Australian & New Zealand Disaster and Emergency Management Conference
5-7 May 2014 – QT Hotel, Gold Coast

BOOK OF PROCEEDINGS - PEER REVIEWED

www.anzdmc.com.au
Australian and New Zealand Disaster and Emergency Conference


Publisher Details

Publisher Name: Association for Sustainability in Business Inc.
Contact Name: Sarah Jones
Address Line: PO Box 29
City: Nerang
State: QLD
Postcode: 4211
Telephone: +61 7 5502 2068
Fax: +61 7 5273298
Email: admin@anzdmc.com.au
Resilience in the Face of Disaster:
Evaluation of a Community Development and Engagement Initiative in Queensland

Ms Sarah L. Dean
Australian Graduate School of Policing & Security
Charles Sturt University, NSW

Paper Presented at the
Australia & New Zealand Disaster & Emergency Management Conference
Surfers Paradise, Gold Coast (QLD) 5-7 May 2014
Resilience in the Face of Disaster:  
Evaluation of a Community Development and Engagement Initiative in Queensland

ABSTRACT

Queensland is disaster prone, a State of extremes where natural hazards such as flooding, cyclones and wildfires are experienced on an annual basis. The unprecedented events of the ‘2010/11 Summer of Disasters’, led to all 73 local governments being disaster declared. To assist communities recover and build resilience to future natural hazards, a Community Development & Recovery Package was activated, under Category C of the Natural Disaster Relief & Recovery Arrangements (NDRRA).

This paper presents the key findings of an academic research study which sought to evaluate participants’ perceptions as to whether the program, jointly funded by the Australian & Queensland Governments, was effective in enhancing communities’ resilience to natural hazard events. A review of the literature explored traditional and contemporary theoretical perspectives of emergency management and community resilience and identified and evaluated its applicability in key legislation, policy and guidance. Primary research methods including key participant interviews, a focus group and a survey were selected to evaluate implementation of the program in the Tablelands Regional Council area, as well as more broadly across Queensland.

The key findings demonstrate that despite a number of challenges defining the inaugural implementation of this package in Queensland, a community development approach to building resilience to natural hazard events has proven effective. Examining projects that have helped people move forward collectively, come together to develop skills, knowledge, self-confidence, community capacity and cohesion demonstrates a need to focus on prevention and preparation and to invest time and resources into community development practice as a key mitigation strategy. Improved collaboration between emergency management and community development practitioners and striking the correct balance between recovery and resilience will enhance future implementation of NDRRA packages and drive emergency management theory, policy and practice. Implementation of the recommendations by practitioners will lead to greater opportunities to prevent disasters and to foster long-term community resilience to natural hazards.

KEYWORDS: Disaster, Emergency Management, Community Resilience, NDRRA, Government.
INTRODUCTION

During the summer of 2010-11, the El Niño-Southern Oscillation climate pattern caused the strongest La Niña pattern since 1974, bringing above-normal wet weather to Queensland (Bureau of Meteorology 2011a, para.2). Flooding began in the State during December 2010, increasing in intensity after torrential rain on December 23rd. Tropical Cyclone Tasha, (category 1), brought further rain and damage on December 24th-25th (Smart, 2012). During January 2011, flooding was experienced in Toowoomba, Lockyer Valley, Brisbane and Ipswich. On February 3 2011, Tropical Cyclone Yasi, the largest and most powerful cyclone to have affected Queensland since records began, crossed the coast at Mission Beach (Bureau of Meteorology 2011b, para.4), causing substantial damage and compounding flood impacts in Far North Queensland. By the end of the wet season, Premier Anna Bligh had declared ‘75% of Queensland a disaster zone’ (cited in AAP/One News 2011, para.9). On 6 April 2011, as a result of the extensive damage, the Australian & Queensland Governments announced funding for a Community Development & Recovery Package under Category C of the Natural Disaster Relief & Recovery Arrangements (NDRRA) to assist communities recover from the ‘2010/11 Summer of Disasters’ and build resilience to future natural hazards.

The inaugural activation of this package in Queensland created a unique and unprecedented opportunity to evaluate participants’ perceptions on whether a community development approach, delivered by local government, post disaster has enabled communities to recover from the ‘Summer of Disasters’ and build resilience to future natural hazards. Using the Tablelands Regional Council area as a case study and evaluating implementation more broadly across Queensland, the research sought to demonstrate through evidence-based evaluation, the degree to which adaptive strategies have been used post-disaster to build capacity to prepare for, respond to and recover from future natural hazard events. It is anticipated that the building of a shared understanding of practical ways in which communities can positively contribute to community resilience, will generate evidence for a community development approach to emergency management and drive future decision making and policy direction.
LITERATURE REVIEW

Theoretical Development of Emergency Management: Dominant Model v Alternative Paradigm

Drawing legitimacy from scientific principles, dominant theorists understand disaster risk as a combination of the probability of an event, multiplied by the impact of its negative consequences (Wisner et al, 2004). The dominant model adopts the ‘lens of a focusing event’ (Birkland 1996, p.221) which implies a strong emphasis on the impacts, as opposed to root causes or origin. As a result, this approach has been criticised for failing to adequately address the goal of prevention (Roux-Dufort 2005, p.9) and for failing to engage the community and focus on citizen interaction (Dynes 1994, p.142). The dominant perspective prevails because it demonstrates a strong orientation towards technical, rational and positivist managerial practices (Djalante, Holley & Thomalla, 2011) which are relatively easy to implement in order to reduce the impact of an event and to respond and recover when one occurs. As a result, emergency management legislation such as the Queensland Disaster Management Act 2003 continues to be delivered by governments that engage in centralised decision making (McEntire, 2004) and view community members as ‘victims’ (IFAS 1998, p.2) as opposed to active agents in the emergency management process.

Contemporary emergency management literature reveals a grassroots, community development and engagement approach (Geis 2000; Twigg 2007; Mulligan & Nadarajah 2012; Ireni-Saban 2012) to building resilience to natural hazards (Mileti 1999; Norris et al 2008; Paton & Johnston 2001; Ronan & Johnston 2005). Alternative models of emergency management, which focus less on the event, are beginning to emerge in the crisis management literature. Paraskevas (2006 p.994) proposes that ‘crises are entrenched and prolonged and do not always have a clearly identifiable cause or origin’ whilst Roux-Dufort, (2005) identifies ‘a series of non-linear phases including warning signals, acute stage, amplification and resolution’ which describes the transition from a situation of normalcy, to one of imbalance, and then disruption, before the situation is resolved. This alternative perspective does not view the ‘event’ as the starting point. Instead, the event is viewed as the catalyst for change, or the ending point of a process of destabilisation. This adds significant perspective when considering ‘complex disasters’ like Foot and Mouth Disease (Brown, 2001), Pandemic Influenza (Shimizu, 2010) and SARS (Smallwood, 2003) by helping to convey understanding that anomalies and vulnerabilities exist, which if left undetected, can
accumulate until saturation point, creating favourable conditions for crises to emerge. This model, which extends beyond a symptomatic approach by defining crises in terms of their root cause, may lead to a stronger focus on prevention and preparation as opposed to response and recovery.

*Theoretical Development of Community Resilience*

Historically, resilience has been applied in fields such as ecology (Holling, 1973), psychology (Bonanno et al 2006) and engineering (Hollnagel, Woods & Leveson 2006) but in the previous 20 years, it has had a strong presence in emergency management (Cutter et al 2008; Norris et al 2008; Paton & Johnston 2001). Community resilience seeks to understand positive responses to adversity at the community level and can be viewed as both an outcome (Vella et al 2012) and a process (Norris et al 2008). It is a complex concept with multi-dimensional attributes making it intangible and difficult to measure (Coles & Buckle 2004, p.6; Victorian Auditor-General, 2010, p.10). From a theoretical standpoint, it is relatively easy to anticipate the value of “disaster resilient communities” (Twigg, 2007) but there is a notable absence of literature relating to evidence-based practice on how the concept can be achieved. Wilding’s (2011 p.2) analogy is that “resilience is like a muscle which must be developed in advance and consistently exercised, to be strong enough to withstand severe challenges and flexible enough to handle a wide range of unpredictable forces”. This begs the question as to what strengths and characteristics resilient communities possess. Scholars that have researched the normative conditions that indicate a competent, resilient community demonstrate these key factors:

- Sense of community (Pooley, Cohen and O’Connor 2010; Veil 2008)
- Social support and networks (Dufty, 2012; Pooley, Cohen and O’Connor 2010)
- Self-efficacy (Kirmayer et al 2009)
- Coping (Pooley, Cohen and O’Connor 2010)
- Empowerment (Norris et al 2008)
- Hazard and risk awareness (Walia, 2008)
- Adaptation (Smit & Wandel, 2006; O’Sullivan et al 2012)
- Capacity building (Ireni-Saban, 2012)
- Self-organising behaviour (O’Sullivan et al 2012; Norris et al, 2008)
- Experience of adversity (Seery, 2011; Walsh, 2007)
- Health and spiritual wellbeing (Fernando, 2012; Walsh, 2007)
Recent disasters globally have demonstrated that Governments are limited to the extent to which they can prevent danger and protect their citizens and so communities need to be empowered to take responsibility for their own safety. Disaster resilience is high on the Australian Government’s agenda as demonstrated by the National Strategy for Disaster Resilience (COAG, 2011). It is evident that international policy like the Hyogo Framework for Action 2005-15 (UNISDR, 2005) is positively influencing Australia’s progress, but there is still a great deal of work to be undertaken to achieve the desired outcomes. Despite a significant policy shift towards a ‘whole of community’ responsibility and a growing recognition that individuals need to be self-reliant and better prepared to take responsibility for the risks they live with, there is currently no legislative basis to support this approach.
METHOD

This research was undertaken between December 2012 and April 2013 (CSU HREC Approval #110-2012-17). A mixed method approach was used for the data collection strategy.

Case Study: A case study approach was chosen because it offers a tangible situation from which to analyse the practical application of the Community Development & Recovery Package and provides a 'real life' example of how theory, policy and practice come together (Yin, 2011).

Focus Group: Purposive sampling was used to invite members of the public who are part of Community Disaster Teams across the study area to participate in a group discussion. Eight people attended and those that expressed an interest, but were unable to attend, were sent a copy of the questions and their written responses were inserted into the transcript, coded and analysed in the same way.

Interviews: Semi-structured interviews were selected as the optimum strategy to illicit the rich, qualitative data that was required to identify trends and to illustrate the successes and challenges in building community resilience. Five interviews were held with Community Development Officers with a view to obtaining data on the implementation of the program in Far North Queensland and a further three interviews were undertaken with the organisations responsible for administering the funding, in order to obtain strategic information on implementation of the program across the State.

Questionnaire Survey: To further validate findings, a broader perspective was sought from the 22 Community Development Officers employed under the program who were geographically dispersed across 17 different local government areas in Queensland. A combination of open-ended and closed questions were utilised to extract quantitative as well as qualitative data. The anonymous survey was initially distributed on December 10 2012 and recirculated again on 25 January 2013. A return rate of 50% (11 responses) was achieved which is excellent and allows for a high degree of generalisation.
Data was repeatedly organised and synthesised using a variety of techniques. Concept mind mapping (Hart, 1998:75), coding (Auerbach & Silverstein, 2003) and triangulation (Guion, Diehl & McDonald, 2011) was used to identify key terms and connections, organise ideas and concepts, compare and contrast different approaches, methods and practices in order to gain an in-depth understanding of the emerging issues and themes characterising the research and to ensure consensus or validity of the results across multiple data sources.

**Limitations:** The $40 Million Community Development & Recovery Package comprised many elements. As a result of time and resource constraints, the scope of this research was limited to the $20 Million Community Development & Engagement Initiative (CDEI) and the Flexible Funding Program (FFP) delivered by local governments. All 73 local governments were disaster declared (QLD Department of Communities, 2011:4) and as a result received some funds under the Flexible Funding Program. However, the 17 Councils targeted for the survey were those that also received funding under the CDEI as these Councils were deemed ‘hardest hit by the flood and cyclone disasters of the 2010-11 wet season’ (Queensland Reconstruction Authority, 2011:12).
CASE STUDY

The Tablelands region is located in Far North Queensland, approximately 100km west of Cairns. The population of around 43,727 are dispersed across 65,008 km2 (Australian Bureau of Statistics, 2011). The mountainous eastern escarpment, predominantly tropical in nature, is the most densely populated, and is heavily farmed with potatoes, sugar, mangoes and banana crops. Further to the west, rainfall is considerably lower, and the terrain is characterised by open bush plains and savannah country. On February 3 2011, the destructive winds of Tropical Cyclone Yasi affected communities in the Tablelands Regional Council area (See Figure 1). The greatest impact was on the cattle industry in the remote southern area of the region where 101 properties were affected, 34 of which suffered severe damage. Fallen trees blocked access roads, destroyed cattle yards and damaged thousands of kilometres of fencing, leading to problems with mustering and straying stock. Reports of damage included two homes that lost their entire roofs, damaged crops and reduction in yields from the dairy, horticulture and cropping industries and extended loss of power and communications that hampered the recovery efforts of small business (Tablelands Regional Council, 2011). The total cost of damage from TC Yasi across the State of Queensland is estimated to be in excess of $3.6 billion (AEMI, 2012).

Figure 1: Image of TC Yasi Impact in Tablelands Regional Council Local Government Area
Examination of key documentation relating to the case study area reveals the Tablelands Local Disaster Management Plan (Tablelands Regional Council, 2012a) prepared under the authority of the *Queensland Disaster Management Act 2003*. Published after Yasi, the plan details the disaster management arrangements in place for the region and outlines the roles and responsibilities of the various agencies involved in the Local Disaster Management Group (LDMG). The plan contains a disaster risk assessment process which documents the context of the region as well as the vulnerabilities. The plan makes reference to a Community All-Hazard Disaster Plan initiative which encourages residents in smaller communities to work together to build resilience and capacity to ensure self-sufficiency for at least several days (Tablelands Regional Council, 2012b p.44).

From the $20 million funding, Tablelands Regional Council was allocated $450,000 under the Community Development & Engagement Initiative (CDEI) and a further $250,000 under the Flexible Funding Program (FFP). A full time Community Development Officer and a part time Community Support Worker were employed on a temporary basis until June 2013 (CDO, 2013) to deliver projects. The exemplar project was identified as the Community All-Hazard Disaster Plans and associated Skills and Capacity Building Program (CDO 2013; Community Members 2013). The plans “formalise what already happens in our smaller communities” and “identifies resources in the local area that can be deployed to assist the community” (CDO, 2013). The approach recognises that “people need to be empowered, actually encouraged to shine in times of disaster” (Community Member, 2013) and that whilst “local government is the lead agency, local communities can self-help to a certain extent by commencing recovery operations until external resources arrive” (Community Member, 2013). During this project, 284 community members were funded to obtain a Level II Chainsaw Certificate and 246 with a Senior First Aid qualification. These projects have clear links to contemporary theory, covering topics such as hazard and risk awareness (Walia, 2008), social support and networks (Dufty 2012; Pooley, Cohen and O’Connor 2010), community competence (Dufty 2012; Pooley, Cohen and O’Connor, 2010) and sense of community (Pooley, Cohen and O’Connor 2010; Veil 2008).  

---

1 This research was undertaken during 2013. As of January 1 2014, the new Mareeba Shire Council was formed as a result of de-amalgamation from the Tablelands Regional Council.
FINDINGS / RESULTS

Understanding of Community Development Recovery & Wellbeing Package

The program was developed from “research into ways in which a community development approach to recovery had aided other places in Australia and around the world” (Funding Body #7, 2013). It was a “welcomed program” (Community Member, 2013) aimed at “supporting communities to reconnect, heal, remember and move on from the events” (Funding Body #8 2013) and “to assist with preparedness and growing resilience” (CDO #2, 2013). Recovery in the context of the program was about “moving from the point of crisis to stability” (CDO #6, 2013) or “getting back to some level of normality” (Funding Body #8; Community Member, 2013). Resilience was considered in terms of “bouncing back” (CDO #1 & #3; Funding Body #7; Community Member, 2013), building capacity (CDO #2 & #3; Funding Body #8, 2013) and “strengthening networks” (Funding Body #4, 2013) so the “community could cope better in future events”, (Community Member, 2013) whilst community development was considered in terms of “working with the community, not doing it for” (CDO #1, 2013) and using a “grassroots methodology or philosophy of engaging and empowering, to solve issues around what the community saw as priorities” (Funding Body #8, 2013).

Funding

This was the “largest investment of funding into this type of community development practice” (Funding Body #7, 2013) and as a result the funding came with a number of terms and conditions. The funding “specifically excluded the requisition of capital assets such as generators” and the “hardest hit Councils were required to leave a legacy or memorial to the event” (Funding Body #4, 2013). Confusion in relation to the funding terms was evident (CDO #1 & 3, 2013) and “in about 5% of cases, there was negotiation on ineligible expenditure” (Funding Body #4, 2013). The benefit of the funding to initiate projects was acknowledged by the participants, but the real value was identified as the human resource embedded within Councils to drive projects at the community level (CDO #1 & 3, 2013). The survey data reveals that 60% of exemplar projects across the State cost less than $15,000 demonstrating that resilience building initiatives do not have to be costly. When asked whether value for money had been achieved implementing projects in their own communities, 100% of survey respondents responded positively. However, when asked whether value for money had been achieved across the State 64% of respondents felt value
for money had been achieved, 9% stated it had not, whilst 27% were unsure (see figure 2) highlighting a potential disconnect between the different elements of the program.

Figure 2: Perceptions of value for money implementing the $20 Million Community Development & Recovery package across Queensland

Do you feel the $20 million package has provided value for money across the State?

- Yes: 64%
- No: 27%
- Unsure: 9%

Program Benefits & Successes

Participants acknowledged the importance of “grassroots activities” (Funding Body #4 & #8, 2013), recognising that “outcomes will be better, if driven by the community” (Community Members, 2013). Participants perceived that the program had “changed the culture of Councils” (Funding Body #7, 2013) by creating meaningful opportunities to engage on community priorities. In turn this ensured communities “felt they had been listened to” (Survey Respondent, 2013) which led to “a better understanding of Council’s role in recovery and the community’s needs and expectations after disaster events” (CDO #2 & 3, 2013). Survey respondents were asked if a community development approach to disaster recovery and resilience building had proven effective in their communities. Ten respondents (91%) perceived it had, whilst 1 person (9%) stated that they were unsure (see Figure 3), because the outcomes had not been tested in a real event.
**Figure 3:** Participants’ perspectives on whether a community development approach to recovery and resilience building has been effective.

![Bar graph showing responses to the question: Has a community development approach to disaster recovery and resilience building proven effective in your communities?](image)

**Exemplar Projects & Key Outcomes**

“Many fantastic and innovative projects have been rolled out across the State” (Funding Body #4, 2013). Survey respondents were asked whether their exemplar projects fell into categories extracted from the community resilience literature. Figure 4 reveals that 19% of respondents cited capacity building, 19% education and training, 15% social connectedness and empowerment, 12% sustainability, 8% awareness of hazards and risks, 8% health and spiritual wellbeing and 4% adaptation skills.

**Figure 4:** Participants’ perspectives on how exemplar project is linked to community resilience.

![Pie chart showing distribution of responses for each category](image)
Analysis of transcripts and survey results reveal that other areas of the State implemented similar projects to the case study area. Similar programs included ‘Community Warden Schemes’, ‘Preparedness Packs’ ‘Resilience Toolkits’, ‘Resilient Leaders Networks’, ‘Special Needs Resources’, ‘Capability Training’ and ‘Seedling to Supper Programs’. The value of such programs is easily understood when considered in a disaster resilience context.

Program Challenges
A key challenge identified through thematic analysis is the ability to strike the balance between reliance and resilience. Examples of projects implemented where the link to resilience was tenuous included ‘movie nights’, ‘fishing competitions’, ‘music festivals’ and ‘pamper nights with masseuses’. Whilst such activities met the terms of the funding agreement and assisted in the recovery process because the “social inclusion aspect encourages people to participate in community-based activities” (CDO #2, 2013), it is difficult to comprehend how such activities will help build resilience to future natural hazards. The need for such activities is not disputed. However, the delivery of such programs by local government raises a question about what expectation or precedent this may have established for future events. The tendency of governments to “throw resources at disasters after the event, after the horse has bolted” (CDO #3, 2013) was recognised. Some considered the “money a bit of a hindrance” (CDO #3, 2013) in that it created “reliance on funding” and ultimately “built a lot of dependency” (CDO #2, 2013). This demonstrates how government policy can undermine resilience by creating reliant societies and how recovery activities can have negative or unintended consequences for a communities’ future resilience.

Other key challenges were perceived as funding, reporting demands and limited timelines. There was “pressure to get the money out quickly and so existing relationships with Councils were used” (Funding Body #8, 2013) but this resulted in “administrative complexities that hadn’t been anticipated” (Funding Body #8, 2013). The “two separate organisations administering the funding program, who ultimately reported to the same steering committee, appeared to have vastly different requirements” (CDO #3, 2013), there appeared to be a “lack of communication between different government departments”, (CDO #3, 2013) and there was evidence of “disconnect at a regional versus state level”, (Funding Body #7, 2013). It is also evident from the primary data that there was limited interaction between the disciplines of emergency management and community development, with no
clear linkages at a State level to Emergency Management Queensland and limited cross-pollination of ideas at a local government level between Community Development Officers and Disaster Management professionals.

A final key challenge identified from the primary data was measuring success. The program, demonstrates that “some indicators are measurable, but others are not” (Funding Body #7, 2013). For example, “no-one really understands what the outputs are because you don’t end up with a bridge or a road but you end up with a bunch of people whose wellbeing and connectedness has improved” (Funding Body #8, 2013). Clearly there is a direct correlation between how many people have been engaged, how many people have attended training sessions or been provided with disaster preparedness literature but there are also “many cases where the outcomes are intangible or the evidence anecdotal” (Funding Body #7, 2013). This highlights the challenge of measuring success and the need to consider the future benefits of government funding programs.

*Sustainability of Projects*

NDRRA funding is for a maximum of two years meaning it is essentially project based and there is no longevity of programs or workers. This reveals the challenge of sustainability. Survey participants were asked whether the projects they had implemented in their communities were sustainable once the funding ended. Whilst 45% of survey respondents said yes, 55% stated they were unsure, which demonstrates that a significant proportion of projects have the potential to fail in the longer-term (see Figure 5). This is a key risk because “there is a danger of the program being a waste of money’ (CDO #3, 2013). “If it’s not sustained you might get a year or two of benefit, but without a driving force, it will probably fade away” (CDO #5, 2013).
Role of Government

100% of survey participants felt Councils have a role in resilience and capacity building. However, the interview data revealed different perspectives. Some respondents felt that “government shouldn’t have a huge role as it’s against the concept in some way” (Funding Body #8, 2013) whilst others perceived that “governments at all levels have huge responsibilities in building resilience” (CDO #1 & 6, 2013). Both perspectives acknowledged a need for government to ‘support resilience’ or “to act as the conduit to make things happen” (Funding Body #8, 2013), recognising they can “play an important and significant role” (Funding Body #7; CDO #2, 2013). Participants perceived that the “role of Federal and State government is to provide funding and resources” (Community Member; CDO #3, 2013) to ensure greater resilience in the future whilst the role of “local government is to champion the cause and provide leadership at times of disaster” (Funding Body #8, 2013).

80% of Community Development Officers surveyed felt Councils should have a permanent position focussed on community resilience and capacity building (see Figure 6) whilst the remaining 20% supported the view that “good community development practice builds resilience and should be ongoing in a general sense, all the time”. This was supported
in the interviews and focus groups discussion where respondents concurred that “governments shouldn’t be waiting for disasters before these programs are rolled out”.

