than the earthquakes.

A new appreciation and compassion for other Cantabrians was also reported by participants. This appeared to result in feelings of resilience and pride in their own ability to cope. Each of our participants made time to connect with the people around them, whether it was looking out for a neighbour, comforting a friend or even a stranger. Participant three held a barbecue at which she felt her dog helped de-stress her guests by "gleefully" greeting them.

All participants re-prioritized safety and became more conscious of environmental dangers such as falling objects or being trapped in an underground car park. Participant two placed extra shielding over and around their dogs' crates whilst she was at work to protect her dogs from any physical harm during aftershocks. Participant six decided to take the dog with them when flying to different parts of the country and others changed boundaries within the family home so that dogs that had been barred from areas such as the bedroom prior to the earthquakes were now allowed free access. Participant three's interview illustrates an example of changed boundaries:

Up until that time [dog's name]'s limit of the house was the doorway to the kitchen and the hallway. She was really upset at that period so they, she ended up sleeping by the bed down there, and she continues to do so... Yeah, because you know how the earthquakes went on and on and on, and we just didn't feel it would be fair on her to be down here scared so I guess when our kids left home we softened up a little bit, so yeah, she now has free rein of the house, but she does have a limit with what she can do within that.

Conclusion

This study examined the perceived effects of dog ownership on the health and wellbeing of humans during and following the Canterbury earthquakes. The findings of our study suggest that dog ownership does impact upon the health and wellbeing of humans during and following a disaster event.. The nature of

the emotional bond and the perceived support from a canine companion can lead to: re-prioritization of the dog's status within the family; additional concern for the dog's physical and psychological safety; and stressful re-homing decisions. Participants who expressed a stronger emotional bond relied more upon their canine companions during these challenging times. The dog's unconditional love towards their owner was treasured and provided a sense of security and normality. Participant two, who did not describe this emotional bond, appeared to gain some comfort in being a strong leader for her dogs.

There has been little prior research focused on identifying the influence of a companion animal on health and wellbeing during and following a disaster event. Our study has identified possible links between the literature describing the positive effects of companion animals (Lowe *et al.*, 2009) and negative impacts on owner health and wellbeing in this situation (Zottarelli, 2010; Fergusson *et al.*, 2014; Kemp *et al.*, 2011). Pet ownership can be a risk factor for injury or death during a disaster, through owners putting themselves at risk for the welfare of their animal companion (Thompson *et al.*, 2014; Zottarelli, 2010). Lowe *et al.* (2009) found that support from pets may have played a protective role from adverse effects on mental health after Hurricane Katrina. Similarly, they proposed that pets can decrease reactivity to stress in a disaster. In our study, this protective role appeared to be enhanced by the strength of the emotional bond. This was also identified by Boldt and Dellmann-Jenkins (1992), who reported that an increase in the wellbeing of elderly people was dependent on the degree of attachment to their pet, with those describing a closer attachment experiencing a heightened therapeutic benefit. Thompson *et al.* (2014) also described how this bond was able to enhance resilience and recovery following a disaster.

We identified that the positive perceived effects of having a dog may mitigate some of the negative health-related effects of the Canterbury earthquakes. We found that companion dogs appeared to reduce stress in adults, especially when the emotional bond was strong. However, this bond may result in owners taking risks to protect and prioritize their pets during disaster, with increased anxiety and stress if separated. Hunt *et al.*, (2012) longitudinally followed the psychological wellbeing of human handlers, and the health and behaviour of their canine partners in Search and Rescue (SAR) personnel following terrorist attacks in New York and

Washington states in 2001. Findings indicated that SAR personnel were less likely to experience long term psychological trauma than other emergency personnel with no canine partner. However, longitudinal psychological states of both human and canine were so inter-linked that the death of a dog, or post-traumatic stress disorder in the human, could influence the psychological state or behaviour of the other (Hunt *et al.*, 2012).

New Zealand's new Civil Defence and Emergency Management (CDEM) plan (Ministry of Civil Defence and Emergency Management, 2015) is a welcome revision because this is the first time the CDEM ministry has acknowledged the need for a structured and organised approach to animal welfare, including companion animals, during an emergency event. Nonetheless, we recommend that welfare agencies, rescue workers, and health care professionals continue to consider potential short and long-term positive health consequences of keeping pets and their owners together in, and following, a disaster.

