

Australian Journal of **EMERGENCY MANAGEMENT**

Volume 34, No. 1, January 2019
ISSN: 1324 1540

Hazard-smart remote communities in northern Australia Page 28

NEWS AND VIEWS

**RESILIENT AUSTRALIA
AWARDS**

PAGE 5

RESEARCH

**UNDERINSURANCE IN
CYCLONE AND FLOOD
ZONES**

PAGE 41

RESEARCH

**DISASTER RISK REDUCTION
IN HOUSEHOLDS**

PAGE 52



Australian Journal of Emergency Management

Vol. 34, No. 1, January 2019

ISSN: 1324 1540

About the Journal

The *Australian Journal of Emergency Management* is Australia's premier journal in emergency management. Its format and content are 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. 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 Institute for Disaster Resilience 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 encourages empirical reports but may include specialised theoretical, methodological, case study and review papers and opinion pieces. The views in the Journal are not necessarily the views of the Australian Government, Australian Institute for Disaster Resilience or its partners.

Publisher

The *Australian Journal of Emergency Management* is published by the Australian Institute for Disaster Resilience – a partnership between the Australian Government, the Bushfire and Natural Hazards Cooperative Research Centre, the Australasian Fire and Emergency Service Authorities Council and the Australian Red Cross. The Journal is published online at knowledge.aidr.org.au.

Editor-in-chief

Dr John Bates, Bushfire and Natural Hazards CRC

Editorial Committee

Dr Noreen Krusel, Australian Institute for Disaster Resilience

David Bruce, Bushfire and Natural Hazards CRC

Leone Knight, Australian Institute for Disaster Resilience

Editorial Advisory Board

Chair: Professor John Handmer, RMIT University

Editorial Team

Managing Editor: Christine Belcher

Design, typesetting and production: Catrin Harris

Print and distribution: Valiant Press

Cover image: *Dousing the flames* Fleur O'Conner, Captain of the Northern Territory Virginia/Bees Creek volunteer fire brigade. Winner 2018 Resilient Australia National Photography Award.

Image: Navin Chandra

Peer reviewers

The AJEM Editorial Committee recognises the efforts of researchers and practitioners who serve as peer reviewers of articles submitted to the Journal. AJEM's peer reviewers play an essential role in ensuring the quality of research published. Their contribution is critical to the success of the journal and, more importantly, to the field of emergency management and disaster resilience.

Circulation

Approximate circulation (print and electronic): 5500.

Copyright

Articles in the *Australian Journal of Emergency Management* are provided under a Creative Commons Attribution Non Commercial (CC BY-NC 4.0) licence that allows reuse subject only to the use being non-commercial and to the article being fully attributed (creativecommons.org/licenses/by-nc/4.0).

© Australian Institute for Disaster Resilience 2019.



Submissions

The Australian Journal of Emergency Management welcomes submissions for News and Views, and Research articles. The Contributors' Guidelines are available at knowledge.aidr.org.au/ajem. The Guidelines provide Word limits for articles, and submissions exceeding those limits will be returned to authors. Articles are to be submitted as a Word file and contain high resolution photographs, graphs and tables in their original software applications as separate files.

Research articles must contain an abstract and a small biographical paragraph about each author. A Copyright Release form and the Editorial Policy are available on the website. Authors should familiarise themselves with the Journal before making a submission. Contributions should be forwarded electronically to ajem@aidr.org.au. All research articles are peer reviewed. The Australian Journal of Emergency Management is indexed by several indexing organisations.

Subscriptions

For new subscriptions, please subscribe online at knowledge.aidr.org.au/ajem.

Contact Us

Mail: Australian Journal of Emergency Management
Australian Institute for Disaster Resilience
Level 1, 340 Albert Street
East Melbourne Victoria 3002

Email: ajem@aidr.org.au

Phone: +61 3 9419 2388

Contents

News and views

Foreword <i>Robert Cameron</i>	4
2018 Resilient Australia Awards <i>Jacqui Douglas</i>	5
Making My Resilient Community a reality <i>Jacqui Douglas</i>	9
A groundswell of caring for country <i>Jacqui Douglas</i>	11
Climate change challenges for Queensland's emergency management sector <i>Matthew Thompson</i>	13
Improving service through valuing inclusion <i>Costa Haritos</i>	14
Unseen need in IFRC World Disaster Report 2018 <i>Alana Beitz</i>	15
The Emergency Service Volunteer Management Framework <i>Courtenay McGill, Jennifer Pidgeon and Professor Marylène Gagné</i>	16
Applying science to build resilience to tropical cyclones <i>Craig Arthur</i>	17
A new wave of tsunami hazard data <i>Dr Gareth Davies</i>	18
Reflections from Sendai: lessons for Australia <i>Dr Jane Sexton</i>	19
Tsunami in Australia: challenging assumptions, building preparedness <i>Amanda Lamont and Dr Jane Sexton</i>	21
Answering the call: mental health needs of first responders <i>Georgie Harman</i>	23
Book Review: Designing to Heal <i>Reviewed by John Richardson</i>	26