Figure 6: Survey participants’ perspectives on whether Councils should have a permanent position focussed on recovery and resilience building.
DISCUSSION & CONCLUSION

Participants perceive that the Community Development & Recovery Package has achieved a high level of success in enhancing communities’ resilience to natural hazards, at least in the short-term by helping people move forward collectively, and come together on projects that have enhanced their skills and knowledge and built self-confidence, community capacity and cohesion. The positives of the inaugural activation in Queensland far outweigh the negatives and it is evident that those involved were fully committed to making it work and have worked exceptionally hard under difficult circumstances. The level of impact varied significantly across the State meaning some Council’s focused on recovery, whilst others had a stronger focus on preparedness and resilience building. This provides evidence that a community development approach can be used to empower individuals, families and communities to participate in different phases of the emergency management process and demonstrates how a bottom-up, grass-roots approach can complement a predominantly top-down, legislative framework.

Whilst the funding was viewed as a significant investment on a relatively untested program, participants perceive that it has demonstrated value for money. Despite this, it is evident that there was ineligible expenditure and that a level of confusion and misunderstanding existed in relation to the terms of the funding agreement which need to be resolved. Truncated timelines and a general lack of awareness of community development processes and outcomes by Ministers, resulted in excessive reporting requirements for workers, who perceived the program was about compliance as opposed to achieving the best possible outcomes for communities.

A broad range of community development practice was used to assist the community recover and build resilience to future natural hazards. Stronger linkages with disaster management may have identified potential conflict that arose between recovery and resilience building activities. Where recovery activities were considered in isolation, it is evident they had the potential to undermine long-term resilience efforts. This demonstrates a need to strike the correct balance to ensure recovery doesn’t create future reliance on government funding or services. The tendency to throw money at disasters after they have occurred is flawed and is systemically contributing to creating reliance on recovery funding. NDRRA programs are well suited to the relief and recovery context because there is no longevity.
However, such programs are detrimental to resilience which requires an ongoing and sustained effort and continual development and nurturing. An investment of time and resources to facilitate the development of community knowledge, skills and capacity will assist communities to plan and prepare for hazards, to make informed decisions, to take appropriate action when events threaten communities and to empower them to participate in the response effort and in their own recovery. The role of governments is not to try to ‘fix’ disasters. Instead, local governments need to invest in a community development approach to building resilience and be ready to support the community when the impacts of an event are beyond their capacity to cope. Anecdotally, there is some evidence to suggest enhanced resilience was demonstrated in areas re-affected by flooding in 2013. It is therefore vital that work to strengthen the capacity of communities to plan and prepare for, respond to and recover from disastrous events continues.
RECOMMENDATIONS

The five recommendations below are based on lessons identified from this research. Adoption of these recommendations will ensure the best possible outcomes for emergency management and long term community resilience.

Theory

1. Consider alternative models of emergency management which have a stronger focus on disaster prevention and preparation

Expanding current perspectives of emergency management towards models which extend beyond a symptomatic approach, by defining crises in terms of their cause or origin, may lead to a stronger focus on prevention and preparation and provide a useful lens for considering the complexity of disasters in the 21st Century.

Legislation & Policy

2. Employ alternative funding models that focus on prevention and preparation as opposed to relief and recovery

The humanitarian industry relies on a small window of opportunity that exists in the public sentiment immediately following a disaster to raise awareness and to ensure immediate assistance is available to those who need it. Governments need to move beyond the current approach of throwing money at disasters after they have occurred, towards a new paradigm where ongoing funding is directed toward community development programs, which focus on disaster prevention, preparation and resilience at a local government level. Over time, this shift will reduce the need for major intervention by State and Federal Governments because communities will be better prepared, more resilient and therefore fewer resources will be required to recover impacted communities. When community resources are overwhelmed, recovery should focus on building stronger communities by incorporating aspects of individual and community resilience, to ensure the efforts of local government are not undermined by State and Federal policies. Furthermore, a clear set of monitoring indicators and outcomes need to be outlined in the development of these programs so that the intangible benefits can be measured and unintended consequences identified and negated before projects are implemented.
3. **Review policy and legislation to ensure a stronger focus on a bottom-up community development approach to emergency management**

Disaster management legislation in Queensland is top down and should be reviewed to incorporate the National Strategy for Disaster Resilience and to provide greater focus on a bottom up, community development approach which enables local governments to work with individuals, groups and communities on resilience building activities on an ongoing basis. Resilience is a key mitigation strategy. Resilience requires a shift in government policy to focus on prevention and preparation all the time, as opposed to response and recovery after an event.

**Practice**

4. **Streamline administrative components of the Community Development Recovery & Wellbeing Package to improve future delivery.**

The administrative complexities associated with the program need to be reviewed to streamline future implementation. The key issues to be addressed relate to the ambiguity of the funding agreements, the bureaucracy involved with more than one organisation delivering the funding, reporting requirements, support for workers and the truncated timelines.

5. **Forge stronger linkages between emergency management and community development professionals to ensure the best possible outcomes for community resilience.**

Stronger linkages between emergency management and community development professionals will produce better outcomes by striking the correct balance between recovery and resilience building activities. Recovery and resilience are distinctly different, but need to be integrated holistically, at a local government level, to ensure the best possible outcomes for communities. A partnership approach will prevent recovery activities undermining the ultimate goal of resilience and consequently creating further reliance on government funding or services.


Providing for legal issues in disaster management:
lessons from New Zealand and the USA

Professor Jeremy Finn
School of Law
University of Canterbury
Christchurch, NZ 8140

Professor Elizabeth Toomey
School of Law
University of Canterbury
Christchurch, NZ 8140

Paper Presented at the
Australian and New Zealand Disaster and Emergency Management Conference
Surfers Paradise, Gold Coast (QLD), 5-7 May 2014
ABSTRACT: This paper identifies and discusses some of the most pressing legal issues that will arise from natural disasters such as earthquakes and floods and how disaster management practice may provide for these to be addressed. (Many other legal issues will arise in the disaster recovery phase but space precludes their discussion here). The paper draws on empirical data from research into the consequences of the Canterbury earthquakes of 2010-2011 and of earthquakes and hurricanes in North America, as well as on the available literature from a range of jurisdictions. During the initial disaster management phase the legal issues most likely to surface are the effectiveness and scope of disaster management legislation, dealing with volunteers, access to both private and commercial properties and media/privacy law. If the disaster period extends for any substantial length of time there will also be issues as to environmental matters (particularly responsibility for the acquisition and/or disposal of damaged property), residential and commercial tenancies, employment law issues and family law issues (particularly issues of custody and access where the parents are not living together). Our research also shows the need for immediate and effective programs for providing legal advice to disaster victims who will frequently not have contacts or resources necessary for them to obtain advice. Overseas experience suggests strongly that such programs need to be planned well ahead of time and the persons in charge need to be involved at an early stage in general emergency and disaster management planning.

Introduction
This paper identifies and discusses some of the most pressing legal issues that will arise from natural disasters and how and why disaster management practice should provide for these to be addressed. We focus in this paper on legal issues around disaster response and management rather than longer term recovery issues. Our work here is part of a wider project investigating the legal consequences of natural disasters and how these may be mitigated or avoided. We began after the Canterbury earthquakes of 2010 and 2011, and have examined the legal issues arising from those quakes and their impact on the local legal profession. We broadened that enquiry to look at legal issues arising from other kinds of natural disasters, particularly floods in New Zealand and floods and earthquakes in North America.1 For this paper we draw principally on data gathered by a survey of Christchurch lawyers and qualitative interviews in Canterbury and in California, New Orleans, New York and New Jersey

1 The authors would like to thank their research assistants who have contributed greatly to this project: Greg Belton-Brown, Shane Campbell, John Goddard, Rachel Trangmar and above all Rosemary Roberts.
with a range of experts or parties affected by earthquakes or hurricanes and floods. That empirical data has been amplified and set in the context of the available relevant literature. We expect to publish the final results of our research at the end of this year.

We argue here that legal issues are rarely taken into account in disaster planning and disaster response. Experience shows this to be a serious weakness. While every disaster is different, there are many steps which can be taken to enhance the preparedness of society to meet the legal issues disasters may create, and to mitigate their effects during the disaster management and recovery phases. Taking those steps is both feasible and essential

Legal issues in the initial disaster management phase and planning to mitigate their effects

Our research has identified three points where uncertainty as to the scope of existing law may cause substantial difficulties for disaster response and management, because entirely predictable occurrences are not clearly provided for.

Emergency legislation and volunteers

The first of these are some potential difficulties with existing disaster response statutes and the general law which should be addressed before, rather than during, a major emergency.

Our research indicates three points at least where reconsideration and possibly reform is likely to be needed. Almost every statute, wherever in force, operates only from the declaration by a competent civil authority of an emergency. While this is constitutionally desirable, it means persons acting to deal with the emergency situation prior to that declaration have no greater powers than the general law permits, and no special immunities. We suggest that there should be some retrospective provision so that things done prior to the declaration in response to the emergency should be protected. Conversely legislation could provide prospectively for out-of-

---

Material from these interviews is not separately identified in the text, but a list of interviews appears in the References.
jurisdiction professional volunteers to practise after an emergency, as had been done with nurses in the USA (Petersen, 2006).

In addition, immunity provisions in disaster management legislation may not be broad enough. We suggest there should be broader protection against criminal or civil liability for property taking or damage, whether by a volunteer or by a government agent done in good faith in an emergency situation - for example a person breaking into a damaged pharmacy and taking medical supplies from it to treat existing or expected injured victims. It is possible a common law defence of necessity would be available in both criminal and civil cases but many formulations of the defence would not apply to property offences (Simester and Brookbanks, 2012 pp 442-445; Todd et al 2013, pp 1129-1133). There are particular problems with volunteers. American law frequently provides immunities from tortious liability for volunteers to encourage volunteer participation in disaster response, relief and recovery but many have significant limitations such as denying immunity if injury is caused while driving a motor vehicle. New Zealand has very limited immunity provisions, as they effectively apply only to members of groups integrated into the civil defence system prior to the emergency. Indeed the legislation largely ignores the question of spontaneous volunteers. Given that all major disasters see substantial spontaneous volunteering it makes sense to have a legal regime in place to deal with the more obvious and predictable issues. Doing so may require a further consideration of two thorny questions. Should we maintain the common view that a volunteer must be acting without expectation of reward, or do we broaden it to include persons who expect to receive the normal salary or income while they are working on emergency response matters? Should the definition of volunteers be limited to natural persons - as all legislation seen so far is - or should issues of both control and immunity extend to companies or other incorporated bodies? At the very least legislation should provide answers to these questions rather than leaving them to be decided during the pressing circumstances of a disaster.

In our Christchurch research, the practitioners had much to say about their ability, or inability, to retrieve lost data - office/client files, deeds and wills, appointment diaries and other calendar information, important original client documents and financial and business records. In most cases the electronically stored and paper files were inaccessible either because the building was cordoned off or destroyed, or the paper documents themselves had been destroyed or rendered useless after having been burnt, saturated or flung out of windows. The inaccessibility or loss of this data had a huge impact on practitioners. The ease and time taken to replace or retrieve important documents and records depended on the form in which they were stored. Those who had stored vital information electronically were faster retrievers than those who had relied on paper systems. A barrister encapsulated the problems for the latter:

I lost all my records because my building fell down….partly that was my fault because my back up system consisted of my secretary and me exchanging memory sticks on a Tuesday. The drill was that I would just leave my memory stick on her desk and she would give me a new one and, of course, I put my memory stick there about 11.30 am that morning and the building fell down at 12.50 with both memory sticks in it.

Often electronic storage failed in that even though a few practices had taken the step to store electronically, by and large the only version of the information was stored on-site. This meant that after emergency evacuation many practices were unable to retrieve their hard drives easily. Some resorted to subterfuge and illegally crept through the cordoned area while others “grabbed and carried” during the evacuation.

The file server, which stored the majority of client files and case information, was saved only when one of the partners, facing the threat of jail, broke through the yellow police tape to get into the smouldering building and pull out the file server.

Elizabeth Toomey has a vivid memory of the February 22 2011 quake that as she was walking to her suburban home – and about 11 km from the city centre - she passed a man in a dust-covered suit with a computer under each arm.
For the paper users, retrieval was a slow and cumbersome process, particularly if the building they had evacuated from had been closed or cordoned off. Some practitioners were without these documents for months; others never retrieved them.

Many interviewees in the USA raised similar issues and spoke of the importance of electronic data and off-site storage. One interview in particular emphasises the lengths to which some law firms go in order to protect their material. The interviewee – a practice manager of a mid-size law practice in San Diego and an IT specialist – started a plan in 2009 to move all the firm’s material to a data centre off-site leaving almost no equipment at the law firm’s San Diego premises. The firm runs completely out of the data centre that is used by a majority of very large companies in San Diego. Snapshots are taken out there three times a day and the firm replicates those snapshots back to the law firm’s premises. His next step is to have a data centre completely out of the region but, as expense is an issue, he contemplates partnering up with another firm to instigate this.

Media
The question of whether media abandon legal and professional protocols in the aftermath of a natural disaster is investigated in a recent article (Cheer and Rosanowski, 2013). After a thorough investigation, the article concludes that legal issues arising from media reporting were rare (p 247):

It is likely media behaviour did not move into illegal or unethical territory because although there was clearly a shift in news routines, this did not affect the values or standards underpinning the output.

In the United States, given the First Amendment jurisprudence, media have a reasonably free rein.

The sharing of information in a large scale emergency can be critical and the intervention of privacy rules can be problematic. One interviewee observed that in some cases it was difficult for insurers or organisations to share valuable information and this obstructed progress.
Legal issues in an extended disaster management phase
We turn now to a range of legal problems which we consider will be near-certain to arise after a disaster, and which will cause continuing problems both for survivors and for the authorities who will been distracted from their primary tasks by the need to deal with those affected – including their own staff.

Waste Management
Earthquake debris management is a fundamental tool in any post-earthquake recovery. In Christchurch, a dedicated Waste and Debris Management Team devised a “fast track” programme to clear the city and enforced a “drop and haul” methodology. All the material was taken to a centralised processing facility, established under the special powers conferred by the Canterbury Earthquake Recovery Act 2011, for resource recovery. Residents in the proximity were far from impressed. They cited increased heavy traffic, noise and dust as the major factors that destroyed their former peaceful environment. Other issues of waste disposal in post-earthquake Christchurch comprised illegal dumping on abandoned red-zoned properties and the very fraught question of whether asbestos had been handled correctly.

In a detailed study on disaster waste management (Brown et al, 2011) the authors note that there is little or no literature as to how the various management options for the waste (for example temporary storage sites, recycling, disposal) are selected post-disaster. Nor does the literature specifically address the impact or appropriateness of, for example, existing legislation or organisational structures. Clearly, more research in this area is needed for a better response to waste management problems in the wake of a natural disaster.

A New Jersey interviewee recounted a discrete problem with the clean up after Superstorm Sandy. Homeowners, faced with significant costs for the removal of flood-borne debris on their property, were advised that the expense would not be met under their insurance policies as the debris did not equate to damage to their properties. Some of the debris included boats. Undamaged ones were usually reclaimed by their owners but many damaged ones were abandoned, the owners preferring to simply claim insurance for their loss. Because the clean-up task was beyond many homeowners, the burden fell on the local council.
Commercial leases and residential tenancies

Legal issues around commercial and residential tenancies arose immediately in Christchurch in the post-earthquake period. There were no robust definitions of “untenantability” (commercial leases) and “uninhabitability” (residential tenancies), terms that become vitally important in a non-tranquil environment. The term “untenantable” in cl 26.1 of the standard form Auckland District Law Society Lease for commercial premises lacks definition. As Greenwood (2012) points out (p 63), there are no parameters to help determine:

- at what point premises become incapable of occupation (the applicable judicial test simply indicates that a “degree of permanence” is required but provides no certainty as to when such a degree of permanence will be reached); and
- what factors may point to untenantability, such as
  - the degree or extent of damage to the building and/or premises,
  - whether the premises can in fact be accessed at all, and
  - whether premises can reasonably be considered to be “inhabitable” (e.g. having regard to whether working power or sanitary systems are available.

A good example of the problems that arose after the earthquake is the Court’s ruling in GP 96 Ltd v FM Custodians Ltd. The building in which the plaintiff lessee was providing economy level accommodation, was both damaged and within the CBD cordon. Access by the public was impossible for months. The Court, counting both the current term of the lease and two six year rights of renewal, failed to find the necessary degree of permanence to render the premises “untenantable” and terminate the lease.

---

A number of Tenancy Tribunal decisions concerning residential tenancies were appealed to the District Court. One particular appeal gives the best guide as to the threshold of uninhabitability.⁵ Although the tenant and his family had no electricity for 5 days, were without water or sewerage for some 10 days, were unable to use their toilet for three weeks, were concerned about the safety of the garage and (most importantly in their minds) were terrified that a very suspect chimney would collapse in subsequent earthquakes and aftershocks into living/sleeping areas of the house, the Judge did not consider these factors met the threshold of “uninhabitability”. In his view, the meaning of that noun had to be assessed “in the light of prevailing conditions and expectations of the particular community at that particular time”.⁶ Quite understandably, the courts viewed the situation from both a tenant’s and landlord’s perspective. In many cases, the landlord, requiring rental payments for mortgage commitments, was enduring the same conditions in his or her own home. In any law review exercise, an explicit definition of “uninhabitability” in the Residential Tenancies Act 1986 or equivalent legislation is mandatory.

Tenancy issues were a major issue after both Hurricane Katrina and Superstorm Sandy, much more so than commercial leases. While both highlighted the difficulties that arise after a natural disaster, the writers found no particular solutions to draw on.

*Employment/labour law issues*

The Canterbury earthquakes, particularly that of 22 February 2011, generated a substantial demand for legal advice about employment issues. Much of this demand was met by lawyers in private practice, but the local Chamber of Commerce was also heavily involved. Several of our survey respondents noted that familiar issues such as redundancy and health and safety obligations presented themselves in very different – and difficult – guises, in particular because the damage to the Christchurch CBD- was followed quickly by the imposition of a “red zone” cordon and then by the relocation of many small and medium sized workplaces to other locations in the city or suburbs.

⁵ Watkin v Brazier Property Investments Ltd, 28/11/11, Judge P R Kellar, Christchurch, CIV-2011-009-001006

A government survey found that 59.8% of Christchurch workplaces in the Professional, Scientific and Technical sector (which includes law, accountancy and architect businesses) relocated part or all of their operations as a result of the earthquakes, while rates for other sectors were significantly lower (Labour Department 2011). Pressure to resolve employment issues was substantially eased within days of the February earthquake because the Government provided substantial funding to employers to retain staff for some weeks. Without that the problems would have been much worse – as would the demand for assistance to obtain unemployment benefits.

This last point seems to us to be a key one. If employers and employees have some substantial financial support from the state, employment issues may not become urgent. Absent that support, there will need to be a substantial diversion of energy and resources into dealing with employment issues – with all the consequences that may have for any return to “normal” business and economic activity.

The American experience appears somewhat different. Employment issues are not treated as a major and pressing legal problem. For example legal assistance provider manuals generally mention employment issues only in the context of survivor eligibility for unemployment benefits, although a later handbook for lawyers assisting with post- Hurricane Katrina issues had significantly more material on a range of employment issues (Morrison & Foerster LLP/ABA, 2007). Nor did our interviews show employment as a pressing issue in the response and recovery phase after Katrina, or in New Jersey after Superstorm Sandy (as there the major impact of the storm was on residential areas). The position in New York State was somewhat different. Employment issues were reportedly a key issue in early calls for legal assistance (Acello, 2013), a view echoed by one New York interviewee, but not by others.

Custody and other family law issues
Amid the chaos of malfunctioning courts in both Canterbury and the Gulf states, custody and other family law issues caused significant problems. In the post-earthquake period in Christchurch, there was a huge spike in custody issues, especially around relocation. A Christchurch earthquake relocation study (Caldwell
and Maynard, 2012) interviewed all seven of the Christchurch Family Court judges and 29 family lawyers captured some of the difficulties faced by family law professionals. The researchers found the lawyers surveyed had very contrasting views of the genuineness of earthquake impact and stress advanced as a basis for a relocation. The Judges were somewhat more empathic towards a terrified and traumatised parent who, at the time, just wanted to leave the city but observed that that primary motive often “evolved into something more than earthquake relocated”.

When given the researcher’s data that showed that Christchurch Family Court Judges leant towards making return orders, one Judge observed that:

… the judges would apply the appropriate balancing exercise, and weigh all the factors without any formalised preconceptions, but there was an “underlying staunchness” about earthquakes and relocation. That staunchness …became part of the “judicial psyche” in the city.

American experience with family issues after disasters has been mixed. A number of authors have all identified the family law area as one of the most unsatisfactory aspects of the incompetent disaster response to Hurricane Katrina. Tens of thousands of evacuees left their homes, many taking with them children for whom they were not the custodial parent. The problem was exacerbated by the timing of the storm which struck on a Monday, the normal day on which visitation periods ceased. In some cases it took more than six months to reunite children with the custodial parent. The scale of the problem – and the incompetent governmental response was summed up by Lauten and Lietz (2008) thus (p 178):

In the five months following Katrina, the National Center for Missing and Exploited Children (NCMEC) identified just over 5,000 missing or unaccompanied children in the Gulf States, with over 4,500 from the Louisiana area alone.

As those authors describe, the lack of any effective centralised information agency in the first weeks of the disaster was crucial. In some cases identification depended on ad hoc responses by medical teams (Brandenburg et al, 2007).

Attempts to deal with custody disputes were hampered by the sheer difficulty of tracing the other individuals involved, and by victims and evacuees not having their own copies of relevant documents while court records were unavailable or
sealed. One interviewee suggested this should be addressed by technology and the determinations embodied in custodial orders being placed on a public record.

The focus on post-Hurricane Katrina custody issues has diverted attention from the very significant increases in domestic violence levels that took place when families which had separated were forced back together with bad effects as many women had no alternative safe places to go.

By contrast interviewees in New York and New Jersey considered Superstorm Sandy had not given rise to many family law issues or problems, and some contrasted this with the great number of very complex family law matters arising from the World Trade Centre attacks.

**The overarching social needs for a functioning legal system and for legal advice**

Over and above the specific issues identified above, we have found two constant themes running through our research findings - the expressed need to have the courts functioning, even in a limited way, as soon as possible after a natural disaster, and the need for effective means of disseminating accurate legal information as soon, and as widely, as possible.

*The Courts*

The court system in Canterbury features prominently as being very ill-prepared for the seismic events. The major problem for practising barristers was access to courtrooms – somewhere where they could physically conduct their business.

Some time after the February 2011 earthquake, the Ministry of Justice found a number of sites around Christchurch to place the various court sittings. These ranged from scheduling trials and fixtures in Timaru (150 kilometres south), in outlying towns in Canterbury, on a marae and at a Prison. Civil trials moved out of Christchurch altogether and were conducted in Wellington and Auckland.

The spread out nature of the replacement courts was cited by many of our interviewees as a huge stress. Lawyers had to travel huge distances which was time-consuming, expensive and inconvenient. Moreover, the roads were damaged and
traffic flows were unpredictable. The reallocation of scheduling dates was done without consultation with practitioners and without any consideration of the lawyers’ other commitments. One practitioner described the court travel as “exhausting”. Administration and office work (up to 4-5 hours) was completed in the evenings. However, one success story must be mentioned. The marae court functioned extremely well and it was widely recognised that it created much more empathetic surroundings for the young defendants whose behaviour, in response, improved remarkably.

As with other areas American experience varies widely. The State of California Administrative Office of the Courts, in pursuit of top-line preparedness in the event of a natural disaster, selected Bold Planning solutions for their state-wide Continuity of Operations Planning Programme. It created a customised California Courts planning system designed to match the specific planning needs of court planners. Training programmes include short and long term relocation plans including facility and IT requirements.

