



Australian Government
Attorney-General's Department

THE AUSTRALIAN JOURNAL OF EMERGENCY MANAGEMENT

ISSN: 1324 1540

Volume 25 | No. 03 | July 2010



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Australia's own Royal Flying Doctor Service

Where are we going
with disaster
resilience policy?

What is it like to be a female
volunteer firefighter in
Western Australia?

Why emergency agencies
must speak with
one voice.

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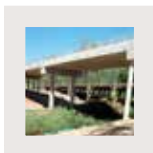
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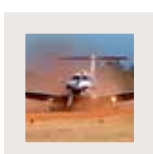
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The Australian Journal of Emergency Management

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ABOUT THE JOURNAL

The Australian Journal of Emergency Management is Australia's premier Journal in emergency management. Its format and content is developed with reference to peak emergency management organisations and the emergency management sectors—nationally and internationally. The Journal focuses on both the academic and practitioner reader and its aim is to strengthen capabilities in the sector by documenting, growing and disseminating an emergency management body of knowledge. The Journal strongly supports the role of the Australian Emergency Management Institute (AEMI) as a national centre of excellence for knowledge

and skills development in the emergency management sector. Papers are published in all areas of emergency management. The Journal emphasises empirical reports but may include specialised theoretical, methodological, case study and review papers and opinion pieces.

PUBLISHER

The Australian Journal of Emergency Management is published by the Australian Government's Attorney-General's Department. The Journal is published on the 'Emergency Management in Australia' website at www.em.gov.au

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The Editor-in-Chief of the Journal with final responsibility for the Journal's operations and policies is Martin Studdert AM, National Security Capability Development Division of the Australian Government's Attorney-General's Department.

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PUBLICATION DEADLINE

The Journal is published on the last day of January, April, July and October, each year. Copies of the Journal are distributed quarterly without charge to subscribers throughout Australia and overseas.

CIRCULATION

Approximate circulation: 3,000.

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Changes to subscription details can be made by emailing ajem@em.gov.au.

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Foreword

THE AUSTRALIAN EMERGENCY MANAGEMENT INSTITUTE CENTRE OF EXCELLENCE

By Miles Jordana, Deputy Secretary, National Security & Criminal Justice Group,
Attorney-General's Department.



The Hon Allen Fairhall, MP, then Commonwealth Minister for the Interior and Works, opened the Australian Civil Defence School on 2 July 1956. During his speech he emphasised the need for the greatest cooperation between the Commonwealth and State Governments; the important role of local government; and for students to be drawn from all walks of life to provide a nucleus of trained civil defence workers.

These sentiments are just as valid today as they were some 54 years ago and remain a pivotal cornerstone for the now *Australian Emergency Management Institute* (AEMI). This is especially relevant in the current context—that of creating a more Disaster Resilient Australia.

As the Institute celebrated its golden jubilee in 2006, it reflected on fifty years of development and achievement as a leading educational establishment whose primary focus has been and remains, on measures to mitigate, minimise, or alleviate human suffering in the event of an emergency or disaster.

2010 marks another new beginning for the Institute as the Attorney-General's Department strives to establish AEMI as a *Centre of Excellence* in the delivery of knowledge and skills development within the emergency management sector. Its primary focus will remain the development and delivery of vocational education and training. Together with promoting best practice community awareness and education in emergency management and a strong strategic research function,

AEMI will be a key component of Government efforts to build a more disaster resilient Australia.

AEMI will continue to support the development of emergency management related capability within government and non-government sectors, with the owners and operators of critical infrastructure, and Australia's emergency management volunteers.

In striving to become a centre of excellence, AEMI is going through a period of revitalisation, which will see it become more strategically aligned and connected with national needs and priorities; more client and partnership focused; innovative and technologically astute; and focused on quality assurance and continuous improvement.

To steer AEMI towards these goals, a new governance regime has been established comprising an AEMI Board and a stakeholder based Advisory Group. Both the Board and Advisory Group will assist in the recognition of nationwide capability gaps, identification of significant emerging issues, the design of effective products, monitoring performance and quality assurance and ensuring an alignment with broader national security policy direction. It is my pleasure to Chair the Board as the Institute embarks on this new phase.

Of course, AEMI is but one piece in the national security and emergency management capability development jigsaw. I'm pleased to see AEMI is actively seeking to establish communities of interest in key areas to build a more informed, strategic and integrated approach to capability development and disaster resilience. For instance, it has started to work towards building a strong relationship with organisations such as the National Security College and the Australian Institute of Police Management. It is also actively seeking out partnerships within the tertiary and private sectors to supplement its capabilities and thereby provide a better national capability development and disaster resilience outcome.

This edition of AJEM focuses on AEMI and also features the 2010 Volunteers in Action Photographic Competition, the 2010 Queen's Birthday honours for the emergency management sector, as well as a diverse range of papers across the all-hazards and national security environment. I trust you will find this a valuable and enjoyable edition, and encourage any comments you may have. Please address any correspondence to ajem@em.gov.au.

INTRODUCING:

Commodore Campbell Darby DSC AM



On September 1, Emergency Management Australia, a division of the federal Attorney-General's Department will welcome its new Director-General, Commodore Campbell Darby DSC AM.

Campbell Darby was raised on a wheat and cattle farm near Quirindi in Northern NSW and joined the Royal Australian Navy (RAN) in 1973. He undertook a variety of junior sea postings including time in New Guinea, in the UK for warfare officer training and in Royal Navy sea exchanges, and seagoing warfare jobs in HMA Ships.

Sea Commands have included the Patrol Boat HMAS IPSWICH, the Frigate HMAS SYDNEY and the Guided Missile Destroyer, HMAS BRISBANE. Senior staff positions have included the Director responsible for all junior officers' career management, Commander Sea Training responsible for operational standards at sea, and as a Captain in Maritime Headquarters responsible for all the RAN's fleet and aviation activities.

During 2002 he attended the Defence and Strategic Studies Course and was promoted to Commodore and appointed as Commandant of the Australian Command and Staff College on completion. From November 2003 until June 2004 he commanded all Australian Forces in the Middle East area of operations from his Headquarters based in Baghdad. He was Commander Northern Command, and Deputy Commander, Border Protection Command before transferring to the Naval Reserves in 2007.

Upon leaving the Navy he retired briefly before taking up a position as Executive Director, Security and Government Services, in the Northern Territory Department of the Chief Minister in July 2007. In this position he was responsible for managing security and emergency management strategic policy and coordination, management of emergency recovery as the Territory Recovery Coordinator, as well as managing the Protocol and Government House business units. He was also the Director of the NT Major Events Company.

He was invested as a Member of the Order of Australia in 2001, and in 2005 honoured with the award of a Distinguished Service Cross for his service in Iraq.

Campbell Darby is married and he and his wife Shani have two adult daughters. They currently reside in Darwin where they enjoy sailing and outdoor pursuits in general. He enjoys current affairs, reading and has a strong interest in all sporting activities particularly rugby, tennis and golf.

Centre of excellence: The new way forward for the Australian Emergency Management Institute

The Australian Emergency Management Institute (AEMI) Victoria has been playing an important role in the national emergency management landscape for over five decades. The AEMI has deserved its time-honoured reputation as Australia's premier emergency management education and knowledge facility.

When the Institute commenced in 1956 as the Australian Civil Defence School, its role was to provide training that offered maximum protection from the effects of hostilities on Australian soil. Under a new name, the Australian Counter Disaster College, the mid 60s saw the role of the Institute also change to reflect the evolving need to provide education that helped mitigate, minimise or alleviate human suffering in the event of a natural disaster. In the late 90s the philosophy of the organisation was extended beyond just natural disasters and began to encompass technological and human-caused disasters—addressing issues such as Y2K and the return to earth of the MIR space station. To reflect a transfer of departmental ownership, the Institute again changed its name to the Emergency Management Australia Institute, also bringing about a change in philosophy—to develop preparedness, prevention, effective response and speedy recovery from emergencies and subsequently, the more embracing creating safer, sustainable communities. These days, to reflect a more integrated national security approach, the Institute has adopted a name that not only announces a new era but also heralds its transformation into a centre of excellence for knowledge and skills development for the emergency management sector, supporting broader national security capability.

All organisations must undergo changes to ensure they remain forward-looking, innovative and connected. To this end the Attorney-General's Department has developed a new strategic vision for AEMI (the Way Forward). The vision sets out a challenge for the Institute to become a centre of excellence by focusing on delivery of products which are:

- Forward looking, innovative, connected and strategically aligned with national policy and capability development needs of government and key stakeholders;
- Efficient and focused on continuous improvement

- Operating a fee for service regime consistent with government's competitive neutrality and cost recovery policies;
- Client focused and performance monitored to ensure value to government and the national security environment.

As part of the overarching Attorney-General's Department strategy for achieving a secure society, the Way Forward aims to ensure AEMI provides strategically-aligned research, training, education and development activities that will assist in building the capabilities of its key stakeholders in preparing for, preventing, responding to, and recovering from significant disaster events.

The new AEMI will focus on continuous improvement and client orientated performance to ensure value to Government and the national security arrangements.

The vision

Continuing its operations from Mt Macedon, the organisation's focal point will of course remain education & training and community awareness. However, the vision for AEMI is that the organisation will take on a much deeper and more strategic role in national security. The Institute will develop into a comprehensive centre of excellence for knowledge and skills development for the sector.

AEMI will deliver national knowledge and skills development activities that build:

- a heightened strategic consideration of emerging emergency management capability issues of national importance to inform policy and practitioner debate and action;
- an emergency management body of knowledge through better practice manuals, lessons learned and applied research;
- community and emergency management sector understanding, capability, awareness and resilience to disaster; and
- professional and volunteer leadership and practitioner competency in high-end emergency management skills to a consistent level across Australia.

The goals

The four corporate goals in the Way Forward strategy are that AEMI will:

1. provide education and training for members of public safety agencies and others involved in emergency management including i) professional development programs; ii) competency-based training and nationally accredited courses; iii) leadership courses; and iv) exercise management;
2. undertake applied research into contemporary issues in emergency management to ensure educational activities reflect contemporary understanding; inform the development of policy and provide leadership in the development of an emergency management body of knowledge;
3. conduct strategic activities to enhance emergency management community insight into emerging issues, challenges and good practice and to stimulate debate on issues of national importance. These activities will include strategic think-tanks, workshops, forums examining contemporary issues and it will develop collaborative knowledge networks, communities of interest and strategic partnerships and alliances; and
4. promote community awareness and resilience through school education activities, engagement with disadvantaged communities, working with the volunteer sector to stimulate community understanding and recruitment and retention of volunteers and supporting Australian Government efforts to build resilience within the region.

Organisational changes

To achieve these goals, a restructure and alignment of resources has occurred.

The new structure will foster a close working relationship between AEMI and other business units within the Attorney-General's Department including the National Security Resilience Policy Division (NSRPD) and Emergency Management Australia Division (EMA); and Prime Minister and Cabinet (PM&C).

The AEMI Board

A newly-established AEMI Board will ensure, among other things, that the activities of AEMI are aligned with and complement current national security policy capability and operations directions. The Board is comprised of:

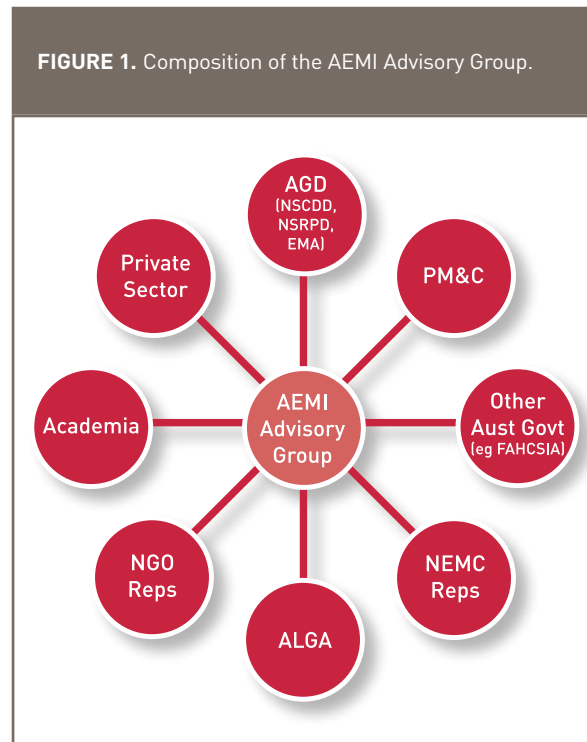
- the Deputy Secretary AGD, National Security and Criminal Justice Group (Chair),
- Deputy National Security Adviser (PM&C),
- First Assistant Secretary, National Security Capability Development Division, AGD,
- Assistant Secretary, Emergency Management Australia, AGD, and
- Assistant Secretary, Emergency Management Policy, National Security Resilience Policy Division, AGD



Aerial photo of the Australian Emergency Management Institute at Mount Macedon, Victoria.

The Advisory Group

Chaired by a Board member (the First Assistant Secretary, National Security Capability Development Division), an AEMI Advisory Group (AAG) comprising representatives from a wide range of key stakeholders, including representatives from states and territories, has been convened. This group will meet every six months and provide an important consultative mechanism for the Board deliberations, in particular identification and endorsement of key AEMI activities and deliverables and the monitoring of performance.



The operational model

A Strategy and Research Unit will play a pivotal lead role in the operational model for AEMI. This business unit will engage with a wide array of interested parties to identify and canvass significant issues for knowledge and skills development within the emergency management environment. It will also drive the development and implementation of a research agenda (in partnership with other Government agencies, academic partners, jurisdictions, NGOs and the private sector). The Unit will also be responsible for establishing an effective 'lessons learned' function—in partnership with the Counter-Terrorism Capability Development Branch of the Attorney-General's Department.

The research agenda will be important to informing engagement on forward-looking capability and resilience policy matters; the design of strategic workshops and forums to generate insight and actions on significant matters which impact resilience and capability and the development of emergency management.

The research and thinking of the AEMI will be focused on the practical application to emergency management skills,

capability development and community resilience. It will include an emphasis on servicing the needs of emergency management volunteers.

The Strategy and Research Unit will also identify suitable secondment opportunities between AEMI and other key stakeholders—including fellowship opportunities from within the tertiary sector.

Strategic insight emanating from each unit will inform the development of training and education products that can effectively address significant emerging issues or gaps and the design of community engagement activities. This will help build national disaster resilience and support the volunteer effort in an ageing Australian population (recruitment, retention and opportunities for development).

Proposals for training and education to be provided under a fee-for-service arrangement and charging regime, are also under consideration. The fee structure and charging regime proposals will be consistent with Government's competitive neutrality and cost recovery policies and will reflect the Attorney-General's Department's acceptance of certain 'community service level' obligations for particular stakeholder groups, including volunteers.

The business units

Four business units have been established to manage the responsibilities of AEMI:

- Strategy and research
- Training and education delivery
- Community awareness
- Education and business support

These units will be directed by the First Assistant Secretary of the AGD National Security Capability Development Division and the Executive Director of the AEMI.



Conclusion

The past half century has seen an exponential growth in the challenges faced to develop a disaster resilient Australia and therefore the services offered through AEMI. Its continuing work to research future directions in emergency management and to position emergency managers to deal with yet unseen challenges will assist the sector to continue to meet its responsibilities and to assure the safety of all communities in Australia.

Further information about the Institute and its current activities is located at the Emergency Management in Australia website at www.em.gov.au/aemi.

Table 1. Roles and responsibilities of each new Business Unit

Business Unit	Areas of Responsibility
Strategy & Research	<p>Strategic activities to further the debate to inform direction on emerging issues of national importance through:</p> <ul style="list-style-type: none"> • Strategic think-tanks/workshops/forums examining contemporary issues of national significance • Conducting ‘lessons learned’ program • Identifying, developing and managing collaborative knowledge networks, communities of interest and strategic partnerships and alliances. <p>Managing a Research Agenda focused on contemporary issues in emergency management which will:</p> <ul style="list-style-type: none"> • Develop and disseminate thinking from research and strategic activities • Inform the development of policy and practitioner debate and action • Inform the delivery of educational activities to reflect contemporary challenges and practice • Provide leadership in the development of emergency management doctrine.
Training & Education Delivery	<p>Design and delivery of professional and volunteer focused training and education products which meet the highest needs of stakeholders. Products will take the form of Mt Macedon based, off-site and on-line delivery of:</p> <ul style="list-style-type: none"> • Professional development programs • Competency based training under Advanced Diploma in Public Safety • Leadership courses • Exercise management. <p>Exploitation of ICT opportunities in the effective delivery of training, education and delivery.</p>
Community Awareness and Education	<p>Community Engagement and EM library services to build understanding, awareness and resilience, with a focus on:</p> <ul style="list-style-type: none"> • Schools and Youth projects • At risk communities and disadvantaged communities (physical/mental disabilities, language) • Asia-Pacific regional opportunities • Publication of EM Journal and update and publication of EM Manuals <p>Supporting the volunteer sector by stimulating community understanding of volunteering and recruitment and retention of volunteers – including in Culturally and Linguistically Diverse communities</p> <p>Exploitation of ICT opportunities in the delivery of community awareness activities.</p>
Business Support	<ul style="list-style-type: none"> • Operational facilitation and support for the other three business units • Performance monitoring and quality assurance activities.

Directions in disaster resilience policy

By Brenton Prosser and Colin Peters, Emergency Management Policy Branch, AGD.

ABSTRACT

Currently, a range of common terms are being used differently within government and the emergency management community. This paper provides a foundation for an understanding of the term 'resilience' so that constructive discussion can emerge amongst those involved in disaster management policy and practice. In doing so, we provide a short review of how the term can be used differently within policy, as well as how it has come to be influential in emergency management policy.

Anyone who has changed sectors, organisations, departments or even jobs will know the feeling of initially being overwhelmed in a new context. You will also appreciate how a work environment can be awash with jargon; it takes a while to learn the lingo.

But this is not just a challenge for those who are new. Often new terms emerge (or old ones are renewed) to create confusion, even when we think we are talking about the same thing. And if a particular term has political support, it can become like a magnet to any and every competing agenda. Sometimes a term can take on so much baggage that it loses any semblance of its original meaning.

Over the past few months, we have found ourselves discussing disaster resilience. You would imagine that working in the same branch, with a focus on building disaster resilience, we might have been on the same page - but we were not. Yet, we found that the process of clarifying our understandings to be a generative exercise.

In this paper we seek to share our thoughts and shed some more light on resilience, a term that is quickly coming to represent a national policy agenda.

The meaning of resilience

In classical mythology, the symbol of resilience was the reed because of its capacity to both sway in the breeze and to withstand the fierce storms that would uproot mighty trees. Its origins come from the Latin word *resilire* which means to rebound, recoil or return to the

original form. In English, resilience was first used in the 17th Century to refer to the quality of certain timbers to withstand severe loads without breaking.

Today, resilience tends to be used to either mean a capacity to 'bounce back' or, more conservatively, a tendency to resist change. In everyday speech, a resilient person is one who can weather the storms of life and emerge unscathed. However, over the years, resilience has also been adopted and used in a range of more specific ways.

Scholarly work provides several variations around the resilience theme. In Physics, it describes objects that are invulnerable to the impact of external forces, while in Chemistry it is the capacity of a metal to return to its original form. In Engineering, resilience is a measure of a material's capacity to withstand impact, as well as to absorb and release energy through elasticity (McAslan, 2009).

The Social Sciences also have different traditions around the use of the term. In Health, resilience can be used to describe immunity to sickness. In Psychology and Social Work, it refers to a capacity to function in immensely demanding settings, as well as the ability to cope with stress (Norris et al, 2009). And in Sociology, resilience is used to describe the capacity of groups to cope with stresses from changes in their environment (Platteau, 2000). Meanwhile, in Ecology, resilience has been used to measure the ability of an ecosystem to absorb change, continue to function and evolve (Klein et al, 2004). In Business Management terms, it is described as the capacity to use disruptive events to slingshot an organisation forward (Parsons, 2010).

More recently, within social sustainability theory, resilience has been defined as the capacity of individuals, groups and communities to identify and advocate for their needs, both now and for future generations (McKenzie, 2004). It has also been described as a form of adding to social capital (Chia, 2010), with resilience being a way through which communities can build their capacity (Prosser et al, 2010).

Clearly, there is plenty of scope for different approaches to what we mean by resilience, and given the differing academic backgrounds that policy makers bring to their work, this can make finding consensus around an agreed definition very challenging.

However, in the policy context, a single definition may not be that essential because narrowing the scope to one aspect risks losing the robustness of the concept as a whole. As McAslan (2009) observes, the term may be imprecise, but the differences in definition are not as wide as the literature often suggests and there is enough common ground around which to build policy.

That said, it is also important not to confuse a lack of a tight definition with a lack of conceptual rigour. This is because the assumptions that people and institutions use to understand a term can present barriers to policy development and point to very different policy outcomes.

For instance, if one's view of resilience is informed by the natural sciences, then resilience is about returning to the original form. If applied in the case of emergency management, this approach might emphasise replacing existing infrastructure – so if a storm washes away a bridge in Southern Queensland, then the policy priority would be to rebuild the same bridge quickly.



Courtesy: Civil Mining and Construction Pty Ltd

An example of the natural sciences view that emphasises replacing existing infrastructure. Here we have the replacement of timber bridges with new concrete bridges in southern Queensland.

But if one's view of resilience is informed by the social sciences or business systems thinking, then resilience emphasises the capacity to transform into an improved entity. Here, resilience is used to refer to reducing future risk by enhancing protection and building for recovery. In the case of the Southern Queensland storm, this would mean a new bridge would be built according to current best standards and to enhance infrastructure.

However, if one takes a socially sustainable view of resilience, then the emphasis might be on creating new capacity through consideration of future community needs, which could result in transformed infrastructure. Back to our case of the storm, any new bridge would need to be built to cater for what each community

believes to be its current and future needs, including the significant growth in population and rising seas levels along the Southern Queensland coast.

So, what may be small distinctions in theory, once applied in the policy context, can result in significantly different policy objectives, capabilities and associated costs.

The international and domestic move toward disaster resilience

Recently, there has been a growing emphasis on disaster resilience in Australian emergency management policy, to the extent that it now matches a previous emphasis on dealing with disasters as they arise (Wilkins, 2010). This change has been driven at both international and domestic levels.

Internationally, the United Nations has advocated regional cooperation, communication and policy coherence as part of a focus on developing disaster resilient communities (United Nations, 2009), while APEC has called for greater mainstreaming of disaster risk reduction and broader long-term sustainable development (APEC, 2009).

On a national level, in 2009 COAG commissioned a National Disaster Arrangements Working Group to seek agreement around building a more disaster resilient Australia. In December 2009, COAG also agreed to adopt a whole-of-nation resilience-based approach to disaster management which recognises that the growing complexity of disasters extends beyond the emergency management community alone (Rothery, 2010). Thus, a national, coordinated and cooperative effort is being sought to enhance Australia's capacity to withstand and recover from disasters. This COAG decision represents a significant shift in national policy as well as government thinking around disasters and emergencies.