Research

Hazard-smart remote communities in northern Australia: community-led preparedness <i>Dr Bevyline Sithole, Otto Bulmaniya Campion and Hmalan Hunter-Xénié</i>	28
Long-term consequences of flooding: a case study of the 2011 Queensland floods <i>Professor Gerry FitzGerald, Dr Ghasem (Sam) Toloo, Sara Baniahmadi, Professor David Crompton and Professor Shilu Tong</i>	35
Underinsurance in cyclone and flood environments: a case study in Cairns, Queensland <i>Dr Nick Osbaldison, Dr Connor McShane and Raechel Oleszek</i>	41
Reconceptualising 'community' to identify place-based disaster management needs in Tasmania <i>Dr Sandra Astill, Dr Stuart Corney, Dr Rebecca Carey, Stuart Auckland and Dr Merylin Cross</i>	48
'(In)action': rethinking traditional understandings of disaster risk reduction <i>Isabel Clare Cornes, Dr Brian Cook, Dr Paula Satizábal and Dr Maria de Lourdes Melo Zurita</i>	52
Disaster preparedness: services for people experiencing homelessness and the pressure-cooker response <i>Elizabeth Osborn, Dr Danielle Every and John Richardson</i>	58
Resilience in the Philippines through effective community engagement <i>Carla Selina Baybay and Dr Richard Hindmarsh</i>	65

Contributions in the Research section of the *Australian Journal of Emergency Management* are peer reviewed to appropriate academic standards by independent, qualified reviewers.

Foreword

Robert Cameron OAM, Emergency Management Australia

It's an exciting and professionally challenging time to be appointed as the Director-General of Emergency Management Australia (EMA); Australia's national disaster management organisation. EMA has undergone significant change in the past year following significant changes to the machinery of the Australian Government. It's appropriate to acknowledge that at the start of a new year and in the first edition of the journal for 2019.



As Director-General, one of my jobs is to ensure we get as much leverage as we can from the other public safety capabilities that make up the still relatively new Home Affairs portfolio to ensure Australian communities are as safe and secure as they can be. That's why we're here. More generally, EMA's enduring strategic intent continues: working to ensure that Australian communities are afforded the best service, support and guidance in preparing for, responding to and recovering from, all sources of risk and threat. We continue to do this by working side-by-side with state and territory emergency management and emergency services agencies, non-government partners and, of course, our own Australian Government agency colleagues.

My predecessor, Mark Crosweller, worked throughout 2018 with a wide range of government, private sector and non-government stakeholders to develop a National Disaster Risk Reduction Framework. This seminal piece of work positions the country to reduce disaster risk more proactively; enables better coordinated risk reduction actions across government, industry and the community and assists decision makers understand the likely future and what that means for decisions made now. This includes decisions about where and how Australians live and the infrastructure and services

on which they rely. It's a big piece of strategic work. We will be working through the course of this year to adopt the framework so that government and industry efforts in emergency and disaster risk management are underpinned by a nationally agreed direction.

This edition of the journal showcases the 2018 Resilient Australia Awards. The national ceremony was held in Brisbane last November and awards were presented by the Australian Government Assistant Minister for Home Affairs, Senator the Hon Linda Reynolds CSC. The national awards are the culmination of individual state and territory awards and they reflect a growing body of achievement, knowledge and activity.

For those who learn most effectively by observing others doing things well, the awards provide practical tutorials in best practice. You can read more about the 2018 Awards in this edition. It is very clear that the winners of the National Award and the National School Award both show how different elements of communities working together can strengthen disaster resilience at the local level. The National Photography Award captures the impact on the environment a fire can have, as well as the endeavour and dedication displayed by first responders. It's a very powerful image.

Since 2000, the awards have showcased creativity and best practice across Australia and they rightly celebrate accomplishments that serve as exemplars from which we all can learn. The Australian Government, through EMA, is proud to sponsor the Resilient Australia Awards in partnership with the Australian Institute for Disaster Resilience and the states and territories. We all hope the ongoing prominence of the awards inspires effort to build greater disaster resilience at the community level.