A Judge in New Orleans painted a different picture of the New Orleans’ judicial response to Hurricane Katrina. Courts had to be closed to circumvent statutory prescriptive deadlines and subsequent extensive litigation if those time limits were not met. The lack of any prior plan for such closure caused major problems. If a lawsuit had to be filed in a districts unaffected by the storm, little sympathy was given to the hurricane-struck lawyers. “We are opening and functioning so the fact that you are not showing up is contempt”. The Judge stressed that the positive action that the Courts took to lobby for an Executive Order which suspended the statute of limitation issues, after extensive consultation with legislators, and lawyers for both plaintiffs and defendants.

Amid the lessons learnt, there is now a process in place whereby the Chief Justice will issue a closure warrant for a designated period which can be extended if necessary; to solve communication issues, every Judge, as well as their official website, must have a personal email address and an emergency contact on file; and the website housed off-site.
In a further interview, an example of prisoner custody was given. On the day Hurricane Katrina hit, there were 8000 prisoners in Orange Parish Prison and these men had to be moved after the city flooded. They were disbursed wherever the authorities were able to put them, and this was considered acceptable. They had no ID and when their cases eventually came up the representing lawyer may well have had to travel five hours simply to interview his client. The interviewee commented that the system has now been tightened and the introduction of wristbands has led to a much better tracking system.

Providing legal advice and assistance

Disaster survivors must be able to access legal advice and information. As Noble (1995) pithily said (P 4):

Disaster victims need to understand their rights, interests and possible options clearly and effectively.

The nature of the advice will depend on the disaster and the surrounding circumstances, but the need is entirely predictable. Unfortunately experience also shows that measures to supply the need will usually not be in place – or even contemplated – when disaster strikes. Some key points are evident.

Provision for legal assistance and advice is rarely part of official government agency planning. It does not appear in the New Zealand civil defence framework, nor is it generally to be found in the US plans. This is a major omission. As Alice Morey (2013) has stated “Early integration of legal services into the city’s disaster recovery efforts is crucial and should be prioritized.” Many interviewees echoed that view.

Experience of the Canterbury earthquakes and North American disasters shows that -related agencies and organisations responsible for assisting with advice and assistance after a disaster must have their own – disaster-proof - plans and facilities. In Christchurch the Community Law Centre – the principal source of legal advice for low or no income groups - lost both its city centre headquarters and the branch office in the most seriously affected suburbs. The same kinds of events happened in New Orleans and some locations affected by Superstorm Sandy, but
responses generally involved a much greater involvement by staff and volunteers in making direct contact with survivors.

Any agency which expects to be providing legal assistance and advice must create and maintain appropriate structures and resources which can be employed when a disaster occurs. This did not happen in Canterbury or in the areas affected by Hurricane Katrina, except where the American Bar Association was able to deploy its disaster assistance program. By contrast when Superstorm Sandy struck, the New York and New Jersey State Bar Associations were far more ready to act, even though the New Jersey SBA – the only one in the USA to have a complete disaster readiness programme – did not need to invoke it state-wide. We stress the need for constant checking that any disaster programme is in readiness, and that critical links have not been lost.

A more complex issue is the content and nature of information which is to be distributed. The mode of communication is most important. Governmental agencies, in particular, may consider that information has been adequately made available when it is placed on the agency’s website. This is not so. As was evidenced after Hurricane Katrina, Superstorm Sandy and in Canterbury, many survivors will simply not have access to the internet – either because they do not own appropriate devices and public facilities are closed, or because disruption of electricity supplies and telecommunications infrastructure prevents or severely limits access. Further, often website information cannot be readily absorbed. Very often information was only available in English, something which immediately posed problems for persons from non-English speaking backgrounds (NESB). Worse, much of that material may require a level of fluency not possessed by many people – including native English speakers. Government websites concerned with the Canterbury earthquakes sometimes required a reading level of 18+, well above the norm for many New Zealanders and far higher than most NESB survivors (CMIAG, 2012). In the aftermath of Hurricane Katrina multi-lingual material was slow to appear but after Superstorm Sandy legal assistance agencies still had to translate available material into other languages, but this was achieved within days. Much can be learnt here from the approach of Santa Clara County, California, where the emergency planning agency has material prepared in 5 languages (of the 162 used by community
members) and employs public information officers who speak these languages and can appear on radio and television channels presented in them.

We may conclude this section by asking where we can find the human resources to make such pro-active assistance possible. The answer is quite simple. Law students need to be mobilised. There was an enormous volunteer response by law students after Hurricane Katrina, Superstorm Sandy and the Christchurch earthquakes. After Sandy many students from the affected states – but few from interstate - did the same kind of work. In Canterbury, the law students were predominantly involved in non-legal work. Our university is proud of the Student Volunteer Army which did much to clean up liquefaction in Christchurch, but perhaps the law students involved would have done more good with law books and community connections than with shovels.

**Conclusion**

This paper has canvassed a range of legal issues which have arisen in the aftermath of natural disasters in Canterbury and in the United States. The experience of those jurisdictions shows that there is a substantial legal dimension to the disaster response and recovery phases. Existing law has proved inadequate and reform is needed to mitigate the consequences of future disasters. Any such reform must involve assessing good practice models from overseas jurisdictions. However law reform alone will not be enough. There must be planning for the application and enforcement of improved laws. Most essentially disaster response planning must incorporate from the outset effective plans to enable the courts to function, and disaster survivors to obtain accurate and timely legal information. Unless this is done, management and recovery efforts by government agencies and survivors alike will be made more difficult and slower than necessary. Improvement is possible and essential.
REFERENCES

Acello, R. (1 March 2013) “ABA responds to Superstorm Sandy with a reinforced disaster response plan”, ABA website post


Interviews with the following: Sharon Balsamo (New Jersey); Carmelite Bertaut (New Orleans); Alison Besunder (New York); David F Bienvenu (New Orleans); Cheryl Buchert (New Orleans); Linton Carney (New Orleans); Robert Christopher(California); Claire Clark (California); Nancy Claypool (New Orleans); Kevin Cremin (New York) John Ducey (New Jersey); Malcolm Franklin (California); Mike Haber (New York); Helena Henderson (New Orleans); Clark Holland (California); Charles Hollenbeck (New Jersey); Dr Laurie Johnson, (California); Justice Madeleine Landrieu ((New Orleans); Kevin Lane (California); Wayne Lee (New Orleans); E Allan MacDuffie Jr (New Jersey); Judson Mitchell (New Orleans); Alice Morey (New York); John Osteras(California); Wendy Patrick (California); Rachel Piercey (New Orleans); Professor Donald Polden (California); Michael Roddy (California); Todd Sidor (New Jersey); Professor William Siembada (California); Cindy Stewart (California); Gael Strack (California); Kenneth Topping(California); Professor Charles
Weisselberg (California); Meg Williamson (California) and Jeanette Zelhoff (New York), and also with a number of New Zealand respondents who have preferred to remain anonymous.


Morey, A “ Superstorm Sandy: Lessons Learned for the Legal Profession” Testimony before the ABA Committee on Disaster Response and Preparedness, April 12th 2013 available at http://www2.nycbar.org/citybarjusticecenter/blog/2013/05/14/superstorm-sandy-lessons-learned-for-the-legal-profession/


Watkin v Brazier Property Investments Ltd, 28/11/11, Judge P R Kellar, Christchurch, CIV 2011-009-001006
Shooting them isn’t the answer…

Why pets matter in disasters.

Abstract

With over 44% of those failing to evacuate during Hurricane Katrina doing so in part because they were unable to take their pets, the issue of pets in disasters has become a major issue and focus for emergency managers worldwide. The academic consensus is that pets are seen as part of the human family and that leaving them behind in an evacuation is contrary to public safety. This paper explores the human-animal bond and the implications of this for emergency managers and responders through an assortment of literature and media articles, providing the basis for taking an evidence based approach to companion animal emergency planning. Finally, a short commentary is offered on the development of the Civil Defence Disability Assist Dog tag in New Zealand and its benefits for the community and emergency response organisations.

Keywords  Pet, animal, disaster, evacuation, emergency management, disability, tag.

With most Australians and New Zealanders owning pets, it is no wonder we find the issue of pets in disasters highly emotive and topical. The human-animal is extremely powerful in an emergency management context, both in creating opportunities to enhance public safety, but also a major risk if pets are not included in emergency management arrangements.
The human-animal bond is frequently illustrated in the media and by the examples in our day to day lives. Most emergency responders are pet owners too and can understand that companion animals are seen as family members, with confirmatory surveys finding close to 100% of pet owners seeing their animals as part of their family (Irvine, 2009; Glassey, 2010).

But even the most hardened hero’s are found to be compassionate toward animals, even in major disasters and crises. In Australia, who can forget the photograph of David Tree, a County Fire Authority Firefighter giving a drink of water to an injured Koala bear during the 2009 bushfires? That same year in New Zealand a gunman took the lives of two police officers in a crisis known as the Napier Siege. Despite the uncertainty that the offender, Jan Molenaar was still alive, armed police re-entered the hot zone to retrieve police drug dog “Fi” who was thought to be dead from her handler’s vehicle outside the gunman’s address. Armed police during the operation also undertook covert missions to feed the pets of surrounding properties after evacuated pet owners raised their concern (TVNZ reporter, personal communication, 2010).

But it has taken some time and some hard lessons for the emergency management sector to take the issue of pets in disasters seriously. Many of the best practices in companion animal emergency management stem from Hurricane Katrina. In August 2005, Hurricane Katrina struck the Gulf Coast of the United States of America. In its wake, it left US$110 billion in damage and 1,836 people dead making it the third deadliest disaster in US history. This disaster also highlighted the importance of companion animal emergency management with over 50,000 pets being left behind during the evacuation of New Orleans and 80-90% of these pets perishing (Anderson & Anderson, 2006; Shiley, 2006). What was anticipated to be over within a few days turned into a disaster beyond comprehension and triggered the largest animal rescue operation in US history – an operation that rescued approximately 15,000 pets supported by some 5,000 volunteers (Shiley, 2006). Prior to 2005, it was FEMA policy that pets should be left behind during evacuations – this has now been completely changed with the introduction of Pets Evacuation & Transportation Standards (PETS) Act. The single most compelling fact for emergency managers to learn from Katrina was that approximately 44% of the people who did not evacuate for Hurricane Katrina stayed, at least in part, because they did not want to leave their pets behind (Fritz Institute, 2006).
Though there may be a legal power to evacuate people without their pets, from an evidence based approach to emergency management, let alone a moral obligation – pets need to be evacuated along with their other family members. Even Oprah Winfrey typifies the public opinion that owners will generally not evacuate if unable to take their pets (Oprah Winfrey Network, 2011) and according to the classic works of Auf der Heide (1989), emergency planning should be based on “likely behaviours” not “correct behaviours” – that is we should plan on how communities are likely to act, not how we want them to act.

If we take a vulnerability approach to animal emergency management emergency management, companion animals are the least vulnerable when contrasted to laboratory animals and intensively farmed animals (Irvine, 2009). In the 2010 Darfield (Canterbury) earthquake over 3,000 animals were killed (Glassey & Wilson, 2011). In September 2000, several tornados destroyed twelve battery farming sheds outside of Croton, Ohio. Over one million birds were trapped in mangled cages (Irvine, 2009). So despite pets being the least zoologically vulnerable, specific legislation namely the PETS Act was passed in the US following Hurricane Katrina. Pets are an emotive issue because of the human-animal bond, in effect each pet is bonded to a voter – pets in disasters is political, hence the landslide passage of the PETS Act with 349 to 29 votes in the US House of Representatives.

The PETS Act has specific provisions that mandate emergency planning to incorporate the rescue and care of pets and service animals, it creates funding mechanisms to assist with such planning and response, and obligates the rescue and care of pets and service animals in an emergency. No such specific legislation exists in New Zealand or Australia. We can learn the lessons the easy way or the hard way from Hurricane Katrina – there are many reasons why the PETS Act was passed and related programmes resourced. Simplistically put, saving pets equals saving people.

Do we really apply an evidence based approach to emergency management in Australasia, or do we only do so when it suits? So what is the evidence behind companion animal emergency management? And how can it convince ourselves, our peers and community leaders to take this issue seriously?
There is academic consensus that pet owners are more likely to refuse to evacuate if they are required to leave their pets, placing them and public safety personnel at risk (Anderson & Anderson, 2006; Basler, 2006; Edmonds & Cutter, 2008; Health 1999, Irvine, 2009; Leonard & Scammon, 2007; Shiley, 2006). Locally, the Queensland Times (2010) ran an online poll and found that 60% of Queenslander’s would not evacuate if they could not take their pets.

Even if pet owners are forced to leave their pets behind (as in Hurricane Katrina, Napier Siege and many other emergencies), pet owners are likely to become determined to re-enter evacuated areas to reclaim their pets, despite advice of public officials – putting themselves and public safety personnel at risk (Heath, 1999; Irvine, 2009; Nolen & Rezendes, 2006; Williams, 2006). In a survey of New Zealand pet owners, 58% of respondents indicated they would likely return to rescue their pets if left behind, despite advice from public safety officials (Glassey, 2010). In the 1997 Yubba County Flood event, 80% of those who re-entered the evacuation zone without authorisation, did so to reclaim their pet (Heath, 2001).

And when pet owners do evacuate with their pets, they provide a pre-existing and strong psychosocial support mechanism with over 63% of surveyed pet owners identifying their pets as an important coping tool during times of stress (Glassey, 2010). By forcing pet owners to leave their pets in a disaster, pet owners are more likely to be psychologically impacted (Edmonds & Cutter, 2008; Hunt et al, 2008; Heath, 1999; Gerwolls & Labott, 1994). So we are actually harming our communities by not evacuating pets and putting their safety, along with the safety of our front line personnel at risk.

Many emergency management organisations have key performance indicators to reach around public preparedness. Being pro-active with companion animal emergency management is likely to improve community preparedness levels with pet owners being more likely to take preparedness measures that will benefit their pets than they are to protect themselves. (Leonard & Scammon, 2007; Selbert, 2002).

Pre-planning should address the issue of response capacity including spontaneous volunteers. Spontaneous animal rescue volunteers can both impact positively and negatively on response and recovery operation (Anderson & Anderson, 2006; Shiley, 2006). In Hurricane Katrina over 5,000 volunteers from across the country deployed
(including self-deployed) to the disaster affected area. Some of these volunteers were well trained, part of formal emergency response systems with specific training in animal and disaster response. Others were not so well prepared logistically, psychologically or physically. In the Mike Shiley film *Dark Water Rising* (2006), spontaneous volunteers are shown looting, drinking excessively and psychologically exhausted. Anderson and Anderson (2006) also provide evidence of some spontaneous volunteers removing dog collars and identification in the belief that the animal’s owners did not deserve to have the animal back after abandoning it. Accredited animal rescue teams are required, just as animal control officers are not Firefighters, rescue professionals are generally not animal specialists. An accredited capacity is needed and through the work of John Haven from the University of Florida, the National Fire Protection Association has added a new chapter on animal rescue to the NFPA Standard on Technical Rescue Operations and Training (NFPA1670. 2014 edition).

In a propane carriage derailment in Weyauwega, Wisconsin (1996), the entire town population of 1,700 people were evacuated and pets were not. Within 4-5 days 50% of owners had attempted to illegally re-enter the evacuation zone to rescue their pets and frustrated with the lack of action by local emergency services, a bomb threat was made to the Emergency Operations Centre (Irvine, 2009). The take away from this conference is that leaving pets behind during an evacuation is not okay. Pet owners feel strongly toward their pets. Don’t under estimate what lengths they will go to, to save their pet. A bomb threat to an EOC will ruin any emergency managers day.

Finally, I take the opportunity to share some good news arising from lessons learned from the Canterbury earthquakes. Traditionally, there has been only a few and quite distinctive disability assist dogs such as for those assigned to the blind as guide dogs. Today, there are genuine disability assist dogs for those members of our communities who are impaired with deafness, autism, epilepsy and anxiety disorders – these dogs come in all shapes and sizes now. The unfortunate by-product though is a loss of identity for disability assist dogs making it easier for pet owners to purport or impersonate that their dogs is service animal so they can enjoy access rights to public places and transportation, when in fact it is just a much loved pet. Certainly the in USA, there is a growing problem of fake service dogs, with identification vests available without question on the internet (Warren, 2014). In New Zealand, this has also happened, but not to the same extent – yet. However, in my previous role as the Chair of the National Welfare Coordination Group (General Manager,
Emergency Management, Ministry of Social Development), I led a project based on the research undertaken by myself and Dr Thomas Wilson (2011) which highlighted the need for bona-fide Disability Assist Dogs to be easily identified in an emergency. The result was the development of the Civil Defence Disability Assist Dog tag (figure 1), which by using the Civil Defence logo became nationally recognised and protected from misuse under the Civil Defence Emergency Management Regulations 2003 (as the logo has statutory protection). Over 200 disability assist dogs in New Zealand are now eligible for the world’s first disaster identification tag for service animals which will result in rapid reunification of disability assist dogs should they become separated from their handler, as well as making it easier for evacuation centre and emergency service personnel to identify legitimate service dogs in future emergencies. The dog exemplifies how research and taking an evidence based approach to companion animal emergency management can save the lives of people, through protecting pets and service dogs.

![Figure 1: Disability Assist Dog Civil Defence tag. (Source: Ministry of Civil Defence & Emergency Management).](image)

By applying the evidence and lessons from this presentation emergency managers can save shooting themselves in the foot, by taking a positive and grounded approach to companion animal emergency management.
Bibliography


Here we go again: Views of Short-Cycle Disaster Preparedness in the Australian Context

Associate Professor John Rice
Griffith Business School
Griffith University
Gold Coast, Queensland 4222

Doctor Nigel Martin
The ANU College of Business & Economics
The Australian National University
Canberra, Australian Capital Territory 0200

Paper Presented at the
Australian and New Zealand Disaster and Emergency Management Conference
Surfers Paradise, Gold Coast (QLD), 5-7 May 2014
ABSTRACT: In this study preparedness is defined as the readiness of a jurisdiction to act in response to threats from the environment in a way that minimises the negative impacts on individuals’ health and safety, and the functioning of physical structures and systems. This paper presents a six part preparedness framework and accompanying analysis using inputs from individual and business stakeholders who have been subjected to multiple disaster events within short time frames. The results show that Australia is under prepared for higher frequency disasters in several important areas. Consequently, government and business must invest more resources in order to develop better protected homes and hardened infrastructure; grow and sustain interoperable emergency services workforces and surge capabilities; strengthen medical, surgical, pharmacy and disease control response teams and assets; and improve household planning and community-level preparations, including raising disaster event awareness and sharing preparedness information. The increased incidence of disaster events, particularly those occurring in short cycle timeframes, suggests that improved preparedness is an urgent and immediate national priority.

Keywords: disaster, framework, preparedness, short-cycle, stakeholders

Introduction

Australia, by virtue of its geographic proximity to large oceanic masses of water, has suffered several major natural disasters dating back to the late 1800s when Cyclone Mahina struck the Gulf of Carpentaria in Northern Australia killing over 400 people and decimating local communities (Nott and Hayne, 2000). In the recent past, severe bushfires, extensive flooding and high powered tropical cyclones have delivered several debilitating blows to Australian cities and regional areas (e.g. Victorian Bushfires 2009 and 2011, Queensland Floods of 2011 and 2013, Tropical Cyclones Ingrid 2005, Larry 2006 and Yasi 2011) (Commonwealth of Australia, 2013). As the frequency of disaster events increases (more short-cycle events), it is critical that we understand the level of preparedness in our communities (Commonwealth of Australia, 2013). Note, as this article is being prepared, 100 of the worst bushfires experienced in over 45 years are sweeping across New South Wales, Australia (Levy, 2013). The aim of this paper is to build and exercise an analytical framework that expands our understanding of disaster preparedness.

Disaster preparedness is ‘the readiness of a political jurisdiction to react constructively to threats from the environment in a way that minimises the negative consequences of impact for the health and safety of individuals and the integrity and functioning of physical structures and systems’ (Perry and Lindell, 2003). Importantly, our preparedness framework includes the following aspects: (i) personal and household preparedness; (ii) health and medical services and disease control; (iii) emergency services delivery; (iv) major infrastructure preparedness;
warning systems and services; and, (vi) insurance, loss adjustment and asset recovery services (Prizzia and Helfand, 2001; Kenreuther and Pauly, 2006; Kapucu, 2008b; IFRC, 2009; Patricelli et al., 2009; Van De Walle et al., 2010). The research method employed a qualitative data set (provided by the Australian government) and structured coding techniques to identify priority areas in the preparedness posture. In doing this, we have sought to answer two major questions:

1. What are the major areas of importance in our disaster preparedness framework? The extraction and analysis of community stakeholder views will enable identification of disaster preparedness priorities.

2. What are the critical shortcomings in disaster preparedness that require investment? Recurring disaster events will require specific improvements in preparedness actions and spending over time.

Our study will answer these questions using a systematic analysis of disaster preparedness within the context of Australia. The balance of the paper will review some of the more relevant disaster preparedness literature, develop the analytical framework for disaster preparedness, outline the study’s methodology, discuss the major findings, and present concluding statements.

**Disaster preparedness literature**

Past examinations of disaster preparedness argue that the construct is multifaceted and includes combinations of measures such as hazard analysis and mapping, disaster planning and community drills (Delica, 1993); or warning and forecasting systems and activities, community education and training, pre-planning and logistics support, and human, equipment and financial resources (Banerjee and Gillespie, 1994). Follow–on studies of preparedness suggested that the conduct of agency and inter–agency drills, the development of disaster coping skills, and substantial improvements in community–wide information delivery and early warning communications are the cornerstones of disaster preparation (Prizzia and Helfand, 2001; Rocha and Christoplos, 2001; Perry and Lindell, 2003; Thomalla and Schmuck, 2004). In a collective sense, these multiple preparedness actions and activities are aimed at ‘reducing people’s vulnerability to disasters’ (Luna, 2001).

Other studies show that community based preparedness, which combines planning, mitigation and institutional developments, assists in the creation of ‘well prepared’ citizens that work cooperatively across social settings and regions (Rocha and Christoplos, 2001; Thomalla and Schmuck, 2004; Allen, 2006; Boin and McConnell, 2007). This type of
preparedness was considered to be important in the case of vulnerable or disadvantaged communities (James et al., 2007; Wingate et al., 2007). In addition, these working arrangements can be complemented with legal instruments, technology investments, and bolstered infrastructure assets (Rohrmann, 2000; Basher, 2006; Troy et al., 2007; Collins and Kapucu, 2008; James, 2008; Kapucu, 2008a; Patricelli et al., 2009). In sum, preparedness at the personal and community levels presents as highly important and concomitant in nature (Rocha and Christoplos, 2001; Paton, 2003; Thomalla and Schmuck, 2004; Allen, 2006; Kapucu, 2008b).

Now, in the case where countries or regions suffer multiple disasters within short timeframes the literature suggests varying paths for preparedness (Banerjee and Gillespie, 1994; Thomalla and Schmuck, 2004; Mayer et al., 2008). In some earlier studies, disaster preparedness was examined from a multi-dimensional perspective that combined planning, training and resources allocation, and exposed the deficiencies in each of these measures (Banerjee and Gillespie, 1994). Further analysis showed that deficiencies were subsequently rectified with changes to planning, education and training drills, personal readiness, community infrastructure, and resources allocation (Banerjee and Gillespie, 1994). Accordingly, communities can learn from their ‘lack of preparedness and experiences’ and make positive changes for the future (Thomalla and Schmuck, 2004).

However, other studies painted a slightly different picture. As an example, Mayer et al. (2008) presented a study where the state of preparedness changed little after a disaster event. Importantly, the study went on to highlight that improvements in planning, personal readiness, infrastructure robustness, data protection, and insurance were critical for future disaster preparedness (Mayer et al., 2008). Hence, we adopt this second path where changes in preparedness must be prioritized and progressed.