Further to this, MCPPEM-EM¹ through the former AEMC² issued a National Disaster Resilience Framework. This has been done with a view to completing a whole-of-government National Disaster Resilience Strategy by the end of 2010. To support this, COAG agreed to establish a new National Emergency Management Committee (NEMC) to drive and coordinate national policies and capability development. The NEMC marks another important shift, as first ministers' departments will now play a more significant role, enabling a whole-of-government view of nationally significant emergency management issues, as well as the ability to influence and facilitate decisions beyond the remit of the traditional emergency management portfolio.

The establishment of our branch, indeed our division, is a further indication of the new way of thinking about national security and emergency management. The foundations of this new way of thinking came largely from work within the field of organisational resilience. More specifically, the PPRR model of emergency

1 Ministerial Council for Police and Emergency Management – Emergency Management.

2 Australian Emergency Management Council.

management (Prevention, Preparedness, Response and Recovery) has also been highly influential. This forms the base of an approach to emergency management that recognises the need for:

- *Prevention*: to hinder, deter and mitigate disasters, while maintaining readiness to deal with disaster events.
- *Preparedness*: to protect our people, assets, infrastructure and institutions from disaster events; and to establish, train and exercise arrangements to respond to, and recover from a disaster event.
- *Response*: to respond rapidly and decisively to a disaster event and manage its immediate consequences.
- *Recovery*: to return national and community life to normal as quickly as possible after a disaster event, through the restoration of social, economic, physical and environmental wellbeing.

The aim of current EM policy is to use this model to work towards a more disaster resilient Australia, that is one that aims to recognise current and future risk, reduce and manage those risks, and be better able to adapt to change and recover from disasters (COAG, 2009).

Disaster resilience, social sustainability and regional capacity

While we note the origins of disaster resilience within organisational resilience and the importance of clear conceptual models to assist in enhancing and assessing resilience within organisations (Gibson & Tarrant, 2010), we also note that a whole-of-government approach to disaster resilience through NEMC brings with it broader cross jurisdictional and cross departmental policy challenges. Not the least of which is the different understandings of resilience, which may be used by departments and policy makers.

For instance, one possible rationale for a resilience approach in policy is to foster greater self-reliance. This interpretation recognises that the growing costs associated with responding to disasters are increasingly difficult to meet in a context where repeatedly raising operating budgets is not an option. Those advocating this view might emphasise that a benefit of greater individual responsibility for preventative action will be to reduce total damage, loss and recovery costs. If this approach was applied in the context of a large bushfire along the coast of regional South Australia, a strict interpretation of funding eligibility might be applied to restrict costs by only providing for the replacement of public infrastructure.

Alternatively, another rationale for a resilience approach could be improving the capacity of communities to bounce back better from disaster events. This interpretation emphasises that government resource provision should prioritise support for efforts that

enhance disaster resilience. Those holding this view might argue that payments should be targeted not to provide incentive for inaction, irresponsibility or failure to take up insurance. Again using the South Australian bushfire example, this interpretation of policy might prioritise funding for local communities that could show they had taken steps to enhance resilience and there would be limited support for rebuilding in areas that might have a high risk of fires in the future.

Yet another approach to using resilience within policy could be around building social sustainability. This interpretation prioritises the responsibility of government to support any citizen facing need, recognises that some vulnerable groups may not have infrastructure to rebuild, and stresses that no government action should contribute to further hardship. Those holding this view might also emphasise investment in improving natural, social, economic and community conditions. In the case of the SA bushfire, this policy interpretation might support claims for assistance irrespective of if the claimant took steps to understand and manage their risks, whether they were unable to afford preventative action, or if they had left their second or holiday home uninsured or unprotected.

As with the previous example, each of these different interpretations can result in significantly different costs and policy outcomes. However, what is important is not so much reducing these diverse approaches into consensus around a single interpretation of the term, rather it is having a common understanding that is robust enough to operate in different policy contexts. While the first approach to resilience may work in the conceptual space or within single organisations, the diverse requirements across departments, agencies, organisations, professionals, semi-professionals, volunteers and communities, all need to be supported by a more holistic approach.

The concept of disaster resilience is characterised by its complexity, interactivity and interconnectedness, while traditional policy thinking often addresses challenges by following a linear and reductionist process, working from problem to solution within tightly defined conceptual models. Traditional policy and program interventions such as model application, evaluation and regulation, are not sufficient alone to effectively achieve the level of behavioural change required by a socially complex policy challenge such as disaster resilience. Linear thinking is inadequate to encompass the interactivity and complexity inherent in building resilience (Rothery, 2010). Thus, we face the challenge of complementing organisational responses with the development of non-linear and holistic policy frameworks that are more capable of grasping the broader policy context and the interrelationships between the full range of factors.

Future directions

As a consequence, it is fundamental that disaster resilience is a collective responsibility of all sectors of society, who by working together will be more effective than any individual effort. A disaster resilient community is one that works together to understand and manage the risks that it confronts, but is also aware of the responsibility of all levels of government (COAG, 2009). Thus, an associated challenge will be that of coordinating a whole-of-government approach across federal, state and local governments.

A further challenge will be facilitating both 'bottom up' and high level engagement with this new policy imperative. There will also be challenges associated with ensuring that a 'Principle of Subsidiarity' (Wilkins, 2010, p.4), which supports greater local flexibility, does not undermine the use of standardised indicators to assess our national progress with resilience. If resilience is a constantly evolving and multidimensional trait of communities (Gibson & Tarrant, 2010), many aspects will be difficult, if not impossible to quantify, so we will need to develop creative and mixed method approaches to ascertain if resilience has grown.

In response to the above challenges, we would argue that Australia needs not only a new way of policy thinking, but new, compatible, policy approaches that integrate, rather than compete, with the existing policy priorities and emergency management arrangements. This will be the key challenge for those working in disaster resilience in coming years.

However, before such new steps can even commence, stakeholders need to be clear about the assumptions and interpretations they bring to the term disaster resilience. To this end, this paper hopes to facilitate constructive discussion amongst those involved in policy and planning for a more disaster resilient future for Australia.

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Women firefighters' experiences in the Western Australian volunteer bush fire service

Cindy Branch-Smith and Dr. Julie Ann Pooley explore the issues and experiences of Western Australian women volunteer firefighters.

ABSTRACT

Recent events, such as Black Saturday, have shown how invaluable Australia's volunteer firefighters are to communities. Volunteer numbers appear to be declining nation-wide and a majority of volunteer fire services report under-representation of women in operational roles. To ascertain an understanding of experiences and issues faced by women in volunteer fire services, the aim of the current study was to explore female volunteer firefighters' experience, and how their experiences impact on their perceptions of themselves as firefighters. A qualitative research methodology was employed, which provided insight into the way in which women perceive themselves as firefighters, and the influences of past experiences which impacted on these perceptions. This study contributes towards the understanding of how to effectively engage and empower women, and also to the development of programs and strategies conducive to the enhancement of women in Australian volunteer-based fire agencies.

Introduction

In Australia, volunteer fire brigades provide the only organised response to fires outside of the built-up areas of major cities or specialised areas such as national parks (Lyons, 2001). Nation-wide, communities rely on more than 220,000 volunteer firefighters (McLennan, 2008), and it is estimated that approximately 25,000 bushfire volunteers in approximately 750 brigades are currently serving in active roles across Western Australia (WA) (Association of Volunteer Bush Fire Brigades of Western Australia Incorporated, n.d.). Volunteers are considered an integral part of the fire services in WA due to the high degree of threat to communities because of vast bushland areas.

Recent events have shown how invaluable Australia's volunteer firefighters are, for example, the events of Black Saturday (February, 2009). However, there is a relatively

scarce amount of information about volunteer firefighters (Beatson & McLennan, 2005). With total volunteer firefighter numbers declining appreciably nation-wide due to complex economic and demographic changes within Australian society (McLennan & Birch, 2005), and most brigades reporting under-representation of women within operation roles (McLennan, 2004a), it should be of interest to bushfire brigades to attempt to maximise volunteer numbers by implementing procedures and strategies conducive to increasing the number of women in volunteer bushfire brigades.

Given there are few studies about volunteer firefighters in Australia (e.g., McLennan, 2004a; McLennan & Birch, 2005; McLennan & Birch, 2008; McLennan & Birch, 2009; McLennan, Birch, Cowlshaw, & Hayes, 2009) and WA (Aitken, 2000; Preston, 1993), there are fewer studies about the experiences of women in Australian volunteer-based fire services (McLennan & Birch, 2006a, 2006b), with the majority of volunteer firefighter research being conducted by the Bushfire Cooperative Research Centre (Bushfire CRC) at LaTrobe University in Melbourne. Preliminary findings accorded priority by the Bushfire CRC included identifying barriers to greater participation by women in operational firefighting roles (McLennan, 2004b).

Studies conducted by the Bushfire CRC have investigated the experiences of female volunteers specifically, with the aim of providing direction for strategies which would assist in the recruitment and retention of women volunteers (McLennan & Birch, 2006a; 2006b). Their research has been conducted with women from the Australian Capital Territory Rural Fire Service (RFS) (n=31) and the South Australian Country Fire Service (CFS) (n=442). Women from both studies reported very positively on their training experiences, though opportunities for advancement and leadership were seen as barriers faced by approximately one quarter of women, with many indicating they were told by at least one man in the brigade that women do not belong in the fire service and/or are not capable of the work.

These research findings concur with McLennan, Birch, Beatson, and Cowlshaw (2007), who conducted surveys with 391 volunteer firefighters from various Country Fire Authority regions across Victoria. Results indicated women within volunteer fire services experienced specific gender-related challenges and issues. These issues included intimidation at training and

dissatisfaction with opportunities for leadership and advancement. However, as the above-mentioned studies were survey-based, little opportunity was given for women to elaborate about their experience and role as a volunteer firefighter.

In reviewing the literature surrounding this sector it appears most of the research pertaining to the retention of female firefighters has been of a quantitative and cross-sectional nature, making it of limited value in understanding the potential impact of such experiences. If more is known about the experiences of women volunteer firefighters, and the impact such experiences have, then brigade strategies can be modified to enhance the number of females within these roles. The aim of the current study was therefore to explore female volunteer firefighters' experiences of firefighting in a WA context. More specifically, the study focused on how their experiences as volunteers impacted on their perceptions of themselves as firefighters.

Methodology

Research design and data analysis

An in-depth qualitative design, using semi-structured interviewing as a vehicle for data collection, was utilised in order to discover and understand the unique experiences of women volunteer firefighters. The recruitment of participants was achieved through the distribution of information letters to all bushfire brigades in the metropolitan and semi-rural areas of Perth. Interviews were conducted either at the participants' home or fire brigade, and involved questions regarding fireground and training experiences. Data obtained from the interviews were analysed using interpretative phenomenological analysis and a question ordered matrix to learn from the participants' experiences (Silverman, 2000). Phenomenological analysis involves the inductive identification of themes within the data (Liamputtong & Ezzy, 2005), while a question ordered matrix allows for viewing of responses of each participant to a specific question (Miles & Hubermann, 1994).

Participants

The sample consisted of 12 women from eight volunteer bushfire brigades across the metropolitan and semi-rural areas of Perth. Participants were aged between 18 and 49 years (M = 39.58, SD = 11.07). Years of experience within a bushfire brigade ranged from 2 to 16 years (M = 6.08, SD = 4.98). All women held an operational role within their brigade, ranging from basic firefighters to lieutenants.

Findings and interpretations

Two key themes emerged from the analysis of the volunteer firefighting experience, within which a further six sub-themes were identified. These are summarised in Table 1. Positive experiences and outcomes refer to experiences perceived by women to be beneficial

and productive in terms of cognitive outcomes for perceptions of themselves as firefighters, resulting in feelings of achievement, confidence and satisfaction. Negative experiences and outcomes refer to experiences perceived by women to be adverse and detrimental in terms of cognitive outcomes for perceptions of themselves as firefighters, resulting in feelings of inferiority and confusion.

TABLE 1. Themes.

Theme	Sub Theme
Positive experiences and outcomes	<ul style="list-style-type: none"> • Life Meaning • Facilitation of confidence • Positive atmosphere • Competence in getting the job done
Positive experiences and outcomes	<ul style="list-style-type: none"> • Negative behaviour towards women • 'Few guy' syndrome

Positive experiences and outcomes

Positive experiences and outcomes appear to have dominated the volunteer firefighting experience for these women. Positive outcomes refer not only to cognitive outcomes of specific situations encountered by women, but also to cognitive outcomes that were associated with being a female volunteer firefighter.

Life meaning

Majority of the women perceived their role as a volunteer firefighter to give additional meaning to their lives and to their personal character. Salient factors women attributed to providing additional meaning in their lives included a sense of community (SOC), personal achievement, and that volunteer firefighting provided them with an avenue in which to encounter experiences and participate in activities typically considered to be out of the ordinary.

SOC appeared to be a key factor in providing participants with a sense of meaning to their lives within their community. This refers to a relational SOC, distinguished by Gusfield (1975) as a quality of human relationships, and is distinct from the territorial and geographical notions of community. The current findings are consistent with research conducted with volunteers generally (Australian Bureau of Statistics, 2006), and in emergency management organisations specifically (Gare, 2000; Fahey & Walker, 2002), in terms of the value of being a volunteer, and its relation to SOC. Volunteer firefighter research in both Australia (e.g., Birch, McLennan, Beatson, & Kelly, 2008; Childs, 2006; Clancy & Holgate, 2004; Palmer, 2000) and the United States (e.g., Thompson & Bono, 1993; Thompson, 1994) has found similar trends for motivations to join and remain with a volunteer fire brigade. Therefore, it appears SOC is

an important and reverberating characteristic, and valued by the majority of volunteer firefighters.

A sense of personal achievement appeared to be another factor, which provided participants with additional meaning to their personal characters. Personal achievement was not necessarily a factor in motivation to join a brigade, but more as a result of participating in and completing required tasks. This finding is consistent with previous research about volunteering generally (Australian Bureau of Statistics, 2006), volunteering in emergency management organisations (Fahey & Walker, 2002), and volunteering in fire brigades specifically (Birch et al., 2008; Country Fire Authority, 1998; McLennan & Birch, 2006a). The current findings are also consistent with Childs' (2006) research with women firefighters in Australia, who reported that women enjoyed the sense of accomplishment obtained from their experiences as a firefighter.

Another area of participants' personal lives positively influenced by being a volunteer firefighter was that such membership provided participants with an avenue which competes with the normalities of their everyday lives. This meant participants felt that being a volunteer firefighter provided them with avenues to meet people outside of their everyday lives, to learn skills outside of their everyday lives, and to provide them with the means to participate in activities outside of their everyday lives.

The value of learning new and different skills is consistent with previous volunteer firefighter research in Australia (Aitken, 2000; Birch et al., 2008; Palmer, 2000), and should be utilised as a key incentive to retention (Fahey, Walker, & Sleight, 2002). The current findings therefore extend on the literature in a number of ways to provide additional information regarding the way in which women volunteer firefighters perceive their role, and the psychological impacts associated with it.

Facilitation of confidence

The facilitation of confidence in varying situations and events appeared to be the most common positive (and overall) outcome for women in terms of the impact on their perceptions of themselves as firefighters. An array of stories by the women elicited examples of how their experiences as a volunteer firefighter promoted confidence in their abilities to competently perform the tasks required of the role.

Being one of the few qualitative studies investigating the positive experiences of female volunteer firefighters in Australia, this study has provided evidence for the notion that gaining confidence is a salient and important aspect of being a woman volunteer firefighter. Although it is not investigated in the volunteer firefighter research, these findings further support the idea that a benefit of volunteering is increased confidence (Leong, 2008; McCabe, White, & Obst, 2007). Future research might assess whether this concept is as salient and as important for men.

Childs' (2006) research with Australian women firefighters also provides support for the idea that confidence is a positive outcome associated with the experiences of being a firefighter. The interview responses from the current study suggest substantial support for the high value attributed to confidence as an outcome of the firefighting experience. The current finding extends on the literature by providing insight into the positive psychological impact of being a volunteer firefighter, and proposes that increased confidence is a fundamental element of the firefighting experience for women.



Courtesy: CFA

Women reported very positively on their training experiences.

Positive atmosphere

A majority of women reported the general atmosphere within their bushfire brigade as being a positive, encouraging and supportive environment. This result is consistent with Australian research in terms of a high reporting of a positive social environment by women volunteer firefighters (McLennan & Birch, 2006a; 2006b). This suggests that while negative experiences and outcomes are areas which require research in terms of recruitment and retention, positive experiences and the generally positive environment of a volunteer fire brigade for women may also be important for recruitment and retention.

Competence in getting the job done

This sub-theme is a positive outcome experienced by women as a result of being a volunteer firefighter. It refers to the notion women were neither scared, embarrassed or ashamed to admit their physical strength sometimes meant a task wouldn't be completed the same way a man would complete the task. Rather, women felt competent the task would be completed their own way, whether that meant completing the task differently, taking longer, or asking for assistance. It appears, then, that women generally felt competent, and also comfortable, in their abilities to perform the activities of a volunteer firefighter, despite biological differences in strength between men and women. The

current finding extends on existing literature by enhancing our understanding of how women appear to be comfortable with their capabilities to perform the tasks required of a volunteer firefighter.



Courtesy: CFA

Positive experiences resulted in feelings of achievement, confidence and satisfaction.

Negative experiences and outcomes

Whilst not as predominant as positive experiences and outcomes, negative experiences and outcomes as a result of the volunteer firefighting experience were a cause for concern for these women. Negative experiences refer to situations and events women perceived to be adverse and detrimental in terms of cognitive outcomes for perceptions of themselves as firefighters. Negative outcomes refer not only to cognitive outcomes of specific situations encountered by women, but also to cognitive outcomes that were associated with being a female volunteer firefighter.

Negative behaviour towards women

A strong and recurring sub-theme, and one mentioned by the majority of participants, related to negative behaviour perceived by women; this appears to pose the most significant barrier to retaining female volunteer firefighters. These women experienced several types of negative behaviours with some occurring at training, and most occurring on the fireground.

Behaviours have been divided into two categories based on the perception of the participant as to how they perceived the behaviour to be. First, inappropriate behaviours were perceived by women to be situations and experiences they felt may or may not (that is, they were unsure) have been discriminatory behaviour towards them. These included the removal of a firehose from the women's hands whilst in the process of suppressing a fire, and negative experiences surrounding fellow male members not following directions given by them. Remembering women were unsure of the intent motivating these acts, they were left feeling confused as

to why it had happened, as though they were not taken seriously as valued volunteer firefighters, and also that these situations could potentially happen again.

Participants also alluded to the negative experiences of covert discrimination among some women and this may compound concerns for the retainment of women as volunteer firefighters. Covert discrimination was perceived by women to be an indirect and discrete form of gender-based discrimination. Perceptions of covert forms of discrimination by participants dominated this broad theme, occurring somewhat at training, and mostly on the fireground. Many participants described how they felt experiences encountered on the fireground and at training were not direct and open forms of discrimination, but more discrete and subtle. For example, women spoke of experiences involving the unfair allocation of tasks and also being used as an excuse to be dismissed from a fireground. Women also expressed that men in authoritative positions within their brigades often expressed covertly discriminatory behaviour towards them, for example, crew leaders and captains expected that women could not perform particular tasks or would only be competent in support roles rather than operational roles.

The interview responses of the female volunteer firefighters suggest substantial support for the negative and often discriminatory behaviour demonstrated towards women firefighters by fellow members and individuals in authoritative positions (Baigent, 2001; Chetkovich, 1997; Childs, 2006; Department for Communities and Local Government, 2008; Floren, 1981; Hulett, Bendick, Thomas, & Moccio, 2008; Manolakes, 2001; Moore & Kleiner, 2001; Rosell, Miller, & Barber, 1995; Yoder & Aniakudo, 1996; Yoder & Berendsen, 2001). It appears the negative experiences of women volunteer firefighters are similar to those of other women who make in-roads into other occupations dominated by men (Manolakes, 2001). Volunteer firefighter research in Australia has also demonstrated similar findings (Gare, 2000; McLennan, 2006a, 2006b).

As previously mentioned, most of the situations reported by women to be unacceptable occurred on the fireground, with only a few occasions occurring during training exercises. Australian research has indicated most women volunteers in operational roles reported positively on their training experiences (McLennan, 2006a, 2006b), however these studies neglected to examine types of experiences and situations encountered by women at fire incidents in terms of their interactions with men. The current findings therefore extend on the literature by providing evidence which suggests women in WA volunteer bushfire services experience negative and often discriminatory behaviour, occurring most often on a fireground. Furthermore, these experiences affect women and their perceptions of themselves as firefighters by making them feel confused as to the intent of the behaviour and devalued by, and inferior to, their fellow male colleagues.

The current result may be explained by a number of factors. First, there may be less chance of this type of

behaviour being recognised by others on the fireground as opposed to training. Another possible explanation is that fireground conditions could potentially make men more susceptible to treating women in such a way, that is, stress experienced as a result of having to perform in dangerous situations (Gomez, 2009; Ordonez & Benson, 1997; Svenson, Edland, & Slovic, 1990), or the amount of time required to make decisions during a fire incident could affect decision-making and judgement processes (Kerstholt, 1995; Finucane, Alhakami, Slovic, & Johnson, 2000; Manouchehr, 2002). Australian volunteer firefighter research is yet to determine what types of discriminatory behaviours women encounter on the fireground as opposed to training, therefore more research on this topic needs to be conducted to determine why more discriminatory and unacceptable behaviours for women occur on the fireground, compared with training.

'Few guy' syndrome

This sub-theme relates to the idea that brigade life was seen by women as a generally positive atmosphere (as discussed in 'positive experiences and outcomes' theme), but in almost all incidents women reported a small number of men within their brigade seemed to consistently express issues directed towards women. This was either expressed explicitly or in most cases the women reported that most men behaved appropriately towards women, implying there were some who did not.

From the interviews conducted it appears these women dismissed the negative experiences encountered with a small number of men, concluding in balance, their experiences with most men were positive. This finding is consistent with a study by Childs (2006), who concluded there may be a culture of tolerance within the Australian fire services whereby women accommodate, overlook, or ignore a small number of men who appear to have issues directed specifically towards women. The current findings therefore support the small amount of Australian research conducted in this area by demonstrating the 'few guy' syndrome exists for the women in this study.

Conclusion

The current study has provided insight into the way in which women perceived their roles as volunteer firefighters, and the influences of past experiences which impacted on these perceptions. Findings differentiated between positive and negative experiences and outcomes, which influenced women's perceptions accordingly. It appears that for these women, an array of positive experiences resulted in favourable perceptions of themselves as firefighters. The general experience of being a volunteer firefighter contributed to a sense of life meaning for the participants, including SOC, personal achievement, and avenues for self-actualisation.

Through gaining a sense of personal achievement, participants perceived themselves to be both confident and competent in completing the tasks required of a volunteer firefighter. Confidence as a result of the

volunteer firefighting experience was the most dominant outcome for women in the current study. Women generally reported positively on their general brigade atmosphere, however a concerning number of women reported they felt a small number of men consistently expressed issues with women.

Also of concern is the experience by many women of covert forms of discrimination occurring at training, and more alarmingly, at fire incidents. As a result, women felt devalued by, and inferior to, their fellow male colleagues. This appears to pose the most significant barrier to the retainment of women volunteer firefighters in operational roles. Of concern also is that covert styles of discrimination by men in authoritative positions within their brigades were reported by the women. This is a complex issue because the varying situations in which covertly discriminatory behaviour may occur implies there is considerable way to go in terms of eliminating these types of behaviours and attitudes, however this issue is beyond the scope of this report.