Robert Cameron OAM
Director-General
Emergency Management Australia

2018 Resilient Australia Awards: bringing everyone to the table

Jacqui Douglas, Australian Institute for Disaster Resilience

The Resilient Australia Awards are always characterised by collaboration. The program responds to the principle of shared responsibility, enshrined in the *National Strategy for Disaster Resilience*. In the 2018 program, that theme of collaboration emerged particularly through knowledge exchange. Submissions selected as national finalists brought diverse groups of stakeholders to the table; supporting nuanced, multi-faceted approaches to resilience-building that engaged whole communities.



Senator the Hon Linda Reynolds CSC, Assistant Minister for Home Affairs addresses the national award ceremony audience.

Image: Australian Institute for Disaster Resilience

The project's community engagement approach uses a range of channels to gather input from the community; from risk identification through to evaluation of solutions.

Project co-founder, Julia Cook, said, 'What makes it so effective is that we design the strategies according to the individual needs of the community.'

The project has achieved cross-sector support in three pilot communities; Moreton Island, Beachmere and Mount Nebo. Not only were community members actively involved, the project has fostered greater cooperation among agencies and other organisations. Numerous outputs have been jointly resourced and developed by multiple organisations.

Read more about My Resilient Community on page 9.

Queensland: My Resilient Community project

The Resilient Australia National Award was won by the My Resilient Community project; a partnership between Queensland Fire and Emergency Services, Queensland Police Service and Moreton Bay Regional Council.

The project puts community at the centre from the get-go; establishing community teams to drive implementation and own resilience strategies. The program recognised the importance of community self-reliance in a context of more frequent, severe disasters – where the response capacity of government and emergency services may not always meet the demand.

Northern Territory: First Aid in Schools - Remote Indigenous Access project

St John Ambulance in the Northern Territory was highly commended in the National Award category for the First Aid in Schools - Remote Indigenous Access project. This initiative centres on the delivery of first aid training to students in remote communities, where access to emergency medical services can be extremely limited. Training ranges from calling an ambulance to managing bleeding, fractures and incidents such as stroke or heart attack.



L-R: Uncle Dave Wandin, Kylie Schabel (teacher), Shanice Banks (student), Jennie Schoof, formally Yarra Ranges Council, Lily Ellis (student), Brett Ellis, Emergency Management Victoria and school parent.

Image: Australian Institute for Disaster Resilience

During 2016–17, St John Ambulance delivered training to over 5000 students over 35 sessions in 35 remote Indigenous communities as part of a broader vision to equip school-aged children with first aid skills.

St John Ambulance undertook extensive consultation over several years by engaging teachers, community health services workers, Indigenous support officers and local elders to ensure the program's relevance and accessibility to remote communities. Content from the mainstream First Aid in Schools program was adjusted for language requirements in remote areas and contextualised to local risks.

The program was designed to align with the Northern Territory Curriculum and training is flexible to fit around significant cultural events in communities.

New South Wales: Disaster Resilience in Social Housing project

Coordinated by a Sydney-based non-government organisation, Inner Sydney Voice, this project was highly commended for the National Award. The project brings together emergency management expertise with valuable local knowledge to build resilience in social housing communities.

Samuel Beattie, Project Officer, Inner Sydney Voice said, 'We thought [it] was going to be a fairly simple task of bringing everyone together [to] start talking about disaster resilience...we found that there were so many things that we could be doing, so many different ways to approach it.

'It's so important, when trying to build disaster resilience in communities, to really have that community-centred approach. [The] people you're planning for – they really have to be at the table. And they really have to be leading

it. That's the only way these kinds of things will have a lasting impact,' he said.

A key output was the establishment of the Redfern and Surry Hills Community Resilience Committee, a collaborative forum for tenant representatives, emergency services, state and local government, community organisations and non-government organisations.

Alison George, Surry Hills tenant representative and member of the Community Resilience Committee said, 'One of the things that came up while this was all evolving was how important it is to build strong community. You can't be resilient unless there is that community already there. That was something that we thought needed to be worked on.'

Victoria: Firestick project

The Resilient Australia National School Award went to the Firestick project: a Wurundjeri-led initiative in partnership with Dixons Creek Primary School, supported by the Yarra Ranges Council and the Department of Environment, Land, Water and Planning in Victoria.