Disaster preparedness framework

In developing our analytical framework, we noted that researchers have developed multifaceted preparedness models (Delica, 1993; Banerjee and Gillespie, 1994; Matsuda and Okada, 2006). As an example, a disaster preparedness index may include a mix of individual and community level measures, including household security and safety, emergency supplies and storage, fire safety training and skills, emergency contact lists, safety shelters and meeting locations, special needs citizen procedures, and community support (Matsuda and Okada, 2006). Table 1 summarises the personal and community level aspects of disaster preparedness in our framework.
Table 1. Disaster Preparedness – Analytical Framework

<table>
<thead>
<tr>
<th>Serial</th>
<th>Preparedness Aspect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personal and household preparedness</td>
<td>Individual citizens and their households are prepared for a disaster or adverse event.</td>
</tr>
<tr>
<td>2</td>
<td>Health, medical services and disease control</td>
<td>Health agencies and medical services providers can respond to a disaster or adverse event. Disease control measures can be enacted following a disaster.</td>
</tr>
<tr>
<td>3</td>
<td>Emergency services delivery</td>
<td>Emergency services personal and assets are available and deployment ready for a disaster or adverse event.</td>
</tr>
<tr>
<td>4</td>
<td>Major infrastructure preparedness</td>
<td>Water, power, transport and telecommunications infrastructure is disaster-ready with backup and work-around options.</td>
</tr>
<tr>
<td>5</td>
<td>Warning systems and services</td>
<td>Disaster warning systems and services are prepared and deployment-ready for a disaster event.</td>
</tr>
<tr>
<td>6</td>
<td>Insurance, loss adjustment and asset recovery services</td>
<td>Affordable insurance and loss adjustment services are available and prepared to respond to policy holder requests for assistance and claims.</td>
</tr>
</tbody>
</table>

First, we present that individuals and the larger community must assume some responsibility for personal and household readiness (Paton, 2003; Thomalla and Schmuck, 2004; Twigg, 2004; Kapucu, 2008b). Individuals must acquire the knowledge and skills to prepare themselves and their households to cope with the disaster event (Matsuda and Okada, 2006).

Second, health agencies and medical service providers must be capable of responding to a disaster (Prizzia and Helfand, 2001; Abramson et al., 2007; Nelson et al., 2007). In addition, disease control will form an integral part of the response protocol (Watson et al., 2007).

Third, in the event of a disaster, emergency services agencies must be adequately resourced and in a state of readiness to respond to unfolding events (McGee and Russell, 2003; IFRC, 2009; COAG, 2011; AFAC, 2013). In the event of more short cycle disaster events, emergency service agencies will require interoperable and highly mobile surge capacity resources to cope with services demand (Waugh and Streib, 2006; COAG, 2011).

Fourth, major infrastructure assets must be prepared for disrupted service delivery, combining critical backup and work-around options (Simpson et al., 2005; Chang et al., 2007; Patricelli et al., 2009; COAG, 2011). Adequate preparation to supply water, power, transport and telecommunications networks and services following a disaster will be critical for first response and ongoing recovery activities (Luna, 2001).

Fifth, disaster warning, forecasting and communications systems and services are major tools for community preparedness and emergency services response (Basher, 2006; Troy et al., 2007; Collins and Kapucu, 2008; Van De Walle et al., 2010). Community emergency warning systems are a critical element of disaster preparedness (Van De Walle et al., 2010).

Sixth, insurance providers and loss adjustment agencies must be capable of responding quickly and effectively to urgent requests for assistance (Kenreuther, 2006; Picard, 2008).
Indeed, slow response to insurance claims assessment and payouts can add to the already high social and emotional costs of the disaster event (Kenreuther and Pauly, 2006; Picard, 2008).

In summary, the framework represents key aspects of preparedness in the context of severe weather events and natural disasters experienced in Australia, and much of the world. They are also a unique ‘basket of preparedness’ items that may require some level of modification in order to meet the challenges of future disaster events. In this broader sense, their examination provides a further kernel of knowledge in the discipline of disaster preparedness.

Research Method

Data Source and Collection

The data was acquired on 17 April 2013 from the Australian Government using community stakeholder submissions to the public inquiry into the preparedness for extreme weather events (Commonwealth of Australia, 2013). The committee was tasked to investigate the preparedness of industry sectors and emergency services (including resources allocations); recovery and rehabilitation costs; and the availability of affordable insurance services in the light of more frequent and extreme weather events (i.e. droughts, bushfires, heatwaves, floods, storms, and cyclones) (Commonwealth of Australia, 2013; IPCC, 2013). Accordingly, stakeholder submissions provided a ready source of data for analysis. The 334 usable stakeholder inputs were compiled for a structured analysis (note, some stakeholders provided promotional and unrelated materials that could not be used in the analysis) (Commonwealth of Australia, 2013). A summary of the stakeholders is depicted in Figure 1.

The stakeholder response profile shows that individuals provided 69% of the comments on disaster preparedness, with Non-Government Organisations (NGO) providing approximately 25% of comments. In the NGO segment of the data, groups associated with the environment and sustainability (e.g. World Wildlife Fund); public policy and research (e.g. Australian Research Council Centre of Excellence for Climate Systems Science); health and medicine (e.g. Australian Red Cross); and, community and social services (e.g. Australian Council of Social Service) offered the largest number of submissions on preparedness. The data set has very few inputs from Government Organisations (GO) and business, although the insurance industry is represented by Australia’s two largest insurance firms (i.e. Insurance Australia Group and Suncorp). In sum, these stakeholders have extensive recent experiences and risk exposure to disasters within the Australian context.
Research Technique and Analysis

The qualitative research method structures and codes the data to the analytical framework (Denzin and Lincoln, 2011). The study is consistent with stakeholder research that seeks to collect and process inputs to specific areas of tension or concern (see Freeman et al., 2004). We took specific advice on the need for a data structure that is closely matched to the scope of the preparedness inquiry, and congruent with the analytical framework (Corley and Gioia, 2004; Commonwealth of Australia, 2013).

In order to analyse the data, the ‘Preparedness Project’ was created using the QSR NVIVO Version 10 analytical software (Walsh, 2003). The collected data files were saved to the internal documents folder of the project. A tree node structure was developed with Preparedness assigned as the apex node, and the six aspects of preparedness serving as major branches. Statements addressing the issue of preparedness (932 in total) were drawn from the stakeholder submissions, matched and coded to the analytical framework, and reviewed and agreed by the researchers within the major branches to maintain and assure integrity of the analysis process (Corley and Gioia, 2004). The coded branches were then axially collapsed into summaries for each preparedness aspect (Denzin and Lincoln, 2011). Table 2 shows a breakdown of the coded statements by preparedness aspect and stakeholder groups.
Table 2. Summary of Stakeholder Statement Coding

<table>
<thead>
<tr>
<th>Serial</th>
<th>Preparedness Aspect (No. of Statements)</th>
<th>Stakeholder Statements – Total Coded (n = 932)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Individuals</td>
</tr>
<tr>
<td>1</td>
<td>Personal and household readiness (216)</td>
<td>86</td>
</tr>
<tr>
<td>2</td>
<td>Health, medical services and disease control (176)</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>Emergency services delivery (110)</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Major infrastructure readiness (158)</td>
<td>52</td>
</tr>
<tr>
<td>5</td>
<td>Warning systems and services (57)</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Insurance, loss adjustment and asset recovery services (215)</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>281</td>
</tr>
</tbody>
</table>

Discussion of Results

The following sections of the article address the two research questions and provide a discussion of the major preparedness issues (ie. required actions and observations) raised by stakeholders as illustrated in Figure 2 (note, the issues summarized in the fishbone diagram cover 92.4% of all stakeholder statements with the balance related to various minor, uncategorised issues). Direct quotes and extracts from stakeholder submissions have been used to illustrate and reinforce the major issues raised.

Figure 2. Major Preparedness Issues raised by Stakeholders

5 – Warning Systems and Services
A: Warning systems are inadequate and require improved forecasting and early warning capabilities (3.1%)
O: Warning systems are adequately prepared for disasters (3.0%)

3 – Emergency Services Delivery
A: More funding and resources for fire fighting, professional and volunteer emergency services, and NGOs (8.0%)
A: Integrated emergency services with defence assets under a national partnership agreement (3.1%)

1 – Personal and Household Readiness
A: Improved home construction codes and protection upgrades (6.9%)
A: Changes to land zoning and development planning approvals (6.7%)
A: Improved community level preparedness planning (2.4%)
A: Increased personal planning and mental preparation (2.3%)
A: Bushfire fuel load clearing and back burning (2.0%)
A: Public information and awareness programs on disasters (1.6%)

6 – Insurance, Loss Adjustment and Asset Recovery Services
A: Improved insurance affordability through strong mitigation (11.7%)
O: Low availability of affordable insurance policies (6.4%)
A: Insurance coverage clarification and faster processing (2.8%)
A: Opportunities for government insurance support measures (2.1%)

4 – Major Infrastructure Readiness
A: Compliance with design standards, more vulnerability and flood analysis, more infrastructure robustness and resilience (6.0%)
O: Vulnerable transport, power, water, telecommunications and private business infrastructure (5.7%)
O: Floods-storms, cyclones, heatwaves and bushfires are the high impact events (2.3%)

2 – Health, Medical Services and Disease Control
A: More medicine, surgery, mental health, and pharmacy resources to support frequent disaster events (10.1%)
A: Improved response to heatwaves, floods-storms, bushfire related illnesses and water borne diseases (6.2%)

(A – Required Action; O – Observation)

Personal and Household Readiness

In this aspect, stakeholders directed their responses in two specific areas. First, there is a strong view that housing construction, retrofit and location zoning are largely inadequate and require urgent changes and investment. In particular, new and retrofitted housing must include storm, flood and heatwave protections (such as structural improvements, levee constructions, high volume drainage, and heat insulation) (Matsuda and Okada, 2006; US Department of
Homeland Security, 2009; ABCB, 2012), while land development zoning decisions and clearing regulations (such as flood plain and coastal storm surge proximity, or bushfire prone developments and limited bushfire fuel load reduction measures) should not place housing at significant risk (Burby et al., 1999, 2000; Commonwealth of Australia, 2003; Tasmanian Government, 2013).

The important message is that, in the light of more frequent disaster events, more mitigation and adaptation measures must be undertaken in the immediate term to increase the level of household preparedness. Studies and surveys in other jurisdictions also support this view, showing that communities and governments must do more to protect households and personal assets in the event of disasters (e.g. Household preparedness for earthquakes in California) (CEMA, 2010).

Second, communities need to be better prepared through enhancements in personal and collective disaster planning (Newport and Jawahar, 2003; Paton, 2003; Trim, 2004; Wang and Kapucu, 2008; Tekeli-Yesil et al., 2010), improved mental preparation, stress coping and emotional control skills (Freedy et al., 1994; Choudhury et al., 2006; Ibrahim and Hameed, 2006; LaJoie et al., 2010), and disaster information and awareness programs (Newport and Jawahar, 2003; Paton and Moore Johnston, 2006). As an example of this enhanced approach to disaster preparedness for the 2013 summer storm and cyclone season, the Queensland government has taken out half page advertisements in the state newspaper messaging citizens that ‘Being prepared is good. Helping your neighbour be prepared too is great’ (taken from the Courier Mail Newspaper, 12 October 2013, p.39), while also directing them to the Get Ready Queensland! website as mechanisms for improved household preparedness and information dissemination (see Figure 3) (Queensland Government, 2013).

Figure 3. Personal and Collective Disaster Preparedness in Queensland (newspaper advertisements and the Get Ready Queensland website)
Importantly, given the remoteness of some Australian regional communities, and the mental trauma that can result from living through disaster events; these types of actions present as immediate and important priorities for preparedness.

**Health, medical services and disease control**

In this area of preparedness, stakeholder submissions argued that Australia requires more general medicine, surgery, mental health and psychology, and pharmacy resources to cope with the health related impacts of heatwaves conditions, floods, storms and bushfire, including burns and dehydration, neurological disorders, and cardiovascular, psychiatric and respiratory illnesses. Doctors for the Environment Inc. (Submission 108, p.8) typified this view:

> ‘As extreme weather events increase more resources will need to be deployed to the health services for appropriate emergency management and treatment of victims, as well as the ongoing medical, mental and social consequences’ (Commonwealth of Australia, 2013).

Specifically, more frequent disaster events in Australia will require surge capacity resources in the area of health care and services delivery, hospitals and general medicine (currently 11.6 per cent of the Australian workforce with over A$121 Billion in total costs) (AIHW, 2012). Without these additional staffing and assets resources, there is the possibility that the currently overstretched health services sector (e.g. shortages in emergency/intensive care units, hospital assets, professional staff, pharmacy services) will be overwhelmed should successive short-cycle disaster events continue into the future (Stratton and Tyler, 2006; Bonnett et al., 2007; AIHW, 2012). As an example, Australia has had to commit an additional A$1 million to deploy an emergency medical team in support of Super Typhoon Haiyan recovery operations in the Philippines (Wroe, 2013).

**Emergency services delivery**

One of the strongest messages to emerge from the study is that emergency services agencies require more resources, coupled with more integrated command structures and bolstering from Australian Defence Force assets. Stakeholders argue that the current emergency services workforce (i.e. 220,000 volunteer and 13,200 professional fire fighters; 26,100 volunteer and 611 professional emergency services officers; and 53,100 sworn police officers) and funding base (i.e. estimated A$740 million for fire fighters; A$152 million for emergency services officers; and A$9.1 billion for police services in 2011–12) (McLennan et al., 2009; AIC, 2011; ACSES, 2012; Commonwealth of Australia, 2013) requires increased resources and funding to cover future short-cycle disaster events. As an example, analytical projections from
the national body representing fire fighters indicated that a personnel increase of 28–40\% would be required from 2013–2026 in order to keep pace with population growth and climate change induced (short-cycle) bushfire events in the state of Victoria (see Submission 143, United Fire Fighters Union of Australia, p3.) (Commonwealth of Australia, 2013). Translated nationally, this could mean an investment of an additional A$360 million for fire fighting services.

Also, complementary studies suggest that decreasing rates of emergency services volunteerism will only exacerbate this growing problem, with more transferable and interoperable resources, and shared service delivery arrangements (e.g. interstate fire fighting crews have been deployed to the NSW bushfires) (Levy, 2013) required to meet increased services demand during higher frequency disaster events (Kapucu et al., 2009; McLennan et al., 2009). As a critical example of resource-stretching, Australian emergency services NGOs are deploying A$3 million in additional resources to the Philippines in support of Super Typhoon Haiyan disaster recovery operations (Wroe, 2013).

**Major Infrastructure Readiness**

The majority of stakeholders observed that public and private infrastructure assets were highly vulnerable to storms, floods, heatwave, and bushfire disaster events. As an example, the Northern Territory Government (Submission 129, p.4) observed this as a key issue:

‘In the Northern Territory, unprecedented floods have occurred which have resulted in significant impacts on transport infrastructure resulting in high social and economic costs. Severe thunderstorms and tropical cyclones destroy and damage infrastructure, particularly as a result of storm surge. In addition, the extreme temperatures reduce infrastructure life and increase maintenance demands’ (Commonwealth of Australia, 2013).

In the light of these infrastructure deficiencies, stakeholders have called for a three pronged approach. First, infrastructure designs must incorporate robustness and protective features that provide higher levels of damage resistance (Schulman et al., 2004; De Bruijne and Van Eeten, 2007; Martin and Rice, 2012). In particular, stakeholders raised concerns that power, water supply and transport networks had poor limited fortification and hardening, and were highly vulnerable to flooding and bushfire events.

As a second measure, the community asserted that the Australian government’s Critical Infrastructure Program for Modelling and Analysis (CIPMA) should be expanded and strengthened with additional investment. Specifically, stakeholders argued that (consistent with regions such as Europe and North America) more flood mapping studies and
vulnerability analyses were urgently needed to support local and state infrastructure governance (Conrad et al., 2006; Fritzon et al., 2007; Tinnion, 2013).

Finally, improved infrastructure resilience activities should form part of the preparedness matrix (Boin and McConnell, 2007; O'Rourke, 2007; COAG, 2011). In particular, several stakeholder views focused on the need to provide uninterrupted power and alternate transport routes in regions where flooding and bushfire events had destroyed major connective infrastructure. In summary, current and planned infrastructure assets will require increased levels of public and private investment in order to lift their overall preparedness and survivability during higher frequency disaster events.

**Warning systems and services**

In relation to disaster warning systems and services, the stakeholders were evenly split on the issue of preparedness. Those supporting the adequacy of the current warning systems pointed to Australia’s deployment of systems, such as its Fire Rating Danger System (FRDS), National Registration and Inquiry System (NRIS), Emergency Alert (EA) system, and 000 emergency communications channels, in the event of disasters (see Submission 64, Federal Attorney General’s Department, p.13–14; Submission 112, Telstra Corporation, p.3–6) (Commonwealth of Australia, 2013). More recent studies in the Australian context tend to support this view, estimating that over 280 different types of disaster related warning and emergency communications systems are deployed within the domestic context (Martin and Rice, 2012).

However, on the opposing side of this argument, stakeholders presented that the Bureau of Meteorology (BOM) should be provided with further resources to developed advanced weather forecasting systems and models, and early warning systems for remote or isolated communities (see Submission 104, Australian Medical Association, p.8 ) (Commonwealth of Australia, 2013). On balance, with consensus unlikely, other contemporary studies tell us that further BOM warning systems investments may complement and integrate with the current base of assets, thereby offering important opportunities to enhance our overall disaster preparedness (Basher, 2006; Troy et al., 2007; Collins and Kapucu, 2008; Van De Walle et al., 2010).

**Insurance, loss adjustment and asset recovery services**

Insurance was the most contentious and argumentative aspect of disaster preparedness in this study. Stakeholders observed that insurance policies were unavailable in some disaster prone
regions, and if they were available the premiums were prohibitively high (e.g. four–seven times pre-disaster premiums) and/or provided insufficient coverage for some events (e.g. no coverage for flood damage caused by overflowing of a natural watercourse such as a creek, estuary or river). The domestic insurance industry countered that premiums could be reduced if strong mitigation measures were undertaken to improve robustness and resilience of the insured assets; and, governments provided insurance support instruments in the form of premium subsidies and reinsurance pools. Ms Christine Simpson, a flood victim in 2012, (Submission 136, p.1) expressed her frustration with current arrangements:

‘I was living in Wagga Wagga (New South Wales) last year when a “once in 100 years” flood happened. I had to evacuate and my insurance went up from A$600 to A$4,000! These and similar events are no longer “one in 100 years”. We need to prepare realistically by building higher levees as a matter of urgency, ensure that councils do not approve and more building on flood plains, and look at government funded insurance (subsidies and reinsurance pools)’ (Commonwealth of Australia, 2013).

More recent national coverage on this issue of affordable insurance for home and business owners in disaster prone areas, suggests that many households (in the absence of any substantive mitigation) are under prepared for extreme storms and flooding (Nannam, 2013). As an example, a comparison of insurance premiums in Queensland, where short-cycle cyclone, storm and flooding events occurred during 2008-2013, confirms that premiums are substantially elevated in areas where weather and disaster events are more prevalent (see Figure 4). The premiums show that equivalent properties in areas which are typically subjected to adverse weather or disaster events (e.g. Bundaberg through to Cairns) pay approximately two to four times more for insurance when compared to less vulnerable areas (e.g. south east corner of the state).

Also, following the National Disaster Insurance Review in 2011, the former Australian government ignored calls to implement government funded insurance support measures in order to improve affordability (Commonwealth of Australia, 2011), while current fiscal conditions have seen the new government baulk at any new funding commitments until the federal budget returns to surplus. Consequently, the default position on insurance preparedness will require communities to seek and acquire investment for a range mitigation measures (e.g. levees, home lifts, extensive drainage networks, storm surge barriers) at their earliest opportunity (note, some of this funding may be accessed through National Emergency Management Projects or the state Natural Disaster Resilience Programs) (Australian Emergency Management, 2013). In the longer term, this may assist with reducing insurance premiums and allow insurance companies to offer policies in vulnerable areas.
Conclusions

In completing the study, we acknowledge that the stakeholder data is limited in scope, with the majority of statements emerging from NGO and individuals. A wider range of responses from the business community may have helped to uncover more preparedness issues related to the millions of small businesses that dominate the Australian economy. Nevertheless, the majority of submissions came from those in the community who were directly impacted by the short-cycle disasters experienced in Australia. Hence, the data reflects the rich and collective experiences of those stakeholders most closely associated with the disaster events.

Based on our observations, the study signals some important messages. As a critical first step to improved disaster preparedness, Australian communities must look to develop better protected and more resilient homes and infrastructure (e.g. enhanced construction standards, robustness and retrofit measures). This includes improved land development planning, analysis, zoning and clearing approvals that improve community assets protections and avoid natural threats and vulnerabilities (e.g. flood plains, proximate storm surge locations, excessive fire fuel loads). As an added incentive to undertake this type of work, the domestic insurance industry has argued that annual premiums should reduce over time, if more disaster mitigation and adaptation work is undertaken by governments and the community. The short-cycle nature of disasters in recent years suggests this is an important and immediate priority.
The growth of the professional and volunteer emergency, fire fighting and medical services workforce is also seen as an urgent priority by stakeholders. The short cycle nature of disasters in recent years, coupled with longer term climatic changes (IPCC, 2013) and unpredictable natural and arson initiated bushfire behaviour (e.g. the New South Wales Rural Fire Service (NSW RFS) was handling up to 100 concurrent fire and fire incidents during September–October 2013) (NSW RFS, 2013), suggests that highly mobile surge capacity resources will be essential in future periods. Arguably, without further bolstering of this critical workforce, communities (both domestic and our near international neighbours) may experience sub-optimal levels of response and unacceptably long recovery periods.

At the individual and community levels, an assemblage of improved personal planning and mental preparation, bushfire prevention measures, community level planning and coordination, and public information and awareness are also seen as key levers for improvements in preparedness. In this instance, preparedness has concomitant individual and collective dimensions that must be satisfied. Critically, the 2013 bushfire crisis in New South Wales exemplified the need for enhanced mental preparation and toughness in the face of widespread home and asset destruction, while also ensuring that fuel load reduction and fire prevention measures formed part of more robust community preparedness (Levy, 2013).

Finally, given the tradition of disaster response and recovery in Australia, it would be unfair to suggest that domestic communities are unprepared. However, what might be argued on the basis of the stakeholder analysis is that the nation is ‘under prepared’ in specific areas. Given these sub-optimal preparations, changes to preparedness are inevitable. Future research might examine some of the changes that emerge over time in line with short-cycle disasters and adverse events.

References


Before the Storm: Project Managing for Preparedness

Chris Quin
Project Sponsor, Major Projects
Ergon Energy
PO Box 1090
Townsville, QLD, 4810

Paper Presented at the
Australian and New Zealand Disaster and Emergency Management Conference
Surfers Paradise, Gold Coast (QLD), 5-7 May 2014
Before the Storm: Project Managing for Preparedness

ABSTRACT: Increasingly, organisations responsible for disaster management are showing interest in investing time and money prior to disaster events to reduce the impact of disasters on affected communities. This paper describes how best-practice project management techniques can be applied to ensure the effectiveness of that investment. The paper provides tools and techniques to allow interested disaster management professionals to front-end load some of the work involved in managing disasters into the period “before the storm,” thereby reducing the cost, scope, and duration of the response, recovery and reconstruction phases of the disaster management cycle.

Keywords: Preparedness, Disaster Management, Project Management, Resilience

Introduction

Natural disasters create huge impacts. In Queensland alone, the cost of public infrastructure damage from recent natural disasters over the five years to 2013 is estimated to be $14.52bn (The State of Queensland, 2013b). Worldwide, estimated damages have risen from an average of $20bn per year in the 1990s to $100bn per year from 2000 – 2010 (International Monetary Fund, 2012). In response to the massive costs of response and reconstruction, many organisations are looking to reduce the cost of natural disasters by conducting preparedness and resilience activities prior to disaster impact. A main concern is how to ensure pre-disaster investments provide tangible preparedness results in the real world. This paper provides interested disaster management professionals with tools and advice to leverage lessons learned from project management to ensure value for money. These include methods for selecting beneficial preparedness projects, proving project worth to help secure funding, and tips on effective project execution. A summary of tools can be found at Appendix 1.