The current study's findings extend upon previous Australian research to highlight the importance of both positive and negative experiences for women in volunteer firefighting, and how these experiences impact on their perceptions of themselves as firefighters. Accordingly, as economic and demographic changes within Australian society continue to affect volunteer firefighter numbers nation-wide (McLennan & Birch, 2005), providing support, practices and activities conducive to promoting retention to this viable pool of volunteer firefighters would be of benefit.

Implications and directions for future research

This study has implications for the current body of knowledge regarding volunteer firefighting in general, and for women in volunteer firefighting roles specifically. Contemporary research on the factors impacting Australian women's volunteer firefighter experience (Beatson, 2005; Childs, 2006; McLennan & Birch, 2006a, 2006b; McLennan et al., 2007) does not entirely take into account both the positive and negative aspects of the experience. With this in mind, future volunteer firefighter research could further explore the positive experiences and outcomes for women in these roles, enabling governing bodies to better develop strategies which include a more holistic understanding to enhancing the retention of women within volunteer fire brigades.

Several key incentives which facilitate the retention of women volunteer firefighters, as well as incidents which impede retention, were identified. As a majority of volunteer fire services in Australia report under-representation of women in operational roles (McLennan, 2004b), it would be of benefit to brigades to provide activities conducive to the learning of new and different skills, to facilitate confidence for women volunteer firefighters. The issue of negative behaviour and treatment of women on a fireground emerging

from this study also has implications for the retainment of women in operational roles. Enhancement of the experience for women volunteer firefighters is important to retention of volunteer participation rates of women (Beatson & McLennan, 2005). It is clear from the results of the current study that educating volunteer firefighters on appropriate and acceptable behaviour, both professionally and socially, within brigades to assist members in accepting and encouraging women within the volunteer fire services is important.

Methodological limitations of the current research involve the sampling technique, which may have produced participants who chose to be explicit about their volunteer firefighting experiences. It is also possible that women who chose to participate in the research were confident in discussing their experiences. Although these could potentially bias results, it was intended that the current research be a stepping stone in the identification of experiences and issues faced by women who are volunteer firefighters. Generally, Australian society is extremely reliant on the work of volunteers, and it is of great benefit to understand the experience of the men and women involved in these roles as without understanding factors for the recruitment and retention of this important group of individuals, communities will suffer immeasurably.

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The major risks faced by Royal Flying Doctor Service Western Operations in the event of a tropical cyclone

Flight Nurse with the Royal Flying Doctor Service, Steven Curnin, discusses the Service's tropical cyclone preparedness plan and the outcomes of a recent risk assessment.

ABSTRACT

The Royal Flying Doctor Service (RFDS) Western Operations operates two bases in the most cyclone-prone region of the entire Australian coastline. In preparation for a tropical cyclone impacting either of the bases, a comprehensive risk assessment was performed and a major risk identified was the reduced operational capability of the service in the event of a tropical cyclone. The relocation of aircraft to a suitable alternate location can facilitate the operational capability of RFDS Western Operations during a period of cyclonic activity affecting a RFDS Western Operations base. The development of a Tropical Cyclone Plan incorporating the relocation of aircraft aims to address this issue in preparation for the 2009 – 2010 cyclone season.

Introduction

RFDS Western Operations provides services to people requiring care throughout Western Australia. This State is the largest in Australia covering 2.5 million square kilometres in total. The vast majority of patients that are transferred from remote and regional areas are taken to one of the teaching hospitals in the Perth metropolitan area. During 2007/2008 RFDS Western Operations aircraft flew 5,578,165 kilometres transferring 5,931 patients and conducting 1,727 clinics. RFDS Western Operations operate two bases in Northwest Australia at Port Hedland and Derby (RFDS, 2009). The Northwest Australian coastline between Broome and Exmouth is the most cyclone-prone region of the entire Australian coastline, having the highest frequency of coastal crossings (BOM, 2008). The bases at Port Hedland and Derby could potentially be affected by tropical cyclones. The development of a comprehensive risk assessment based on the Australian/New Zealand Risk Management Standard AS/NZS 4360:2004 sought to identify major risks that RFDS Western Operations could encounter in the event of a tropical cyclone impacting one of the northern bases.

Identified risks

The need for RFDS Western Operations to update its Tropical Cyclone Plan utilising a risk assessment framework was important given recent cyclone events that have affected the North Western Australia for example Tropical Cyclones Monty (2004), Glenda (2006) and George (2007). The most likely major risks identified were injury/death to RFDS Western Operations personnel, damage to RFDS Western Operations assets, and reduced operational capability. The RFDS Western Operations Cyclone Planning & Coordinating Committee (CPCC) used a qualitative risk analysis matrix to assess the level of risk associated with reduced operational capability. The likelihood of a tropical cyclone impacting on a northern base was identified as likely and the consequence of this affecting the operational capability of RFDS Western Operations was identified as major. Using a risk level matrix the risk was assessed as extreme. Personal safety and the preparation and maintenance of buildings and their contents in the event of a tropical cyclone are managed under the guidance of the Fire & Emergency Services Authority of Western Australia (FESA) under the Western Australia State Emergency Management Plan for Tropical Cyclone (2007). Reduced operational capability can result in RFDS Western Operations providing a level of service which may be unable to meet the demands of the population in certain areas of the state. Subsequently, this risk was addressed by the Tropical Cyclone Plan.

If no aircraft or crews are available at a particular base then it means that other bases have to be brought in to cover this geographical area. This can have a negative impact on operational capability as this would usually mean that crews from other bases would have to travel greater distances to provide a service to the region which has no crews. This manifests a problem as pilots can only fly 8 hours per day as governed by the Civil Aviation Safety Authority of Australia (CASA, 2004). This may result in crews being unable to respond to certain flights as pilot hours may be compromised. Ultimately, the loss of only a small number of crews and aircraft from one particular base can result in reduced operational capability for the entire state of Western Australia.

Cyclone George

In 2007 Severe Tropical Cyclone George was the most destructive cyclone to affect Port Hedland since Tropical Cyclone Joan in 1975. Tropical Cyclone George intensified to a Severe Tropical Cyclone Category 5 and was still at its maximum intensity when it crossed the coast 50 km northeast of Port Hedland at 2200 Western Daylight Savings Time on Thursday 8 March. At 0025 Western Daylight Savings Time on Friday 9 March people in the coastal community of Port Hedland were put on red alert until further notice. In total there were three reported fatalities related to Tropical Cyclone George (BOM, 2007). The operational capability of RFDS Western Operations during Cyclone George was affected due to a number of factors. No aircraft were relocated to alternate locations during Cyclone George and the two aircraft based at Port Hedland were secured in the hangar at the base. There was no damage to aircraft or to Port Hedland airport as a result of Cyclone George. Despite this the full operational capacity of the Port Hedland base was affected as there was an unavailability of flight crews due to fatigue. This was due to RFDS Western Operations medical and nursing crews assisting the local health authorities and other RFDS Western Operations flight crews were fatigued due to maintaining their homes during the cyclone period. This resulted in a late start of crews from the base at Port Hedland culminating in reduced operational capability in this area.

Relocation of aircraft

The relocation of aircraft to an alternate location was identified by the RFDS Western Operations CPCC as an important component in maintaining operational capability. The relocation of aircraft is not a new concept and the United States military often relocate aircraft

from the East Coast bases that could potentially be affected by Hurricanes (Miles, 2003). In the event of a potential tropical cyclone threat affecting any RFDS Western Operations bases, volunteer crews are asked if they can remove the aircraft to an alternate location. As most of the crews living in Port Hedland and Derby have families and homes in the respective towns, few staff will volunteer to relocate aircraft as they want to be with their families and their home. Ultimately, this can result in no aircraft been relocated and the aircraft and crews remaining in the affected base. The RFDS Western Operations CPCC developed a plan in which the early relocation of aircraft to an alternate location could be achieved. It was determined that the relocation of aircraft plan would be activated when the yellow alert phase had been issued. FESA uses the Western Australia Colour Alert System for Tropical Cyclones. In the event of a cyclone there are four stages of alert, blue alert, yellow alert, red alert and all clear. The yellow alert phase states that the cyclone is moving closer and there is a significant risk that destructive wind gusts will develop and it is highly likely to affect the community within 12 hours (FESA, 2007).

It was determined by the CPCC that if there were no volunteers from the potentially affected bases who could relocate the aircraft then alternate pilots could be sought from other bases. These pilots could then be transferred to the affected base either by commercial aircraft, charter aircraft or by company aircraft. The aircraft could then be relocated to an alternate location. This would mean that crews in the affected base could remain with their families and homes yet the aircraft would be in a safe location and if required extra crews could be sourced and deployed to these aircraft thus maintaining operational capability. This would be an expensive option but would maintain operational capability and ensure the security of the aircraft in the



The aftermath of Tropical Cyclone George

Courtesy: RFDS Western Operations



Courtesy: RFDS

RFDS Western Operations Pilatus PC-12

event of a tropical cyclone. The CPCC determined that the advantage of relocating the aircraft eliminated the risk of the aircraft becoming damaged during a tropical cyclone if it was left at the affected base and in the event that the hanger suffered damage this could result in damage to the aircraft making it unusable. The relocation of aircraft also eliminates the problem of having aircraft that could be utilised but were unable to be used due to external elements. These external elements include crew fatigue and issues that could make the airport inoperable following a cyclonic event including flooding of the runway, debris on the runway and damage to aviation installations (Grady, 2005).

Conclusion

The impact of a tropical cyclone on an RFDS Western Operations base could be catastrophic resulting in loss of life and assets. During a period of tropical cyclone activity RFDS Western Operations still needs to maintain optimal operational capability. The development of a Tropical Cyclone Plan incorporating the relocation of aircraft to alternate locations can maintain operational capability providing there are pilots available to relocate the aircraft. Activating the relocation of an aircraft plan at the yellow alert phase gives RFDS Western Operations a realistic amount of time to organise the logistics involved in relocating aircraft. There is a need to review the relocation of aircraft plan following the 2009 – 2010 tropical cyclone season. If such a plan were to be implemented then its effectiveness in maintaining operational capability needs to be evaluated.

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Speaking as one: The joint provision of public information in emergencies

Anne Leadbeater, of the Office of the Emergency Services Commissioner in Victoria, highlights the critical importance of emergency services speaking with one voice when providing public information in emergencies.

At 8.50am on July 7, 2005, a bomb explodes on a train travelling in the London Underground between Liverpool and Aldgate stations. One minute later, another explosion occurs on the train travelling from Edgware Road to Paddington. At 8.53am, a third blast is detonated on a train travelling on the Piccadilly Line. For the next 45 minutes, emergency agencies scramble to respond to what are thought initially to be a series of isolated events, variously anticipated as 'power surges', 'collisions', 'a derailment', and a 'tunnel fire'.

Despite media outlets fielding calls within minutes of the first explosion, followed, within half an hour, by reports from eye-witnesses of 'bodies on the line at Aldgate', the official report of 'possible power surges' persists for almost an hour. At 9.46am, it is 'finally discredited' with a fourth explosion on board a bus at Tavistock Square, after which 'the official "line" was changed to reflect what had actually happened' (London Assembly 2006, p. 137), from the Report of the July 7 Review Committee into the London Bombings.

ABSTRACT

Access to information that is timely, accurate and consistent is a critical element in any disaster or major incident. That it is also, almost invariably, one of the first 'casualties' is possibly the most challenging aspect of emergency management today. The importance of effective communication cannot be overstated; as Bullock et al observe:

Reaching the widest possible audience with the most up-to-date, credible information can save lives and property, reduce public fears and anxiety, and maintain the public's trust in the integrity of government officials.

(2004, p. 3)

However, the challenges for first responders gathering data during the initial stages of an emergency, combined with the capacity and interoperability of emergency systems and protocols and the need to verify and approve the release of information can significantly constrain the flow of knowledge in an emergency. According to Richard Falkenrath, Visiting Fellow of the Brookings Institute, 'a bit of experience managing complex national incidents teaches three iron rules':

1. First reports are usually inaccurate;
2. Accurate reports are typically embedded within significant uncertainty; and
3. The public, the media and the government's communications specialists will demand information much faster than "the interagency" is prepared to provide it.

(2005, p. 133)

In an effort to address the critical issues

of providing emergency information to communities and sharing intelligence and data between response agencies, many governments and emergency managers world-wide are implementing protocols to facilitate information-sharing between the responding agencies; those at risk or directly affected by an emergency; the broader community and the media. Known variously as 'joint information systems' (JISs), 'joint public information committees' (JPICs), or 'public information and warning partnerships (PIWPs), these entities are established with the common aim of facilitating effective multi-agency responses to, and mitigating the consequences of emergencies through the efficient collection, analysis and dissemination of information.

The formation of joint information systems to develop and deliver key messages in emergencies has primarily evolved from the lessons learned during and after the 2001 attacks on the World Trade Centre in New York. As part of the National Information Management System, the Federal Emergency Management Agency (FEMA) has developed a comprehensive protocol for the establishment and operation of a joint information system staffed by public information officers (PIOs) representing government, emergency response and other stakeholder agencies. FEMA describe this model as 'the systems used to deliver the right information to the right people at the right time, in order that they may make the right decisions' (2008). FEMA's public information systems operate on three basic principles:

1. The role of the Public Information Officer (PIO) is to support Incident Command;
2. Public information functions must be coordinated and integrated across jurisdictions and functional agencies; among Federal, State, local, and tribal partners; and with private-sector entities and nongovernmental organisations; and
3. Organisations participating in incident management retain their independence (ibid).

In considering the efficacy of joint public

information systems, this paper will reflect on FEMA's pre-emptive model of information management and will examine the small but growing body of research that evaluates specific examples of the 'joint public information committee' model in relation to particular emergency situations. It will seek to identify the key challenges inherent in the successful establishment and operation of a joint public information committee and will draw on the available literature to explore those challenges.

A new world view

Technological advances have, over the last decade or so, facilitated a proliferation of new and increasingly portable means of communication and an extraordinary level of access to and use of the internet. This same period has seen an escalation in 'connectivity' including 24 hour news broadcasts, text messaging, geographic information systems, cable television, satellite transmissions, webcasts, blogging, and more. Not only has this emerging technology 'radically altered the way we collect, process, analyse, utilise, and disseminate information' (Rodriguez et al. 2007, p.483), it has fuelled an unprecedented level of public expectation concerning information availability and the capacity for emergency managers to provide timely, consistent, coordinated and trustworthy responses.

Prior to this profusion of technology, emergency managers could rely on having at least a small window of time in which to assess and evaluate a situation and to then 'manage' emergency information through the development and release of a media statement to their choice of sources. The current reality sees a population that can be 'virtually' and instantly connected and where anyone with a mobile phone has the capacity to become a 'breaking news' reporter. As an example of the speed with which news can travel in the contemporary environment, journalist and author Margaret Simons cites Gary Linnell, Director of News and Current Affairs for Channel Nine, Melbourne. Linnell recalls that his teenage son in Melbourne learned of the 2005 London Bombings from a friend in London via an internet chat room before Linnell, himself did and prior to any television coverage on either Sky News, BBC World or any local networks (2007, p.299).

The increasing demand for information and knowledge is occurring in a social and political environment that is experiencing rising levels of public participation in policy development and governance (OESC 2008, p. 43). Importantly, the right of all Victorians to participate in public life is now protected under Section 18 of the Victorian Charter of Human Rights and Responsibilities.

Section 18 of the Charter, 'Taking Part in Public Life' not only establishes the right to participate, but requires that citizens be afforded the 'opportunity' to participate '...in all levels of public governance and policy making' including 'matters that have international, regional and local impacts' (VEOHRC 2008, p.21). Handmer and Dovers note that efforts to encourage 'broad-based ownership of emergency management policy' are resulting in 'an expanding involvement away from a select group of specialists towards engagement with many stakeholders' (2007, p. 80).

The benefits of improved communication and collaboration in emergency management are well documented, (See Drabek 2007, p.230; US Department of Homeland Security 2008; Haddow and Bullock 2006; London Assembly 2006; OESC 2008; Pike 2006; Rodriguez et al. 2007; Handmer and Dovers 2007) and form the cornerstone of reviews and recommendations for future improvement (London Assembly 2006; Home Office UK 2006; Jefferson 2006; McEntire 2007; OESC 2008). However, a growing range of participants, 'each with their own agendas and priorities' adds, inexorably, to the complexity and multiplicity of demands faced by emergency managers (Handmer and Dovers 2007, p. 80). The model of the joint information committee provides a valuable framework to assist in dealing with these complexities, but in order to succeed it requires that the critical issue of 'relationships' is acknowledged and understood.

Relationships and trust

In emergency communications, relationships can generally be categorised as existing between 'agencies, with each other', 'agencies and the community', 'agencies and the media', and 'the media and communities'. In terms of the relationship between agencies, the successful operation of a joint information committee relies heavily on the capacity for agencies to participate effectively, to work cooperatively and to understand and value each others roles, responsibilities and capabilities. The negotiation and management of conflicting priorities, policies and organisational values is also a key element for joint information committees. In discussing international emergencies, Haddow and Bullock describe coordination and cooperation as vital considerations, which, when achieved can result in 'great success and many lives saved', whereas 'infighting, turf battles, and non-participation can lead to confusion and even cause a second disaster (2006, p. 221).



Caption: Kinglake residents gather to hear CFA, DSE, Police and local government advice about an impending fire - January 2006

Courtesy: Paul Hendrie

One of the key elements of all relationships concerning the joint provision of information is that of 'trust' – and this is particularly true of the relationship between agencies and the community. In 'Preparing for Natural Hazards: the role of community trust', Douglas Paton states that it is not the content of emergency information that determines action but rather, how that information is interpreted in the context of individual and community 'experiences, expectations and beliefs'. He further contends that the relationship between the community and the source of the information has a great bearing on its interpretation (2007, p. 370-371).

Mike Granatt, Visiting Professor, University of Westminster and former Head of the UK Government Information and Communication Service, states that the key role of 'public information and warning partnerships' in the UK 'is to create and sustain trust, particularly between official bodies, including central and local government, and the news media' (2004, p. 355). He recommends using 'authoritative sources to deliver the same messages' given that, when 'faced with unexpected advice, people will seek a second source before acting'. Granatt warns that 'conflicting advice destroys trust' and 'that a particular fright factor is conflicting messages from voices of authority' (ibid, p. 358). He observes:

'The paramount need for consistency and confirmation puts a very high premium on cooperation and coordination between all those involved in issuing or handling public warnings and information during an emergency including experts, public services and reputable broadcasters' (ibid, p. 359).

An effective example of the relationship between consistency and trust is provided within the *Report of the July 7 Review Committee into the London Bombings*. The report is critical of the fact that it was not until 11.15am, almost two and a half hours after the initial explosion that the first message of advice was communicated to the general public via a news conference, and that it simply comprised the generic message to 'go in, stay in, tune in'. Presented by Police Commissioner, Sir Ian Blair, the news footage was replayed throughout the day, even after the message to 'go in, stay in, tune in' was no longer relevant. As it was not 'time-limited', the message conflicted with an announcement at 3pm that the bus service was being reinstated, causing further confusion and delays for people seeking to return home from central London. 'Because Sir Ian Blair gave the first news conference himself at 11.15am, subsequent interviews with less senior officers were not seen to supersede that news conference' (London Assembly 2006, p. 88).

Working with the media

Relationships between emergency services and the media are particularly complex and crucial. They can be affected by competing priorities, media deadlines, access to and verification of information, and the past experiences of journalists and emergency management agencies. In the event of any disaster, 'the media learn about it, report what they hear, try to obtain more information, use their files to add background to their

stories, and dispatch news crews' (Scanlon 2007b, p. 414). In 'Partnerships: The Path to Improving Crisis Communication' Fitzpatrick observes:

'Minutes after an incident occurs, media inquiries will overwhelm the local police chief and fire chief at an emergency scene or via pager or cellular telephone. What they say to the media and the language they use sets the tone for whether the public remains calm or reacts in fear' (2007, p. 19).

Depending on the nature of the emergency, media interest can manifest on a vast scale. For example, as far back as 1988 several thousand media made their way to the small, border town of Lockerbie, Scotland in the first 48 hours after the crash of Pan Am 103, (Scanlon 2007b, p. 415). Significant tensions were experienced in New York in the days following the attack on the World Trade Centre when the media presence 'swelled to 5000 journalists and technical personnel' (Granatt 2004, p. 364). This phenomenon, identified in 1957 by Fritz and Mathewson as 'convergence' can also extend to volunteers and off-duty emergency personnel who 'self-dispatch' to emergencies in response to media reports (Scanlon 2007a, p.83)

An on-going cause of tension in relationships with the media is the dissemination of misinformation and/or rumour. Formal and informal cooperation between journalists and media outlets, together with the copying of rival reports, can mean that one report (true or false) may be repeated many times and via different media methods. Media reports can tend to perpetuate myths of panic, confusion and looting in the wake of emergencies, and, in some instances, may encourage altered behaviour, such as panic buying, so that the 'visuals will match the myths' (Scanlon 2007b, p. 417). In seeking to establish and maintain positive working relationships with the media, proactive efforts are required to 'prevent the information vacuum'—as 'in the absence of information, speculation will take over' (Pike 2006, p. 11).

In spite of these challenges, the role of the media in emergencies is imperative. Fitzpatrick urges emergency managers to make use of the media's capacity to influence public behaviour and to disseminate protective behaviour information:

'The need for first responders and the broadcast news media to work cooperatively in a crisis cannot be overstated. The loss of more than 1,500 people in Hurricane Katrina is a sobering reminder of the consequences of a failure on the part of public officials and broadcast media to deliver consistent safety messages' (2007, p. 1).

In his paper 'On Trust: Using public information and warning partnerships to support the community response to an emergency', Granatt examines and compares the levels of credibility and public trust afforded to various emergency management stakeholders and observes:

'It is widely agreed there is no practical substitute for using the media to broadcast detailed information, and indeed some obvious advantages, given their reach and credibility with the public' (2004, p. 357).

Haddow and Bullock reflect on the challenge of disseminating accurate risk information to the public amidst many other competing and potentially conflicting information sources, stating:

'The government has no control over what unofficial sources say because it can't regulate talking heads, so-called experts, and Web sites. Partnering with the media to provide a steady stream of consistent and accurate information from responsible authorities is the best way to overcome this obstacle' (2006, p. 206).

To establish and support working relationships with the media, FEMA has developed a comprehensive on-line training program for public information officers together with a series of checklists to ensure that the priorities and constraints faced by the media will be considered in the management of emergency information (2008). In 9/11: Implications for Communications, the UK Media Emergency Forum sets out a draft protocol for crisis communication that encompasses participants, timing, background, content, accreditation, media access, access to victims, safety issues, establishment of a media centre, media pooling arrangements, role of the Media Emergency Forum Standing Committee of Editors and the status of media organisations as priority users of essential services such as fuel and power (Media Emergency Forum 2002).