This study had several limitations. Only seven participants were recruited, most of whom identified themselves as of NZ European ethnicity. The sample mostly comprised women aged between 44 and 75 who were health professionals and this population have been shown to have higher self-reported effects of disasters (Canterbury District Health Board *et al.*, 2013). In addition, we did not recruit participants from all the major geographical areas affected by the Christchurch earthquakes. Future studies would benefit from a sampling strategy that aims to capture demographic diversity. Such samples may include diverse genders, and people of different ages and professions. Given that our participants all freely volunteered, this may have attracted a sample with a greater interest in either their dog, health and wellbeing, or the earthquake.

The timeframe for this study was limited to a six-week period. However, it seems that saturation was reached for the demographic representation of this study sample because no new potential themes were identified by the seventh interview. In addition, our independent member checker felt that the analysis reflected her own experience and did not offer any further insights which may have altered our analysis.

Companion dogs appear to have influenced human health and wellbeing during and following the Christchurch earthquakes. Positive influences included

a strong emotional bond, faithful companionship, and maintenance of routines. Negative influences included increased worry relating to the needs of dogs and anxiety about having to leave the dogs at home while working. We recommend that health practitioners continue to develop their understanding of companion animals as a potential source of psychological support outside the health system. We also recommend that, where possible, emergency management practitioners and policy makers ensure that humans and their canine companions stay together following disaster events.

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Quiet heroes: Teachers and the Canterbury, New Zealand, earthquakes

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Abstract

This article argues that teachers deserve more recognition for their roles as first responders in the immediate aftermath of a disaster and for the significant role they play in supporting students and their families through post-disaster recovery. The data are drawn from a larger study, 'Christchurch Schools Tell Their Earthquake Stories' funded by the United Nations Educational, Scientific and Cultural Organisation and the University of Auckland, in which schools were invited to record their earthquake stories for themselves and for historical archives. Data were gathered from five primary schools between 2012 and 2014. Methods concerned mainly semi-structured individual or group interviews and which were analysed thematically. The approach was sensitive, flexible and participatory with each school being able to choose its focus, participants and outcome. Participants from each school generally included the principal and a selection of teachers, students and parents. In this study, the data relating to the roles of teachers were separated out for closer analysis. The findings are presented as four themes: immediate response; returning to (new) normal; care and support; and long term effects.

Keywords: *disaster studies, schools, teachers, first responders, psychosocial support*

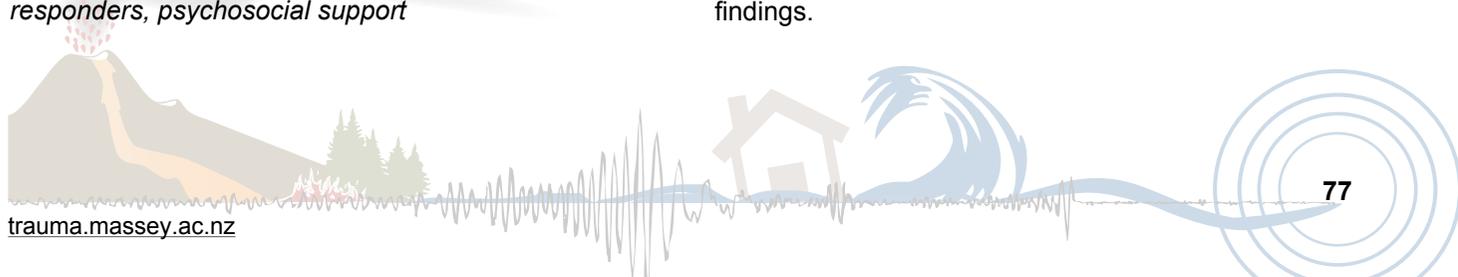
Introduction

The February 22, 2011 earthquake in Canterbury, New Zealand hit in the middle of a school day. Some secondary school teachers were attending a union meeting in the Town Hall but elsewhere, across the region, teachers evacuated, calmed and reassured students until they were collected by a family member or had somewhere safe to go. When school resumed, teachers coped with difficult conditions, teaching in relocated, damaged or temporarily repaired classrooms, tents, community centres or church halls. While other first responders have been praised and received awards for their efforts, teachers have remained largely unrecognised, except by their school communities.

All these teachers are quiet heroes. I know there are teachers here that have lost their homes and some of them are living in the same situation as we are and they come to work and they get on with it. They do their job as best they can and they never ever show their frustration to the kids.