The Benefits of Preparedness

Preparedness is defined as “the taking of measures to reduce potential loss of life and property damage, sometimes known as disaster mitigation” (The State of Queensland, 2013a). Well executed preparedness projects result in reductions to loss of life and injury, and a minimisation of private and public property damage, allowing disaster-affected persons a
more rapid return to normalcy. This also assists in return to economic growth (Hill et al., 2012).

Disaster preparedness financial benefits are not limited to those affected by the disaster. They extend to society as a whole. Figure 1 shows total economic cost of natural disasters in Australia is currently estimated at $6.3bn per annum, and projections show an increase to $23bn annually by 2050.

Figure 1: Forecast costs of disasters: 2011 – 2050 (Deloitte Access Economics, 2013).

![Chart showing forecast of total economic cost of natural disasters: 2011 – 2050](source: Deloitte Access Economics (2013))

The same economic modelling advises a funding increase for pre-disaster preparedness from $50m per annum to $250m per annum would reduce the cost of disasters to the Australian community by 50% over that period. (Deloitte Access Economics, 2013).

There are benefits to preparedness projects themselves in undertaking resilience-building activities before the natural disaster (preparedness or mitigation) rather than after the disaster (reconstruction). “Post-disaster reconstruction projects are…subject to compressed timeframes within an environment of close public scrutiny” (Norling, 2013). Preparedness activity operates under less pressure and allows the development of better, more considered options for disaster resilience. Resources are also more likely to be available before disasters:

Post-disaster reconstruction projects are susceptible to resourcing bottlenecks, such as lack of resources and alternatives, limited sources of resources, and difficulty in accessing the resources that are required for reconstruction (Chang et al., 2010).
Better availability of physical and human resources to do the work before the disaster significantly reduces cost. Case studies of projects from Australia and around the world illustrate the benefits in completing work pre-disaster.

**Case Studies of Preparedness Projects**

Preparedness projects come in all shapes and sizes. Case studies here include capital works on public infrastructure, technological toolsets for rapid damage assessment, community engagement and training, environmental works for storm surge and flood mitigation, and modifications to land use planning. All have yielded increased preparedness.

*Capital Works: Ergon Energy’s Cyclone Area Reliability Enhancement (CARE) Program*

Since 2001, Ergon Energy, the government-owned company responsible for distributing electricity throughout 97% of Queensland, has undertaken the Cyclone Area Reliability Enhancement (CARE) Program:

CARE is designed to improve the reliability of power supply to key community infrastructure and reduce the risk of damage to our network by undergrounding high voltage powerlines in key sections of our network in cyclone-prone areas (Ergon Energy, 2013).

During Cyclone Yasi, in Townsville suburbs where data was collected, approximately 95% of the damage to Ergon’s overhead power network was caused by falling vegetation (Calvert, 2011). This illustrates the potential benefit of undergrounding power lines, although this does not completely remove the threat of vegetation damage. Figure 2 shows damage to underground infrastructure caused during Cyclone Yasi, where the roots from an uprooted tree damaged infrastructure.

Figure 2: Damage from uprooted tree to underground infrastructure due to Cyclone Yasi (Calvert, 2011).
The cost of undergrounding high-voltage power lines is four–fourteen times the cost of constructing overhead power lines (Alonso and Greenwell, 2013), making power distributors reluctant to underground entire networks. CARE projects must meet the same stringent financial rules that all capital works do within Ergon. Undergrounded power lines to important community facilities such as hospitals, water infrastructure, airports, and supermarkets have reduced power outages to these important facilities. This not only reduces recovery effort on Ergon’s own assets, but allows communities a swifter recovery and return to business as usual.

Technological Systems: The Queensland Reconstruction Authority’s Damage Assessment and Reconstruction Monitoring System (DARMsys)

The Queensland Reconstruction Authority’s (QRA) Damage Assessment and Reconstruction Monitoring System (DARMsys) grew from the need to rapidly assess the damage to Queensland after cyclone and flooding disasters in 2010/2011 (Queensland Reconstruction Authority, 2011). DARMsys allows for initial rapid damage assessment, speeding up response and recovery, and also allows for monitoring of the reconstruction phase, shown through Figures 3-5 below:

Figure 3: Post Disaster Damage Assessment – Brisbane Floods July 2011 (Newton, 2012).
The DARMsys project is an interesting example of a reconstruction project becoming a preparedness project. Developed for reconstruction, the tool has been used in every declared natural disaster in Queensland since 2011, up to and including Cyclone Ita in April 2014 (Queensland Reconstruction Authority, 2014a). This has enabled a speedier path
through the recovery and reconstruction phases of the disaster management cycle, effectively turning the development of DARMsys into a preparedness project. With each use of DARMsys for a new disaster response, the financial payback on initial project investment increases, as does the preparedness level for Queensland communities, and Queensland’s ability to more rapidly recover from natural disasters.

Community Engagement: Tablelands Regional Council’s Skills and Capacity Building Program

Disaster preparedness projects do not need multi-million dollar budgets for effectiveness. After Cyclone Yasi, Tablelands Regional Council in Far North Queensland used Community Development & Engagement Initiative (CDEI) funding to deliver the Skills and Capacity Building Program. Designed to enhance the preparedness of local communities via education, 284 community members obtained chainsaw certificates and 246 Senior First Aid qualifications. Analysis showed the community considered the project provided value for money and “a high level of success in enhancing communities’ resilience to natural hazards” (Dean, 2014).

Storm Surge Barrier: Mangrove Planting in Vietnam

The Red Cross in Vietnam undertook a project to plant mangroves along coastline vulnerable to storm surge from hurricanes. An initial $1.1m investment in vegetation renewal resulted in a saving of $52m in the first seven years from costing on dyke maintenance alone. (International Federation of Red Cross and Red Crescent Societies, 2001). This is without taking into account benefits of protecting lives and livelihoods from deadly storm surge.

Flood Mitigation: Simple Dams in Kinshasa, Democratic Republic of the Congo

A program of flood risk mitigation, using sandbag dams, revegetation, and drainage canal cleaning in 1998 resulted in direct savings of $45 for every $1 spent in the next flood season alone (Setchell, 2008). The benefits continued to accrue every year to the people of Kinshasa, but also to the international community in reducing the amount of response funding required after flooding events in the Democratic Republic of the Congo.

Policy: Land Use Planning in Katherine, Northern Territory, Australia

After the devastating 1998 floods in Katherine, Northern Territory, Australia, modifications to land use policy were put in place. The location of new urban development was changed, as
was the building code for the housing floor height above ground level. These administrative changes are expected to save $29m in costs for a 1 per cent AEP (one in a hundred year) flood event. (Commonwealth of Australia, 2002). Flooding in 2006 did not inundate new land use areas east of the CBD.

These case studies show that disaster preparedness projects cover a wide spectrum of activity and the benefit to cost ratios can be staggeringly high when the right preparedness activities are selected. The case studies explain why preparedness activity should be undertaken and the rest of this paper advises how project management can provide the techniques required to enjoy the same success as these case studies.

**Disaster Preparedness Success through Professional Project Management**

Project management can supply tools to allow more preparedness activities to get the funding they require, and provide techniques to inspire confidence in funding providers on the successful completion of these projects. The project management strategies outlined in this paper can help disaster managers turn a preparedness wishlist into a program of work for real-world change. Professional project management staff and practices can increase successful project outcomes from 36% to 92% where success is defined by the project being on time, within budget, and achieving the organisation’s intent for the project (Project Management Institute, 2010). The World Bank recommends hiring professional project managers to supervise reconstruction projects (The World Bank, 2010) and this same philosophy should be adopted into the preparedness phase of the disaster management cycle.

**The Disaster Management Cycle and Projects**

Useful to understanding disaster management is the disaster management cycle (Figure 6), a graphic showing the phases of disaster management which naturally overlap each other. Professional project management practice is frequently integrated into the reconstruction phase of this cycle (Podger, 2013). In figure 6 the disaster event occurs at the top of the circle.
Figure 7 takes the base disaster management cycle and uses the duration between two North Queensland cyclone events to illustrate the amount of time spent in each phase of the disaster management cycle. In this example, the duration between Cyclone Yasi in 2011 and Cyclone Ita in 2014 (Bureau of Meterology, 2013) shows that much of the time between those two events passed during the Preparedness and Reconstruction phases.

Figure 7: Time-Weighted Disaster Management Cycle based on recent North Queensland Severe Tropical Cyclones
Figure 7 shows the preparedness phase as rich in the resource of time to undertake resilience-building activity. Currently often used for the training of emergency response resources, and preparedness exercises where disaster response is simulated, this paper contends that this period can also be used to front-end load the work of recovery and reconstruction required for large disaster events. The reconstruction and preparedness phases frequently overlap and if reconstruction were weighted toward preparedness, as is the case with the Queensland State Government’s betterment fund via the Queensland Reconstruction Authority (Queensland Reconstruction Authority, 2014b), increased community resilience to natural disasters would result. If preparedness can save lives and reduce property damage before disaster strikes, and project management can ensure that preparedness projects have better outcomes, disaster managers may find it worthwhile to learn about the tools that project managers use for ensuring project success.

Fundamentals of Project Management

A project is a temporary endeavour to create a unique product, service, or result. (Project Management Institute, 2013) and project management is the method to deliver the result. The Project Management Golden Triangle provides a useful way to illustrate important aspects of project management. The triangle represents the pressure that the most significant factors of a project creates upon the others (Figure 8).

![Figure 8: Project Management Golden Triangle](image)

Every project has a financial cost, and this element of project management forms one side of the triangle. Projects are by definition temporary, and this creates a focus on the time a project takes to complete, another side of the triangle. For preparedness projects the deadline may be the impending storm or bushfire season, or simply the quickest possible
execution of the project scope. Project scope is “the work performed to deliver a result with the specified features and functions” (Project Management Institute, 2013). Scope is often aligned with an organisation’s core business or function, but should be specific to and achievable within that project. It forms the third side of the golden triangle. Another important factor in projects is the quality of the outcome of the project. Quality is related to the desired performance of the project deliverables, for example how flood proof a bridge should be. Figure 8 illustrates that a change in quality will also impact upon time, cost, or scope, and often all three.

A decrease in time available to execute a project might mean a reduction in scope (leaving out project features) or an increase in cost (assigning more resources to get the project done more quickly). An increase in scope or quality often results in increases to both other areas. If a project is forced out of shape by changes to these parameters, the task of returning it to shape rests with the project manager, the person who leads the team responsible for achieving the project objectives (Project Management Institute, 2013). Keeping the golden triangle in mind helps deliver individual projects, but to select which project is the right one to execute, project managers use portfolio management.

**Portfolio Management**

Portfolio management aligns with an organisation’s strategies by selecting the right projects, prioritising them, and providing the needed resources to execute the projects (Project Management Institute, 2013). In times where project funding may be limited, project portfolio management can “achieve maximum value within resource and funding constraints” (Daniel et al., 2011). This is very true for pre-disaster projects, where funding is not yet commensurate with post-disaster funding (Deloitte Access Economics, 2013).

**Portfolio Development**

Creating a project portfolio is called portfolio development. In traditional capital works, portfolio development is often top down, where the business executive hands the project portfolio to the project office to manage. Disaster managers can reverse this approach by compiling a wish list of resilience-building activities, either individually, or with other disaster management agencies. This is called bottom-up portfolio development (Daniel et al., 2011). Many organisations have blended portfolios, a combination of these two types (Enterprise Portfolio Management Council, 2009). In the early stages of portfolio creation a
disaster manager should include everything, even projects considered unlikely to find funding, as all projects are assessed for viability later in the process. This stage can be viewed as the first step in an organised approach to turning a preparedness wish list into real-world change. Regardless of your organisation, the portfolio should include all activity, from capital works to community engagement. The next stage in managing a portfolio is to select which projects deserve more time spent developing them.

Assessing Competing Projects for Execution

Prioritisation of projects within a portfolio will vary depending on organisational objectives (Daniel et al., 2011). When budgets are limited, projects that require less money but more time may be selected. When a business objective must be completed before a hard deadline, a project considered costly may be endorsed for rapid execution. When first trialling a project management approach to building resilience, quicker, cheaper projects may be selected to prove the concept and create confidence for project sponsors. Initial assessment can be very high level and each project does not have to be scoped in detail. Indicative costs are sufficient to select a project for further detailed scoping and cost estimating.

A key decision at this early stage is which stakeholders to involve in project selection. Early endorsement from project sponsors ensures less time is wasted detailing projects that are unlikely to proceed, however the downside is that if sufficient work hasn’t been done on a project, project stakeholders may become biased against that project for future consideration.

A useful and useful tool for selecting the right projects is a project portfolio matrix.

Figure 9: Project Portfolio Matrix

<table>
<thead>
<tr>
<th>Rank</th>
<th>Activity Name</th>
<th>Start-up Cost</th>
<th>Ongoing Cost</th>
<th>Start-up Time</th>
<th>Ongoing Time</th>
<th>Category/Size (SME/IBRA)</th>
<th>Likely Cost?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project 1</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Emergency Management</td>
<td>High</td>
<td>Critical to successful implementation of other recommendations</td>
</tr>
<tr>
<td>2</td>
<td>Project 2</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Landscaping Planning</td>
<td>High</td>
<td>Reducing damage would reduce recovery time and cost</td>
</tr>
<tr>
<td>3</td>
<td>Project 3</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Emergency Management</td>
<td>Medium</td>
<td>Significant building damage assessment phase</td>
</tr>
<tr>
<td>4</td>
<td>Project 4</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Building Design</td>
<td>High</td>
<td>Extending a proven program into new facilities</td>
</tr>
<tr>
<td>5</td>
<td>Project 5</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Emergency Management</td>
<td>High</td>
<td>Reducing recovery time through proven technology</td>
</tr>
<tr>
<td>6</td>
<td>Project 6</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Electrical &amp; Distribution</td>
<td>Medium</td>
<td>Although expensive to implement, the will reduce cost of recovery</td>
</tr>
<tr>
<td>7</td>
<td>Project 7</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Emergency Planning</td>
<td>Medium</td>
<td>Although requiring some investment to set up and materials, this would likely pay for itself</td>
</tr>
<tr>
<td>8</td>
<td>Project 8</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Emergency Planning</td>
<td>Medium</td>
<td>Reducing recovery time through the validation of a proven resilience asset</td>
</tr>
<tr>
<td>9</td>
<td>Project 9</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Emergency Management</td>
<td>Medium</td>
<td>More resources for response and recovery and less fatigue over several projects</td>
</tr>
<tr>
<td>10</td>
<td>Project 10</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Emergency Management</td>
<td>Medium</td>
<td>Initial residential, community and health infrastructure. Should be delivered at an investment that can fund the project</td>
</tr>
<tr>
<td>11</td>
<td>Project 11</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Emergency Planning</td>
<td>Emergency Planning</td>
<td>Medium</td>
<td>Appear to be a project that can be funded but have uncertain overall impacts</td>
</tr>
<tr>
<td>12</td>
<td>Project 12</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Community Education</td>
<td>Medium</td>
<td>Continuing capacity program with an uncertain provision</td>
</tr>
<tr>
<td>13</td>
<td>Project 13</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Emergency Planning</td>
<td>Medium</td>
<td>Innovated staff and demands decisions</td>
</tr>
<tr>
<td>14</td>
<td>Project 14</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Community Education</td>
<td>Medium</td>
<td>Ensuring all customers are informed and involved in emergency planning activities</td>
</tr>
<tr>
<td>15</td>
<td>Project 15</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Community Education</td>
<td>Low</td>
<td>Availability of private materials will decrease costs and reduce stakeholders</td>
</tr>
<tr>
<td>16</td>
<td>Project 16</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Emergency Management</td>
<td>Low</td>
<td>A very simple quick win with very little upfront investment</td>
</tr>
<tr>
<td>17</td>
<td>Project 17</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Emergency Management</td>
<td>Low</td>
<td>A very simple quick win with very little upfront investment</td>
</tr>
</tbody>
</table>
As can be seen from Figure 9, initial assessment can be at a high level as all projects will undergo detailed planning during project initiation. More sophisticated mechanisms exist for complicated portfolio management, but this tool is useful on small portfolios to direct effort toward projects with business benefits that are likely to satisfy project stakeholders.

**Stakeholders and Stakeholder Commitment**

Experience shows that projects do not achieve their objectives without strong commitment from stakeholders. Stakeholders can exist within the business or be from external funding bodies such as local, state or federal governments. In disaster preparedness, there are often many stakeholders, and funding for a project may come from multiple sources. To obtain the resources for project success it is useful to understand three things about stakeholders: what their stake is in the project, what the project needs from the stakeholder, and what the stakeholder expects from the project. Knowing these three things will allow projects to negotiate for better outcomes (Bourne, 2011).

Drivers for stakeholder endorsement are many in the area of disaster preparedness, and can include meeting statutory obligations, improving organisation performance, or improving organisation reputation. All project stakeholders want value for money. More than anything else, a stakeholder wants a defensible decision. To endorse a project, often worth millions of dollars, the decision to undertake the project must be defensible to other interested parties, both now and into the future. Other items that a project can supply a sponsor are an increase in their own reputation, promotions or bonuses, a sense of achievement from involvement in a worthwhile endeavour, and an increase in their organisation’s reputation.

Stakeholder commitment, especially funding commitment, is one of the two main pre-requisites for project success. The other is project resources – the people and materials required to execute the project. Once an initial level of commitment is achieved, and there is enough interest to justify more work on the project, detailed project planning can be completed by compiling a project business case.

**The Project Business Case**

The UK Government’s Department for Business, Innovation and Skills promotes the development of project business cases:

The business case documents the justification for the undertaking of a project, based on the costs of development and the anticipated benefits to be gained. It provides an initial appraisal
of the different options available, drives the decision making processes, and is used continuously to align the project's progress to the achievement of business objectives. The initial Business Case is used to secure full senior management and stakeholder commitment at the end of Project Initiation (Department for Business Innovation and Skills, 2010).

As well as aligning projects with organisational objectives, a business case can provide a good platform for government funding submissions, and provide a rapid start up to project activity should external funding applications be successful. At the business case stage a fully-detailed project budget may not have been developed, but it is important to understand project cost, and the time it will take to undertake the project well enough to ensure a reasonably accurate estimate can be supplied.

Most business cases focus on financial justifications for projects. This is necessary as projects almost always require a significant investment, either in up-front capital or employees’ time to execute, both at a cost. For some preparedness projects financial analysis techniques work well, especially where a certain hazard will create a disaster within a set of period of time, and preparedness expenditure is guaranteed to reduce the cost of response, recovery and reconstruction. Projects in this category include flood warning systems, levees, and hardening bridges and roads. Examples of these projects can be found on the Queensland Reconstruction Authority’s Betterment Fund website (Queensland Reconstruction Authority, 2014b). Projects that are difficult to justify financially need to align with organisational objectives. Techniques for both financial and non-financial project justification are described below.

**Business Case Financial Analysis Techniques**

Knowledge of financial analysis techniques is useful for developing business cases. There are many types of investment modelling. This paper discusses Payback Period, Internal Rate of Return (IRR), and Net Present Value (NPV).

Payback Period is the time in years required for an initial project outlay to be repaid via cash inflows from the project. It indicates how long it will take to see a net benefit from a project. Used for simple portfolio management, it is criticised as too simplistic as it doesn’t account for the value of money across time and doesn’t factor in benefits to the organisation once project investment has been paid back (Tiffin, 1999). A variation called Discounted Payback Period takes into account the time value of money, but still ignores benefits once investment has been recovered.
Internal Rate of Return (IRR) builds on the Payback period by taking into account the value of money over time. It is a strong indicator of the efficiency or yield of an investment. (Schmidt, 2014c) Very useful for disinterested investments such as comparing financial gain on investments, this method is less useful for preparedness projects due to a purely financial focus.

Net Present Value (NPV) has become a standard in business cases and is based on the concept that the value of money changes over time (Coster, 2011). It builds on previous models by reverse-engineering the future value of the return of an investment into the value of today’s capital. NPV is stronger at assessing projects from ‘interested’ investors, where investment is not based solely on financial performance (Tiffin, 1999).

Whichever financial analysis method is used, it is important to identify all possible financial benefits to an organisation within the business case. This gives the project the strongest chance of attracting funding where many well-deserving projects are competing for funding.

*Including All Financial Benefits in Business Cases*

If a preparedness project allows communities a more rapid return to normal via reduced time in the response and recovery phases, a financial metric can be applied by calculating *avoided* costs. Cost savings based on how rapidly your organisation or community can return to normal as a result of the project can provide investment justification. Organisations responsible for the economic health of a community can also add the avoided cost of a prolonged return to economic stability, by factoring in industries such as tourism.

While financial justification methods are useful for projects creating increased revenue or avoiding costs, the link between financial benefits and organisational outcomes is not always so clear for disaster preparedness projects. In these cases project proponents should highlight each intangible benefit in the business case.

*Non-Financial (Intangible) Project Benefits*

For stakeholders to view an intangible benefit as legitimate, it should be tested against three principles: the benefit is likely, the benefit is measurable, and the benefit contributes to meeting an important business objective (Schmidt, 2014a).
Explicitly stated intangible benefits within a business case should be linked to the organisation’s mission statement or goals. Two questions are useful in extracting all potential benefits for a project: “What is Your Mission?” and “Whom Do You Serve?” (Schmidt, 2014b). For government this might result in meeting statutory obligations, improved quality of service to constituents, or an improved public opinion of the organisation or region. Improved organisational resilience and a reduction in reliance upon outside organisations for assistance may also be considered legitimate. Analysing the performance targets of stakeholders can assist in identifying benefits likely to be accepted. Business case drivers used in the not-for-profit sector often include enhanced mission delivery, reduced risk exposure, improvements to constituent service, motivating and retaining staff, enhanced relationships, and improved transparency (Crader, 2013).

Another useful device in situations where direct benefits are difficult to calculate can be to include the ‘do nothing’ option in the business case. Selecting this option obviously requires no capital investment, but especially where a project carries a form of organisational or statutory obligation, this additional inclusion can highlight the risks of inaction and make a compelling case to select some form of project activity.

Business Case Rejection

Business cases are rejected for many reasons, and a rejection may not mean the death of the project’s idea. There may be alternative sources for funding or cost sharing possibilities, and a careful review may highlight where a revised business case or a different funding target might yield better success. Football games are not won in the first half and boxing matches often go ten rounds. Disaster preparedness is all about building resilience, and at times this might be the resilience of the disaster manager or project team.

To assist in ensuring your business case is not rejected, it is often useful to include a Cost/Benefit Analysis (CBA) and a Benefit to cost Ratio (BCR) in the business case.

Cost Benefit Analysis (CBA)

Cost Benefit Analysis (CBA) is a process of weighting total expected cost versus total expected benefits of a project (Brzozowska, 2007). While traditional CBA provides a good starting point for any project investment, recent techniques factor in the special circumstances surrounding preparedness and resilience-building projects.
Disaster Preparedness Cost-Benefit Analysis

Avoided costs can be also be utilised within a Cost-Benefit Analysis. Natural disasters are costly and the expected cost of a disaster event, via historical costs for a region, can be factored into the benefits of a successful preparedness project. The report Building Our Nation's Resilience to Natural Disasters (Deloitte Access Economics, 2013), is the best illustration of how to do this. Cost-Benefit Analysis is sometimes criticised compared to new methods for public investment in social infrastructure including Cost-Effectiveness Analysis (CEA) and Cost Utility Analysis (CUA), however these methods are more useful for assessing competing expenditures when funding has been guaranteed, which is not often the case for disaster preparedness projects (Deloitte Access Economics, 2013). Once a CBA has been completed, a Benefit-Cost Ratio (BCR) can provide a concise estimate of project spend versus project benefit.