There is agreement between emergency managers and the media that positive, cooperative relationships can deliver optimum outcomes both in the response and recovery phase of an emergency. During the protracted rescue operation following the 2006 collapse of Tasmania's Beaconsfield Mine Joint Venture, a comprehensive, multi-agency plan was established to manage the national and international media interest in the rescue of the two trapped miners. There were thirteen identified stakeholder groups including Mine management and staff, Tasmania Police and Emergency Services, the Chief Inspector of Mines, the Australian Workers Union, Launceston General Hospital, the West Tamar Council, and the Tasmanian Minerals Council. According to Constable Phil Pike, media specialist with Tasmania Police, all stakeholders 'had to be included in the communications processes to varying degrees' (Pike 2006, p. 6). One of the key outcomes of the management process was the negotiation with media sources to share 'pool footage' of miners, Webb and Russell, emerging from the mine, filmed by one cameraman provided with a suitable vantage point and 'live linked' to all networks. This arrangement provided access to high quality footage for all visual media, whilst still protecting the rights of the miners and their families, mine operators and staff. Prior agreements and guaranteed access to footage also facilitated the unhindered passage of ambulances transferring Russell and Webb to hospital through the waiting crowd of media and community (ibid).

Resourcing

A fundamental relationship exists between any joint information system and the resources required to enact and operate it. The issue of resourcing is critical both in terms of physical resources such as suitable equipment, technology, infrastructure and location, as well as access to sufficient numbers of experienced staff and the financial resources to operate the system throughout the response and recovery phases of an emergency. Whilst there is ample evidence to support the value of pre-planned emergency communication strategies (See Handmer and Dovers 2007; Media Emergency Forum 2002; OESC 2008; US Department of Homeland Security 2008; Jackson 2008), as Bullock et al observe:

'The most well-written communication plan is not worth much without a strong commitment from elected officials and department managers to put the infrastructure in place to carry out the plan' (2004, p. 4).

The primary consideration is the development of protocols that determine and authorise the establishment of a joint information system. Clear, agreed guidelines are required that will identify and support the need for a joint information system and/or the establishment of a joint information centre in any given emergency. Failure to develop and adhere to these guidelines will likely result in experiences such as the aftermath of the terrorist attack on the Pentagon on September 11, 2001; The *Arlington County After-Action Report* states:

'The failure to establish a Joint Information Centre (JIC) proved to be an impediment to the presentation of coordinated, factual, and timely public information. There was not a central point of interface between the media and the agencies involved in the response. Each agency dealt separately with the media' (2002, p. 53).

By contrast, the *Report on the Southern California Firestorm 2003* observes:

'...that establishing a multi-agency JIC had a significant positive effect on the timeliness and effectiveness of information management when compared to large incidents that did not use a JIC' (Mission-Centered Solutions 2003, p. 10).

Once the joint information system is established, one of the key resource challenges is the need for it to be 'scalable' in response to an escalation of the emergency. An incident that begins with one public information officer with a 'go kit' in the field may end up requiring a fully staffed Emergency Operations and Media Centre (FEMA 2008). Both the UK Media Emergency Forum Joint Working Party and FEMA recommend the prior development of protocols outlining 'the basic requirements of a media centre' as well as 'prior clarification of financial and staff resource support arrangements' before an emergency incident occurs (Media Emergency Forum 2002; FEMA 2008). Both agencies agree that the establishment of a JIC should

not be determined or delayed by financial considerations – however, the question of 'who pays' must be addressed (ibid).

Another significant challenge is the number of requests for information that a JIC may receive. In the aftermath of the London Bombings, the establishment of a Casualty Bureau, at first delayed by an incorrect telecommunications connection, was eventually operational at 4.00pm, seven hours after the first explosions. In its first hour of operation, there were 42,000 attempted calls to the Casualty Bureau. It is estimated that to handle the volume of calls received would have required 2,500 call-takers' (London Assembly 2006, p. 84). However, even this enormous volume of calls seems small when compared to the 400 million attempted calls on the day of the World Trade Centre attacks. Communications were further compromised by the fact that key internet servers were located within the World Trade Centre complex (Granatt 2004, p. 364). Issues with the capacity and interoperability of radio and telephone systems also feature extensively in post-disaster evaluations, such as the failure of mobile telephones to operate in the underground railway system after the London Bombings (London Assembly 2006).

Infrastructure and telecommunications resources are essential considerations when planning for emergency communications. Table top exercises undertaken by the UK Media Emergency Forum in 2002 involved a scenario of two linked chemical attacks in Northern England. According to 'mid-range calculations' such an emergency would see hundreds of media personnel and tens of satellite and other support vehicles on site within hours. 'After 24 hours, the estimate was 3,000 staff and 100 support vehicles'. Such an influx of media raises a number of issues including reinforcement and/or restriction of mobile telephone systems essential to outside broadcasting, siting of satellite trucks and frequency clearances, location of media centres and vantage points, accreditation of media personnel and pooling arrangements (Granatt 2004, p. 365).

The small Tasmanian community of Beaconsfield experienced its own media convergence following the mine collapse in 2005. Constable Phil Pike reports that the public park around the mine boundary became a camping ground for the media contingent, which included news, current affairs, and morning show presenters and crews from the major mainland networks as well as radio and newspaper journalists and an extensive number of photographers. According to Pike, 'the discovery of Webb and Russell saw an explosion in hired campervans, broadcast vans and media tents' (2006, p. 8).

The US Department of Homeland Security's 'Lessons Learned Information Sharing' website (LLIS 2008) includes a Best Practice guide to Crisis Communication Planning and the establishment of Joint Information Centres. This guide makes recommendations about JIC locations, including that they be 'easily accessible, with sufficient parking, power, phones and phone lines and

minimal background noise'. The location should be close to the incident and the emergency operations centre, but at a distance sufficient to ensure that JIC staff are safe and that the operations of the JIC do not conflict with the emergency response (ibid).

In pre-planning a joint information system or joint information centre, the issue of availability, experience and qualifications of staff is an essential factor. FEMA recommends that emergency managers identify 'the staffing capabilities needed to maintain public information operations for 24 hours per day for at least several days' as well as establishing agreements and authority to borrow, hire or call up temporary staff. Further recommendations concern staff training, suggesting that all staff that have been identified to assist JIC operations should be provided with training prior to an incident. A comprehensive resource to assist with staff training is available via FEMA. Comprising seven web-based lessons, the NIMS Public Information Systems course (IS-702) provides detailed information about the Joint Information Systems concept, pre-incident activities, public information systems during an incident, and post-incident activities. The on-line course, targeted at public information officers, is readily available from the FEMA website. As well as providing a thorough understanding of the philosophies and processes of the joint information system, the course also generates organisation-specific checklists and self-assessment guides based on the information provided by participants during the lessons (FEMA 2008).

Information

FEMA identifies that 'the best defence in any disaster is an informed public' (2008). Whilst the benefits of an integrated approach to emergency information are evident, the development and dissemination of public information is, by no means, a straightforward issue. The first consideration is access to accurate data about the size, scope and implications of an emergency. This data must then inform the development of key messages for the public about how to respond to the emergency in order to minimise loss of life, injury and loss of property. This information will vary in relation to the type, duration and scale of the incident, as well as the target audience. To be effective, it must anticipate social, geographical, technological, demographic and linguistic barriers; it must be consistent, up-to-date, concise, and relevant; and it must be delivered across a range of mediums by a trusted, authoritative source (ibid).

Adding to this complexity, the information provided must engage with physical and psychological reactions to stress and fear in order to motivate the actions required to mitigate the affects of the emergency. In *The Unthinkable: who survives when disaster strikes – and why*, journalist and researcher Amanda Ripley divides the reaction of individuals to a crisis into three phases. 'Denial'—the initial response period where individuals seek to normalise their situation, often by delaying any decisive action; 'Deliberation'—the process during which humans review their reserves of knowledge and previous experience in order to try to make sense of what is

happening to them; and the 'Decisive Moment'—when individuals react, either appropriately or inappropriately, or fail to react to the threat of disaster (2008). Thus, the most effective emergency communication will not only seek to provide the information needed to understand and respond to a disaster. It will also be developed and disseminated in such a way as to support individuals to cope with their instinctive responses and to elicit the required actions that will best protect them. The inherent challenges are well illustrated by Ripley who cites a survey conducted in 2006 by the Harvard School of Public Health. Less than one year after Hurricane Katrina, researchers interviewed 2,029 people living in high-risk hurricane zones. When asked what they would do if told by government officials that they had to evacuate before a major hurricane, and despite images of the aftermath of Hurricane Katrina still featuring regularly in news broadcasts, 25 percent of respondents said they would not leave. A further nine percent responded that they were not sure what they would do, making a total of 34 percent of people who may not evacuate, despite official advice to do so (ibid. p. 39).



Courtesy: J Leadbeater

'What we know, what we don't know, what we are doing and what we need you to do' - Emergency services and relief agencies met with Kinglake residents every day after the Black Saturday fires in February 2009.

It is not difficult to imagine how such ambivalence could be magnified by information that is conflicting, out of date or construed as untrustworthy. By contrast, the operation of a joint information system established in response to Hurricane Gustav in 2008 delivered positive outcomes. Lead PIO with the Arkansas Department of Emergency Management, Tommy Jackson identified the constructive elements of such an integrated approach. With lead officers from a range of key agencies on hand to share in preparing press releases, together with email and cell phone contact with the Governor's Office, utilities and others, the Arkansas Department of Emergency Management was, according to Jackson, able to 'get closer to our goal of one voice for the citizens of Arkansas' (Jackson 2008).

'Knowledge is power', according to the old adage, and this is certainly true in emergencies. The more one knows and understands about a situation, the better one will perform and, ultimately, recover from the experience. From their book 'Deadly Force Encounters', Ripley cites police psychologist Alexis Artwohl and co-author Loren Christensen:

The actual threat is not nearly as important as the level of preparation. The more prepared you are, the more in control you feel, and the less fear you will experience (2008, p. 70).

The implications of the relationship between knowledge and power in emergency management are significant. People who have pertinent information before an emergency are more likely to respond appropriately and effectively during the event. Adherence by the community to messages such as 'Leave Early or Stay and Defend' (CFA 2008) and 'Go In, Stay In, Stay Tuned' (UK Cabinet Office 2008) establish a connection or 'communication gateway' through which specific, expert information can be provided.

One way of valuing and integrating local knowledge is the monitoring of requests for information made to call centres during an emergency and using those questions to inform the development of key emergency messages (FEMA 2008; Scanlon 2007b). Another important strategy is to engage with and integrate emergency responders and local government representatives from affected communities into response and recovery planning processes (Caruson and MacManus 2006). As well as response information, the provision of preparedness and recovery information is greatly improved by multi-agency integration. Effectiveness is further enhanced through an understanding of local media and media audiences in the development of effective messages—such as the use of children's program Sesame Street to deliver information on hurricane preparedness (Scanlon 2007b, p. 418). Collaboration between agencies also facilitates the development of comprehensive, 'multi-faceted' messages that can best capitalise on the media's capacity for public education, warning and information dissemination (ibid).

Importantly, access to quality information before, during and after an event also has profound implications for resilience and recovery (Nicholls and Healy 2008). Information about recovery must, in some instances, be conveyed during the response phase of the emergency, engendering specific challenges for emergency managers who may be developing response and recovery strategies and messages simultaneously. The 7 July Review Committee observes:

The most striking failing in the response to the 7 July attacks was the lack of planning to care for people who survived and were traumatised by the attacks. Hundreds of people were left to wander off from the scenes. An estimated 1,000 adults and 2,000 of their children are likely to have suffered from post-traumatic stress as a result of their experiences on 7 July. 3,000 others are estimated to have been directly affected by the explosions. The majority of them are still not known to the authorities, are not part of any

support network of survivors, and have been left to fend for themselves. Those who are known to the authorities in some cases received excellent care and support following 7 July. Others registered their details but received no follow-up contact, and no advice or information about the support that was available (London Assembly 2006, p. 121).

In some cases, recovery information will be needed for months, even years, after an event, with significant implications for resourcing. In the case of the attacks on the World Trade Centre, a program of crisis counselling and public education was established; called 'Project Liberty' the program expended \$US137 million of federal funding from an allocated budget of \$US155m. From September 2001 to December 2003, 'the program provided face-to-face counselling, education and outreach to an estimated 1.2 million individuals' (Nicholls and Healy, 2008 p.15).

Conclusion

The last decade has seen an increasing level of support for the value of joint information systems in managing emergencies. The importance of pre-planned, collaborative communication processes is well illustrated in the 7 July Review Committee's report into the London Bombings:

The key to an effective response to a major or catastrophic incident is communication. This includes communication within and between the emergency, health, transport and other services. It also includes effective communication with the individuals caught up in the incident, and the public at large (London Assembly 2006, p. 12).

However, establishing and maintaining interagency communication and collaboration, whilst being vitally important, also poses some significant challenges. And, as Handmer and Dovers observe, '... the existence of interdepartmental committees does not, by itself, indicate that they achieve their aims' (2007, p. 137)

My personal interest in the provision of public information in emergencies began in 2006 as a member of a community under threat of bushfire. It developed, over the ensuing 12 months, as coordinator of bushfire recovery working with fire-affected communities in Murrindindi Shire. My experiences during that period provided many appreciable examples of the sense of empowerment and resilience derived by communities and individuals who felt they were included, respected and 'in the loop' in relation to emergency information. I was also able to witness, first-hand, the anger, frustration and sense of betrayal manifested by the provision of information that was perceived, or indeed proved to be conflicting, inaccurate, irrelevant or out-of-date.

The growing number of reports that evaluate 'lessons learned' in emergencies (See Arlington County 2002; FEMA 2008; Fitzpatrick 2007; Granatt 2004; Handmer and Dovers 2007; Home Office UK 2006; London Assembly 2006; Media Emergency Forum 2002; Mission-Centered Solutions 2003; OESC 2008; Rodriguez et al.

2007, etc.) suggest an increasing aptitude for self-reflection and a genuine commitment to accountability and continuous improvement amongst emergency services, world-wide. Part of this improvement is the nascent recognition that in all aspects of emergency preparedness, response and recovery, the community can and should be considered as active partners, rather than passive recipients—an evolving relationship that highlights communication as ‘the lifeblood of participation’ (Handmer and Dovers 2007, p. 76). The ability to anticipate, respond to and recover from emergencies is contingent on access to high-quality, consistent information, effectively disseminated by trustworthy sources. We know this is true of communities and individuals as well as governments, non-government agencies and emergency services. It is, hopefully, a ‘lesson’ that should not need to be learned more than once.



Courtesy: J Leadbeater

Fuel, water and roadblocks? - Emergency services and recovery agencies speaking with the Kinglake community in the immediate aftermath of Black Saturday.

Postscript

Whilst this paper predates the devastating bushfires in Victoria on 7 February 2009, the principles of multi-agency collaboration and joint communication were used during ‘Black Saturday’ and through the initial relief and recovery effort.

Victoria’s Emergency Management Joint Public Information Committee (EMJPIC) was activated on 28 January 2009 in preparation for an impending heatwave and unprecedented fire conditions. EMJPIC, which is chaired by Victoria Police, comprises senior communications personnel from Victoria’s emergency service agencies and other specialist organisations, and works to provide accurate, timely, and consistent emergency information.

In response to the heatwave and bushfires during January and February, the emergency management focus of EMJPIC broadened to encompass a whole-of-government approach with the dissemination of emergency and health warnings, weather alerts, information about power outages and road closures, advice for tourists and visitors to fire prone areas, information about fatalities and the impacts of the fires, provision of aerial images of the fire-affected areas, messages about school closures, details of Coroner’s orders and the establishment of the Bushfire Royal Commission. Simultaneously, at the local level are examples of responding agencies meeting two to three times per day to prioritise key messages and to collaborate on a diverse range of recovery issues from the provision of water, fuel and emergency grants to the removal of dangerous trees and dead stock, access to emergency accommodation, fodder and fencing materials, counselling and business support.

The 7 February fires resulted in unprecedented media coverage for an event of its type generating over 122,000 separate media items from more than 1,250 journalists in the first month¹. The events surrounding Black Saturday represent a unique opportunity to further evaluate the joint provision of public information in emergencies and to inform future research into the critical importance of emergency services ‘speaking as one’.

Acknowledgement: The author would like to thank Robyn Betts (OESC) and Kate Driscoll (RMIT) for their advice and encouragement. Thanks also to the referees for their constructive comments.

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The need for 'adequate' farm dam safety management accountability to avoid dam failure emergencies

Dr. John D. Pisaniello shows, through 12-year demonstrative case studies, that relying only on landholders' Common Law duty to maintain dams does not provide adequate accountability and assurance for dam safety.

ABSTRACT

Farmers in Australia often overlook their Common Law responsibility to maintain dams and the downstream community is threatened if dam failure becomes possible. The seriousness of this problem has been demonstrated by past research regarding spillway capabilities. This paper adds to previous research by providing illustrative and comparative evidence on a broader range of private dam safety management practices, issues and threats based on case studies over a 12-year period in South Australia. An historic case study of inadequate and complacent policy responses to these threats is included. The paper shows that relying only on landholders' Common Law duty to maintain dams does not provide adequate accountability and assurance for dam safety. Governments must adequately protect the community from unacceptable dam safety management practices. Guidance on how to do this is provided based on international best practice and key-actor feedback on the Tasmanian "model" approach.

Introduction

There is an estimated 480,000 farm dams in Australia (Price et al, 2003) of which thousands have failed and/or pose significant safety threats to downstream communities. The Australian National Committee on Large Dams (ANCOLD) in 1992 reported a 23% failure rate for farm dams in NSW (ANCOLD, 1992, p.11). In Tasmania a number of private/farm dams have failed in the past 80 years with serious consequences (Ingles, 1984; Pisaniello, 1997), and currently some 500 of the 8000 registered dams pose significant safety risks (DPIWE, 2005, p.21; Ditchfield, 2008). In Victoria around 1000 of the 300,000 farm dams are very dangerous (Murley, 1987; Lake & Bond, 2006, p.290), and Lewis and Harrison (2002) reported that at least ten significant failures have occurred in Victoria in the last decade.

Small dam failures internationally have had disastrous consequences. For example, in China the Shimantan and Banquia dams failed in 1975 due to the cumulative failure of 60 smaller upstream dams, resulting in the death of 230,000 people (Fu & Quing, 1998). In the United States, the Kelly Barnes Lake dam, only 8 metres high, failed in 1977 killing 39 people (Hiser & McDonald, 1989); the Evans and Lockwood dams, which were only around 5 metres high and held only 89 ML and 39 ML of water respectively, both collapsed in 1989, killing 2 people (Graham, 1999). In Indonesia, the Situ Gintung earthen dam, only 10 metres high, failed by overtopping in March 2009 killing around 100 people and causing widespread damage (The Associated Press, 2009; BBC News, 2009). Graham's (1999) study of dam failures in the US that resulted in fatalities from 1960 to 1998 found that dams less than 15 metres high (ie typical height range of smaller "private/farm" dams) caused 88% of deaths [ie 88% of those attributable to dam failure]. The study also found that dams less than 6 metres high (ie very small dams) which failed caused 2% of the deaths. These events demonstrate that without appropriate design, construction, maintenance and surveillance, poorly managed small dams pose both significant individual and cumulative threats and can cause considerable human, property and environmental losses.

In most countries, including Australia, ongoing owner responsibility exists under Common Law to maintain dams according to current standards (Pisaniello & McKay, 2007). In Australia, these standards are set by ANCOLD (2000a, 2000b, 2003). However, many jurisdictions have found that it is not enough to rely solely on Common Law responsibility to protect downstream communities, property and the environment from poor dam safety management practices. Some form of government-implemented dam safety accountability and assurance policy is required where privately-owned dams exist (Pisaniello & McKay, 2005; 2007). ANCOLD states:

"A role of government is to enact legislation to protect the community. Legislation should establish regulatory authorities that ensure dam owners, and potential dam owners, are taking appropriate actions in regard to dam safety" (ANCOLD, 2003, p.3).

Policy responses in Australia include NSW, Victoria, Queensland and Tasmania making good legislative progress. However, more work needs to be done in

certain States, particularly concerning cumulative/cascade safety threats posed by smaller catchment dams (Pisaniello & McKay, 2005; 2006; 2007). For example, the remit of dams supervised needs to be increased, and effective and efficient administration of laws is vital for private dam safety assurance policy to be successful. South Australia and Western Australia have been altogether too complacent with private dam safety policy (Pisaniello, 1997; Pisaniello & McKay, 2007). The seriousness of the problem with such 'policy-limited' States was partly demonstrated by Pisaniello and McKay (1998a; 2005) concerning dam spillway capabilities.

“ Beyond legislation, guidance on the responsibility of dam owners and on dam safety management, both at the sites of dams and downstream of them, is provided in a recently reviewed Australian Emergency Manual (Commonwealth of Australia, 2009). This document is one of a series of best-practice guides on the management of flooding in Australia. ”

This paper provides “follow-up” historic, illustrative and comparative evidence on a broader range of private dam safety management practices, issues and threats in South Australia based on case studies that have extended over a 12-year period. Lessons and guidance, relevant to any jurisdiction, are provided for achieving ‘adequate’ private dam safety accountability and assurance policy that minimises dam failure emergencies.

An historic case study of inadequate private dam safety policy responses in South Australia

South Australia has over 22,000 farm dams in the Mount Lofty Ranges alone (McMurray, 2004, p.5). Pisaniello (1997) found that at least 100 of these represent considerable hazard potential. However, dam safety assurance policy remains absent.

A Bill on dam safety was introduced into Parliament in 1985 but lapsed. Several years later the Bill was reintroduced but unfortunately the new Government entered into a “mode of deregulation”, so the Bill was not implemented (Sheuard, 1993). Nevertheless, the

need for private dam safety assurance policy continued to be expressed on many fronts, for example:

“The Construction of farm dams.....around Adelaide is a potential cause of concern.....lack of power to ensure safety during and after construction has in the past and will in the future, inevitably lead to failures and the exacerbation of flood flows in the river systems.....urges the Government to introduce legislation and controls and the establishment of safety standards for the construction and maintenance of farm dams” (Flood Warning Consultative Committee SA, 1990).

Following the severe floods throughout the Mount Lofty Ranges in the latter months of 1992, a study discovered that farm dam failures provided additional problems and contributed to damage costs (Harrison, 1992). In response, the Hydrological Society of South Australia held a seminar on farm dams in April, 1993. Its proceedings suggested that it was time to “jump start” a Dam Safety Bill again. However, no further progress was made (Sheuard, 1993).

A study (LDC & SMEC, 1995; Kazarovski, 1996) of the Kangaroo Creek Dam, one of SA’s largest public dams, found the peak inflow would increase four-fold if all small dams in the catchment failed at the same time in a 1-in-200 years flood event. This event would exceed Kangaroo Creek Dam’s spillway capability putting downstream communities at unacceptable risk. The small dams’ cumulative failure was a reasonable assumption given that Pisaniello and McKay (2005; 2007) found most small dams cannot even pass the 1-in-100 years design flood event. The Kangaroo Creek study demonstrated the considerable cumulative risk of farm dam population failures in larger catchments. It also urged the South Australian Government to introduce laws to regulate farm dam construction and safety. The warnings were unheeded.