(School E, Parent 4)

The data for this article come from a larger study, 'Christchurch Schools Tell Their Earthquake Stories,' in which five primary schools shared their on-going earthquake response and recovery experiences. Findings from the wider study have been published elsewhere and have focused on children, principals, schools and communities (see, for example, Mutch, 2013a; Mutch, 2014a; Mutch & Gawith, 2014). The current article puts teachers at the centre, in order to recognise and celebrate these 'quiet heroes'. After providing relevant background and introducing the small body of literature on the experiences of teachers in disaster contexts, the findings are outlined under four themes: immediate responses; returning to (new) normal; providing care and support; and long term effects. The article concludes with reflections on the methods used, and on implications of the current findings.



Background

The Canterbury earthquakes were a sequence of large jolts (four over 6 on the Richter scale) and multiple aftershocks. The sequence began with a 7.1 earthquake at 4.35am on the morning of September 4, 2010. Located in the vicinity of Greendale, this first jolt became known as the Darfield earthquake, after the nearest town, but more colloquially referred to as the September earthquake. It caused major damage to infrastructure and buildings. Fortunately, due to the time of day, no one was killed but the city of Christchurch and surrounding districts of Selwyn and Waimakariri faced liquefaction, flooding, ruptured and sinking land, and on-going aftershocks (Aydun, Ulusay, Hamada & Beetham, 2012; Canterbury Earthquakes Royal Commission, 2012). Many people had to move out of their homes, and schools were closed until they could be inspected and repaired or relocated (Education Review Office (ERO), 2013).

While the region was still recovering, a 6.3 magnitude earthquake, centred closer to the city with an upthrust of twice the force of gravity, hit at 12.51pm on February 22, 2011. It destroyed much of the central business district, killing 185 people and injuring thousands more. There was further liquefaction and flooding, further damage to infrastructure, and further dislocation for families and businesses. Tens of thousands of people left the city. This earthquake, officially an aftershock of the September quake, became known as the Christchurch (or February) earthquake (Aydun et al., 2012, Canterbury Earthquakes Royal Commission, 2012). It hit in the middle of a school day and principals and teachers became first responders as they helped up to 100,000 children and young people in their care. Schools were again closed for several weeks until premises could be checked, repaired, relocated or until alternative modes of educational delivery could be found (ERO, 2013; Ministry of Education, 2012; Shaping Education, 2013).

When schools reopened, teachers returned to work and began the exhausting task of getting the normality of school life up and running, while supporting each other, students and families. At the same time, they were coping with the trauma of loss, disruption and dislocation in their own lives amid on-going aftershocks. This article provides an insight into how they juggled these multiple priorities and the toll that this took.

Literature

A literature review by Mutch (2014b) showed that there is a growing body of literature on the role of schools in disaster settings but the majority focuses on pre-disaster contexts. There was very little literature on schools in disaster response and recovery contexts and even less on the specific role of teachers post-disaster. The literature that does concern response and recovery contexts is mainly descriptive – accounts written by teachers themselves or by researchers who interviewed teachers in different post-disaster settings. The next section briefly summarises some of the relevant international literature where teachers are mentioned.

A discussion of the role envisioned for teachers in disaster response and recovery is included in a collection of disaster articles edited by Smawfield (2013). This collection highlights how teachers are expected to go well beyond their normal duties and functions, from administering first-aid in the immediate aftermath to providing psychosocial support as part of longer term recovery. The discussion noted that teachers need to be provided with training to fulfil these expectations and that it is also important to remember that teachers, too, might need support following a disaster (Smawfield, 2013).

Several authors in this collection of articles discussed the disaster-related experiences of teachers (for example: Beaton and Ledgard, 2013; Ema, 2013; Zhong, 2013). Literature concerning the 2011 Japanese earthquake, tsunami, and nuclear disaster and other sources complements those accounts (for example: Japan Society, 2011; Ministry of Education, Culture, Sports, Science and Technology, 2012; O'Connor & Takahashi, 2013; Parmenter, 2012). Themes that emerge from the sum of all these accounts are: (a) how teachers put students first when the disaster hits; (b) how they often prioritise their school situation over their home situation; (c) how they manage in difficult post-disaster teaching environments with few resources and increased workloads; and (d) how they provide on-going psychosocial support for students and their families. Zhong (2013) stated that teachers receive little recognition for this work:

Teachers themselves were among the hardest hit groups in the Sichuan earthquake, although this has not received sufficient attention. During and after the earthquake, the teachers shouldered the role of protectors to their students and schools, but the

teachers themselves were also victims who suffered all kinds of losses; losses from which it takes a long time to recover.