Benefit-Cost Ratios

A Benefit-Cost Ratio (BCR) is “an indicator that attempts to summarise the overall value for money of a project” (Deloitte Access Economics, 2013). There is an oft-quoted World Bank BCR for disaster preparedness of 7:1, that is, for every $1 spent pre-disaster (cost), the benefit is $7 in savings post-disaster (Dilley and Heyman, 1995). It is now strongly recommended that this number not be used (Kelman and Shreve, 2013), as each project should be assessed on its individual merits.

Both the complexity and usefulness of calculating Benefit-Cost Ratios can be seen from the case study projects. The revegetation in Vietnam created a BCR of 52:1 in the first seven years, and the flood mitigation in Kinshasa created a BCR of 45:1 in just one year. Projects such as the Queensland Reconstruction Authority’s DARMsys have an increase in their BCR for each subsequent natural disaster where the system is used. A BCR on the Tablelands Regional Council community education project, based on the prevention of just three first aid incidents per year over a three year period created a break-even BCR of 1:1 for the entire community program, not just the education component (Safe Work Australia, 2012). The knowledge gained by the community does not evaporate in three years, and especially with first aid, the benefits could literally save lives and livelihoods. BCR is a useful tool in selecting the most effective preparedness projects, and a very powerful tool in convincing stakeholders to invest in preparedness projects.
When funding has been secured, real-world change depends on successful project execution. Three tips for project success are included below.

**Three Tips from the Trenches: Advice from Project Managers on Managing Projects**

A study of megaprojects (projects worth over $1bn), showed significant reductions in failure rates (cost overruns, time overruns or project not to specified quality) if some principles were followed (Merrow, 2011).

**Front End Load**

In the same way that work in the preparedness phase of a disaster is cheaper and more effective than work after disaster impact, work at the front end of a project is cheaper and more effective than at the back end. Front end loading is the practice of creating an excellent understanding of the project in the early stages, before stakeholders have committed large amounts of funds to a project. By articulating the project objectives in a meaningful way, and creating clear priorities from the outset, projects have a much higher rate of success.

**Plan to be Slow**

Planning to be slow does not mean relaxing or under-promising on project performance. It means being reasonably conservative in estimating how long a project or task will take to complete. In early stages of projects there is a tendency to be overly optimistic and setting unrealistic timeframes for project teams leads to a reduction in quality or an increase in cost, and can also do significant damage to stakeholder relations.

**Maintain Project Leadership**

Changes to project leadership can derail well-functioning projects. When a project manager leaves a project, all of the non-documented agreements evaporate and much momentum is lost. Studies recommend avoiding leadership changes wherever possible (Merrow, 2011).

**Conclusion and Recommendation**

This paper has reviewed ways of ensuring that preparedness projects deliver on the great promise of providing increased resilience to communities and infrastructure before disasters. By integrating project management methods such as portfolio and project management, managing stakeholder expectations, clear business cases leading to sound investment via
cost-benefit analysis, and tips from the real world on executing projects, the success illustrated by the case studies can be achieved by future preparedness projects.

Executing resilience-building projects in the preparedness phase of the disaster management cycle can increase quality, save cost, and reduce time to deliver. By utilising well-proven best-practice project management techniques, the same levels of success in constructing public infrastructure can be achieved in not only the reconstruction of public infrastructure, but also for increasing preparedness and resilience before disaster strikes.

This paper demonstrates that well executed preparedness projects complimented with excellent emergency response will result in a more resilient community, saving lives and reducing property damage. It is recommended that both disaster managers and governments at all levels look to the preparedness phase as an opportunity to reduce total country spend on the cost of natural disasters, and utilise project management techniques in order to ensure that quality objectives are achieved.
**Paper References**


CALVERT, G. 2011. An assessment of tree susceptibility and Resistance to cyclones: A study based on Severe Tropical Cyclone Yasi. Greening Australia,.


Appendix 1: Project Management Tools for Disaster Managers

Support for Investment in Disaster Preparedness

One of the best recent white papers on disaster preparedness investment from the most respected economic analysts in Australia: http://australianbusinessroundtable.com.au/white-paper

Project Management


Portfolio Management

Although targeted at mining, a useful paper from Price Waterhouse Coopers that looks at portfolio management in more detail, including integrating assessment of risk: http://www.pwc.com.au/industry/energy-utilities-mining/publications/mining-capital.htm

Business Case Tools


Cost Benefit Analysis


Project Payback Period


Net Present Value


Government Project Funding Assessment Guidelines

Queensland Treasury and Trade Knowledge Centre – Project Approval Guidelines: (other countries, states and territories will have similar guides for government-funded projects) http://www.treasury.qld.gov.au/office/knowledge/docs/index.shtml
Caring for emergency service personnel: Does what we do work?

Associate Professor Jane Shakespeare-Finch¹, Mr Todd Wehr², Ms Ilse Kaiplinger¹, & Ms Emma Daley¹
¹School of Psychology & Counselling, Faculty of Health, Institute of Health and Biomedical Innovation, Queensland University of Technology, Kelvin Grove, Australia 4059
²Queensland Ambulance Service

Paper presented at the Australia & New Zealand Disaster & Emergency Management Conference, Surfers Paradise (QLD), 5th-7th May 2014
Caring for emergency service personnel: Does what we do work?

ABSTRACT: Most emergency service organisations have some form of staff support program that share general aims of promoting and maintaining the mental health of their workforce. Yet few of these services have been subject to evaluation and fewer still have commissioned external professional researchers to scrutinise their programs. The Queensland Ambulance (QAS) Service provides a comprehensive and multifaceted program that is both proactive and reactive in design and with the support of the Commissioner, was the subject of a rigorous evaluation throughout 2013. In this paper the program services are briefly outlined and the considered approach to the evaluation is presented within the context of existing scientific literature. Using focus groups, information regarding the uptake of the program’s various ‘arms’, and survey data, results suggest the program is widely used and that staff are very satisfied with the services provided. Further, analysis of established psychometric measures demonstrated organisational and interpersonal factors that are important in the promotion of mental health and in warding off the deleterious impacts that frontline emergency service staff can endure. Data presented in this paper indicate how best to ensure a professional quality of life for ambulance personnel, how to promote resilience to the sometimes extremely challenging aspects of the work role, and ways in which difficulties such as depression may be minimised.

Keywords: staff support services, employee assistance programs, well-being, evaluation

Introduction
Given the complex and often chaotic nature of their work, emergency service personnel such as paramedics and emergency medical dispatchers, are at a heightened risk of experiencing extremely stressful and sometimes traumatic events. With a goal of mitigating the risk of such experiences on well-being, emergency service organisations offer employee assistance programs (EAPs) that are developed and largely delivered ‘in house’ or are outsourced to human resource and psychological agencies. In addition to the ethical obligation of providing an EAP for staff, providing professional support services is an organisational obligation in order to adhere to an increasingly scrutinised provision regarding an employer’s duty of care. Yet very few organisations have opened themselves up to a rigorous and transparent
evaluation of the staff support services they provide. In this paper a summary of best practice in evaluating EAPs is presented and then the method undertaken in this evaluation of the Queensland Ambulance Service’s (QAS) EAP is outlined. Due to the constraints of this paper only major results are described which is followed by a general discussion.

Literature reflects that very little empirical research has been conducted to determine the long term value of EAPs to both the employer and the employee (Alker & Cooper, 2007). Providers tend to publish summary data and statistics of their effectiveness through articles and media releases in organisational literature, but these publications are essentially internal evaluations lacking clear transparency of empirical evidence. In an attempt to more clearly identify current empirical evidence of EAP evaluations, Csiernick (2011) conducted two extensive academic literature reviews which encompassed a combined period of 20 years (1989-2009). Csiernick’s reviews of the EAP evaluation literature illustrated that a variety of methods are used by organisations, often tailored to meet differing organisational needs and structures. However, many of the approaches do not follow comprehensive steps of evaluation and their methodologies do not contribute significant growth in understanding effective evaluation processes to the academic literature.

Courtois and colleagues (2005) proposed that to develop an EAP evaluation for an organisation, the following factors need to be identified first; aspects of the EAP being evaluated, the purpose of the proposed measures, the type of measures, and how they will be used. A comprehensive plan needs to be devised prior to implementation to ensure that the evaluation is both empirical and meets the needs of the organisation. Csiernick, Chaulk and McQuaid’s (2012) study represents one of the most current and comprehensive EAP process evaluations where a focus group and one-on-one interviews were conducted to enable pertinent issues to be forthcoming before development and administration of a survey. Csiernick et al., conducted in-depth qualitative group and individual interviews with key informants including human resource managers, senior managers, senior labour leaders, internal and external counsellors and volunteer employee EAP users. Participants were questioned on a variety of areas including; counselling services, workplace education and wellness, program promotion, operation and governance. This approach enabled these stakeholders to generate their own knowledge and observations of the program and to identify strengths and weaknesses with the EAP. Input from a wide range of varying employees’ positions can inform a committee overseeing the project and provide more direction than from a merely speculative stance (Csiernick, 1995). However whilst focus
groups are informative, this is distinctly different from a comprehensive employee needs assessment where greater numbers and a wider range of employees is needed to be fully representative (Csiernick, 1995).

Process evaluations have been found to use multiple sources of data for measurement including focus groups, interviews, client satisfaction of services accessed, surveys conducted on a sample of the workforce, program utilisation, and work performance in addition to absenteeism data (Csiernick, 2011). Implementing process evaluations can be a more complex undertaking, however they can also provide vital information on how a current EAP is being translated into outcomes, defining what is and is not working well, thereby enabling recommendations for adjustments (Csiernick et al., 2012). Outcome measurements can also be used in process evaluations with self-reflective data collection in the form of satisfaction ratings through surveys which can provide vital information on potential problems or changes needed for EAPs (Shumway, Kimball, Korinek & Keeling, 2006). Simple measures can be used or complex instruments that combine satisfaction with additional outcome evaluations (Shumway et al., 2006).

Survey data about the satisfaction levels of current EAPs can provide important information on the success of the services. Also, the use of feedback from clinical counselling services can be used to identify stressful areas within the organisation when multiple areas of information are placed together (Arthur, 2004). Essentially, to provide a rigorous and detailed EAP evaluation involves a complex series of research collection and data analyses. The outcomes of extensive, well planned and developed methodology can bring forward important and useful data for organisations who take their EAPs seriously as a genuine and essential service they provide to their employees.

The QAS has a comprehensive EAP called Priority One. A full description of the program was provided by Scully (2011) and the EAP was first evaluated in 2003 (Shakespeare-Finch & Scully, 2004). The services include trained peer support officers, professional counsellors (e. g., psychologists; social workers) who are external to the organisation, professional internal counsellors (all of whom have also been paramedics of various ranks), a 24 hour telephone service, a chaplaincy, gay and lesbian support group, indigenous support group, and many psychoeducation programs that begin in basic training.

To provide a rigorous and detailed evaluation of the Priority One program the current methodology was formulated through empirical investigation. The outcomes will include
detailed insights into the efficiency of the EAP and value of the current services through determining usage of EAPs, employee satisfaction of EAPs, relationships between the EAP and other measures of well-being, and identifying any new needs of employees with respect to the EAP services. An additional benefit of an EAP evaluation is that is indicates to employees that the organisation’s culture is one that cares about the services they provide to their staff. The use of combined methods of data collection and analysis holds the potential to provide well-informed recommendations through empirical research.

Method

Review Committee

As proposed by Csiernick (1995), a committee can add value and rigor to process evaluations especially when conducted by a third party to the organisation and when expert advice is also sought from people in various roles throughout the organisation. Consistent with this premise, an academic with extensive research experience and specific knowledge of trauma research in emergency service contexts was invited to Chair a committee. The committee was further comprised of three external professional psychologists, an Assistant Commissioner, a Paramedic, an Officer-in Charge, an Operations Centre Manager, and a Manager of Clinical Education. Following a review of current literature regarding best practice in process evaluation of an EAP, measures were discussed and agreed upon, as was a methodology. The committee agreed that a series of stratified focus groups would be an important step in ensuring all questions aiding the evaluation were asked when subsequently sending a survey to all employees.

Focus Group Participants and Procedure

Five focus groups were conducted in March, 2013. Two groups were facilitated by the committee Chair and three were conducted by a psychologist who provides services to the QAS but is in private practice. Both facilitators were experienced researchers. The groups consisted of open discussions for one to two hours focusing on the Priority One EAP. There were 40 participants in total. The first group comprised five senior executives and was held in Brisbane. The second group was held in Townsville and was comprised of six Emergency Medical Dispatchers. The third was a mixed group with one student paramedic, four Advanced Care Paramedics and three Managers and was also held in Townsville. The fourth
group were from the rural areas of North Queensland \((n = 10)\) and the fifth group were 11 Peer Support Officers from various regions throughout the state.

**Focus Group Qualitative Data**

Whilst it is beyond the scope of this paper to provide details of all focus group data, in this section some major themes are outlined in order to provide a context for additional information added to the survey instrument beyond standard demographic questions, satisfaction ratings and established psychological measures. These themes were:

- A need to ensure Priority One resources are meeting the current needs of employees (e.g., identify new issues, assess demand and supply).
- To ensure accessibility of Priority One for all QAS employees (including students, rural etc.) through adequate information and advertising.
- To provide managers/hierarchy with clear insight into benefits of the EAP.
- To assess the extent of desire for knowledge, resources and forums that enable employees to improve their own mental health and well-being and to generate more cohesive work places.
- To review the importance and perceptions of confidentiality with accessing Priority One assistance.
- To assess if improvements to Priority One are needed (e.g., other services, apps, social media).

These themes (and others) were transformed into questions for example, “Are there other services you think Priority One can offer that would be beneficial to your well-being”? Other questions added to the survey related to if an employee had accessed a particular service, how satisfied they were with that service, and who they had sought assistance from, if anyone, in times of need.

**Survey Participants**

The survey participants were 1042 current employees of the Queensland Ambulance Service which is a response rate of approximately 30% of all personnel. 64.3% of the sample was male and 35.7% was female. Participants’ ages ranged from 20 to 69 years with a mean age of 40.87 years \((SD = 10.45)\). Length of service ranged from six months to 56 years \((M = 11.18, SD = 9.39)\). Most participants were married (76%), 15% were single, 4% were divorced, 3% separated, 0.3% widowed and 1.7% did not indicate a relationship status. Only 8.5% of respondents were trained Peer Support Officers (PSOs). Nearly 59% of participants had accessed a Priority One Service. People occupying all QAS job roles were represented.
with the largest group comprising Advanced Care Paramedics (56%) and the next largest in number being Emergency Medical Dispatchers (10.6%).

Survey Materials

Based on the focus group data and a review of current literature, a questionnaire was compiled. A number of demographic questions were asked for example, age, gender, relationship status, work role and region, if the participant had experienced trauma and if so what the nature, frequency, and intensity of the experience was. The survey also contained five scales measuring 1) satisfaction with the Priority One EAP, 2) a resilience measure, 3) a measure of organisational connectedness, 4) a measure of distress (depression and anxiety) and 5) the Professional Quality of Life scales. A description of these scales follows.

Priority One Satisfaction Scale. An evaluation of the QAS EAP was undertaken in 2003 (see Shakespeare-Finch & Scully, 2004). At that time a series of items were developed to assess general satisfaction levels with the Priority One program and satisfaction with 4 of the EAPs most frequently used resources: External counsellors, Peer Support Officers (PSOs), telephone counselling, and debriefing/defusing. In order to assess satisfaction levels with the EAP, five items representing each of these domains of care (total of 25 items) were included in the survey battery. Participants were asked to respond on a 5-point likert scale regarding the extent to which they agreed or disagreed with each item.

The Professional Quality of Life Scale (ProQOL; version 5, Stamm, 2010). The ProQOL is used as a measure of both negative and positive effects of helping others who experience trauma. The scale consists of 30 items measuring three constructs of compassion satisfaction, burnout, and secondary traumatic stress. The compassion satisfaction subscale measures the extent people experience pleasure through their work. Compassion fatigue is measured with two subscales: burnout, which measures feelings of hopelessness and difficulties in a person’s ability to do their job, and Secondary Traumatic Stress, which assesses the impact of work-related indirect exposure to traumatic events (Stamm, 2010). Each subscale comprises 10-items and respondents are asked to report the frequency each item was experienced in the previous 30 days on a 5-point rating scale ranging from 1 (never) to 5 (very often).

Psychological Sense of Organisational Membership (PSOM). Organisational connectedness was measured using the PSOM (Cockshaw & Shochet, 2007), a scale adapted
from Goodenow’s (1993) Psychological Sense of School Membership scale. The measure comprises 18 items scored from 1 (not at all true) to 5 (completely true) that assess the extent to which respondents feel accepted, valued and respected in the workplace by peers, supervisors and the organisation in general. An example question is ‘I feel like a real part of this organisation’ (Cockshaw, Shochet, & Obst, 2012). Higher scores on the PSOM indicate that the respondent feels a sense of belonging to their workplace.

The Brief Resilience Scale measures a person’s perceptions of their capacity to recover from stress inducing situations (Smith, Dalen, Wiggins, Tooley, Christopher, & Bernard, 2008). This scale consists of six items (three of which are reversed) and respondents are asked to indicate the extent to which they agree with statements posed with 1 representing strongly disagree and 5 representing strongly agree. An example item is “I tend to bounce back quickly after hard times”. In a detailed development paper Smith and colleagues demonstrate strong convergent and discriminant validity as well as the reliability of their measure. The presence of resilience was also included in the QAS survey as resilience is most often operationalised as an absence of pathology; a premise that is now widely regarded as erroneous.

The Kessler 10 (K10) is a measure of distress in the form of symptoms of anxiety and depression. Scoring on this scale can vary but in Australia, most researchers (including the Australian Bureau of Statistics) ask respondents to rate their level of agreement with items from 1 to 5 with 1 indicating the question is true none of the time and 5 representing the question is true all of the time. An example of a K10 question is “About how often did you feel that everything was an effort” (Furukawa, Kessler, Slade, & Andrews, 2003). Given the availability of Australian normative data, the latter format was used in this survey. The K10 has been widely used and is regarded as a reliable and valid measure of distress.

Procedure

Approval to conduct this study was obtained from the Queensland University of Technology Human Research Ethics Committee (Approval Number #1300000159) and the Commissioner of the QAS. All QAS staff were invited to participate in the survey component of the evaluation of Priority One. For convenience and to maximise participation, surveys were made accessible to staff in a hardcopy and in an electronic format. Paper surveys were posted by the QAS to employees’ addresses and returned directly to the independent researchers, while access to the online survey was promoted via staff email and the QAS
intranet site. The survey packet included information on the purpose of the research, expected risks and benefits of participation, and confidentiality. The survey included questions on demographic information; access to Priority One; the participants’ experience of trauma; and five recognised scales relating to distress, well-being, organisational connectedness and professional quality of life as described above in the materials section of this method. Approximately half the surveys were completed online (545). Participation was voluntary and consent was implied through the submission of either the online or hardcopy survey.

**Results**

*Survey Results*

The first series of analyses were focussed on the satisfaction participants felt with the services that Priority One provides. Given the multiple comparisons made, a more stringent alpha level was applied of $p < .01$. Those who had accessed the services had significantly higher levels of satisfaction than those who had not accessed the services with respect to the EAP services in general $t(884) = 4.63, p < .001$. Debriefing was perceived to be supportive debriefing or defusing rather than formal psychological debriefings that are referred to in the extant literature. Those who had used this form of support trended toward being more satisfied with it than those who had not $t(870) = 3.25, p = .019$. Staff who had sought assistance from PSO’s were more satisfied than those who had not $t(862) = 3.96, p < .001$, and the same was found for external counselling services $t(855) = 11.62, p < .001$. No difference in satisfaction levels was found between those who have used telephone counselling and those who have not $t(797) = .977, p = .329$.

PSOs and external counsellors were the most heavily endorsed groups with respect to being satisfied with services provided and finding them useful. On a scale of 1-5 with 1 representing the service was “not at all useful” and 5 representing the services were useful “to a great degree”, mean levels of satisfaction with counsellors were approximately 4/5 and satisfaction with peer supporters were rated as 3.6/5 demonstrating that overall the participants positively endorsed these services. The age of a participant made no discernible difference to satisfaction levels with Priority One services or to most scores on the well-being scales used: the Psychological Sense of Organisational Membership (PSOM), the Burnout and Compassion Satisfaction scales included in the Professional Quality of Life Scales (ProQOL-V), the K10 as a measure of distress or the brief resilience measure. There was a small but significant correlation between age and the Secondary Traumatic Stress scale ($r = .13, p < .01$). Likewise, the length of service of a participant did not differentiate satisfaction
with Priority 1 levels however there was a small but significant correlation between length of
service and symptoms of secondary traumatic stress with higher levels of STS in those who
had been in the service longer ($r = .21, p < .01$). Other correlations were below .1 and
therefore considered negligible; only being statistically significant due to the large sample
size.

Males and females had significantly different scores on some of the measures used.
Females were significantly less likely to experience Burnout $t(945) = 3.27, p < .001$ or
Secondary Traumatic Stress than their male counterparts $t(945) = 2.87, p < .01$ yet there were
no sex differences in levels of Compassion Satisfaction $t(945) = -.34, p = .71$. There were no
differences between males and females on measures of distress $t(880) = .78, p = .43$ or
resilience $t(970) = -1.12, p = .26$. However the sexes demonstrated significantly different
scores for all of the Priority One services as can be seen in Table 1 below. Females were
significantly more satisfied with all Priority One services when compared to male participants
with the exception of external counsellors.

Table 1

<table>
<thead>
<tr>
<th>Service accessed</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>T score (df)</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 in general</td>
<td>Males</td>
<td>15.93</td>
<td>3.63</td>
<td>-2.58 (893)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>16.57</td>
<td>3.32</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td>Males</td>
<td>14.09</td>
<td>4.36</td>
<td>-3.64 (803)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>15.23</td>
<td>4.24</td>
<td></td>
</tr>
<tr>
<td>Supportive debriefs</td>
<td>Males</td>
<td>16.32</td>
<td>5.11</td>
<td>-3.77 (876)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>17.65</td>
<td>4.74</td>
<td></td>
</tr>
<tr>
<td>Peer Support</td>
<td>Males</td>
<td>17.59</td>
<td>5.12</td>
<td>-3.10 (869)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>18.68</td>
<td>4.55</td>
<td></td>
</tr>
<tr>
<td>Counsellors</td>
<td>Males</td>
<td>19.26</td>
<td>4.99</td>
<td>-2.14 (861)</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>19.99</td>
<td>4.44</td>
<td></td>
</tr>
</tbody>
</table>
Table 2 provides correlation coefficients for each of the five Priority One satisfaction measures and the indicators of psychological well-being. As can be seen, the strongest relationships overall are with Compassion satisfaction which was significantly related to levels of satisfaction with all aspects of the Priority One services. The next strongest relationship was with levels of connectedness with the QAS which represents the extent to which participants feel they are valued, respected, and belong within the organisation and levels of satisfaction with the overall Priority One program, debriefing, and peer support officers. Burnout was significantly and negatively related to all aspects of services provided. In short this means that satisfaction with the Priority One services was significantly related to the presence of well-being as measured by compassion satisfaction, to feeling connected to the QAS and that those people satisfied with the services were less likely to experience burnout.

Table 2

Correlations Between Satisfaction Levels With Each Priority One Service and Measures of Well-being.