Pisaniello (1997) undertook case studies of hazardous private dams in South Australia to test their condition, general maintenance and spillway capabilities. The results on the spillway capabilities (Pisaniello & McKay, 1998a; 2005) provided empirical evidence on the urgent need for a dam safety policy. Policy response, however, was still not forthcoming despite much guidance made available in this area (see Pisaniello & McKay, 2007). The results on the condition and general maintenance of the dams are reported for the first time below to further reinforce this need.

Currently, local councils, in providing development authorisation under the Development Act 1993, have only very limited control over the siting and construction of new dams. Natural Resources Management (NRM) Boards under the NRM Act 2004 do have some control over farm dams, but this is mainly concerning water allocations. The NRM Act provides for a permit/licence process to build new dams or alter existing dams which may restrict the dam’s storage capacity or require “environmental flow” release from the dam. The issuing authority is not obliged to consider questions of building or flood safety.

The South Australian Government could have included dam safety assurance measures in its water laws when it developed the integrated NRM Act 2004. Yet the issue is still not considered critical enough by policy makers. Since the early 1990s, extensive safety studies and subsequent upgrading have been commissioned for most government-owned dams (Pisaniello, 1997; Pisaniello & McKay, 2006). By failing to establish some form of safety accountability and assurance policy on managing potentially hazardous private dams, South Australia is, in effect, unconsciously devaluing the lives of people living downstream of these dams compared to the lives of those living downstream of public dams to which attention has been given. The Government should be held accountable for this inequity. It appears that the necessary policy response in South Australia will only be activated once a disastrous, fatal dam failure occurs. This is not a proactive approach to the problem and unfortunately for downstream communities the potential consequences could be devastating.

12-year demonstrative case studies

Pisaniello (1997) undertook case studies of hazardous private dams in South Australia to test their condition and general maintenance in the absence of dam safety policy. These results are reported here and contribute to the identification of trends in such a “policy limited” State.

The study sample and investigative procedure

In 1995, eleven hazardous earthen farm dams were randomly selected for investigation in the Mount Lofty Ranges (see Table 1). The following criteria were adopted when selecting the dams:

1. Referable in size in accordance with ANCOLD (1986) guidelines, ie higher than 5 metres with at least 50 ML storage capacity.
2. Hazard rating of either “Significant” or “High”, based on a subjective assessment (using topographic maps, aerial photography and site inspections) of the dam size, development downstream, services involved and the environment, in accordance with ANCOLD (1986) guidelines. These hazard ratings can be summarised as follows:
 - High Hazard—dam failure will endanger many lives in a downstream community and will cause extensive damage
 - Significant Hazard—failure may endanger some lives and will cause extensive damage
 - Low Hazard—failure poses minimal risk to life and will cause limited damage

TABLE 1. Summary of the Basic Characteristics of the Sample Dams.

Dam No.	When Built (year)	Max. Height (m)	Storage Cap. (ML)	Hazard Rating	Why the Assigned Hazard Rating?
1	1968	7.8	147	High	Located directly above a township
2*	1990	9.2	83	High	Number of residential households close downstream
3*	1939	10.5	249	High	Large historic township close downstream
4*	1967	9.0	89	High	Residential households directly below
5	pre 1970	8.0	162	High	Sewage treatment plant close downstream
6*	1975	10.7	50	High	Number of residential households close downstream
7	1980	8.1	177	Sig.	Much valuable property downstream
8	pre 1970	7.5	60	Sig.	Other storages located downstream—domino effect
9	pre 1970	5.5	54	Sig.	Much valuable property downstream
10	pre 1970	6.6	103	Sig.	Another storage and much property downstream
11*	1965	8.4	70	Sig.	Other storages located downstream—domino effect

*The only 5 dams for which permission could be gained to re-inspect in 2007

Over 100 dams were large enough to satisfy the first criterion based on GIS data. Most of these were at least "Significant" hazard following assessment based on the second criterion. Dam owners were contacted to request property access, but many refused. Eventually 11 owners permitted access subject to confidentiality of their names and addresses. Fortunately, six of the 11 dams were amongst those confirmed as "High Hazard" as summarised in Table 1.

Detailed inspections were made of each sample dam's general condition and apparent maintenance in late spring/early summer 1995. In 2007 permission was given to revisit only five of the dams in Table 1 (marked by asterisk). Site inspections re-affirmed their hazard ratings against the updated ANCOLD (2000b) guidelines and provided results for comparison with the 1995 results: hence, 12-year case studies. The inspections explored whether dams met the basic ANCOLD (1994) requirements, which are now found in ANCOLD (2003). The publication "Your Dam - An Asset or a Liability" (DCNR, 1993) was adopted as a guide in the visual inspections and assessments. Any potential problems or basic limitations associated with owner management practices were noted.

Investigative results

The condition of the dams and apparent levels of maintenance varied but many basic deficiencies were common. A brief description and assessment of three of the five sample dams inspected in both 1995 and 2007 is provided below. A summary of all the inspections together with a comparative analysis follows.

Dam No. 2

Upon first inspection of this High hazard dam in 1995, physical obstructions, including a walkway bridge and sandbags, were present across the spillway restricting its potential capacity (Figure 1). The top section of the bank contained localised depressions and cracks approximately 5 mm wide by 100 mm deep indicating shrinkage. Trees had grown out of the embankment and harsh obscuring vegetation covered the entire downstream face of the embankment violating ANCOLD requirements. Overall, the dam's condition in 1995 was poor. Despite pointing out these deficiencies to the owner, they still existed in 2007 (see Figure 2). The dam had obviously received minimal or no maintenance in the 12-year period.

Dam No. 4

Inspection of this High hazard dam in 1995 revealed some maintenance activity. Good uniform protection existed along the upstream face of the embankment and the crest was well graded and uniform (Figure 3). The spillway was clear of vegetation but contained a large mound of dumped earth causing obstruction and reducing capacity (see Figure 3). These circumstances violate ANCOLD requirements and the local council repeatedly warned the owner of these problems (Seamen, 1995). In 2007 the dam's condition had worsened. As illustrated in Figure 4, vegetation grew out of embankment as well as within the spillway, and the mound of soil blocking the spillway remained.

FIGURE 1. Dam No.2 in 1995 showing the spillway blocked by a walk-way bridge and sand bags, and trees allowed to grow out of the crest.



FIGURE 2. Dam No.2 in 2007 showing a close-up of the sand bags used to block the spillway.



FIGURE 3. Dam No. 4 in 1995 showing the spillway blocked by a mound of dirt. There is also dense vegetation allowed to grow on the downstream face of the embankment.



FIGURE 4. Dam No. 4 in 2007 showing the spillway still blocked by a mound of dirt, but now shrubs and vegetation are growing in the spillway and along the upstream face of the embankment.



FIGURE 5. Dam No. 6 in 1995 showing the spillway undercutting and weakening the dam wall. The embankment was otherwise well maintained.



FIGURE 6. Dam No. 6 in 2007 showing the spillway still undercutting the dam wall. Dense vegetation is also now allowed to grow out of the embankment and to completely block the spillway.



Dam No. 6

This High hazard reservoir was clearly unsafe in 1995 due to the manner in which the overflow undercut and weakened the dam wall, see Figure 5. The owner had been warned by the local council to correct the problem by re-diverting the overflow (Seamen, 1995). In 2007 the dam had not been upgraded (see Figure 6). Without legislation, the council is powerless to ensure compliance. The dam in 1995 was otherwise found to be in reasonable condition, having a clear spillway, excellent grass cover over the embankment and a uniform, well graded crest (see Figure 5). Unfortunately, in 2007 these conditions did not prevail because harsh vegetation completely blocked the spillway and grew out of the embankment (Figure 6).

Comparative summary and analysis of results

Figures 1 to 6 well typify problems identified for the other 2 sample dams investigated over 12 years and also the 6 dams inspected only in 1995. Most private owners either underestimate or ignore the risks and hazards associated with their dams and are depriving the structures of necessary maintenance and upgrading. To quantify the extent of the problem in the study area, the results have been analysed by rating the condition and associated maintenance level of each dam as either: (1) Good, (2) Reasonable, (3) Poor, or (4) Very Poor. Dams rated either poor or very poor were considered “unacceptable” in respect to ANCOLD (1994 & 2003) guidelines. This analysis is provided in Table 2.

The results in Table 2 demonstrate that most of the selected dams in 1995 were deficient in some ways. In fact, nine (82%) were rated unacceptable, five of these being “High Hazard”. As the basis of selecting the dams was not their lack of maintenance, it was expected that more than two of the dams would show compliance with ANCOLD requirements, but this was not the case. For the 5 dams re-inspected in 2007, where 4 of these are High hazard, the deficiencies remain in every case and in fact worsened in most cases. This confirms that these owners have, in the past 12 years, ignored the warnings on their dams’ risks and hazards, as well as their Common Law responsibility to maintain them.

This provides strong evidence that the status of private dam safety in South Australia is extremely poor and unacceptable in the absence of adequate dam safety assurance policy. It is a matter of when rather than if a serious private dam failure will occur in South Australia. Consequently the need for policy is critical.

How to provide ‘adequate’ private dam safety accountability and assurance policy

This section provides guidance on developing private dam safety accountability and assurance policy that is in line with international best practice. Useful reference to Tasmanian “model” policy and key-actor feedback is included.

TABLE 2. Rated Summary of Condition / Maintenance Level of Sample Dams over 12 Years.

Dam No.	Hazard Rating	1995 Condition / Maintenance Level Rating (Good, Reasonable, Poor, or Very Poor)	1995 Acceptability per ANCOLD (1994) Guidelines	2007 Condition/ Maintenance Level Relative to 1995 per ANCOLD (1994/2003) Guidelines
1	High	Good	Acceptable	n/a
2*	High	Very Poor	Unacceptable	Worse
3*	High	Poor	Unacceptable	Unchanged
4*	High	Poor	Unacceptable	Much Worse
5	High	Poor	Unacceptable	n/a
6*	High	Very Poor	Unacceptable	Worse
7	Sig.	Reasonable	Acceptable	n/a
8	Sig.	Very Poor	Unacceptable	n/a
9	Sig.	Very Poor	Unacceptable	n/a
10	Sig.	Very Poor	Unacceptable	n/a
11*	Sig.	Very Poor	Unacceptable	Worse

*The only 5 dams for which permission could be gained to re-inspect in 2007

International best-practice policy guidance

The dam safety management and assurance practices of Australia, USA, Canada, United Kingdom, Finland, Portugal and South Africa were reviewed by Pisaniello (1997); see also Pisaniello and McKay (1998b; 2007). Schemes to control dam safety management vary between and within countries but key components in certain practices exist. Jurisdictions have regulated dams as small as 1.8 metres high (Michigan, USA) and with a minimum storage capacity of 25 ML (UK) regardless of dam hazard potential. New Zealand has also recently joined this list of countries, implementing dam safety legislation to regulate dams as small as 3 metres high and with a minimum storage capacity of only 20 ML (Building Act 2004; Building (Dam Safety) Regulations 2008). Clearly these overseas countries recognise the need to assure the safety of even the smallest of dams.

Pisaniello and McKay (1998b; 2007) provide detailed policy models and criteria for determining “appropriate” dam safety assurance policy. This can help guide the action that any jurisdiction currently lacking in private/ farm dam safety accountability and assurance policy should take.

A “model” approach and key-actor feedback from Tasmania

Tasmania has over 30% of Australia’s total water storage capacity, including thousands of farm dams. It is the only State to acknowledge that, due to their cascade/ cumulative threats, even small, low hazard dams must be registered and supervised, albeit to a modest extent. To this end, Tasmanian dam safety policy provides some form of monitoring of all dam storages down to as small as 1ML. Pisaniello and McKay (2006) provide more specific details of this “model” approach.

Cost burdens to small dam owners can be minimised by making available affordable design/review processes, for example, the simple Tasmanian reporting pro-forma (see Pisaniello and McKay, 2006) and the Pisaniello (1997) cost-effective spillway design/review procedure (see Pisaniello et al 1999). The Tasmanian government commissioned preliminary development of this procedure in July 2008. When fully developed, regulators can use it as a spillway safety checking tool. Dam owners and engineers can also use it as a cost-effective tool to review/design spillways and fulfil reporting requirements.

The Water Management Group of the Department of Primary Industries and Water (DPIW) is responsible for administering the Tasmanian dam safety policy. The problems discovered in the 12-year South Australian study were discussed with DPIW in June and July 2008. DPIW revealed that South Australian landholders’ bad dam management and spillway blocking practices also occur in Tasmania, and were more common prior

to the recent law reforms. DPIW also confirmed that the general intention of landholders purposefully blocking their spillways is to store more water than may otherwise be allowed by entitlement. DPIW will include the following statement in its forthcoming *Guidelines for the Construction of Earth-Fill Dams*:

"In no circumstances should a spillway be blocked by either logs becoming wedged in the spillway or the spillway being purposefully filled to increase the capacity of the dam" (DPIW, 2007, p.15).

Rigorous implementation of the policy is critical - it usually takes an inspection by the authority and instruction to cease and remedy in order to stamp out such practice.

Low hazard dams are specifically targeted when potential cascade or cumulative failure scenarios arise. Such scenarios are common. DPIW carefully considers each scenario and adjusts hazard ratings of smaller dams when appropriate, thus imposing stronger surveillance, reporting, and safety standards. Inevitably, as dams throughout Tasmania are discovered and come onto the register, the cumulative threats posed by small dams in large catchments will be reduced. Tasmania's approach shows that governments can ensure that not only individual potentially hazardous dams are kept safe, but also the cumulative safety threats posed by small dams are kept in check.

Conclusion

If dams are not managed properly, then all dams, large and small, high and low hazard, pose considerable safety risks because of the potential for failure. Such risks can arise at either the individual and/or cumulative level within catchments. These risks can be magnified by the attitudes, behaviours and practices of private dam owners as well as the attitudes and responses of policy makers.

In South Australia, the attitude of farm dam owners is clearly one of complacency. Their on-farm behaviour and practices over the past 12 years show that they underestimate the importance of a dam's spillway and dam maintenance and safety in general. Policy makers are also complacent. The absence of any policy responses despite numerous research and warnings over many years indicates a dangerously reactive rather than proactive approach in South Australia. It is tantamount to "waiting for a disaster to happen" and does not set a good example for others to follow.

Relying only on the Common Law responsibility for landholders to maintain dams, and giving them more time, awareness and encouragement does not work. Adequate farm dam safety accountability and assurance can only be provided by implementing appropriate legislative policies. Tasmania provides a good example of an Australian jurisdiction that is addressing private/farm dam safety issues well, including the management of both individual and cumulative dam safety threats. Since it is the role of government to protect the community, government must provide such policies which assure the community that owner accountability and participation protect them from unacceptable dam safety

management practices. The evidence and guidance provided in this paper should strongly encourage such action in South Australia and any other 'policy deficient' jurisdictions.

Acknowledgements

The 1995 component of this study was undertaken as part of the Pisaniello (1997) doctoral studies thanks to an APRA scholarship and supervision by Prof John Argue and Prof Jennifer McKay at the University of South Australia. The 2007 component of this research was made possible through financial support from the UniSA Research Office. The Australian Research Council is also acknowledged for its recent Discovery Project funding to enable further research into cumulative catchment threats. Thanks to Prof Roger Burritt from the Centre for Accounting, Governance and Sustainability at UniSA for his recent interest and support for this research, and to Mr Arthur Spassis for his valuable field work and assistance. Much appreciation is extended to the Tasmanian Department of Primary Industries and Water for the information provided on that State's dam safety situation: Mr Sam Ditchfield for participating in valuable discussions and contributing key facts; and Mr Lud Schmidt and Dr Alan Harradine for their ongoing support. Thanks also to Dr Chas Keys for contributing useful information on the recent Commonwealth flood manuals.

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Willingness of frontline health care workers to work during a public health emergency

Kirsty Hope et. al., report on the findings of a survey of frontline health staff to determine their perceived willingness to report to work given three public health emergency scenarios.

ABSTRACT

As the effectiveness of a health care response during a disaster depends on an available, skilled and motivated front line health workforce, it is essential to understand and address potential barriers to their participation. We conducted a survey of front line health staff employed in a large regional health workforce in Australia to determine their perceived willingness to report to work during three public health emergency scenarios (weather event, influenza pandemic and bioterrorism event). While willingness to report to work differed by scenario, our research indicated that a similar framework for preparing staff and their families could apply to all disaster scenarios. To ensure that frontline health staff will report to work when they are most needed, response plans should ensure personal confidence in their defined role, emphasising the value of their role and addressing their family concerns.

Introduction

When a disaster occurs, those who provide health care are subject to the same challenges as others in the affected area; they may be injured, lose family members, suffer significant damage to their property or experience significant emotional issues. Disasters often result in additional health service challenges, placing increased demands on health workers. These may include longer hours, deployment in other locations or functions, and dealing with personal loss, confusion or grief.

Health care workers must be prepared to deal with a range of disasters, including natural disasters, infectious disease outbreaks or even bioterrorism-related events. If physically able to attend work, some health workers may not be willing to report due to illness of dependents, fear, or closure of childcare facilities and schools.

A recent survey in Australia concerning an influenza pandemic situation found that 83% of health workers surveyed were prepared to report to work if a patient in their ward/department had an influenza-like illness (Seale 2009). This is consistent with surveys of health care workers in Singapore, Japan and Canada following SARS, in which many health workers acknowledged that the risks associated with SARS were part of their work, although high levels of fear and anxiety were identified across all occupational groups (Campbell 2006, Imai 2005, Koh 2005). A survey of paramedics also performed in Australia found that not all paramedics were willing to report to work during disasters. Concerns identified included health and safety, communication issues, the need for accurate and timely information, and suitable training (Smith 2007).



Courtesy: NSW Nurses Association

It is essential to address potential barriers to healthcare workers' participation in health emergencies.

While several studies focusing on willingness to report to work during public health disaster have been conducted in the United States (Balicer 2006, Barnett 2005, Chaffee 2009, Barnett 2009), their results may not be relevant to the Australia context. Reasons for the differences include the following: (1) different health care systems in the United States and Australia, (2) many of the US surveys focused on government public health workers, not frontline hospital staff, (3) different public health and healthcare professional culture in the United States and Australia, and (4) a differing perception and reality of the



If physically able to attend work, frontline hospital staff may not be willing to report due to illness of dependents, fear, or closure of childcare facilities and schools.

types of disasters or threats which may occur in Australia compared to the United States. We therefore conducted a survey of front line health staff in a large regional health workforce in Australia to determine their perceived willingness to report to work during three public health emergency scenarios (weather event, influenza pandemic and bioterrorism event).

Method

A cross sectional survey of Hunter New England Area Health Service (HNEAHS) employees defined as front line health staff for responding during a large scale public health disaster was conducted between 1 November 2007 and 30 January 2008. HNEAHS in Northern NSW covers both rural and metropolitan areas, with approximately 14,500 staff providing health care for approximately 840,000 people.

Front line health staff were defined as: hospital staff, selected community health staff (nurses, social workers, early childhood nurses, Aboriginal health workers and migrant interpreter services), all mental health staff and all pathology staff. In addition staff were only eligible for inclusion in the study if they were classified as full-time or permanent and thus had a contact number and payroll location. All staff meeting the inclusion criteria were identified in the HNEAHS human resource database.

A simple random sample of 1600 employees was selected using SAS version 9.1 (SAS institute Inc. Carey, NC, USA). Allowing for an expected response rate of 50% this number would allow precise estimation of outcomes of interest (i.e. 95% confidence intervals for proportions within $\pm 4\%$). It would also allow detection of difference in characteristics between those who were and were not willing to report to work of 10% for binary variables and 0.2 standard deviations for continuous variables, with a significance level of 5% and 80% power.

Survey content

The public health infrastructure survey tool designed by the Johns Hopkins School of Public Health's Center for Public Health Preparedness and used in the US context (Balicer 2006) was adapted for the Australian health context. Pre-survey interviews were conducted with 25 staff meeting the inclusion criteria to ensure survey content was appropriate for the Australian environment. The survey tool was amended accordingly, including terminology changes; two questions were added to all three scenarios: willingness to work in a different location, and confidence in working in a different location; and two questions were added to the influenza pandemic scenario: awareness of appropriate infection control measures and access to vaccine would improve confidence. The survey included questions on personal characteristics, such as professional classification, gender, age and clinical status. The respondents were required to use a 10-point scale from 1 (agree) to 10 (disagree) when responding to questions.

Survey delivery

A Computer Assisted Telephone Interviewing (CATI) system was used to contact randomly selected individuals. Employees were telephonically provided with a short background to the study and offered the choice of declining to participate, filling out the survey on-line or by email using a PDF version, or a paper version by fax or internal mail. If there was no contact with the employee at the first telephone call, up to six call-backs were made. Participants were excluded if they had resigned, were on long service leave, maternity leave or extended sick leave, if they were on secondment outside the health department or if they had relocated and their whereabouts were unknown. Participants received a follow-up telephone call or email if they had not returned the survey within three weeks. Ethics approval for the study was obtained from the Hunter New England Human Research ethics Committee.

Statistical methods

The data was cleaned and quality checked using SAS, version 9.1 (SAS Institute, Carry, NC, USA). Questions about scenario-related attitudes and beliefs were dichotomised into those who definitely agreed (1, 2 and 3) and others (4-10). The proportion of individuals willing to report to work for each scenario was determined with 95% confidence intervals. For each scenario these proportions were compared across standard socio-demographic variables and attitudes / beliefs using chi square tests. Multivariable logistic regression was used to explore the association between socio-demographic variables, attitudes/beliefs and willingness to report to work, with variables included in the initial model if their p value was less than 0.2 in univariable analysis. A backward stepwise model was employed for removing variables with a p-value less than 0.1 on the likelihood ratio test. The Hosmer-Lemeshow test was used to assess the fit of the final models (Hosmer 2000).

Results

Response rate

Of the 14,000 HNEAHS employees 8,905 met the inclusion criteria for front line health workers during a public health emergency, and 1600 were randomly selected to participate in the survey. Two hundred and eighty seven were ineligible due to maternity leave

(n=54, 19%), long service leave (n=44, 15%), annual leave (n=54, 19%), extended sick leave (n=15, 5%), resignation (n=32, 11%), relocation/secondment (n=6, 2%), whereabouts unknown (n=42, 14%), uncontactable (n=32, 11%), changed work status to casual (n=6, 2%) and other leave (n=2, 1%). Of the 1313 eligible to participate, 868 (66%) returned completed questionnaires, 112 declined participation and 333 failed to return their questionnaire. The sample completing the questionnaire were from similar locations and settings as those not responding (Table 1) but there was a slightly higher proportion of patient support / administration staff and a slightly lower proportion of hospital support staff among those completing the questionnaire compared to those who did not.

Willingness to respond if required differed by emergency scenario; 78% [95%CI 75%-81%] of participants indicated they would be willing to report to work during a weather related event compared to 67% [95% CI 64%-70%] during an influenza pandemic and 52% [95%CI 48%-55%] during a bioterrorism event. Willingness to report to work did not differ significantly by clinical status or professional classification, however rural participants were more likely than urban participants to indicate a willingness to report to work during a weather related or a bioterrorism event as shown in Table 2. Participants who worked in a community health facility were more likely to indicate a willingness to report to work during an influenza pandemic scenario.

TABLE 1. Demographic characteristics of Hunter New England Area Health front line disaster response staff who did and did not respond to the survey, 2008.