(pp. 143-144)

Methodology

The 'Christchurch Schools Tell Their Earthquake Stories' project, funded by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and The University of Auckland, took place between September 2012 and May 2014. The funders allowed the current author to design a sensitive, flexible, facilitative and participatory approach, which was so necessary in this Canterbury post-earthquake environment. As well as ensuring that regular research ethical considerations were respected, it was important to take time to build a relationship with each school and have support mechanisms, such as a counsellor or teacher, available in case the data-gathering caused distress. The principal investigator had been through the earthquakes herself and this helped build rapport and trust with each school.

Participants varied from school to school but usually included the principal and selection of senior leaders, teachers, school support staff, students, parents and other family members. A range of qualitative and arts-based methods was used to gather detailed data in a way that assisted participants to see their experiences as part of the larger story of this significant time in New Zealand's history, without distressing them (see: Mutch, 2013a; Mutch & Gawith, 2014). In brief, each school negotiated the process, participants, data gathering and dissemination concerning their own school. In one school, audio and video recordings of small group discussions of participants with their peers or family members became an illustrated book. In another school, the students made a documentary drawn from interviews they conducted with other students, teachers and parents. In yet another school, the students designed a community memorial mosaic which involved every student and many community members. The schools each owned their final product with the proviso that the research team could use the raw data (audio transcripts, video footage, observations, field notes, stories, drawings and photographs) to conduct cross-case analysis and produce written material for academic journals. The detailed process of facilitation, negotiation and agreed outcomes is outlined in full, in Mutch, Yates & Hu (2015).

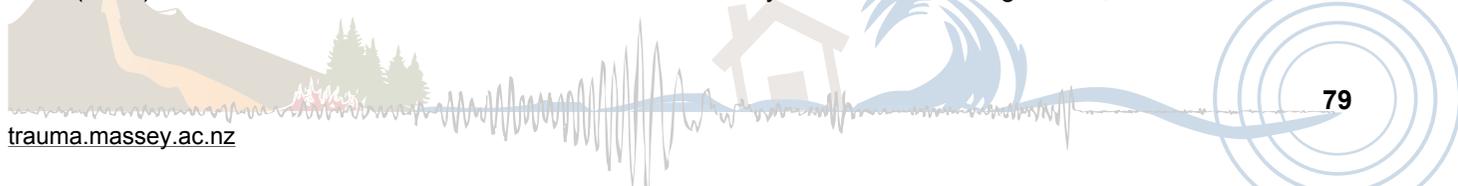
The current article draws from approximately 25 semi-structured qualitative interview transcripts where principals, teachers and parents spoke specifically about the role of teachers. The term *teachers* is used generically and includes teacher-aides and support staff, such as librarians. The original interviews were video-recorded, audio-recorded or recorded in note form. Sections of focus group and video transcripts from children were also reviewed for this article. While this study did not initially aim to investigate the experiences of teachers, many teachers volunteered to tell their stories. Other accounts of teachers' experiences were provided by principals, parents and students, so there was sufficient data available for analysing this particular dimension of the Canterbury earthquakes. It seemed important to extract and collate this data and examine it more closely so that the experiences of teachers could be specifically acknowledged.

The data were analysed in a constant comparative manner, outlined by Mutch (2013b). Each set of interviews was independently analysed for codes, categories, concepts and themes. These were then compared and contrasted horizontally (across all participating schools) and vertically (within each theme). The following four themes emerged from the teacher-related data set: (a) immediate responses; (b) returning to (new) normal; (c) providing care and support; and (d) long term effects. The findings section will discuss each of these themes in turn. Verbatim quotations are used to illustrate these themes with the authentic voices and emotions of the participants.

Findings

Immediate responses. Because the September earthquake occurred on a weekend, teachers' response stories were mainly about their families. By the time Monday came, teachers became aware of the size of the disaster and that their schools would be closed for some time. One teacher recalls her first thoughts were to protect her own children. Once her children were safe and the power came back on she could take stock. She phoned her mother in Dunedin, who said, "Did you feel the Alpine Fault at 4 this morning?" to which she replied, "Mum, that was us; it was in Christchurch" (School A, Teacher 3).