<table>
<thead>
<tr>
<th></th>
<th>PI overall</th>
<th>Telephone Counselling</th>
<th>Supportive Debriefing</th>
<th>Peer Support Officers</th>
<th>External Counsellors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distress (K10)</td>
<td>-.07*</td>
<td>-.06</td>
<td>-.14**</td>
<td>-.11**</td>
<td>.01</td>
</tr>
<tr>
<td>Resilience</td>
<td>.01</td>
<td>.01</td>
<td>.05</td>
<td>.05</td>
<td>-.12**</td>
</tr>
<tr>
<td>Connectedness</td>
<td>.26**</td>
<td>.18**</td>
<td>.32**</td>
<td>.29**</td>
<td>.17**</td>
</tr>
<tr>
<td>Secondary Traumatic Stress</td>
<td>-.01</td>
<td>-.01</td>
<td>-.05</td>
<td>-.02</td>
<td>.07</td>
</tr>
<tr>
<td>Burnout</td>
<td>-.21**</td>
<td>-.16**</td>
<td>-.27**</td>
<td>-.27**</td>
<td>-.12**</td>
</tr>
<tr>
<td>Compassion Satisfaction</td>
<td>.29**</td>
<td>.20**</td>
<td>.34**</td>
<td>.34**</td>
<td>.22**</td>
</tr>
</tbody>
</table>

Note. ** = significant at p<.001; * = significant at p<.01

Further correlations were conducted to ascertain the strength and direction of relationships between the well-being measures. Participants who felt connected (i.e., have a sense of belonging with the QAS) were significantly more likely to experience compassion satisfaction ($r = .37$) and resilience ($r = .22$) and less likely to experience burnout ($r = -.37$), secondary traumatic stress ($r = -.23$) or distress ($r = -.31$). Lower levels of distress (symptoms of anxiety and depression) were significantly related to higher levels of resilience ($r = -.55$),
connectedness \((r = -.37)\) and compassion satisfaction \((r = -.38)\) and those with higher levels of distress were more likely to experience secondary traumatic stress \((r = .61)\) and burnout \((r = .65)\).

There were no differences in the well-being variables as a function of work role with the exception of students who reported significantly higher levels of compassion satisfaction \(F(3,852) = 4.48, p<.01\) and lower levels of burnout \(F(3,852) = 5.07, p<.01\) than all other groups. This is to be expected given the lack of experience in the paramedical role students have had and their subsequent lower levels of exposure to work-related challenges. Perhaps students are still in a honeymoon phase of their careers where they are still cognisant of the reason they have chosen this career and are actively seeking to remind themselves of the positive aspect of providing emergency medical care to others.

The participants were then separated into 1) on-road staff only and 2) those who had experienced trauma. In the first group (on-road staff) the majority of participants had accessed Priority One \((n = 345, 57\%)\) and had also experienced a traumatic event \((n = 465, 77\%)\). Overall respondents were satisfied with Priority One, with the negative skew in the data indicating that most respondents agreed with the survey statements that Priority One was useful. Table 3 provides the descriptive statistics for on-road staff (Paramedics, Advanced Care Paramedics, and Intensive Care Paramedics) with respect to levels of compassion satisfaction, burnout, secondary traumatic stress, connectivity to the QAS, and general levels of satisfaction with Priority One.

### Table 3

**Descriptive Statistics and Reliabilities of ProQOL-V subscales, PSOM and EAP Satisfaction**

<table>
<thead>
<tr>
<th>Scale</th>
<th>n</th>
<th>M (SD)</th>
<th>95% CI</th>
<th>(\alpha)</th>
<th>Range</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProQOL-CS</td>
<td>602</td>
<td>38.63 (6.39)</td>
<td>[38.11, 39.20]</td>
<td>.91</td>
<td>10–50</td>
<td>-0.95</td>
</tr>
<tr>
<td>ProQOL-BO</td>
<td>602</td>
<td>22.45 (5.89)</td>
<td>[21.95, 22.95]</td>
<td>.79</td>
<td>10–48</td>
<td>0.59</td>
</tr>
<tr>
<td>ProQOL-STS</td>
<td>602</td>
<td>20.16 (6.29)</td>
<td>[19.64, 20.71]</td>
<td>.85</td>
<td>10–49</td>
<td>0.92</td>
</tr>
<tr>
<td>PSOM</td>
<td>596</td>
<td>3.46 (0.73)</td>
<td>[3.40, 3.52]</td>
<td>.92</td>
<td>1.17–5</td>
<td>-0.37</td>
</tr>
<tr>
<td>EAP Satisfaction</td>
<td>568</td>
<td>3.58 (0.99)</td>
<td>[3.49, 3.66]</td>
<td>.88</td>
<td>1–5</td>
<td>-0.73</td>
</tr>
</tbody>
</table>

*Note.* CI = confidence interval; ProQOL = Professional Quality of Life scale; CS = Compassion Satisfaction; BO = Burnout; STS = Secondary Traumatic Stress; PSOM = Psychological Sense of Organisational Membership; EAP = Employee Assistance Program.
The paramedics had average levels of compassion satisfaction, and low levels of burnout and Secondary Traumatic Stress as indicated by the mean scores on these subscales. The variability in the ProQOL-V data was also moderate and similar across the subscales, suggesting that there was a good spread of scores across each of the subscales. Visual inspection of the histograms for each ProQOL-V subscale showed that compassion satisfaction scores were slightly negatively skewed, indicating that in general the paramedics obtained pleasure from their helping work. The histograms of the burnout and Secondary Traumatic Stress measures were slightly positively skewed, indicating that fewer respondents experienced extremely negative reactions to their work.

To explore the prevalence of compassion satisfaction, burnout and STS in the sample, participants were placed into categories of low, average and high for each construct, according to criteria outline in the ProQOL-V manual (Stamm, 2010). The number and percent of paramedics in each category is displayed in Table 4. Overall a greater number of paramedics demonstrated low risk of burnout and STS, than the reported norms (25%; Stamm, 2010). Only two participants indicated experiencing psychological problems as a result of their work, as indicated by high burnout and STS scores. The majority of respondents had average levels of compassion satisfaction, and more paramedics (35.5%) reported high levels of pleasure in their job, compared to the benchmark of 25% (Stamm, 2010).

Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low (0–22) n (%)</th>
<th>Average (23–41) n (%)</th>
<th>High (42–50) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compassion satisfaction</td>
<td>14 (2.3%)</td>
<td>374 (62.1%)</td>
<td>214 (35.5%)</td>
</tr>
<tr>
<td>Burnout</td>
<td>302 (53.2%)</td>
<td>280 (46.5%)</td>
<td>2 (0.3%)</td>
</tr>
<tr>
<td>STS</td>
<td>421 (69.9%)</td>
<td>179 (29.7%)</td>
<td>2 (0.3%)</td>
</tr>
</tbody>
</table>

Note. STS = Secondary Traumatic Stress. N = 602

The second group of participants subjected to analysis regarding their resilience and distress levels had all experienced trauma. This represented 81.8% of the total sample. For more than half of participants, this event had been perceived as either highly severe (28.4%)
or extremely severe (28.1%). Most employees also indicated that they had experienced more than one traumatic event (90.4%). Over half of ambulance personnel in this group had accessed services provided by Priority One (63.6%). Overall QAS employees had low distress levels and moderately high levels of resilience, workplace belongingness and satisfaction with the services Priority One provides. Consistent with the earlier analysis of on-road staff, the distress scale results indicated that the majority of QAS participants were ‘likely to be well’. The relatively high mean scores and limited variability in the resilience, belongingness and Priority One satisfaction distributions indicated that the majority of QAS employees were able to bounce back from stress, felt a sense of belongingness within the organisation, and were satisfied with the EAP services.

A series of independent sample t-tests were then run to determine if participant’s distress and resilience levels differed significantly on demographic and work context factors including gender, whether they had accessed Priority One services or not, whether they were a Peer Support Officer or not, whether they had experienced more than one traumatic event and whether the traumatic event they had experienced was personal or work related. Results presented in Table 5 indicate that significant differences on distress levels existed between participants who had accessed Priority One or not and between participants who were Peer Support Officers or not. Predictably, those people who were most distressed were the people who had accessed Priority One services indicating the services were being used by those who needed them. Peer Support Officers had significantly lower levels of distress than staff who did not occupy this role.

Independent samples t-tests were also conducted to determine participant differences in resilience levels based on the same demographic and work context factors examined above. Significant differences existed between groups who had accessed Priority One services and those who had not. Participants who had experienced trauma and had accessed Priority One had higher levels of resilience than those who had not. The results are presented in Table 6.
Table 5
*Independent Sample t-tests Comparing Participants on Psychological Distress*

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>t</th>
<th>p (2-tailed)</th>
<th>Mean Diff</th>
<th>SE</th>
<th>95% CI</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>726</td>
<td>1.1</td>
<td>.270</td>
<td>.58</td>
<td>.53</td>
<td>[-.45, 1.62]</td>
<td>.09</td>
</tr>
<tr>
<td>EAP Access</td>
<td>636.26</td>
<td>-3.69</td>
<td>.000</td>
<td>-1.79</td>
<td>.49</td>
<td>[-2.74, -.84]</td>
<td>.28</td>
</tr>
<tr>
<td>PSO</td>
<td>67.42</td>
<td>3.3</td>
<td>.002</td>
<td>2.39</td>
<td>.73</td>
<td>[.95, 3.84]</td>
<td>.40</td>
</tr>
<tr>
<td>W/P Trauma</td>
<td>707</td>
<td>.27</td>
<td>.707</td>
<td>.19</td>
<td>.69</td>
<td>[-1.19, 1.56]</td>
<td>.03</td>
</tr>
<tr>
<td>1+ Trauma</td>
<td>725</td>
<td>2.1</td>
<td>.036</td>
<td>1.78</td>
<td>.84</td>
<td>[.11, 3.43]</td>
<td>.27</td>
</tr>
</tbody>
</table>

Note. SE = standard error of mean difference; PSO = peer support officer; W/P Trauma = work or personal trauma; 1+Trauma = more than one trauma experience; Equal variances not assumed for variables EAP access and PSO or not.

Table 6
*Independent Sample t-tests Comparing Participants on Resilience*

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>t</th>
<th>p (2-tailed)</th>
<th>Mean Diff</th>
<th>SE</th>
<th>95% CI</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>733</td>
<td>-.94</td>
<td>.349</td>
<td>-.05</td>
<td>.06</td>
<td>[-.16, .06]</td>
<td>.07</td>
</tr>
<tr>
<td>EAP Access</td>
<td>725</td>
<td>5.06</td>
<td>.000</td>
<td>.27</td>
<td>.05</td>
<td>[.17, .38]</td>
<td>.39</td>
</tr>
<tr>
<td>PSO</td>
<td>733</td>
<td>-.96</td>
<td>.340</td>
<td>-.09</td>
<td>.1</td>
<td>[-.29, 1.02]</td>
<td>.14</td>
</tr>
<tr>
<td>W/P Trauma</td>
<td>713</td>
<td>-1.28</td>
<td>.200</td>
<td>-.09</td>
<td>.07</td>
<td>[-.24, .05]</td>
<td>.13</td>
</tr>
<tr>
<td>1+ Trauma</td>
<td>732</td>
<td>-.07</td>
<td>.946</td>
<td>-.01</td>
<td>.09</td>
<td>[-.18, .17]</td>
<td>.01</td>
</tr>
</tbody>
</table>

Note. SE = standard error of mean difference; PSO = peer support officer; W/P Trauma = work or personal trauma.

**Objective Usage Data**

Objective usage data collected for 2011 showed that on 1,650 separate occasions, a different member of the QAS used the PSO program (more than half of the QAS employees). There were a total of 2,163 contacts that were responded to by 89 PSO’s. The 45 external
Professional Counsellors throughout the state provided support for 795 individual officers on 2,368 occasions ($M = 2.98$) during the 2010 year. In 2011 the external counsellors provided 891 clients with their services on 2,588 occasions ($M = 2.90$). The usage data identified that there had been significant increases in Priority One usage for Paramedics, Classified Officers, Emergency Medical Dispatchers and Student Paramedics. In 2011 personnel accessed counsellors most often for work related stress, followed by marital/relationship issues, anxiety, personal stress/tension and depression. In the same year personnel sought assistance from Peer Support Officers most often for work related trauma, followed by personal stress/tension, interpersonal difficulties with a supervisor or manager and marital/relationship issues. Interestingly more females than males accessed counsellors when taking into account the proportions of males and females in the QAS. Although females make up approximately 30% of the total staff, 47% of people who accessed counselling were female.

**Discussion**

The research outlined in this document used a rigorous and comprehensive design in order to investigate the Queensland Ambulance Service’s employee assistance program known as Priority One. A review of current best practice revealed the gold standard in making such assessments to include:

1. A thorough review of scientific literature.
2. An independently coordinated committee of stakeholders to oversee the research.
3. Selection of scales that provide validated self-report measures.
4. Themes extracted from stratified focus group data to further inform survey construction specific to the organisational context, and to provide a means of triangulating data.
5. Usage data of how many personnel access particular services provided and for what reasons specific services are being accessed.
6. Questions regarding satisfaction with the services provided.

All of these methods of investigation were included in the current study.

The first question asked of the data was if QAS personnel who had actually used the Priority One services had different levels of satisfaction with the services when compared to those who had not. With the exception of telephone counselling and supportive debriefing, data indicated that people who had accessed the services (peer support, external counsellors
and internal counsellors) were significantly more satisfied with services than those who had not accessed them, which in itself is a positive endorsement of the program. Overall the results suggest that QAS personnel are satisfied with the services that Priority One provides both in general and in terms of specific services. For example, external counsellors and peer support officers were particularly noted as worthwhile and important components of the program and attracted high levels of endorsement from all participants.

In addition to assessing satisfaction with the EAP, a number of scales assessing various aspects of well-being were used. This approach to the research was designed to provide measures of well-being that essentially were used to ask the “So what?” question: “So what if personnel are satisfied with Priority One services; what does that mean for well-being?” Correlations conducted between these scales and the staff support satisfaction measure demonstrated that staff who were accessing services and were satisfied with those services were significantly more satisfied with the giving nature of their work role (i.e., compassion satisfaction), perceived a greater sense of connection and belongingness with the organisation, and were less likely to suffer from burnout. Staff who were satisfied with the EAP were also more likely to feel that the QAS valued and respected them as employees; that they belong and are an integral part of the organisation.

The well-being data collected demonstrated that overall, the QAS staff are psychologically healthy with low levels of burnout and secondary traumatic stress and comparatively high levels of compassion satisfaction. Results also demonstrated low levels of distress and moderately high levels of resilience, workplace belongingness and satisfaction with the services Priority One provides. This is a positive picture for the general well-being of QAS personnel bearing in mind that cross-sectional research can only demonstrate the direction (positive or negative) and strength of relationship between variables, and cannot establish causality.

Staff who had accessed Priority One services had higher levels of distress than those who had not, which is to be expected; if a participant did not experience distress there would be little point in accessing staff support services. An encouraging result in terms of the efficacy of services provided is that those who had accessed services were also significantly more resilient than those who had not. Further, those personnel who occupied a peer support officer role had higher levels of resilience and other indices of well-being than those who did not occupy such a role. It may be that this result is due to the self-selected nature of a peer
supporter but may also be as a result of the training they undergo prior to taking on such a role. For example, part of the PSO training is about reflection of one’s own internal states and psychological well-being. Psycho-education may serve to protect against negative psychological consequences and promote mental health. In addition to this is their access to ongoing supervision and sense of being part of a cohesive network of other peer support officers. This finding has implications for all members of the service and highlights the advantage of keeping psycho-education an ongoing priority for all staff.

A major strength of this research is in the comprehensiveness of data collected. When taken together, the usage data, focus group themes and survey results can be triangulated to provide an overview of the efficacy of the Priority One program. Triangulated data suggests high levels of satisfaction with the employee assistance program in general, with particularly high endorsement of the peer supporter and professional counsellor components. Furthermore, stress, whether perceived to originate from management or the organisation more broadly can be reduced through accessing the program, resilience can be enhanced, compassion satisfaction heightened and burnout reduced. Triangulation also sheds some light on the differences between males and females who participated in this research. Females were less likely to experience burnout or traumatic stress than males and were also more satisfied with all Priority One services with the exception of external counsellors with whom males and females were equally satisfied. Combining these survey results with the usage data, it can be seen that proportionately more females than males are accessing services. This trend is consistent with previous research that suggests males are more likely than females to wait until an issue has become a significant problem before seeking assistance (Mansfield, Addis, & Mahalik, 2007).

References


Promoting posttraumatic growth in police recruits: Preliminary results of a randomised controlled resilience intervention trial.

Associate Professor Jane Shakespeare-Finch\textsuperscript{1}, Professor Ian Shochet\textsuperscript{1}, Dr Colette Roos\textsuperscript{1}, Mr Cameron Craig\textsuperscript{2}, Dr Deanne Armstrong; Professor Ross Young\textsuperscript{1}, & Ms Astrid Wurfl\textsuperscript{1}

School of Psychology & Counselling,
Faculty of Health,
Institute of Health and Biomedical Innovation,
Queensland University of Technology,
Kelvin Grove, Australia 4059

\textsuperscript{2}Queensland Police Service

This research was supported by a grant from the Australian Research Council in Partnership with the Queensland Police Service

Paper presented at the
Australia & New Zealand Disaster & Emergency Management Conference, Surfers Paradise (QLD), 5th-7\textsuperscript{th} May 2014
Promoting posttraumatic growth in police recruits: Preliminary results of a randomised controlled resilience intervention trial.

**ABSTRACT:** Recent research has demonstrated that the same experiences that may elicit symptoms of post-traumatic stress disorder (PTSD) in emergency service personnel can also provide a catalyst for positive personal changes such as posttraumatic growth (PTG). In this research newly recruited police officers (N = 412) participated in a randomised control trial of a program specifically designed to promote mental health. On entry to the academy, new recruits were randomly allocated, by classrooms, to either a treatment as usual condition (i.e., existing psychoeducation program) or to the intervention group. The Promoting Resilient Officers (PRO) program is a resilience building intervention adapted from an earlier resilience building program in collaboration with the police service. The PRO program also includes additional components on trauma and PTG. The current research included the participants who had experienced trauma prior to or during the research period (N = 246). It was hypothesised that participation in the PRO program would increase levels of PTG and lower levels of PTSD when compared to recruits in the control condition. Using multilevel modelling and post-hoc analyses, results indicated there were significantly higher levels of PTG across multiple dimensions when compared to the control group. There was no effect on PTSD symptoms with both conditions showing a floor effect. The research indicated the potential value of developing interventions that elicit reflections on the potential for positive as well as negative outcomes of experiencing traumatic and other highly challenging events.

**KEYWORDS:** police, trauma, posttraumatic growth, RCT, intervention

**INTRODUCTION**

Emergency services personnel (e.g., police, fire and ambulance officers) are routinely exposed to a wide range of potentially traumatising events (PTE) in the course of their employ (Hart & Cottom, 2003; Violanti & Paton, 2006). For example, police attend to people when they are at their most vulnerable, and to critical incidents that are frequently chaotic, violent and unpredictable. Police officers may experience a threat to their own personal safety, as well as bearing witness to death or the threat of death or serious injury of others. Exposure to critical incidents can often provoke overwhelming emotions of fear and vulnerability, and cause some individuals to develop posttraumatic stress symptoms, such as
hypervigilance, insomnia, irritability, mood swings, and concentration difficulties. In severe cases where symptoms inhibit normal functioning and persist over time, mental health diagnoses such as Acute Stress Disorder (ASD) and partial or full Posttraumatic Stress Disorder (PTSD) may be made (Harvey & Bryant, 1998; Maia et al., 2007; Yehuda, 2002).

The experience of stress disorders can be a source of considerable health and financial burdens for individuals, which has flow-on effects to families and the community (Walker et al., 2003). Reduced work productivity, disturbances in relationships and family functioning, greater healthcare needs (Jordan et al., 1992; Maia et al., 2007), alcohol and substance misuse (Creamer et al., 2001; Ménard & Arter, 2013), and co-morbidity with other psychiatric disorders, such as depression and anxiety, are common among PTSD sufferers (Yehuda, 2002). For example, one Brazilian police study found that officers with full PTSD were five times more likely to be divorced than officers without PTSD (Maia et al., 2007). Those with full PTSD also reported having accessed medical services significantly more often during the last 12 months, and had more suicidal ideation.

Research estimates the 12-month prevalence of PTSD in the general Australian population range from 1.33 – 6.4% (Australian Bureau of Statistics, 2007; Creamer et al., 2001), and rates among the police population have been reported to be considerably higher. For example, international studies report rates of around 7-9% for full PTSD among police (Carlier, Lamberts, & Gersons, 1997; Maia et al., 2007), and 16% for partial PTSD (Maia et al., 2007). In a Dutch police study, Carlier, Lamberts, and Gersons (1997) found that as many as 34% of the police sample had symptoms of PTSD or sub-threshold PTSD.

Police organisations evidently have a vested interest in protecting the well-being of their officers and minimising the potential for serious negative life outcomes as a product of their duties. Although newly-recruited police officers are mentally healthy, the accumulated effect of repeated exposure to work-related stress and traumatic events can take a toll on officers’ psychological resilience (Burke & Mikkelsen, 2006). Effective interventions are urgently needed, yet the prevention and treatment of posttraumatic stress symptoms can be difficult. For example, sufferers can often be reluctant to seek help from mental health practitioners due to social stigma and possible work-related consequences (Yehuda, 2002). This can be particularly problematic among police as the fear of job-related consequences, such as the loss of the right to carry a weapon or loss of their police badge, may be high (Waters & Ussery, 2007; Yehuda, 2002). Current intervention efforts such as exposure therapy are largely reactive and focus on the treatment of symptoms after the traumatising event. Psychological debriefing following traumatic events has been a technique widely used...
in the police setting, however there is mixed evidence concerning the effectiveness of this strategy, with some research indicating that it may even increase psychological stress symptoms (Arendt et al., 2001; Rose, Bisson, Churchill & Wesseley, 2009).

Potential for Posttraumatic Growth

Traditionally the focus of mental health research in emergency service populations has been to examine the predictors and correlates of mental ill-health and to identify ways of alleviating symptoms associated with poor mental health (e.g., Violant & Paton, 2006). Despite the negative sequelae that can be seen in individuals following a traumatic event, it is also known that the same experience can lead to quite different and more positive outcomes. Posttraumatic growth or PTG is a term coined by Richard Tedeschi and Lawrence Calhoun (1995) to denote positive post-trauma changes rather than focusing on the deficits or pathology that can ensue following a traumatic event (e.g., PTSD, depression). The positive changes referred to in this cognitive model of growth can be conceived as occurring in one or more of three domains: changes in philosophy of life; changes in perceptions of personal strength; and changes in relationships. Importantly, Tedeschi and Calhoun’s model of PTG does not deny the presence of ongoing levels of distress (Tedeschi & Calhoun, 2006). Thus, while PTG research focuses on positive changes, the model does not deny the presence of enduring distress and so increasingly research that investigates PTG also examines indicators of mental ill-health such as symptoms of PTSD (e.g., Shakespeare-Finch et al., 2003). In other words, while officers may perceive positive changes as a result of the struggle they engage in following a traumatic experience, those same officers may also exhibit symptoms of PTSD.

Yet positive life changes or PTG has been found to be more prevalent than PTSD symptoms in emergency service personnel. For example, Shakespeare-Finch and colleagues (2003) found PTG to be commonly reported as an outcome of negotiating trauma in ambulance personnel. Similarly, Armstrong and colleagues (2013) identified that fire-fighters reported both PTG and symptoms of PTSD. PTG is not to be confused with resilience. Resilience in its simplest conceptualisation refers to a return to pre-event psychological functioning whereas PTG refers to positive changes that move beyond pre-event functioning. Researchers such as Westphal and Bonnano (2007) provide cogent commentary about differences between PTG and resilience, noting that most people are resilient which provides little opportunity for growth given that an event needs to be severe enough to shatter pre-existing schemas. Although the program tested in this research is called the “Promoting
Resilient Officers’ program, a specific module detailing PTG was included (Shochet et al., 2011).

Predicting post-trauma adaptation

In seeking to create an intervention to promote resilience and positive adaptation following exposure to trauma, it is important to first consider the most appropriate targets for intervention; those variables that have been found to predict both PTG and PTSD. Characteristics of both the event and the individual, and the presence of risk and protective factors, influences the development of PTSD and return to baseline functioning following exposure (Carlier et al., 1997; Keane, Marshall & Taft, 2006; Martin et al., 2009; Yehuda, 2002). The question of which of these factors intervention efforts should focus on to make the possibility of positive adaptation more likely to occur is critical to the development of effective mental health strategies for police and other emergency services workers.