Characteristic		Respondents n =868 n (%)	Non-respondents n=445 n (%)	Chi squared	df	p value#
Professional Classification	Doctor	46 (5%)	36 (8%)			
	Nurse	438 (50%)	227 (51%)			
	Allied Health	72 (8%)	26 (6%)			
	Administration/Clerk	155 (18%)	51 (11%)			
	Pathology/Technical	90 (10%)	46 (10%)			
	Hospital Support Services*	67 (8%)	59 (13%)	23.13	5	<0.01
Location	Rural	452 (52%)	222 (50%)			
	Urban	416 (48%)	223 (50%)	0.56	1	0.45
Facility Setting	Acute	406 (47%)	218 (49%)			
	Community	462 (53%)	227 (51%)	0.58	1	0.45

* including catering services, linen services

TABLE 2a. Demographic characteristics, attitudes and belief associations with willingness to report to work if required during each emergency scenario, HNEAHS, 2008.

Characteristic		Weather-related event		Influenza pandemic		Bioterrorism event	
		n (%) ^a	p-value [#]	n (%) ^a	p-value [#]	n (%) ^a	p-value [#]
Clinical Status	Clinical	423 (78%)		361 (66%)		277 (51%)	
	Non-clinical	236 (78%)	0.93	202 (68%)	0.67	153 (52%)	0.96
Professional Classification	Doctor	33 (79%)		29 (67%)		29 (67%)	
	Nurse	324 (77%)		275 (65%)		207 (50%)	
	Allied Health	71 (86%)		59 (69%)		42 (49%)	
	Hospital Support	75 (84%)		59 (63%)		44 (48%)	
	Administration / Clerk	87 (73%)		79 (66%)		59 (50%)	
	Pathology / technician	75 (85%)	0.25	69 (79%)	0.20	53 (62%)	0.11
Gender	Male	152 (81%)		126 (67%)		111 (60%)	
	Female	512 (77%)	0.24	442 (67%)	0.89	320 (49%)	0.01
Work Load	Full time	425 (79%)		372 (69%)		300 (57%)	
	Part Time	234 (76%)	0.23	195 (63%)	0.08	132 (43%)	0.13
Age (years)	20-29	55 (73%)		44 (59%)		40 (54%)	
	30-39	111 (73%)		91 (59%)		60 (40%)	
	40-49	231 (76%)		195 (65%)		146 (49%)	
	50-59	223 (82%)		198 (73%)		153 (58%)	
	>60	48 (84%)	0.14	44 (79%)	0.01	34 (62%)	<0.01
Dependents	Yes	359 (77%)		306 (66%)		226 (49%)	
	No	300 (79%)	0.59	260(69%)	0.39	203 (55%)	0.10
Location Type	Urban	297 (72%)		264 (64%)		194 (48%)	
	Rural	371 (83%)	<0.01	309 (69%)	0.13	241 (55%)	0.05
Facility type	Acute	301 (77%)		224 (62%)		192 (49%)	
	Community	367 (79%)	0.42	329 (71%)	<0.01	243 (54%)	0.17

*total numbers differ slightly due to missing data

^a number and % willing to report to work

[#] p values for chisquare test

TABLE 2b. Attitudes and belief associated with willingness to report to work if required during each emergency scenario, HNEAHS, 2008.

Attitudes / Beliefs	Weather-related event		Influenza pandemic		Bioterrorism event	
	n (%) ^a	p-value [#]	n (%) ^a	p-value [#]	n (%) ^a	p-value [#]
Likelihood of event occurring in region	492 (81%)	<0.01	253 (81%)	<0.01	35 (53%)	0.81
Public health consequence would be severe if occurred	387 (83%)	<0.01	510 (71%)	<0.01	356 (56%)	<0.01
Likelihood of being asked to report	357 (89%)	<0.01	365 (64%)	<0.01	245 (56%)	<0.01
Previous training	85 (80%)	0.58	88 (72%)	0.24	19 (48%)	0.60
Knowledge of public health impact	184 (87%)	<0.01	209 (75%)	<0.01	69 (66%)	<0.01
Confidence in area health service preparedness	228 (87%)	<0.01	196 (89%)	<0.01	45 (73%)	<0.01
Mentally prepared	419 (90%)	<0.01	317 (88%)	<0.01	139 (85%)	<0.01
Knowledge of role	212 (89%)	<0.01	179 (84%)	<0.01	79 (77%)	<0.01
Confidence in skills	510 (89%)	<0.01	399 (83%)	<0.01	230 (79%)	<0.01
Confidence safe to work	251 (92%)	<0.01	446 (80%)	<0.01	258 (78%)	<0.01
Confident will be safe while at work	391 (92%)	<0.01	276 (89%)	<0.01	132 (86%)	<0.01
Confident to perform duties	463 (90%)	<0.01	328 (82%)	<0.01	190 (82%)	<0.01
Family prepared to function in their absence	363 (93%)	<0.01	342 (87%)	<0.01	219 (80%)	<0.01
Discussed with family the possibility of working	214 (90%)	<0.01	130 (23%)	<0.01	53 (12%)	<0.01
Confident to work in a different location	337 (89%)	<0.01	306 (88%)	<0.01	214 (85%)	<0.01
Able to communicate with the public	216 (92%)	<0.01	165 (80%)	<0.01	40 (67%)	0.02
Importance of role in response	242 (87%)	<0.01	280 (81%)	<0.01	165 (68%)	<0.01
Successful performance of role is important	345 (85%)	<0.01	317 (76%)	<0.01	188 (63%)	<0.01
Awareness of infection control procedures			373 (76%)	<0.01		
Access to a vaccine will improve confidence			381 (93%)	<0.01		

*total numbers differ slightly due to missing data

^a number and % willing to report to work

[#] p values for chisquare test

Multivariable analysis indicated that those factors associated with a respondent's willingness to report to work differed for the three scenarios. The three variables significantly associated with higher odds of willingness to report to work during all three scenarios were: perceived confidence in own skills, likelihood of being asked to respond and family preparedness (Table 3).

For a weather-related event, additional significant variables were working in a rural location, ability to communicate with public, confidence in personal safety while at work and confidence in ability to perform duties. For an influenza pandemic, additional significant variables were perceived likelihood of the event occurring in the region, confidence in being able to safely get to work, confidence in being able to work in a different location, ability to communicate with the public, confidence in the Area Health Service preparedness and access to vaccine would improve confidence. The final model for a bioterrorism event also included full-time work load, confidence in being able to safely get to work, confidence in personal safety while at work, confidence in ability to work in a different location, and ability to communicate with the public (Table 3).

On the basis of the Hosmer-Lemeshow goodness of fit test the final models for each scenario fitted the data well (weather event: $\chi^2=7.54$, $df=8$, $p=0.48$, influenza pandemic: $\chi^2=6.29$, $df=8$, $p=0.61$ and bioterrorism event: $\chi^2=6.90$, $df=8$, $p=0.55$).

Discussion

Willingness to report to work differed by scenario. A higher proportion of staff indicated willingness to report to work for a weather-related disaster than for other disasters. Previous studies, including an Australian study of paramedics, also found that willingness to present to work was greatest for conventional disasters, such as weather related events, and lowest for non-conventional disasters, such as those caused by infectious diseases (Qureshi 2005, Smith 2009). This may relate to familiarity, with most local health workers having some experience of working during a local natural disaster in the recent past (Cretikos 2007).

Frontline health workers were less willing to report to work if they reported a lack of confidence in their skills, lack of family preparedness or indicated a belief that their role may not be important. Staff confidence in their ability to perform their role and staff perception of likelihood of being asked to respond appear to be pivotal factors in their willingness to respond, requiring not only a clear role delineation but ideally prior opportunities to perform this role. Field or desktop exercises may assist in increasing familiarity with an individual's roles during a response to a disaster (Collander 2008, Johns Hopkins University Evidence-based Practice Centre 2004).

Family preparedness has been a missing element in most disaster plans. Many health workers have other people to consider when making the decision to report to work (Dalton 2008). Staff need to be equipped with the skills to discuss such events with their family members,

develop their own family plan and also be assured of reliable communication links and the welfare of family (Barnett 2005, Qureshi 2002, Chaffee 2009). During SARS, many family members of health workers working at affected hospitals were discriminated against in the community (Koh 2005, Campbell 2006). Communication plans need to address these broad family issues.

Previously-identified barriers to participation in responding to a disaster include transport problems, care for children, elderly or pets, lack of knowledge concerning risk and responders role, and fear or concern for family and self (Smith 2007, Cretikos 2007, Ehrenstein 2006). Where available, provision of appropriate vaccinations or antivirals and effective communication are important strategies for improving participation of health workforce during an influenza pandemic (Cretikos 2007).

A previous study of local public health workers from four health regions in the United States found that "concerned and confident" workers – i.e., those with a sense of threat, coupled with a sense of efficacy toward responding to that threat – had the highest rates of willingness to respond to an influenza pandemic (Barnett 2009). Our study found similar findings, with those believing an influenza pandemic was likely in the region having higher odds of reporting to work (OR2.8 95%CI 1.8-4.4). Our study also found similar scenario-specific trends, with a terrorism event producing the lowest willingness to respond.

While willingness to report to work differed by scenario, our research indicated that a similar framework for preparing staff and their families could apply across disaster scenarios. When developing disaster response plans, health authorities should consider the following six areas: 1) determine roles and type of staff required, 2) accurately determine likely threats to staff and their families resulting from fulfilling their role (predict concerns), 3) provide basic education on disaster response, the threat of different types of disasters and the roles staff may be asked to fulfil (do not assume health workers know their role), 4) develop strategies to ensure staff confidence in their role and to mitigate risk in the workplace, 5) develop strategies to assure staff members of the importance of their role and to assist them to assist their families to function during a disaster, and 6) develop strategies to maintain knowledge and engagement of health workforce. Similar strategies have been proposed in the United States focusing on role education and role importance (Barnett 2009).

While this study is limited by its cross sectional design, the results provide a starting point to engage health workers in the response planning process. The information gathered will guide planning activities. As is common with similar study designs, results reflect respondents' intentions rather than actual responses but do provide a baseline against which actual responses should be measured following the occurrence of a public health emergency. This will be of particular interest after the widespread introduction of pandemic H1N109 influenza in Australia.

TABLE 3. Multivariate final models for front line health workers' willingness to report to work if required during a weather related, influenza pandemic and bioterrorism emergency scenario, HNEAHS, 2008.[‡]

Characteristic		Weather-related event model		Influenza pandemic model		Bioterrorism event model	
		OR*	95%CI	OR*	95%CI	OR*	95%CI
Work Location	Urban	1.0					
	Rural	2.1	1.4-3.3 [†]				
Work Load	Full time					1.6	1.0-2.3 [†]
	Part time					1.0	
Confident in their own skills	Yes	3.0	2.0-4.8 ^{††}	1.9	1.2-3.0 [†]	2.5	1.6-3.8 ^{††}
	No	1.0		1.0		1.0	
Family prepared to function during their absence	Yes	4.0	2.4-6.7 ^{††}	2.5	1.6-4.0 ^{††}	3.2	2.0-5.1 ^{††}
	No	1.0		1.0		1.0	
Likelihood of event occurring in the region	Yes			2.8	1.8-4.4 ^{††}		
	No			1.0			
Confident that can safely get to work	Yes			3.3	1.5-3.6 ^{††}	2.8	1.9-4.3 ^{††}
	No			1.0		1.0	
Confident to work in different location	Yes			2.1	1.3-3.5 [†]	4.8	2.9-7.9 ^{††}
	No			1.0		1.0	
Confidence in personal safety while at work	Yes	2.6	1.5-4.4 [†]			3.1	1.6-6.0 ^{††}
	No	1.0				1.0	
Communicate with public	Yes	1.9	1.0-3.5 [†]	0.5	0.3-0.9 [†]	0.3	0.1-0.7 [†]
	No	1.0		1.0		1.0	
Likelihood of being asked to respond	Yes	2.7	1.7-4.3 [†]	2.5	1.6-3.9 ^{††}	3.4	2.3-5.1 ^{††}
	No	1.0		1.0		1.0	
Confident to perform duties required	Yes	1.8	1.1-3.0 ^{††}				
	No	1.0					
Confidence in the Area Health Service's preparedness	Yes			2.7	1.5-4.9 [†]		
	No			1.0			
Access to vaccine will improve confidence**	Yes			8.2	4.9-13.7 ^{††}		
	No			1.0			
Discussed with family	Yes					0.4	0.2-0.8 [†]
	No					1.0	

[‡] Table only displays data for significant variables in the final model for each scenario

* Adjusted for professional classification, age and gender.

** Access to a vaccine will improve confidence" was only asked for the influenza pandemic scenario.

[†] p<0.05 ^{††} p<0.001

Conclusion

Health workers may be required to work during a number of different disasters scenarios. To ensure they will report to work when they are most needed, response plans need to ensure personal confidence of frontline health staff in their defined role, emphasise the value of their role and address their family concerns.

Acknowledgements

I would like to acknowledge, Megan Valentine and John Fejsa from Hunter New England Health for their technical support in producing the survey tool and collecting the data and Carol B thompson from the Department of Statistics, Johns Hopkins Bloomberg School of Public Health and Natalie L Semon, Executive Director, Public Health Preparedness Programs, Johns Hopkins Bloomberg School of Public Health for their assistance and support during the project. The authors also acknowledge the funding support provided by NSW Health through the Hunter Medical Research Institute.

The co-development of this manuscript by the Johns Hopkins Center for Public Health Preparedness [CDC/Cooperative Agreement# U90TP324236; Grant# 906860] and the Johns Hopkins Preparedness and Emergency Response Research Center [CDC/Cooperative Agreement# 1P01tP00288-01; Grant# 104264] was supported in part through funding from the U.S. Centers for Disease Control and Prevention (CDC). All aspects of all authors' work were independent of the funding source.

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An exploration of a fire-affected community undergoing change in New Zealand

Pamela J. Jakes, Laura Kelly, and E.R. (Lisa) Langer report on the findings of a study that examined how a wildfire affects rural-urban community behaviour and perceptions.

ABSTRACT

In the first case study of a fire-affected community in New Zealand's rural-urban interface, researchers found evidence to support findings raised in other countries regarding evacuation, blaming behaviour and perceptions of risk. Differences were evident based on ownership tenure, including less awareness of wildfire risk and preparedness among those with shorter residency. The study also provides new evidence of wildfire highlighting or intensifying existing divisions within an affected community.

Introduction

On 14 December 2003 a fire swept through West Melton, a township of approximately 280 residents in the rural-urban interface 25 km west of the South Island's largest city, Christchurch (Figure 1). The cause was a fire that had been lit in a pile of horticultural rubbish in November. Although the land owners thought the rubbish fire had been extinguished, it was smouldering and reignited three weeks later as a result of extremely dry conditions and a northwest wind gusting to over 91 kph. Fire agencies managed to gain control of the fire within a few hours, but the fire's high intensity and rapid spread resulted in significant damage to the small community—grasslands, wood lots, orchards, a vineyard, outbuildings, hedges and fences, farm equipment and one house were destroyed over an area of 130 ha (Selwyn District Council 2004).

Between 1991 and 2007 New Zealand averaged more than 3,033 wildfires burning nearly 5,900 ha annually (Doherty et al. 2008). These fires are substantially smaller in area than those experienced in the United States and Australia, and rural communities generally do not incur significant damage. However, the small community was significantly impacted. In addition, there are factors that cause New Zealand fire managers to contemplate a growing wildfire danger in the future. Weather forecasts under various global climate change scenarios in New Zealand indicate a potential for more

frequent days with very high or extreme fire danger (Pearce et al. 2005; Hennessy et al. 2007). Land use change will have a significant impact on the potential for wildfire. For example, in New Zealand in 2003 there were nearly 140,000 lifestyle block assessments documented, totalling over 753,000 ha with a mean block size of 5.53 ha (Sanson et al. 2004). 'Lifestyle block' is a distinctly New Zealand term introduced by real estate agents in the 1980's to describe rural small holdings purchased by people who want to live a rural lifestyle but who derive their principal income from non-farming activities (Paterson 2005). Lifestyle block development is growing steadily—approximately 6,800 new lifestyle blocks were registered annually between 1980 and 2002 which equates to just over 37,600 ha per year converted to lifestyle blocks (Sanson et al. 2004). Projections suggest that rural areas with moderate urban influence are likely to increase in population by 21% between 2001 and 2021, compared with a national average of 16 % (Statistics New Zealand 2005). An increase in population on lifestyle blocks puts more people at risk from wildfire and increases ignition potential.

The general view is that wildfires impact on communities in Australia, the western United States and Mediterranean countries rather than rural communities in New Zealand. Perceptions that the fire risk is low and that large damaging wildland fires occur infrequently mean that New Zealand communities are not well prepared to withstand a wildfire and are vulnerable as conditions change. By studying the social impacts of wildfires that occur in New Zealand today, communities and individuals can better prepare to minimise the impacts of future fires whether or not any of the factors cited above, or factors not yet anticipated, result in more frequent or more severe wildfires.

In this paper we report the findings of a study conducted to understand the varied reactions of residents to the 2003 West Melton fire (Kelly 2007). Findings are based on 20 in-depth semi-structured, face-to-face interviews with residents who were either affected by the fire or participated with the recovery, as well as emergency managers who experienced the fire. Interviews took place in the summer of 2006, three years after the West Melton fire. Participants were selected using purposive sampling, a type of non-probability sampling where participants are chosen for their knowledge and

experience in the event being studied, in this case the West Melton fire (Babbie 1998). The interviews provided much detail, but may not necessarily provide a full representative picture. We highlight findings in four areas: impacts of the fire, assessment of blame for the fire, responsibility for managing fire risk, and steps taken to reduce risk since the fire.

FIGURE 1. In December 2003 a fire swept through the West Melton township and lifestyle blocks with about 280 residents in the rural-urban interface 25 km west of the South Island's largest city, Christchurch.



Findings from the West Melton fire

Impacts of the fire

One of the first impacts of the fire on many local residents was evacuation of the area. The evacuation was carried out by the New Zealand Police just before 2:00 pm, less than three hours after the first 111 call was made about the fire. Although no exact count is available, police estimate the number of people evacuated was between 150 and 300. People were allowed back into their homes after power was restored to most of the evacuation area the next morning. As with most evacuations, people questioned the wisdom of the action. Some people complained that the order to evacuate came too late:

The evacuation was a joke... we finished fighting the fire about 4:00 in the afternoon and then came back to the house, and then the police came and said that we've got to be evacuated, that it's a danger that we were here. This is after we spent all day fighting the fire and the fire had gone. I said there was no way I was gonna leave here, I'd sooner stay and keep my eye on things... but because I wouldn't go they came back with reinforcements but they didn't see me because I hid in the shed.

This quote points out the desire of a number of residents to stay and defend their property, some of whom had prepared for the possibility. As observed by one resident, "A lot of people have gone to the trouble to prepare themselves with fire fighting equipment and what's the point if we can't use it?"

But emergency managers' first concern is the safety of the residents and the fire fighters, which during a fire event can put them in conflict with rural people whose livelihoods may be threatened. As one fire manager explained:

If you are inside the [fire] area you either need to be part of the [fire fighting] game plan or you need to be an observer, you gotta be one or the other. If you are an observer you need to stay out of the game. The problem we have had in the past, and this is still an unresolved issue with a large section of the rural community, is how to get people out of the game or get them on the team. They want to be able to protect their own interests.

In general, West Melton residents who were relatively new to the area were more willing to evacuate because they trusted the authorities' judgment, while those who had lived in the area longer tried to stay and defend their properties.

In West Melton, there is evidence that for a time, the shared fire experience brought the community closer together. One resident offered, "Being affected by the fire seemed to cement our place in the community ... [the fire] has given us a bond with a lot of people."

As people thought about the fire they reassessed what is important to their lives, "It has made us realise that all we lost was stuff, it's just stuff... We don't have the same attachment to things any more, just as long as everyone is all right."

But the West Melton fire also unmasked differences between what residents characterised as old lifestylers and new lifestylers. Old lifestylers have generally lived in West Melton longer than new lifestylers, and are accustomed to deriving economic gain from working their land. New lifestylers moved to West Melton primarily seeking a rural lifestyle that focuses on leisure activities and aesthetics, and derive their principal income from work outside the community. Although membership is not always clear-cut, residents in both groups seemed to share an understanding of what it means to belong to one or the other.

Regarding impacts of the wildfire, old lifestylers described the impacts as being more significant for new lifestylers than themselves. Old lifestylers argued that they were not as adversely affected because, having more experience living in an area of high fire risk, they had taken steps to increase their preparedness. Because new lifestylers had come to West Melton more recently and were primarily from urban areas, they lacked the experience and therefore local knowledge necessary to live safely in a rural area. As an old lifestyler observed about new lifestylers, "Most people are not aware of or prepared for fire. Most come from the city and do not know farming practices or fire risk." Many new lifestylers agreed with that assessment. When asked if they were prepared for wildfire, one new lifestyler indicated that they were prepared for some civil defence emergencies but not for wildfire. Old lifestylers argued that a wildfire is a major risk for a rural area, and therefore having correct rural knowledge about how to prepare for wildfire is critical.

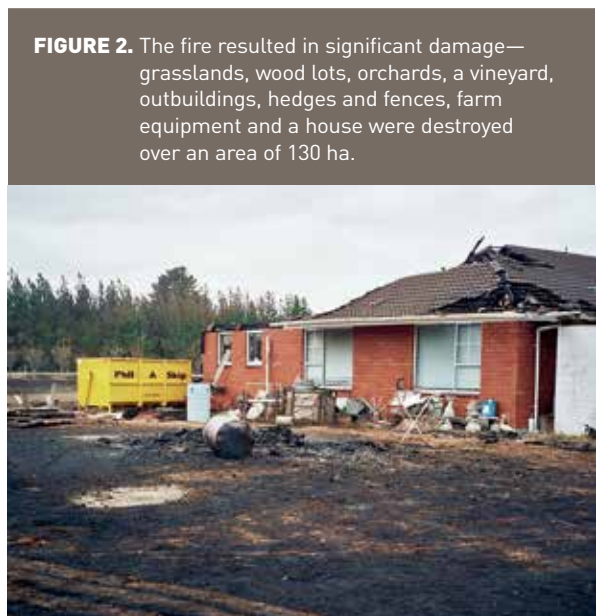


FIGURE 2. The fire resulted in significant damage—grasslands, wood lots, orchards, a vineyard, outbuildings, hedges and fences, farm equipment and a house were destroyed over an area of 130 ha.

Blame

In West Melton, residents assigned responsibility for the damage that occurred as a result of the fire to five agents: the people who started the original fire, New Zealand Police, responding fire crews, new lifestylers, and the Selwyn District Council. Regarding the people who started the original fire, residents said that even though there was no fire ban in affect at the time, the original fire should not have been lit because of high fire risk weather conditions which were apparent at that time. The New Zealand Police were assigned some responsibility because they enforced the evacuation order. If people had been allowed to stay and defend their property, residents claimed that fire damage would have been limited. The responding fire crews shared in the blame because they were not from West Melton but from other Canterbury communities, and residents felt that these crews lacked the local knowledge that would have enabled them to fight the fire most effectively.