February was different. It was at lunchtime and teachers were commonly supervising children eating lunch in classrooms or school playgrounds. Although many children were frightened, most schools had



been practicing earthquake drills since September, so everyone knew what to do. This was outlined by Parent 6 at School A: “The school was phenomenal. The children streamed out of the classrooms and down onto the field. The teachers were incredible. It was very prompt and calm”.

Other schools faced more dramatic situations. This student was on a school trip to the beach:

All of a sudden a huge earthquake struck. I tried to crawl away but the earthquake threw me back down again. They always say that your life flashes before your eyes before you die and I was waiting for that to happen.

(School C, Student 1, 11 years)

Another school had over a hundred children plus teachers and parents at the local swimming complex. One teacher recalls:

...my thoughts now, when I look back, is that the whole place could have fallen in. We were so jolted that we stood up then we were jolted back down the force was so great. ... We tried to stand and go forward but we were just knocked back ... the lights went out and the children were screaming. All I remember is the siren noise and I went and grabbed a few of the Year 4 children out of the pool and I just huddled with them.

(School E, Teacher 2)

Teachers reported that they had no time to think, and that they had to react instinctively, getting children under desks or into the turtle position. What teachers did next however, was often a blur. They reported feeling unable to register what had happened. One school, located on the Port Hills, watched as the cloud of dust from the collapsed city rose in front of them. It all felt quite surreal. This feeling of disassociation is commonly reported in disaster contexts (Borrell & Boulet, 2009) but teachers had to refocus on their responsibilities to their students, for example “We put on that teacher smile, took a deep breath and carried on” (School A, Teacher 1).

Children were evacuated to the school fields or returned to school. Here teachers checked that everyone was unharmed and accounted for. The ERO (2013) reports that no child was killed or seriously injured on school or early childhood premises in the February earthquake. Teachers then calmed and comforted children until parents arrived. They remained until all children were

collected or alternative arrangements had been made, for example:

We had to wait until all the parents had picked up the children. I had one girl in my class whose mum didn't come for a very long time.... When the mother arrived, she was in a real state ... in tears and red-faced and she was like: “The Cathedral's gone, there are people dead in the streets....” That was like the moment of reality.

(School A, Teacher 2)

Teachers reported moments of panic when they thought about their own families. One principal made a decision to let staff leave if they needed to:

There were staff who had families elsewhere at other schools – their partners working in town. Because the mobile network wasn't reliable, there was no information coming in for them – so we had to review which staff could be released first to go for their personal reasons.

(School B, Principal)

After slow and difficult journeys home, teachers found their houses in varying states of disrepair. They needed to attend to distraught family members, check on neighbours and relatives, make their homes habitable or find alternative accommodation, for example:

In February our house broke in three places. We had water coming in with the rain, which was great with three young children. We had liquefaction to knee deep right through the backyard again, but luckily not through the house... It was horrendous.

(School A, Teacher 3)

Returning to (new) normal. Schools were closed for several weeks. In the interim, principals and teachers kept in touch with each other and their school communities, as much as was possible, for example:

I can't remember the first contact we had, I think our senior teachers e-mailed or texted or made sure we were okay over the next few days. We obviously knew because it was state of emergency schools would be closed anyway.

(School E, Teacher 2)

Before school opened, staff met socially where they could. Teacher 3 from School E stated that: “Even when the school was closed we still got together as a staff and just processed everything”. Gordon (2004) and Lazarus,

Jimerson & Brock (2003) report that reconnecting after a disaster is an important recovery activity. This was reflected by teachers re-bonding with their school colleagues, for example:

We had a big debrief in the staff room. We had a chance to connect with the other staff to find out about all their different situations as some of the staff had lost homes and really suffered. The session was not just about commiserating, we were also celebrating that we were all still here.

(School A, Teacher 2)

Once schools were given the green light to open, principals, teachers, caretakers, support staff and parents arrived to undertake repairs, clean rooms, pick up furniture, replace books, empty lunchboxes and tidy playgrounds. As well as making the physical environment attractive and welcoming, they met to consider how they would support students when they returned. Teacher 2 from School A said that:

The staff got given a list of possible short and long term symptoms or effects of trauma that children can have after a natural disaster. When children were acting out we weren't to automatically assume that they were being naughty. We could consider that their behaviour could be a long term effect of the earthquake.