As the nature of traumatic events means that they are often unpredictable and unable to be controlled, research efforts may be best focussed on factors that are modifiable such as coping skills and interpersonal resources. In this regard, research investigating putative predictors of PTSD among police officers hint at some potential avenues for targeted intervention. Of particular interest are findings from both prospective and retrospective studies which demonstrate that an individual’s perception of relationships and support from colleagues both before and after the experience of a traumatic event is an important influence on likelihood of developing PTSD (Charuvustra & Cloitre, 2008; Karlsson & Christianson, 2003). For example, Carlier et al. (1997) examined internal and external risk factors for posttraumatic stress symptoms among 262 traumatized police officers. Predictors of symptoms at 3 and 12 month follow-up included (but were not limited to) difficulty in expressing feelings, dissatisfaction with organisational support, and lack of social interaction support. In another example, Martin et al. (2009) found that dissociation and positive social support from colleagues within the first few hours or days following a trauma accounted for 35% of the variance in PTSD symptoms. The relationship between social support and PTG has not yet been investigated within a police population, however social support is a feature of the model of PTG (Calhoun & Tedeschi, 2013) and has demonstrated a consistent positive relationship with PTG in non-emergency services populations (Prati & Pietrantoni, 2009).

Such findings point toward potential gains in promoting police officers’ awareness of the value of supportive relationships and the role that they play in mental health. That police officers tend to be reserved when it comes to confiding in others and seeking help with difficulties (Kureczka, 2002) suggests there is room for more adaptive coping skills to be
learned. The challenge may lie however in the ability of police officers to adapt their self-concept to accommodate new self-perceptions regarding relating to others and seeking help, that may be seemingly at odds with their possible existing beliefs about how police officers should cope. To this end, there are conceivable benefits in coaching the attitudes of newly recruited police officers and using well-regarded senior colleagues to model communication, social support and coping behaviours, in order to equip officers with a range of skills to manage the emotional and psychological effects of the situations they will encounter in their future work.

In this paper, we investigate the effect of a proactive resilience intervention designed specifically for police recruits on PTSD symptoms and PTG scores at two follow-up time points. Our aim was to test whether a police officer resilience intervention that covers improved relationships and also includes specific components on PTG would be associated with higher levels of PTG and lower levels of PTSD. Although previous research has used a CBT psychoeducational approach to interventions, for example, in cancer outpatients (Garland, 2007), and college students (Dolbier, et al., 2010), none have specifically included topics that are directly related to the promotion of PTG. Further, at this stage there has been no research published that has adopted a universal approach to developing an intervention to promote PTG in emergency service personnel, let alone done so using a RCT design. The PRO (Promoting Resilient Officers) program draws on a strength based approach to promote resilience and growth in police personnel. A full description of the development of the PRO program has recently been published (Shochet et al., 2011) and a brief outline is presented here.

**Promoting Resilient Officers (PRO) program**

Based on the Promoting Adult Resilience (PAR) program (Shochet et al., 2007), PRO was developed in conjunction with a State Police Service using the Community Based Participatory Research (CBPR) framework (Shochet et al., 2011). PRO involves 7 x 2 hour weekly sessions which are facilitated by a police psychologist. The program is fully manualised with a Group Leader Manual and Participant Workbook. PRO is conducted in groups, and is an integration of evidenced-based techniques drawn from Cognitive Behavioural Therapy and Interpersonal Therapy. PRO is a universal workplace based resilience building program with a comprehensive approach focussing on intrapsychic, interpersonal and organisational protective factors. Topics covered in the program include: the recognition of existing strengths and resilience capacity, exploration of a comprehensive model of personal resilience, stress management techniques, cognitive restructuring to maintain positive self-talk,
communication skills to promote harmony and support in the workplace, the promotion of a positive work-life balance, posttraumatic growth, and techniques for drawing strength from adversity. PRO sessions are experiential and include homework tasks that are reinforced between sessions by email communication. The intervention also utilises online refreshers and email boosters to promote the sustainability of knowledge gained. The cognitive model inherent in the PRO intervention focuses on promoting the quality of interpersonal relationships while capitalising on existing strengths and skills.

Assessment of the efficacy of the PRO program was conducted through a randomised controlled trial design and in this paper we specifically examine outcomes of trauma and the capacity of the PRO program impacting on perceptions of both positive and negative post-trauma changes. It was hypothesised that participants in the intervention group would report higher levels of PTG and lower levels of PTSD following completion of the PRO program when compared to participants in the control group.

**Method**

**Participants**

Participants in the PRO program were 412 newly recruited officers in the Queensland Police Service (QPS). As the variables of interest in the research reported here were post-trauma outcomes, following an description of trauma based on the DSM IV-TR criteria for PTSD, only participants who indicated they had experienced a traumatic event were included in the analyses. The final sample for the research presented here included only those participants who had reported experiencing a traumatic event at by T3, leaving 246 participants\(^1\) (122 intervention group; 124 control group). Ages ranged from 19 to 50 years with a mean of 29.44 (SD = 6.99) years. There were 170 males and 76 females (69.1% males).

**Measures**

*Posttraumatic Growth Inventory* (PTGI; Tedeschi & Calhoun, 1996). The 21-item PTGI assesses positive changes resulting from the negotiation of challenges faced post-trauma, and exhibits high reliability in US populations (e.g., \(\alpha = .93\); Tedeschi & Calhoun, 1996) as well as in Australian emergency service populations (e.g., \(\alpha = .93\); Shakespeare-Finch, et al., 2003). The PTGI is scored on a 6-point rating scale ranging from this change did not happen for me “at all” to change happened to “a very great degree”. The PTGI distinguishes five

\(^1\) Of the participants who reported trauma by T3, 3 did not complete the IES-R at any time point and so the IES-R analysis included 243 participants.

Impact of Events Scale – Revised (IES-R; Weiss & Marmar, 1997). The IES-R is a 22 item scale designed to measure the three symptom clusters that comprise a diagnosis of PTSD (APA, 2000): Avoidance, Intrusion, and Hyperarousal. Participants indicate the degree of distress they have experienced over the previous 7 days on a rating scale ranging from 0 (not at all) to 4 (extremely). The IES-R has been shown to be a reliable measure in Australian populations with strong alpha coefficients (e. g., .94, Morris & Shakespeare-Finch, 2010).

Procedure

Data examined here have been extracted from a larger ongoing Randomised Controlled trial, and are from the first three time points. Time 1 was prior to any training in issues of mental health and was collected in the first week at the police academy. The second time point was following completion of the intervention program 2 months after Time 1. The third collection point occurred immediately prior to leaving the academy and starting the participant’s career as sworn police officers (6 months post time 1). At the individual level, the police service utilises a computer generated system to randomly allocate the recruits to classes. In most of the intakes, there were 4 classes. For the RCT, class was the unit of randomisation. A block randomisation schedule was generated using SPSS version 15. This allocated the four classes within an intake to either the control or intervention trial groups, thus ensuring that two classes per intake were allocated to each arm to achieve a balanced design at study completion. The randomisation and allocation complied with CONSORT guidelines. Due to some intakes not having four classes, the design at study completion included 10 intervention classes and 11 control classes.

Results

Descriptive statistics are reported in Table 1. For inferential statistics, multi-level modelling (MLM) was chosen over repeated measures analysis, as it offers two key advantages relevant for the current data set and analysis aims: robustness against missing data, and the ability to estimate clustering effects. MLM is useful when a research design has individuals nested within a higher level collective unit, as it takes into account the influence of both fixed and random factors at multiple levels (Quené & van den Bergh, 2004). MLM’s robustness against missing data means that the power of the research design is less compromised than if other analysis methods that are sensitive to missing data were used.

In the present analysis, the most parsimonious model was with two random effects, intake and officer nested in intake. Fixed effects included group (control or intervention),
time (pre-intervention, post-intervention and 6 month follow-up) and the group by time interaction. Residual variances were identified across time for intake and officer. Note that when using mixed models, the denominator of degrees of freedom may not be whole numbers as PASW/SPSS software uses an approximation method to compute the degrees of freedom (West, 2009). Similarly, because of the estimation process, the analysis yields standard error terms rather than standard deviations.

The means depicted in Table 1 highlight a general trend whereby those in the intervention group report higher levels of growth at T3 than T1, while the control group report lower levels of growth at T3 than T1. Both groups tend to endorse a reduction in growth scores between T2 and T3, however in the control group this is a continuation of the decline seen between T1 and T2, while those in the intervention group reported marked increases between T1 and T2 and were better able to maintain their growth scores between T2 and T3. Table 2 presents the results of the Type III Tests of Fixed Effects for all three fixed effects on the total and domains of the PTGI. Estimates of Fixed Effects were then used to determine where significant differences existed between groups across time following a significant interaction (group by time) or a significant main effect of group where the interaction failed to reach significance.

There was a significant group by time interaction on the PTG Relationships domain. Following this, Estimates of Fixed Effects identified a significant group difference between T3 and T1 (baseline), \( t(233.10) = 2.40, p = .017 \), and T2 and T1, \( t(228.10) = 2.22, p = .028 \). There was also a significant interaction on the Appreciation of Life domain. Estimates of Fixed Effects found a significant group difference between T3 and T1, \( t(230.70) = 2.36, p = .019 \), and the differences between T2 and T1 approached significance, \( t(261.63) = 1.86, p = .064 \). The significant interaction between T3 and T1 reflects that those in the control group reported a reduction in appreciation of life between T1 and T3, while the scores in the intervention group were higher at T3 than T1.

The omnibus Test of Fixed Effects for total PTG did not reach significance, however, there was a significant main effect of group and the Estimates of Fixed Effects analysis indicated significant total PTG differences between the groups between Time 3 and Time 1, \( t(228.51) = 1.98, p = .048 \), and data approached significance between Time 2 and Time 1, \( t(226.41) = 1.94, p = .054 \). Inspection of the means in Table 1 demonstrate that those in the intervention group reported an increase in total PTG between T1 and T3, while total PTG scores in the control group decreased between T1 and T3. Spiritual Change also did not elicit a significant interaction, although there was a main effect of group. The Estimates of Fixed
Effects for Spiritual Change did not show a significant group difference between T1 and T2, $t(207.43) = 1.06, p = .291$, however there was a significant group difference between T3 and T1, $t(228.20) = 2.15, p = .033$. While there were significant group effects for the New Possibilities and Strength factors of the PTGI, the Estimates of Fixed Effects did not identify any group differences between time points.

**Table 1: Estimates of Mean PTGI Scores and Standard Errors at Each Time Point for Both Groups**

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th>SE</th>
<th>Control Group</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationships</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>18.34</td>
<td>1.37</td>
<td>17.11</td>
<td>1.37</td>
</tr>
<tr>
<td>T2</td>
<td>19.98</td>
<td>1.41</td>
<td>15.52</td>
<td>1.38</td>
</tr>
<tr>
<td>T3</td>
<td>19.31</td>
<td>1.53</td>
<td>13.99</td>
<td>1.54</td>
</tr>
<tr>
<td><strong>New Possibilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>11.77</td>
<td>1.06</td>
<td>10.76</td>
<td>1.06</td>
</tr>
<tr>
<td>T2</td>
<td>13.72</td>
<td>1.09</td>
<td>10.96</td>
<td>1.07</td>
</tr>
<tr>
<td>T3</td>
<td>13.65</td>
<td>1.19</td>
<td>11.10</td>
<td>1.20</td>
</tr>
<tr>
<td><strong>Strength</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>11.95</td>
<td>.88</td>
<td>11.00</td>
<td>.87</td>
</tr>
<tr>
<td>T2</td>
<td>12.72</td>
<td>.89</td>
<td>10.47</td>
<td>.88</td>
</tr>
<tr>
<td>T3</td>
<td>12.01</td>
<td>.93</td>
<td>9.76</td>
<td>.95</td>
</tr>
<tr>
<td><strong>Spiritual</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>3.00</td>
<td>.28</td>
<td>2.61</td>
<td>.28</td>
</tr>
<tr>
<td>T2</td>
<td>3.28</td>
<td>.28</td>
<td>2.51</td>
<td>.27</td>
</tr>
<tr>
<td>T3</td>
<td>3.82</td>
<td>.35</td>
<td>2.41</td>
<td>.36</td>
</tr>
<tr>
<td><strong>Appreciation of life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>8.51</td>
<td>.61</td>
<td>8.52</td>
<td>.61</td>
</tr>
<tr>
<td>T2</td>
<td>8.82</td>
<td>.64</td>
<td>7.57</td>
<td>.62</td>
</tr>
<tr>
<td>T3</td>
<td>8.84</td>
<td>.66</td>
<td>7.11</td>
<td>.66</td>
</tr>
<tr>
<td><strong>PTG Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>53.64</td>
<td>4.07</td>
<td>50.12</td>
<td>4.06</td>
</tr>
<tr>
<td>T2</td>
<td>58.58</td>
<td>4.21</td>
<td>47.13</td>
<td>4.12</td>
</tr>
</tbody>
</table>
Table 2: *Type III Tests of Fixed Effects on PTGI scores*

<table>
<thead>
<tr>
<th>PTG Domain</th>
<th>F tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relationships</strong></td>
<td>Time $F(2, 267.07) = .97$, $p = .379$</td>
</tr>
<tr>
<td></td>
<td>Group $F(1, 238.84) = 8.99$, $p = .003$</td>
</tr>
<tr>
<td></td>
<td>Time x Group $F(2, 267.62) = 3.78$, $p = .024$</td>
</tr>
<tr>
<td><strong>New Possibilities</strong></td>
<td>Time $F(2, 282.34) = 2.16$, $p = .117$</td>
</tr>
<tr>
<td></td>
<td>Group $F(1, 234.56) = 5.61$, $p = .019$</td>
</tr>
<tr>
<td></td>
<td>Time x Group $F(2, 283.15) = 1.30$, $p = .274$</td>
</tr>
<tr>
<td><strong>Strength</strong></td>
<td>Time $F(2, 259.86) = 1.08$, $p = .342$</td>
</tr>
<tr>
<td></td>
<td>Group $F(1, 239.53) = 6.76$, $p = .010$</td>
</tr>
<tr>
<td></td>
<td>Time x Group $F(2, 260.19) = 1.36$, $p = .258$</td>
</tr>
<tr>
<td><strong>Spiritual</strong></td>
<td>Time $F(2, 275.48) = .88$, $p = .416$</td>
</tr>
<tr>
<td></td>
<td>Group $F(1, 249.51) = 6.00$, $p = .015$</td>
</tr>
<tr>
<td></td>
<td>Time x Group $F(2, 275.76) = 2.33$, $p = .099$</td>
</tr>
<tr>
<td><strong>Appreciation of life</strong></td>
<td>Time $F(2, 260.33) = 1.16$, $p = .315$</td>
</tr>
<tr>
<td></td>
<td>Group $F(1, 238.95) = 3.87$, $p = .050$</td>
</tr>
<tr>
<td></td>
<td>Time x Group $F(2, 260.64) = 3.25$, $p = .040$</td>
</tr>
<tr>
<td><strong>Total PTG</strong></td>
<td>Time $F(2, 270.94) = .28$, $p = .760$</td>
</tr>
<tr>
<td></td>
<td>Group $F(1, 240.35) = 7.37$, $p = .007$</td>
</tr>
<tr>
<td></td>
<td>Time x Group $F(2, 271.58) = 2.75$, $p = .066$</td>
</tr>
</tbody>
</table>

The means in Table 3 below highlight the floor effect in relation to the levels of PTSD symptoms reported across time in both groups. In Table 4 type III Tests of Fixed Effects indicate that there were no significant main effects of group or time, and no significant differences between groups across time for the total IES-R scores or for any of the factors; hyperarousal, intrusion, or avoidance.
Table 3: Estimates of Mean IES-R Scores and Standard Errors at Each Time Point for Both Groups

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th></th>
<th>Control Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SE</td>
<td></td>
<td>SE</td>
</tr>
<tr>
<td>Intrusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>3.21</td>
<td>.50</td>
<td>2.91</td>
<td>.48</td>
</tr>
<tr>
<td>T2</td>
<td>2.71</td>
<td>.44</td>
<td>2.44</td>
<td>.41</td>
</tr>
<tr>
<td>T3</td>
<td>2.42</td>
<td>.58</td>
<td>2.26</td>
<td>.57</td>
</tr>
<tr>
<td>Hyperarousal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>1.05</td>
<td>.32</td>
<td>1.21</td>
<td>.30</td>
</tr>
<tr>
<td>T2</td>
<td>.98</td>
<td>.24</td>
<td>.75</td>
<td>.22</td>
</tr>
<tr>
<td>T3</td>
<td>1.01</td>
<td>.37</td>
<td>1.12</td>
<td>.36</td>
</tr>
<tr>
<td>Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>3.08</td>
<td>.48</td>
<td>3.18</td>
<td>.45</td>
</tr>
<tr>
<td>T2</td>
<td>2.92</td>
<td>.45</td>
<td>2.59</td>
<td>.43</td>
</tr>
<tr>
<td>T3</td>
<td>2.40</td>
<td>.63</td>
<td>3.01</td>
<td>.62</td>
</tr>
<tr>
<td>IES-R Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>8.33</td>
<td>1.18</td>
<td>7.31</td>
<td>1.11</td>
</tr>
<tr>
<td>T2</td>
<td>6.61</td>
<td>1.04</td>
<td>5.78</td>
<td>.98</td>
</tr>
<tr>
<td>T3</td>
<td>5.80</td>
<td>1.48</td>
<td>6.35</td>
<td>1.45</td>
</tr>
</tbody>
</table>
### Table 4: Type III Tests of Fixed Effects on IES-R scores

<table>
<thead>
<tr>
<th>Domains</th>
<th>F tests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IES-R Total</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>$F(2, 245.87) = .96, p = .385$</td>
</tr>
<tr>
<td>Group</td>
<td>$F(1, 266.28) = .01, p = .936$</td>
</tr>
<tr>
<td>Time x Group</td>
<td>$F(2, 245.87) = .24, p = .784$</td>
</tr>
<tr>
<td><strong>Intrusion</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>$F(2, 23.20) = 1.38, p = .26$</td>
</tr>
<tr>
<td>Group</td>
<td>$F(1, 254.48) = .23, p = .634$</td>
</tr>
<tr>
<td>Time x Group</td>
<td>$F(2, 239.20) = .01, p = .988$</td>
</tr>
<tr>
<td><strong>Hyperarousal</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>$F(2, 259.68) = .67, p = .511$</td>
</tr>
<tr>
<td>Group</td>
<td>$F(1, 272.72) = .00, p = .962$</td>
</tr>
<tr>
<td>Time x Group</td>
<td>$F(2, 259.68) = .40, p = .673$</td>
</tr>
<tr>
<td><strong>Avoidance</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>$F(2, 238.58) = .68, p = .509$</td>
</tr>
<tr>
<td>Group</td>
<td>$F(1, 263.36) = .06, p = .815$</td>
</tr>
<tr>
<td>Time x Group</td>
<td>$F(2, 238.58) = .57, p = .567$</td>
</tr>
</tbody>
</table>

**Discussion**

Results yielded mixed support for the hypothesis with significant group differences in posttraumatic growth after participation in the PRO program, but there was no group effect on PTSD outcomes. Specifically, participants in the intervention group tended to report increases in growth between baseline and T2, with T3 reports of growth also higher than T1. Both groups generally endorsed a reduction of growth between T2 and T3, but for those in the control group this was a continuation of a downward pattern from T1 through to T3, whereas those in the intervention group had increased at T3 compared to T1 scores, and reported only slight decreases between T2 and T3. Significant group differences between time points were found in the Relationships with others, Appreciation of life, and Spiritual growth factors and on the total PTGI scores. These results are encouraging in that they suggest posttraumatic growth can be enhanced as a potential outcome for emergency service personnel if included in psychoeducational programs such as PRO, even within relatively short time frames.

Results are also consistent with previous research in emergency services that has found posttraumatic growth to be a relatively common outcome following the experience of trauma (e.g., Shakespeare-Finch et al., 2003). Importantly, growth as an outcome is not an automatic bi-product of experiencing trauma (Calhoun & Tedeschi, 2006; Tedeschi &
Calhoun, 1995). Rather, it is the result of many factors including effortful rumination, unconditional support and validation of the experience from others, and the creation of meaning around the experience (Calhoun & Tedeschi, 2006). With skilled assistance, posttraumatic growth may be possible after even the most harrowing of life events (see Calhoun & Tedeschi, 2013 for clinical practice guidelines). The preliminary results of this trial of the PRO program add confidence to that claim. For example, receiving education about posttraumatic growth, elucidating the various ways in which positive changes can be experienced, and ways in which a person may engage with the traumatic material to promote adaptation were an integral part of the PRO program but were not a standard part of the existing psychoeducation in this police service. That the intervention group was significantly more likely to perceive growth than the control group is extremely encouraging in terms of the capacity of proactive interventions to facilitate positive post-trauma changes.

There are a number of explanations for the lack of significant group differences for PTSD symptoms, the primary one being that recruits are screened on application to the police service and those who had scores indicating PTSD would have been excluded. Therefore the IES-R data showed a floor effect whereby all recruits in both conditions recorded very low scores. In other words, they were well. Further, the third time point in this study was 4 months after completion of the intervention. The presence of resilience requires something to bounce back from, and as the participants had not yet begun their on-road duties, and were still in training, it is probably that the larger majority of the sample (both intervention and control) did not experience difficulties significant enough to allow for the full utilisation of the skills that were in the PRO program which has the aim of preventing significant distress. This is supported by the fact that, while there were no significant differences between the intervention and control groups at time 3 on PTSD symptoms, neither were there differences in either group between time 1 and 3. Thus the lack of difference detected on PTSD symptoms in particular may not be a failure of the intervention as much as a lack of opportunity to see the effects of the intervention. Previous research in this area that has investigated predictors of mental health outcomes have generally utilised samples of experienced officers (e.g., Ménard & Arter, 2013) or followed recruits over longer periods of time (e.g., four years; Galatzar-Levy et al., 2013). Due to the rigorous nature of selection procedures and consequently the psychologically healthy nature of those who begin training as police officers in this study, it may take longer to see the impact of the training.

With the time constraints in mind, there is also good reason to believe that the changes detected in the positive relations with others domain of PTG may be protective
against the development of PTSD for those in the intervention group in the longer term. It may be that the changes observed in relating to others in this study may be a precursor to resilience in the longer term, as there is evidence to suggest that positive relationships may be protective against the development of PTSD (e.g., Ménard & Arter, 2013; Yuan et al., 2011). Police officers are less likely to develop negative outcomes during the early stages of their employment (Burke & Mikkelsen, 2006), and there was a floor effect in terms of very low levels of PTSD symptoms in this study. Therefore, while the timeframe of the current study may not be sufficient to appreciate the full benefit of the resilience building program, it is possible that over time, those in the intervention group may maintain their low levels of pathology.

Continuation of study for a longer period of time to assess the long term impact of the intervention is an important step in furthering the research. In order for the PRO program to maintain its salience across time, ongoing contact with recruits, for example through on-line refreshers may be useful. It will also be important to examine other health and well-being outcomes and the relationship they have to PTG. Another direction for future research is to explore strategies for the implementation of the intervention for longer serving officers.

Conclusion

People in high risk occupations not only experience an increased risk of mental health challenges, but also the potential for increased personal growth and well-being. There is a shift towards proactive approaches to mental health for those in high risk occupations, challenging the traditional reactive and pathogenic focus (Scully, 2011). However, many such approaches are theoretically based and have not been subject to the rigorous design of an RCT. This paper has described preliminary results from the first proactive program aimed at promoting PTG in a high-risk occupation. The differences detected in the relatively short time frame have provided support for a comprehensive strength-based intervention to promote the opportunity for growth and well-being. Such interventions could be implemented as a routine part of training for these valued personnel.

REFERENCES


officers. *Psychiatry Research, 188*, 45-50. doi:
http://dx.doi.org/10.1016/j.psychres.2010.10.034