New lifestylers were assigned blame because they were perceived to lack the correct local knowledge that would have prompted them to reduce the risk of wildfire around their property. One old lifestyler commented:

Yeah there are people frequently coming and going and changing. That is one of the problems, is that there are all these new ones coming in and they don't get to understand the problem of the area.

Specifically, new lifestylers were blamed for not cutting their grass and for planting highly flammable vegetation around their homes, both of which would provide fuel to feed a fire. This behaviour of blaming new lifestylers was practiced by both old and new lifestylers. In reality, we did not document whether new lifestylers' lack of rural knowledge attributed to the damage caused by the fire, but the blaming behaviour was used to deflect blame away from the individual making the claim.

The Selwyn District Council was assigned blame for the West Melton fire based on what residents perceived as actions that should have been taken or should not have been taken. First, the Council was blamed for fire damage because one of the local fire alarms had been disconnected 10 months earlier and therefore residents had no warning of the fire, "No one knew there was a fire until it was on their back doorstep. There was no warning whatsoever." The alarms were principally there to alert fire crews to respond to an emergency. When a new paging system was put in place to alert crews, the need for the alarm no longer existed and it was disconnected. Although some nearby residents were opposed to the alarms because of the noise, others interviewed said that they used the alarm as notification that they should look outside and see if there is any sign of a fire.

Secondly, residents felt that the Council should have had a prohibited fire season (fire ban) in place in November at the time the fire was lit. In fact one of the reasons that the people who initially started the fire were not blamed as much as might have been expected is that no fire ban was in place at the time - they were within their rights to start the fire when they did. Residents felt that the Council should have imposed a fire ban because of the extreme weather conditions in November. However, emergency managers interviewed claimed that they are "damned if we do and damned if we don't" as individuals often become angry when the Council will not issue them fire permits because a ban is in place.

Thirdly, residents felt that the Council should not have allowed the West Melton volunteer Rural Fire Force to be away at training on the day of the fire. Residents argued that training should have occurred in the winter when the fire risk is lower. Some people felt that fire damage would have been minimised if the West Melton Force had been in the area, "I have no doubt that if the local fire brigade was home I don't think that the fire would have got away the way it did." Emergency managers argued that there was no time lost when other fire forces responded to the fire and that having the West Melton crew at the fire earlier would have made no difference to controlling the fire or minimising damage.

Finally, residents believed that it is the Council's responsibility to mow grass along roadways. The perception was that roadside grass generally had not been mown prior to this fire, leading residents to believe that it contributed fuel to the fire.

Managing fire risk

While blame was consigned to a number of agents, perceptions of responsibility for managing fire risk depended on whether a new lifestyle or old lifestyle was being interviewed. New lifestyle, having more recently moved from urban areas, generally expected the level of emergency support provided in those areas, and were more dependent on authorities and organisations or agencies to manage hazard risk. New lifestyle saw the District Council as being responsible for managing fire risk, including supporting the rural fire force so they could respond efficiently and effectively. Old lifestyle were perceived as being more self-reliant and expected to look after themselves so that the role of the Council or government is limited. They held themselves responsible for managing fire risk and felt that they had implemented preventative strategies and organised themselves in a way to limit damage.

This assignment of responsibility for managing fire risk is reflected in the steps people have taken since the fire to reduce risk. Old lifestyle stated that they did not have to make many changes to reduce risk following the 2003 fire because they possessed the correct rural knowledge and had already done what was necessary. They also spoke out against the need for new regulations because they felt that they were not the ones causing the problems that led to the fire. Some new lifestyle said that they had been more proactive in managing fire risk since the fire:

We mow a strip now around the house, we have put in sprinklers around the house and make sure we now plant less flammable plants. No more pine trees, we won't plant pine trees again, we think [the fire] jumped between our pine trees.

Both new and old lifestyle indicated that they have reassessed their insurance. New lifestyle in particular have increased their liability insurance to cover their responsibility for the costs of extinguishing a fire on rural land and of damage to third party property as determined by the Forest and Rural Fires Act 1977 (Graham & Langer 2009). However, some recognise that they may never have enough insurance to cover possible losses. One property owner who increased their liability insurance from \$500,000 to \$1,000,000 stated that, "It will never be enough, if a fire started and spread all the way to Ashburton, it would never be enough."

Despite these steps, new lifestyle remained focused on what the Council should do to reduce fire risk. Suggestions for steps the Council should take included developing information packets for new residents about the risk of fire, forcing property owners to manage vegetation to reduce fire risk, and the Council managing fuels on the land for which they are responsible (including road verges).

Discussion

The social science literature on wildfire has been growing, as evidenced by a recent synthesis and compilations of research (Daniel et al. 2007; Donoghue & Sturtevant 2008; Handmer & Haynes 2008; Martin et al. 2008) and, bibliographies on international and Australasian perspectives of wildfires and communities (Bones 2005; Kelly 2005). This first case study of community impacts of wildfire in New Zealand supports many of the findings raised by researchers in other countries, while providing new evidence of wildfire highlighting and intensifying divisions within a community.

Evacuation is described in the literature as one of the most socially disruptive impacts of a wildfire (Paveglio et al. 2008). West Melton residents who refused to evacuate did so because they felt the evacuation was unnecessary or it would be more productive to stay and defend their property. Although those who owned their own fire fighting equipment felt prepared to stay and defend their property, it is questionable whether they possessed the knowledge necessary. Even if they had proper training, these residents were not part of the fire control organisation, so they would not have current information on the fire's location and behaviour, and may well have put themselves at risk by remaining to protect property. This, in turn, can impose additional risks to fire fighters who will try to protect the resident, thereby employing resources that could otherwise be used to fight the fire. The disaster research tells us that people who have survived a disaster are less willing to evacuate should the need arise again (McCaffrey & Kumagai 2007). This presents a significant challenge for emergency managers who may in the future need to evacuate West Melton or other communities that have previously experienced a disaster.

Even when a disaster may be characterised as "an act of God" people need to assign blame or hold someone responsible for the negative impacts of that event. This blaming behaviour has been evident after wildfires (Carroll et al. 2005). While residents often recognise that they are responsible for some of the damage resulting from a wildfire because of their inadequate preventative measures, they are more likely to blame someone else. Blame is often directed towards those who started the fire, towards agencies responsible for fighting the fire (but seldom towards the fire fighters themselves), and towards individuals, agencies or groups whose land management practices may have resulted in a build-up in fuels (Cohn et al. 2008). Each of these three entities were blamed by West Melton residents for the 2003 fire. Although the Selwyn District Council and West Melton Residents Association held meetings and used several communication techniques in an attempt to provide accurate information following the fire, two years later the West Melton residents interviewed still did not believe the official story. It is interesting to note that while a meeting organised by the Council and Association immediately after the fire drew capacity attendance, a meeting held the following winter to address wildfire risk and preparedness drew only a few people—the issue had lost its salience for West Melton residents.

Assigning blame for damage caused by the West Melton fire highlighted divisions within the community. Immediately after the fire, the community pulled together as residents worked cooperatively to help neighbours in need—what is referred to as a therapeutic community ((Fritz 1961; Gurney 1977; Carroll et al. 2005; Graham 2003). But differences between old lifestylers and new lifestylers began to emerge as residents not only talked about who was to blame for the damage, but also about how they perceived fire risk and what they had done to reduce risk. This is supported by other studies such as Gardner et al. (1987) who found that people who had lived in the rural-urban interface for longer had an increased awareness of wildfire hazard. Individual households' preparedness has been found to be linked to residency in the rural area with clear differences in the levels of preparedness between established residents and those new to an area who did not have access to established social networks with high levels of tacit knowledge of wildfires and felt this reduced their understanding of bushfires and therefore they were less likely to prepare for wildfire consequences (McGee & Russell 2003). Similarly another study found that an individual's experience with, and awareness of, wildfire and other disasters has been shown to influence their risk perception and willingness to take or support action to mitigate risk (Cohn et al. 2008). Whether or not an individual takes actions depends on the biophysical context, including climate, topography, and vegetation, and the social-demographic context, including spatial distribution of structures, construction features, mobility of residents, availability of fire-protection resources, and institutional factors (Daniel 2007). Personal and cultural experiences with fire, attitudes towards risk and social prohibitions and incentives have been shown to influence an individual's response to their social-demographic context. This was true in West Melton where old lifestylers, with wildfire experience and what they perceived as "correct" rural knowledge, exhibited an understanding of the community's wildfire risk and were prepared for the wildfire.

Risk is a socially constructed interpretation and response to what people consider to be a real danger (Lupton 1999). Old and new lifestylers had a different perception of the wildfire risk because they had not shared experiences and values that would lead to a common understanding of wildfire. This lack of cohesion means communication and education about wildfire risk needs to account for and address these differences. This is important because managing a community's fire risk, or increasing community preparedness for wildfire, requires collective action, with roles to be played to all levels of government, non-governmental organisations and groups and individuals (Jakes & Nelson 2007).

A second case study of a New Zealand fire-affected community is currently ongoing in the more rurally based community of Mt Somers, mid-Canterbury. Comparisons will be made between the two communities to highlight differences, similarities and lessons learned. Collecting evidence from multiple communities highlights the diversity in communities and the importance of understanding community context when dealing with wildfire readiness, response and recovery.

Acknowledgement

This research was funded by the Bushfire Cooperative Research Centre under a Masters scholarship; Foundation for Research, Science and Technology (Contract C04X0403, Protecting New Zealand from Rural Wildfire), New Zealand; and USDA Forest Service Northern Research Station and National Fire Plan, U.S.

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At the time of this study, **Ms. Laura Kelly** was a graduate student at the University of Canterbury, and the thesis on which this paper is based was in partial fulfilment of the requirements for the Degree of Master of Arts in Anthropology.

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Urban earthquake events and businesses: Learning from the 2007 Gisborne earthquake in New Zealand

Dr Felicity Powell reports on the findings of a study conducted three months after the Gisborne earthquake investigating its effect on businesses in the area.

The Australian experience

Australia recently experienced the largest earthquake ever recorded in Kalgoorlie/Boulder region of Western Australia. At 08:17 hours on Tuesday 20th April 2010 a magnitude 5 Earthquake occurred approximately five kilometres South West of the Kalgoorlie city centre. The initial event was followed by a significant number of minor aftershocks. This earthquake surpassed a previously recorded magnitude 4.5 earthquake event recorded in 1987.

Assessments of the damage caused by the earthquake identified the historic Boulder shopping/business precinct as having sustained the most damage with the main Street of Boulder closed until buildings in the area were deemed safe by structural engineers. Building damage included extensive cracking to walls and building facades, most of the damaged buildings were built at the turn of the last century and are a part of Boulder's history.

Information kindly supplied by Trevor Tasker, Regional Director, Fire & Emergency Services Authority of Western Australia Operational Service, Goldfields/Midlands.

ABSTRACT

The earthquake of 20 December 2007 off the coast of Gisborne provided the first opportunity in 50 years to examine the impacts of an earthquake on a sizeable urban settlement in New Zealand. The investigation focussed on individual businesses, a unit of analysis often overlooked in disaster research. Three months after the earthquake, businesses throughout the Gisborne region were surveyed to determine the nature of the earthquake's short-term impact on businesses, their vulnerability and initial recovery experience.

Background

After a major natural disaster it is important that businesses reopen quickly in order to provide income and employment to residents, and thus aid the recovery process. A variety of problems face a community whose business district is damaged by a disaster, including the loss of income from business rates or the potential loss of large and/or important employers (Tierney 1994). If businesses are forced to close for a long period of time, they are less likely to recover in the long-term (Webb et al. 2000). Longitudinal studies of natural disasters in the USA found that very few companies fail in the short-term, and some struggle for several years to restore their business before eventually closing down (Alesch 2005). Induced economic activity, mainly in the building sector, may also obscure the impact of a disaster on the local economy in the short-term as repair and restoration work is carried out (Butcher et al. 1998).

This study focuses on the business community in the Gisborne region and was initiated after an earthquake on Thursday 20 December 2007 centred 50 km southeast of the city of Gisborne¹. The main axis of motion of the magnitude 6.8 earthquake ran parallel with Gladstone Road, the main street running through Gisborne's central business district (CBD). With the earthquake taking place a few minutes before 9pm, customers and staff vacated

¹ Gisborne, on the east coast of New Zealand's North Island, has an urban population of 33,700 and is remote from other urban settlements, the nearest being Whakatane about 3 hours drive away (Statistics New Zealand 2008a).

stores, restaurants and bars in the dark as nearly all power substations in the district temporarily lost power. Within minutes the police cordoned off the CBD, and police and security guards ensured the area was secure overnight to prevent looting. Although access to the CBD was restricted, anecdotal accounts relate how business owner-managers, staff and families spent the night clearing debris in order to reopen as usual the next day (see for example The Gisborne Herald 2007, 2008). Their efforts were to no avail as the CBD did not reopen until Saturday because all buildings in the CBD had to be assessed by structural engineers. Estimates of payouts for the Gisborne earthquake stand around NZ\$55 million (Brennan 2008; ICNZ 2008), indicating that even though final rebuilding costs are not yet known, the earthquake will be significantly less costly than New Zealand's last major earthquake in Edgumbe².



Courtesy: Felicity Powell

Damaged and vacated buildings fronting Gladstone Road, the main thoroughfare in Gisborne's CBD.

Disaster research tends to place greater emphasis on units of analysis other than businesses, such as families, households and government agencies (Webb et al. 2002; Zhang et al. 2009), and it is therefore the intent of this study to fill this knowledge gap. Further, there had been no significant earthquake affecting an urban settlement in New Zealand since 1931 when an earthquake virtually destroyed the centre of the city of Napier and had a death toll of 256 (Wright 2001)³. Whilst the Gisborne earthquake in 2007 was neither as costly nor as destructive as it might have been, it presented an opportunity to learn about an urban earthquake event, investigating the characteristics of the impacts of an earthquake on businesses, the preparedness measures that businesses had in place, and the initial recovery of businesses and the community. This paper reveals the findings of this study conducted three months after the earthquake and forms the first stage of a two-part investigation into the earthquake's effect on businesses in Gisborne.

Method

This study employed a postal questionnaire, using a combination of open and closed questions. The questionnaire was divided into five sections, gathering information on the businesses themselves, the nature of the damage to the business, the extent that trading was interrupted, the preparedness measures that had been in place, and details about the initial recovery from the earthquake. Some of the questions, relating to preparedness and the damage, were similar to those used in other studies by Webb et al. (2000) and Chang and Falit-Baiamonte (2002) to enable comparisons with research completed on similar issues.

The earthquake affected a large geographic area, and it was decided that questionnaires should be sent to businesses throughout the Gisborne region, rather than focus on the city alone. There are 4971 enterprises in the region (Statistics New Zealand 2008b), and in order to capture the views of as many businesses as possible and to obtain a reasonable sample size, an initial target of 1000 businesses was set. Businesses were chosen from the Gisborne region telephone directory, using a purposive selection technique of every tenth business in the directory until 1000 had been selected. Once duplicates were removed this number was reduced to 925. The questionnaire was sent by post in March 2008⁴.

In total 286 surveys were returned using a Freepost service, giving a response rate of 31%. One survey was excluded as it was largely incomplete. Answers to the questionnaire were coded and entered into Microsoft Office Excel 2003 for statistical analysis. The findings of the questionnaire are presented in the next section. As confidentiality was assured to respondents, care has been taken to ensure that details are not attributable.

Findings

In the results presented here, the patterns of damage and loss are described. Disruption to trading is also outlined, looking at the causes of temporary closure and at the resultant loss of income. The survey data revealed the ways in which businesses began their initial recovery from the earthquake, exploring who and what assisted them, the preparedness measures in place, and how costs incurred by the earthquake will be recovered.

Patterns of damage and loss

Businesses were asked about the different ways in which the earthquake caused damage, including structural damage to the building; non-structural damage (e.g. windows, light fittings); damage to furnishings and furniture, machinery and office equipment, and stock; disruption in the supply of utilities, sewerage and transport; damage to the immediate locality (e.g. footpath, neighbouring building); and, personal injury.

² The magnitude 6.5 Edgumbe earthquake in 1987 resulted in NZ\$330 million in payouts (adjusted for inflation to 31 December 2007) from the Earthquake and War Damages Commission and co-insurers (ICNZ 2008).

³ Although the Edgumbe earthquake was of a large intensity it was in a predominantly rural area.

⁴ In order to facilitate a high response rate, an incentive for recipients to return surveys was offered in the form of book vouchers to be awarded to a respondent whose name would be drawn at random from all survey respondents.

As might have been anticipated most of the damage occurred to respondents located in the CBD. Of the 285 respondents to the survey, 162 (57%) received some form of damage. About half of these (n=80) reported only one form of damage, and in the worst cases four firms in the CBD stated that they had experienced more than six types of damage. A total of NZ\$1.92 million was estimated as the value of the damage incurred, although not all companies that sustained damage provided an estimate of its value.

Patterns of damage were examined across industry sectors. A greater proportion of businesses in the wholesaling, health, finance, manufacturing, education and retailing sectors were found to have sustained damage. This compares to the construction, agriculture, transport and cultural sectors, in which fewer firms were affected.

A little under a quarter of all respondents closed their businesses for a short while after the earthquake. Nearly all of these closures occurred in the CBD where the area was cordoned off for building inspections. Most of the businesses that closed temporarily were either retailers or take-away food outlets. The main reasons given for temporary closure were remaining shut to clean up the interior and waiting for structural assessment of the building. Eighteen businesses, all in the CBD, lost more than a day's trading.



Six weeks after the earthquake, this furniture retailer tries to shift damaged stock.

A consequence of the earthquake occurring just before Christmas is that estimates of lost revenue due to business closure are probably higher than if the earthquake had occurred at another time of year. The total amount of revenue lost was estimated to be NZ\$0.57 million, of which NZ\$0.39 million was lost by retailers. These figures may be an underestimate as not all businesses that closed provided an estimate of their losses.

Measures in place to reduce vulnerability

Measures to mitigate the effects of an earthquake were in place in a substantial proportion of businesses, with only 39 (14%) respondents acknowledging that they had no measures in place. There appears to be some bias in the sectors in which businesses had no measures, with slightly more than a quarter of companies operating in each of the agricultural and construction sectors falling in this category. Table 1 reveals the frequency of utilisation of the measures that businesses had in place. The most frequently utilised measures are insurance policies and the provision of first aid resources. In most cases businesses relied on multiple measures, with only 16% dependent on only one type of measure, and 27% of respondents having more than three types of measure in place. The mean number of measures taken is 2.9.

It is evident that there is a greater propensity to use low-level preparedness measures, like insurance policies and first aid kits, rather than high-level measures, such as business continuity plans or carrying excess capacity (Spittal et al. 2006). Only in the use of property insurance is there no difference in behaviour between small, medium and large sized companies, as the take up of this is in the range of 77-80% for all sizes of business. The utilisation of other measures, such as disaster preparedness and business continuity plans, business interruption insurance, structural and non-structural measures, increased with the size of the company. Larger companies also seem more likely to take more measures, however the small number of large companies that responded to this survey (n=9) make it difficult to be conclusive on this.

TABLE 1. Frequency of preparedness measures adopted by businesses

Type of preparedness measure	Number of businesses (% of total survey respondents)
Property, stock and equipment insurance	221 (77)
First aid kit and/or first aider	164 (57)
Business interruption insurance	117 (41)
Stored water and other essential supplies on premises	55 (19)
Non-structural (e.g. fastening cupboards to walls)	43 (15)
Disaster preparedness plan	30 (10)
Structural reinforcement of building	28 (10)
Business recovery and/or continuity plans	25 (9)
Regular earthquake drills for evacuation	19 (8)
Intentionally carried excess capacity (e.g. held additional stock or spare equipment)	14 (5)
No measures	39 (14)

Courtesy: Felicity Powell

Initial recovery

To build a picture of the path to recovery of businesses, respondents were asked who had assisted them and the sources of finance they intended to use to pay for repairs and replacements, and to recover lost revenue. About a third of companies reported that they had received assistance with clearing up and/or reopening their business. Employees were the most often used source of assistance for recovery, cited by 29% of respondents, and were the dominant source of assistance for medium and large businesses. For small firms, the most important resource was family.

Respondents who incurred damage or had to close temporarily were asked to specify how they intended to recover their losses. A high proportion of companies had some form of insurance policy, but this was not the most commonly used means of cost recovery. Only about a quarter of businesses that incurred damage indicated their intention to claim from their insurance policies, while more than half intend to cover costs by drawing from cash flow or savings. The latter typically incurred small amounts of damage, although one company reported its intention to pay for NZ\$100,000 damage from its own resources. For those businesses that lost money due to temporary closure, the situation was similar to those who had incurred physical damage. Of the 68 businesses that had to close for a short time after the earthquake, a little more than half had taken out business interruption insurance and only 19% (n=13) intended to make an insurance claim.



Courtesy: Felicity Powell

Although this pharmacy was able to continue trading as normal, the sidewall of the building had to be supported.

Almost two-thirds of survey respondents stated that there had been no impact on their business revenue. However, whilst most businesses experienced no change in income, 20% of businesses saw a decline, and this was on an ongoing basis for 3% of respondents. Businesses in the retailing sector and the accommodation and café sector seemed most vulnerable to a short-term downturn in trade. Five of the nine businesses that suffered a sustained downturn in business were CBD-based retailers. By way of contrast, 14% of respondents experienced improved revenue after the earthquake, with 4% seeing an increase in revenue on an ongoing basis. These businesses were mainly in the construction or retailing sectors or in some other way associated with repair work.

Pathways to community recovery

Respondents were also asked what they believed were reasons for the speedy recovery of Gisborne businesses reported in the media (TV3 News 2007). The most frequently cited reason was that the earthquake coincided with the Christmas peak season, with 20% of all survey respondents suggesting this was the main motive for a quick recovery. Closely associated to this, 15% of respondents indicated that businesses wanted to or had to reopen quickly in order not to lose sales. A second category of reasons relates to the Gisborne community. In particular 19% of respondents referred to the ways in which people pulled together or worked hard to facilitate recovery. The importance of community spirit or support from the community (11%) and the special character or resilience of Gisborne people (6%) were also given as reasons.

Characteristics of the earthquake were cited: 17% noted that the damage caused by the earthquake had been localised, not very destructive, and was relatively short in duration. The role that particular groups played in facilitating recovery were also mentioned, namely tradespeople (5%), and recovery experts including the Gisborne District Council, emergency services, Urban Search and Rescue, and Civil Defence (each cited by approximately 3%). Finally, pre-disaster planning and the response to the earthquake were recognised: 10% of people believed that the quick response and/or assessment of damage were important to the city's recovery, and suggested that effective pre-disaster planning had assisted (3%).

Discussion and conclusions

This study set out to investigate the impacts of the 2007 earthquake on the Gisborne region's business community and to document aspects of the initial recovery phase. The results established that whilst the worst of the physical damage was incurred by businesses based in Gisborne's CBD, companies located outside the city centre, including rural parts of the region, also experienced damage. Even within the CBD, there were inequalities in the extent of the damage sustained, with some businesses suffering multiple forms of damage and others receiving none. This picture of localised damage is consistent with studies of business districts in the USA affected by earthquakes (Chang and Falit-Baiamonte 2002; Kroll et al. 1991). However, studies elsewhere identified the size of a business as an important indicator of vulnerability (Alesch et al. 2001; Chang and Falit-Baiamonte 2002; Dahlhamer 1998, cited in Webb et al. 2000; Kroll et al. 1991), but there is no evidence to suggest that smaller companies in Gisborne were more vulnerable to the short-term damage and disruption effects of this earthquake.