Teachers were anxious about how children would feel. For example:

As teachers, we didn't really know how to deal with children after a natural disaster especially after they had had a month off school. So we were worried about how the children were going to be.

Teachers were relieved when children nonetheless appeared ready for school, as reported by Teacher 2 from School E:

We had a preparation day where kids could come in and see the school was still normal. The kids were amazing, we couldn't get over it, like it was security for them; it was really good.

Schools prepared for what might happen when children came on the first day. Counsellors were available and teachers had been briefed on how to deal with different responses. They knew that many children were still at school in other parts of the country and they also expected to receive new children temporarily. According to the Principal of School D:

Half of them didn't come back, of course, because some of them had shifted away. Some of them were too scared to come back. Some parents were too scared to let their children come back so there were a whole lot of different reasons why we didn't have our normal cohort.

Students reported having more games and fun activities when school first started. Teachers said it was because they wanted to impress upon children that school was a safe and happy place to be. Teachers also explained that with children living in damaged houses or shifting frequently, it was important that there was one place that was recognisable and consistent. Teachers were keen to make things as normal as possible, for example: "The children were just so resilient and just wanted to get back to normal" (School A, Teacher 1). Students reported getting back into routines quickly, for example: "The teachers kept all the routines going and they tried to make it normal" (School A, Student 15, 12 years). Returning to routines and distracting children from rumination are two activities that can support children's recovery. Psychologists recommend reinstating routines where possible at home and school to provide a sense of normality and security in the aftermath of trauma. (Australian Psychological Society, 2013; Lazarus, Jimerson & Brock, 2003). Research also suggests that physical activities such as games or calming activities such as listening to music can distract children from dwelling too much on the negative aspects of their experiences (Cahill, Beadle, Mitch, Coffey, & Crofts, 2010; Prinstein, La Greca, Vernberg, & Silverman, 1996).

Teachers also provided opportunities for students to safely process their experiences. For example: "Were they going to want to write about it? And how would they want to process it?" (School E, Teacher 1). Emotional processing, where children begin to normalise their experiences and absorb them into their personal histories, is important for children not exhibiting severe trauma. Researchers suggest activities such as relevant conversations, drawing, play, story, drama and dance (Cahill, Beadle, Mitch, Coffey, & Crofts, 2010; Prinstein et al., 1996). Children reported talking, writing and drawing about the earthquakes. Teachers reported using a range of activities and resources: video cameras for children to record their stories; engaging in the 'Teaspoon of Light' drama activity; reading the picture book, 'Quaky Cat'; and using curriculum resources, 'It's Time to Hope Again' and 'Lion Quest'.

Earthquake drills continued and schools reviewed and improved their processes. Counsellors were available for staff, students and families and the on-going earthquakes were a constant reminder not to become complacent. One student discussed the subsequent earthquake in June, 2011:

We were told to be prepared for lots of aftershocks. However, it was a big wake up call when we had another 6.3 in June – just when we thought they were only going to be small aftershocks. Everyone knew what to do and they didn't freak out as much. They went straight to the field – teachers didn't have to worry about getting the stragglers.

(School A, Student 15, 12 years)

Providing care and support. A Canterbury Earthquake Recovery Authority (CERA) (2014) survey of Christchurch residents found that the earthquake had impacted on all aspects of their lives and the rebuild was testing their patience. They felt negatively impacted by living in a damaged environment surrounded by construction work with the on-going loss of many facilities. Teachers coped by throwing themselves into their work, for example:

I've just been so amazed with some teachers in particular whose homes were badly damaged in town and they were offered discretionary leave to sort out their own lives but all of them wanted to be here for the children and when I asked them (or pleaded with them)—they said, "We deal with that outside of school hours. This is a fantastic distraction for us. We want to be here for our children, for our classes.

(School B, Principal)

Teachers were committed to being at school to support their students, for example: "They've been really good. If we need help or if we're struggling, there's always teachers to talk to and lots of us struggle with change" (School E, Student 14, 10 years). One student said they thought it must be hard for teachers to "keep calm and carry on" (School A, Student 9, 12 years). He felt there was pressure on teachers to look after children and make them feel safe (School A, Student 9, 12 years).

Teachers were also there to support the students' families, for example:

...straight after February, teachers rallied round. Teachers are great. I can't say enough about how much strength, how much integrity, how much they would go the extra mile to drop kids off, to look after

kids in their classrooms after school, to buy them special treats, take them to McDonalds, all those sorts of things... to find clothes for them, to find a pram for a mother who didn't have a pram to wheel her baby to school....

(School D, Principal)

They became key figures in supporting the emotional wellbeing of their communities, for example:

We've always had a really strong positive school culture but once we got through the initial emotions of the earthquakes, we've galvanised a lot more. Teachers and staff are more aware to support the children emotionally than they have done in the past.

(School B, Principal)

Through all this, they also needed to recognise their own need for support: "I've had a really supportive team and they have got in counsellors for staff and children and parents" (School E, Teacher 3); and to look after each other:

The school looked out for the staff. There were constant e-mails and messages at morning teas and lunchtimes – that if staff were not coping to let management know as there was support and funding for relief teachers. Also, if we needed to go and sort things out with our houses, then we were encouraged to do so.

(School A, Teacher 2)

Long term effects. One of the difficulties with earthquakes is that there has been no endpoint. Over 12,000 aftershocks continued into 2014. Long after the immediate impact of an event subsides, survivors can face secondary stressors that slow their recovery. These stressors can include financial concerns, repairing or rebuilding homes, loss of possessions and resources, health issues, family matters, education concerns, and changes in their understanding of the world and their place in it (Lock et al., 2012). Teachers reported health concerns, such as, stomach cramps, bowel disorders, panic attacks, headaches and sleep disorders. Teacher 3 from School E stated that:

If you looked at the stress-related illnesses since the earthquake – the number of parents that have had cancer, heart attacks, brain tumours – it's horrendous. And we're all dealing with that as well as everything else. There's been some very sad stories at school – we lost a staff member from a

stress-related heart attack – it's just been one thing after another....

They also mentioned mental health issues, worrying about elderly parents, moving or rebuilding houses and worrying about the long-term impacts on their children, for example:

It's the cumulative things we are dealing with. People have got so many responsibilities, so much is going and the big decisions are just not under our control. A teacher's performance has to be affected. It is not possible to carry on being the person of usual everyday circumstances.

(School A, Teacher 4)

Sometimes the impact of what had happened did not hit them until they had time to stop and reflect, for example:

I'd have to say that right from September til we shifted out four or five months ago, I coped really well. It's not til I moved out and I had time to look back that I find I get upset quite easily.

(School E, Teacher 5)

Some teachers thought there might be some positive outcomes, for example: "Kids in the school in future will be really resilient and able to deal with a lot of stressful situations" (School A, Teacher 1). Others were ready to continue with their lives and had hopes for the future.

I hope Christchurch will be a better place. I know my neighbours now. When we first moved to [our old house], we didn't know our neighbours and it wasn't until we had the earthquake that we really got to know them. When we moved to [our new house], the first thing we did was to get to know our neighbours.

(School A, Teacher 3)

For others, they had new challenges to face. In a post-earthquake review of educational provision in the city, the Ministry of Education decided to close School E. How does that affect the staff? The emotional ties and the relationships are torn apart; families that have been associated with the school for decades have gone. That kind of link and historical connection, and knowledge of the community and the school and its involvement goes as well.

(School E, Acting Principal)

Teachers at School E found they had to draw on inner strength to support their school community through what one parent referred to as "another aftershock"

(School E, Parent 2). Yet through all this, they put their personal feelings aside, drew on the resilience that they had garnered during their ordeal and chose to cope by what Teacher 3 from School E described as: "...making it a positive thing for myself, staff and students – looking forward, moving forward and knowing that out of this we will create another great school."

Reflections and conclusion

This section explores three areas in more depth. Firstly, a brief review of the strengths and limitations of the methodology is provided. Secondly, a reflection on the findings is outlined. Finally, this section provides a conclusion which includes a discussion of certain implications from the current findings.

Much has been written about researching in a sensitive setting, where researchers are cautioned to gain familiarity with the nuances of the context, build trust with the gatekeepers and participants, use methods that do not cause unnecessary distress and act ethically throughout each phase of the research (Dickson-Swift et al., 2007; Liamputtong & Ezzy, 2005). In the current study, a participatory approach was envisaged where the process and outcomes could be negotiated between the researcher and each school. What was not envisaged was how long a negotiated process takes nor the complexity of taking a participatory approach.