The survey findings support the conjecture that industry sector affects vulnerability (Meszaros and Fiegenger 2002; Webb et al. 2000). Businesses in the retailing and wholesaling sectors, which other studies have observed to be the most vulnerable, were amongst the sectors most likely to have received damage or closed temporarily after the earthquake. As the CBD was closed for trading for a whole working day just before Christmas, retailers

and fast food outlets lost more income due to their closure than other types of businesses. For a handful of organisations, losing a day's trading was the start of a more sustained downturn in trade. In comparison, businesses associated with the recovery and rebuilding process, including retailers/wholesalers of furniture and building supplies, benefitted from the earthquake with short- and long-term increases in revenue; a fairly typical experience after a natural disaster event (Dahlhamer 1998, cited in Webb et al. 2000; Kroll et al. 1991; Meszaros and Fiegner 2002; Tobin 1999). Also noteworthy is that businesses in the construction sector were the least likely to have experienced any damage after the earthquake. An explanation for this is that most construction businesses were located outside the more intensely damaged CBD.

At first sight the overall level of preparedness for a natural disaster amongst businesses seems quite high compared to other places (Tynan 2003), since only a small proportion of businesses had no measures in place, and the mean number of measures adopted is a little under three. However low-level preparedness measures that are simple to acquire and maintain are preferred to high-level measures that are time-consuming or resource intensive, like preparing business continuity plans or conducting earthquake drills (Webb et al. 2002). This study confirmed findings elsewhere that larger businesses are more likely to take high-level preparedness measures (Dahlhamer and D'Souza 1997; Webb et al. 2000).

The observed high consumption of insurance policies and first aid measures obscures the true vulnerability of many businesses in the region. The former may offer only limited financial assistance to policyholders, and the latter would only be useful in the immediate aftermath of a disaster. The employment of other earthquake preparation measures, such as a disaster recovery plan, earthquake drills or simple non-structural measures like fastening cupboards to walls, is low compared to other places that have been affected by a natural disaster (Dahlhamer and D'Souza 1997; Webb et al. 2000, 2002). The results suggest few businesses have effective measures in place to minimise the short- and long-term impacts of an earthquake.

This study found that many insurance policy holders, in the region of 72-81%, would not be making a claim against their policies, covering their losses instead from their own finances. This low propensity to claim is consistent with studies of businesses affected by a natural disaster elsewhere (Alesch et al. 2001; Chang and Falit-Baiamonte 2002; Webb et al. 2000). It suggests that the losses of around three-quarters of businesses are not discernible in official estimates of the earthquake's economic impacts, and that damage to businesses and the wider community in the Gisborne region was possibly more extensive than implied by statistics reliant on insurance claims. Another area for concern arising from the sources of finance used to recover losses or pay for damage is that, because many businesses are self-financing the costs of the earthquake, there may be implications for their long-term viability.

The results of this study paint an interesting picture of the factors people believe assisted the speedy reopening of businesses. From the literature it was anticipated

that the features of the earthquake, post-disaster community resources, external support, and planning and reconstruction strategies would be identified as significant factors (Drabek 1986; Lindell et al. 2006). All but external support were cited as important by respondents, but, in addition to these factors, economic urgency was identified in Gisborne as being the most important pathway to recovery. Perhaps fearful that their local economy might be entering a recession and that a natural disaster would be likely to exacerbate existing economic trends in their community (Alesch et al. 2001; Cross 2001), the people of Gisborne rallied to enable businesses to reopen quickly to capitalise on Christmas spending, fulfil orders, and to meet the anticipated demand from visitors and especially for the annual Rhythm and Vines music festival due to take place on New Year's Eve.

In conclusion, the findings of the Gisborne study largely support findings from similar studies elsewhere. Several outcomes from this study could be of interest to policy-makers and emergency managers. The evidence implies that businesses in the region are probably insufficiently prepared for a more destructive natural disaster, appearing to disregard official advice to prepare and plan to minimise the risk of hazard events (MCDEM undated). As a result businesses affected by the December 2007 earthquake may be ill-equipped to recover fully from both its physical effects and the temporary downturn in revenue at what should have been the peak time of the year for trading. These difficulties may be exacerbated by businesses self-financing their losses. Official representations of the effects of the earthquake are probably underestimated, and a lack of understanding of the true extent of the financial impacts of the disaster may mean that insufficient support and assistance was provided to the Gisborne community. Whilst confidence can be gained from the community's solidarity and its response to the economic urgency caused by the earthquake, there is a need to understand the longer term impacts of the earthquake to confirm whether or not businesses in the region are resilient to natural disasters.

Acknowledgements

This study forms part of the Natural Physical Hazards research programme (OPSPX0401) funded by the Foundation for Research, Science and Technology, which funds science and technology research on behalf of the New Zealand Government. The programme seeks to identify the factors that would enable New Zealand towns and cities to recover quickly after a natural disaster such as an earthquake.

The author would like to thank Dr Abigail Allan for reviewing this paper.

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About the author

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Emergency management volunteers:

The 2010 National Emergency Management Volunteers Photographic Competition

In 2010 the Attorney-General's Department conducted a National Emergency Management Volunteers Photographic Competition. This year's competition was designed to promote awareness of the role and value of emergency management volunteers, not only in responding to disasters but also in everyday activities—activities such as the delivery of community education programs, administrative roles and a range of support services for people affected by disasters.

The competition, which is now in its third year, was judged in three streams—professional, secondary school students and individuals (non professional). The photographs depict volunteers in action and showcase their capability and commitment to enhancing Australia's capacity to prepare for, respond to, and recover from emergencies.



**National Winner
- Professional Category -**
*Appreciation in a hug, by Michael Marston,
© The State of Queensland.*



**National Winner
ACT Highly Commended Award
- Student Category -**
*The heroes of the bush, by Tim Eckert,
Meningie Area School.*



**National Highly Commended Award
South Australian Highly Commended Award
- Individual Category -**
Thanks for the tow mate, Yvonne Hill.



**Western Australian
Highly Commended Award
- Individual Category -**
Taking a beating, Volker Vierecke.



**National Highly Commended Award
- Individual Category -**
A selfless gift, Carl Woodberry.



**National Highly Commended Award
- Professional Category -**
*No ordinary job, Mathew Hayes,
Freelance Photographer.*

thank you!



**Queensland Highly Commended Award
- Professional Category -**
*Mount Archer bushfire, Chris Ison,
The Morning Bulletin, Rockhampton, QLD.*



**Queensland Highly Commended Award
- Individual Category -**
Respectful silence, Lynda McManus.



**National Highly Commended Award
Victorian Highly Commended Award
- Individual Category -**
Lean on me, Blair Dellelijn.



**New South Wales Highly Commended Award
- Individual Category -**
SES Air Search Team, Ray Faggotter.



**National Winner & Tasmanian
Highly Commended Award
- Individual Category -**
Matt, the quiet achiever, Anthony Smith



**National Highly Commended Award
ACT Highly Commended Award
- Individual Category -**
One picture - two worlds, Michelle Jenkins.



**National Highly Commended Award
- Student Category -**
*Rollover rescue training, Mark Jesser,
Euroa Secondary College.*

**A selection of entries into
the competition can be
viewed online at
www.em.gov.au/volunteers**

NATIONAL SECURITY UPDATES

Excerpts from the Emergency Management in Australia website www.em.gov.au

MAY

3 MAY 2010

2010 NATIONAL BUSHFIRE ARSON FORUM

Attorney-General, Robert McClelland, and Minister for Home Affairs, Brendan O'Connor, today announced new initiatives to combat deliberately lit fires as part of the second annual 'National Forum for the Prevention of Bushfire Arson'.

5 MAY 2010

ATTORNEY-GENERAL MEETS JAPANESE MINISTER FOR PUBLIC SAFETY AND DISASTER PROTECTION

Attorney-General, Robert McClelland, today met with the Japanese Minister for National Public Safety Commission and Disaster Protection, Hiroshi Nakai, to discuss cooperation on law enforcement issues in the region.

26 MAY 2010

\$3.6 MILLION FOR EMERGENCY MANAGEMENT PROJECTS

Attorney-General, Robert McClelland, today announced the Government will invest \$3.6 million to assist Australian communities respond to and recover from natural disasters and emergencies.

JUNE

4 JUNE 2010

COMMONWEALTH ASSISTANCE FOR LENNOX HEAD TORNADO VICTIMS

Attorney-General, Robert McClelland, today announced that the Government will provide financial assistance to communities affected by the tornado and severe weather in Lennox Head, New South Wales.

11 JUNE 2010

RUDD GOVERNMENT PROVIDES ILLAWARRA WITH \$350,000 SEARCH AND RESCUE VEHICLE

Attorney-General, Robert McClelland, together with the Federal Member for Cunningham, Sharon Bird, today handed over the keys to a new \$350,000 search and rescue vehicle to be based at the Wollongong Fire Station.

19 JUNE 2010

BETTER MANAGING TRIPLE ZERO CALLS

Attorney-General, Robert McClelland, today announced a key initiative to better manage the volume of Triple Zero emergency calls made during major natural disasters or emergencies.

NATIONAL SECURITY UPDATES

30 JUNE 2010

PREPARING KIDS FOR DISASTERS AND EMERGENCIES

Attorney-General, Robert McClelland, and Federal Member for Eden-Monaro, Mike Kelly, launched new education materials to help school students better understand and prepare for natural disasters and emergencies.

The new materials, used for the first time today by students in years 4 and 5 at Jerrabomberra Public School, include an interactive media game, actual student experiences and lesson plans aimed at teaching kids how to be ready for an emergency.

“Using the latest technology to encourage students to understand their community, and what happens during and after a natural disaster—be it a bushfire, hailstorm, flood or even a tsunami—is a great way to ensure young people become more self-reliant if a natural disaster occurs,” Mr McClelland said.

The materials have a strong focus on personal stories and experiences and include:

- *Dingo Creek – The Recovery*: Raises awareness of local risks and impacts of disasters by introducing the recovery process through engagement with an affected community;
- *Living with Disasters*: Includes 10 digital stories from young people who experienced the events of Black Saturday in Victoria in order to learn how families and communities were affected; and
- *People, Get Ready*: Comprises four activities to build student understanding and awareness of emergency issues prior to a natural disaster occurring.

Dr Kelly said residents in Eden-Monaro were all too familiar with the need to prepare for natural disasters, from fires to floods and severe storms.

“These innovative resources will be a valuable addition to the important work that local emergency service agencies, volunteer groups and non-government organisations are doing to help Australians cope with disasters in the future.”

The materials are available from the Emergency Management in Australia website at www.em.gov.au/Education/Schoolseducation/Pages/default.aspx



Attorney-General, Robert McClelland and Federal Member for Eden-Monaro, Mike Kelly with students from years 4 and 5 at Jerrabomberra Public School launching an interactive natural disasters and emergencies media game designed to teach kids how to be ready for an emergency.



PUBLIC SERVICE MEDAL (PSM)

AUSTRALIAN PUBLIC SERVICE

Ms Glenys Ann BEAUCHAMP

AUSTRALIAN POLICE MEDAL (APM)

AUSTRALIAN FEDERAL POLICE

Assistant Commissioner Francis Vincent PRENDERGAST

Assistant Commissioner Kevin ZUCCATO

NEW SOUTH WALES POLICE

Sergeant Leslie John BURROUGHS

Superintendent Terence Charles DALTON

Inspector Gordon DOJCINOVIC

Detective Superintendent John Steven KERLATEC

Chief Inspector William Joseph LARDNER

Inspector James William McARTHUR

Superintendent Michael James ROBINSON

Detective Inspector Gregory William SMITH

VICTORIA POLICE

Chief Inspector Ronald Stuart COOKE

Superintendent Peter Eugene DE SANTO

Inspector Peter Michael HOLLOWAY

Inspector Nigel John HOWARD

Inspector Kerryn Frances HYNAM

TASMANIA POLICE

Sergeant Elwyn James WILLIAMS

NORTHERN TERRITORY POLICE

Senior Sergeant Vincent Michael KELLY

QUEENSLAND POLICE

Detective Superintendent Anthony James CROSS

Senior Sergeant Errol Jonathon DELLIT

Sergeant Gregory Gordon KIDD

Detective Senior Sergeant Edward John KINBACHER

Superintendent Garry John MOLONEY

Inspector Deborah Joyce PLATZ

WESTERN AUSTRALIA POLICE

Assistant Commissioner Gary Elmars DREIBERGS

Senior Sergeant Anthony METTAM

Senior Sergeant David Timothy NORRISH

Superintendent Nigel William WHITE

SOUTH AUSTRALIA POLICE

Senior Sergeant First Class Thomas Michael CARTER

Detective Senior Sergeant Patrick Eugene McMANUS

Superintendent Giovanni VENDITTO

AMBULANCE SERVICE MEDAL (ASM)

QUEENSLAND AMBULANCE SERVICE

Mr Gerardus Hendrikus RABELINK

Dr Stephen James RASHFORD

SOUTH AUSTRALIA AMBULANCE SERVICE

Mr Keith Allen DRISCOLL

AUSTRALIAN CAPITAL TERRITORY AMBULANCE SERVICE

Ms Rebecca Ruth LUNDY

Queen's Birthday Honours List

AUSTRALIAN FIRE SERVICE MEDAL (AFSM)

NEW SOUTH WALES FIRE SERVICES

Mr Ian Charles BARTHOLOMEW

Mr Allan Vincent CAREY

Mr Barry Howard CARR

Mr Kevin COOPER

Mr James Patrick FLYNN

Dr Kenneth Charles HUGHES

Mr Christopher Ernst JURGEIT

Mr John Michael McNAMARA

Mr Robert John McNEIL

Mr Kenneth James NEVILLE

Mr Geoffrey Colin THIESSEN

VICTORIA FIRE SERVICES

Mr Ian Daniel BOARD

Mr Noel Charles FLAKEMORE

Mr John Beresford GERRAND

Mr Rodney William HOLLAND

Mr Bryan Charles McCARTHY

Mr Peter Vincent RICE

Mr Peter Russell SANDELL

Mr Ian Claude WALTER

Mr Andrew Allan WILSON

QUEENSLAND FIRE SERVICES

Mr Colin Frank HARCH

Mr Ronald Francis STEMME

Mr Ivan Ernest WESTERN

WESTERN AUSTRALIA FIRE SERVICES

Mr Robert Henry STONER

SOUTH AUSTRALIA FIRE SERVICES

Mr Anthony Leonard WEGE

Ms Trudy Lola WHELAN

AUSTRALIAN CAPITAL TERRITORY FIRE SERVICES

Mr Brian Phillip MURPHY

EMERGENCY SERVICES MEDAL (ESM)

QUEENSLAND EMERGENCY SERVICES

Mr Reginald James MARSHALL

Mr Thomas William SHORT

Mr Peter TAYLOR

WESTERN AUSTRALIA EMERGENCY SERVICES

Mr Alfred George BAIRSTOW

Mr Colin James BAIRSTOW

Mr Gary John GIFFORD

SOUTH AUSTRALIA EMERGENCY SERVICES

Mr Robert William PYCROFT



2010 Queen's Birthday Honors List RECIPIENT PROFILE:

Gary Gifford **EMERGENCY SERVICES MEDAL**

Gary Gifford has been an influential member of the emergency services in Western Australia for over 10 years with the Fire and Emergency Services Authority (FESA).

A former police officer, he was initially appointed in the FESA as a regional Director in the Pilbara Kimberley for the WA State Emergency Service (SES).

He had many successes in the role particularly in modernising and improving the response capability in vulnerable communities. He worked extremely hard to improve relationships amongst all services, and oversaw and led many emergency responses.

More recently he has been employed in a senior operational role as an Assistant Chief Operations Officer, being responsible for natural hazard planning for operations, and has been instrumental in improving the FESA's preparedness and response capabilities.

Mr Gifford has provided outstanding leadership in the development of Operational Doctrine related to the SES functions of the FESA ensuring that the one-service all-hazard philosophy has been adopted. He has also been influential in developing the support of key SES volunteers in this regard and has used opportunities such as leadership forums and SES conferences to develop this strategy. Mr Gifford has served the FESA and the community of Western Australia with distinction.



Australian Government
Attorney-General's Department
Australian Emergency
Management Institute

SEEKING NOMINATIONS FOR MEMBERSHIP

AUSTRALIAN JOURNAL OF EMERGENCY MANAGEMENT EDITORIAL ADVISORY COMMITTEE

Nominations are invited for the Australian Journal of Emergency Management (AJEM) Editorial Advisory Committee. AJEM is looking for people with skills, expertise and knowledge in emergency management and publication development for an appointment term of 3 years.

AJEM is published by the Australian Government's Attorney-General's Department. The Journal focuses on both the academic and practitioner reader and its aim is to strengthen capabilities in the sector by documenting, growing and disseminating an emergency management body of knowledge. The Journal strongly supports the role of the Australian Emergency Management Institute as a national centre of excellence for knowledge and skills development in the emergency management sector.

AJEM is supported by an Editorial Advisory Committee that actively participates in the development of each issue. The Editorial team relies on the expertise and skill base of the committee members in writing and reviewing articles and promoting the journal, domestically and internationally. Attendance at biannual meetings is expected and travel expenses will be reimbursed.

The Advisory Committee provides advice to the editor-in-chief on a range of matters including:

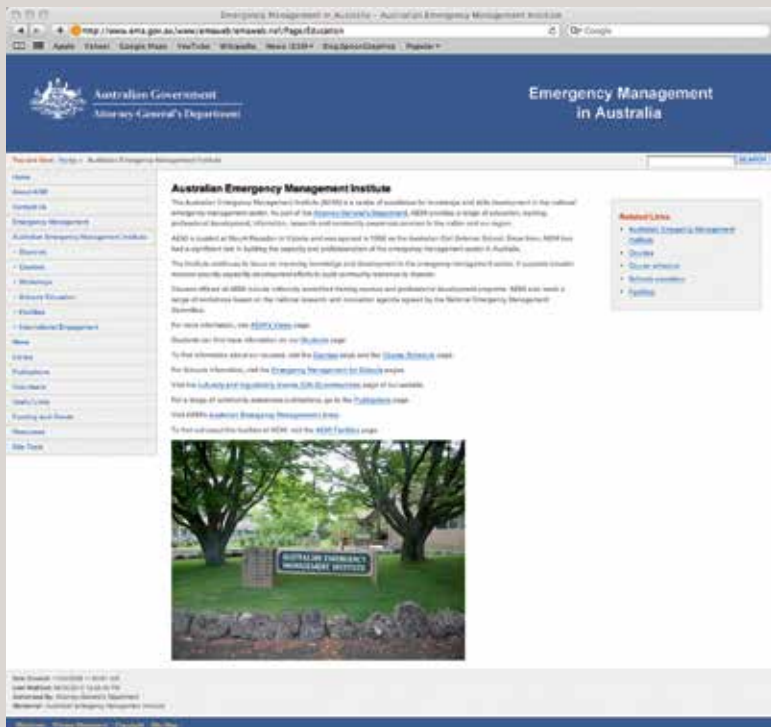
- The strategic direction for AJEM
- The coverage and balance of the Journal's content
- Management and administrative issues affecting the viability of the Journal (eg. format and distribution)
- Legal and procedural arrangements appropriate to the function of the Journal
- Future enhancements and developments.

Additionally, the Advisory Committee provides practical support by:

- Accessing and utilising professional networks to the advantage of AJEM
- Facilitating contacts with authors, reviewers and experts in various areas of the emergency management sector
- Providing assistance in the project management of themed issues of the journal
- Using professional experience to inform editorial decision-making
- Sourcing and assisting in the selection of content
- Reviewing submitted articles
- Actively promoting AJEM at national and international forums.

If you feel you can contribute to Australia's premier journal in emergency management on an honorary basis, are resident in Australia, and are interested in being considered for a position on the editorial advisory committee, please send an expression of interest, addressing the above requirements, and giving us examples of how you can add to the journal, or any enquiries beforehand, to ajem@dem.gov.au by 30 September 2010.

INTERESTING WEBSITES:



AUSTRALIAN EMERGENCY MANAGEMENT INSTITUTE

www.em.gov.au/Education/Pages/default.aspx

As this issue of the Australian Journal of Emergency Management celebrates the new focus of the Australian Emergency Management Institute it is appropriate that we highlight the AEMI website.

A visit to their site provides an overview of the courses offered at the institute, the course schedule, the focus on schools education and the facilities available at the Institute.



GEOSCIENCE AUSTRALIA

www.ga.gov.au

Geoscience Australia is Australia's national agency for geoscience research and geospatial information. It is located within the Resources, Energy and Tourism portfolio. Major initiatives include: enhanced global attractiveness of Australia's offshore and onshore exploration; improved resource management and environmental protection; safer communities and transportation.

Do you wish to continue receiving AJEM?



We need to know if you wish to continue to receive AJEM.

The mailing label in the October edition will be printed with the following options:

- **YES** – I would like to continue receiving AJEM
- **NO** – I no longer wish to receive AJEM
- **NO** – I no longer wish to receive AJEM in print, however I would like to receive it electronically in PDF format, my email address is...

You will be asked to return the mailing label by fax or mail.

If we do not receive confirmation by 30 November 2010, your name will be removed from the AJEM mailing list. This removal will take effect from the January 2011 edition.



Australian Government
Attorney-General's Department

Australian Emergency
Management Institute

BEYOND COMMAND AND CONTROL

NEW LEADERSHIP FOR NEW CRISIS

22–24 September 2010

AN EXCITING NEW LEADERSHIP PROFESSIONAL DEVELOPMENT PROGRAM AT
THE AUSTRALIAN EMERGENCY MANAGEMENT INSTITUTE

We are entering the Megacrisis era. This is not “something more”, but “something else”. We had the intellectual framework and the operational answers; we are now left with a blank page, in a new territory, adrift with no compass, but with the demand to find some new orientation, and decisional and managerial capacities.

Patrick Lagadec,
2008

Crisis leadership in the 21st century

cannot ignore the complex political, social, environmental and legal context of crises. Emergency management is as much about networks and relationships as the hard skills required for command and control. Crisis leaders must negotiate a maze of relationships, networks, organisations and expectations in order to protect communities and assets. New leadership demands innovation, creativity, improvisation, negotiation and strategic vision.

Beyond Command & Control is a professional development program designed to allow you (a senior leader in emergency management) an opportunity to explore the nature of new leadership and examine your own styles and underpinning assumptions.

This 3 day program combines work with acknowledged experts, academics, experienced practitioners and experiential

learning to allow you to build on your own experience, reflect on your own understanding and build new knowledge in the context of complex crises and non-routine events. You should expect to be challenged by new ideas, facilitated activities and mentoring.

The program will be held at our unique facility on Mt Macedon. Away from the pressures of work and daily life you will be able to focus on developing a deeper understanding of modern leadership and your own practice.

For information about how to apply for this program please visit our website at:

www.em.gov.au/Education/Courses/Professionaldevelopmentcourses