Having goodwill on both sides and being prepared to be flexible and listen actively to each other helped solve issues arising while maintaining the overall momentum of the research. In terms of research rigour, such a process might appear to have limitations. There was no definitive research design. Likewise, the data gathering methods and participants varied from school to school and the small sample of schools (5) limit the generalisation of conclusions to schools across the entire Canterbury region. However, the in depth approach taken by the current research is also a strength. The iterative, fluid and on-going process meant that many hours of video and audio data were collected from over 100 children and 30 adults along with drawings, photographs and field notes over a period of three years. This data could be then examined across schools, across age groups, across roles and over time. The results have therefore provided rich in-depth portrayals of the lived experiences of those who experienced this traumatic time in New Zealand's history.

Subsequent findings, have been discussed through outlining four themes that emerged from the data: immediate responses; returning to (new) normal; providing care and support; and long term effects. These themes highlight how teachers in this study were the 'glue' that supported students, families and communities through the immediate aftermath and recovery phases of the earthquakes. On the day of the 2011 February earthquake, teachers became first responders. Examples from the present study demonstrate that where students were out of the regular classroom, such as on field trips or at the swimming pool, teachers put their own lives at risk to remain, rescue students and guide them to safety. Similarly, where school buildings or the local geography put lives in danger, they quickly found alternative routes to safety. Even when the school buildings were relatively secure, they put their personal fears and anxieties aside and ushered students to the agreed meeting points where they calmed and comforted them, waiting for hours until each child had somewhere to go. Staff, students and parents from School E in the current study spoke of a particularly enduring bond arising from the trauma they had faced together.

When schooling resumed after the earthquake in repaired or relocated classrooms, teachers arrived to teach day after day, despite the chaos in their own lives. They balanced a return to academic learning with on-going pastoral and practical care for students and their families. With constant aftershocks and family dislocation, teachers provided security and regularity. They also remained vigilant for students and fellow staff members who were not coping and who might need specialist help. These themes resonate with themes from the earlier review of the literature: that teachers put students first when the disaster hits; that they prioritise their school situation over their home situation; that they manage in difficult post-disaster teaching environments; and that they provide on-going psychosocial support for students and their families. This was also the case with the teachers in this study. An additional theme identified during the current research is the stress that these responsibilities put on teacher's emotional and physical well-being and how this may impact on their own recovery.

There are several implications arising from the current research. Firstly, there are implications for further research. As noted in the literature review, there is a dearth of studies on the experiences of teachers following a disaster event. A useful place to start

would be to collate and synthesise research arising from the Canterbury earthquakes to provide a broader understanding of the roles and issues experienced by teachers. It would be useful to conduct a survey to find out how many teachers: (a) stayed in Christchurch and continued teaching; (b) stayed in Christchurch but left teaching; or (c) left Christchurch; and their reasons for making these choices. It may also be useful to research the ways that teachers reconfigured their roles to balance educational and pastoral care roles. As discussed below, this aspect of teachers' experiences has important practical implications. Another study could examine the role of secondary stressors, such as teachers' own housing, insurance and family issues and how those impacted on their ability to undertake their teaching roles satisfactorily. Broader research syntheses, both national and global could then continue to expand our understanding.

Secondly, several recommendations arise from the current findings and findings from surrounding research. One recommendation concerns teacher preparation and training. Pre-service or in-service programmes could consider alerting teachers to the possibilities of unexpected events, how they might respond and where to go for assistance. Another recommendation is that disaster response and recovery agencies need to actively involve teachers and principals in emergency planning and training, given that at any one time during a school day, thousands of students could be in the care of teachers when a major emergency event occurs.

Finally, it seems important to stop and reflect on what teachers did on that day in Canterbury and over the weeks, months and years that followed. Through each step of the response and recovery process, they put their personal concerns aside and acted with calm professionalism. The findings in this study illustrate their courage, selflessness, practicality, thoughtfulness and empathy, perhaps at the expense of their own health. Teachers shared their stories modestly, often through tears, always downplaying what they had done and turning the spotlight on the achievement of others. The current article provides an opportunity to recognise their efforts, their resilience and the major contribution they have made to Canterbury's earthquake response and recovery process. This goes some way towards addressing the concern articulated by the Acting Principal of School E, that "teachers have not been recognised as first responders to this disaster", by giving them due acknowledgement.

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