The project saw students of the school walk on country with Wurundjeri Elder Uncle Dave Wandin, accompanied by Ralph Hume and Indigenous fire practitioner, Victor Steffensen. Students learnt about the constructive use of fire in Indigenous land management practices and gained a greater understanding of the natural environment through sensory experience. The process promoted healing from the fearful legacy of the 2009 Black Saturday bushfires and influenced fire management practices in the broader community.

Lily Ellis, a student at Dixons Creek Primary School said, 'Fire can help the country regenerate and get better again...[the fire in a traditional Indigenous burn] trickles along the ground, without burning the trees. It just burns the leaves and then it gives regeneration to the grass.'

Uncle Dave Wandin said, '[The children] will be the driving force in the future...to lead the groundswell of caring for our country in a traditional and culturally sensitive manner that is governed by the country not governed by people.'

Read more about the Firestick project on page 11.

Tasmania: Floodscapes project

The Launceston Floodscapes project was highly commended for the School Award. Managed by The Holographic Lounge, the project engaged students of Invermay Primary School, meenah neenah Aboriginal Cultural Education Program and the Launceston Big Picture School in the production of three short films on disaster resilience.

The films combine aerial footage from the city of Launceston, the State Emergency Service, Southern Cross television and community members, with overlaid student voices and animations from student drawings. The short clips are both accessible and easily shared through digital channels.

With the 2016 floods fresh in recent memory, the Floodscapes films deliver preparedness messages in with a new voice; positioning young people as 'guardians and messengers for the city of Launceston'. There's an emphasis on looking out for family, friends and other community members.

Floodscapes debuted at the Breath of Fresh Air film festival in 2018.



Peter Randel, NSW Rural Fire Service Warrimoo Brigade, Kellie Mar, Photographer / NSW Rural Fire Service.

Image: Australian Institute for Disaster Resilience



Regina Sellar, St John Ambulance NT, Gemma Bellenger, Northern Territory Fire, Rescue and Emergency Services and Northern Territory State Convenor.

Image: Australian Institute for Disaster Resilience

New South Wales: Getting Bushfire Ready at Warrimoo Public School

Highly commended in the School Award category, the Getting Bushfire Ready at Warrimoo Public School project saw the Warrimoo brigade of the Rural Fire Service (RFS) team up with the local public school to build student confidence in preparing for fire. RFS members shared knowledge with students on a range of topics including Triple Zero (000), fire types, emergency kits and drills (at school and at home) and helping others in the community.

Amelie, a student at Warrimoo Public School said, 'The Rural Fire Service helped me learn a lot about what to do in the event of a fire. Overall, this experience gave me knowledge that I couldn't get anywhere else and made me feel safe and prepared for bushfires'.

The program put the RFS *Guide to Working with School Communities* to the test; developed after a fire started near Warrimoo Public School in 2014.

The project also encompasses an ongoing partnership between the school and the brigade, whereby the annual RFS Get Ready weekend is hosted in the school's hall. These weekends engage the broader community and are an opportunity to highlight the school's evacuation plan and position it as a safe place for students in the event of a fire.

Northern Territory: Dousing the Flames

The photo, *Dousing the Flames*, won the Resilient Australia National Photography Award. Described by photographer Navin Chandra as an 'environmental portrait', the striking image captures Virginia/Bees Creek



Photographer Kellie Mar was highly commended for her photo of firefighter Emily Rawbone, Portrait of a Lady, in the 2018 Resilient Australia National Photography Award.

Image: Kellie Mar

Volunteer Fire Brigade Captain, Fleur O'Connor, in a burnt-out landscape in the Northern Territory.

'I think this photo is powerful because it connects with many people. It doesn't just show the landscape that's been damaged by fire, it also shows the work of a firefighter,' said Navin Chandra.

New South Wales: Portrait of a Lady

Highly commended for the National Photography Award was Kellie Mar's photo, Portrait of a Lady, which celebrates the spirit of accomplished firefighter, Emily Rawbone.

'Emily's an exceptionally amazing person...she's a mother of two, she works full-time, she's hearing impaired and

she's also one of the best firefighters I've ever seen in my life.

'The fires that she's fought in and the circumstances that she's faced; the resilience that she actually shows against these is phenomenal,' said Kellie Mar, photographer and Blaxland RFS member.

Queensland: Cyclone Resilience - Whitsunday Water

Another highly commended image, Cyclone Resilience - Whitsunday Water depicts images immediately after Cyclone Debbie, which took out water and sewerage services. Taken by Edwina Pettiford, the photo captures her husband, Troy Pettiford, and the team from the Whitsunday Regional Council setting up in a makeshift office in a garage. The team worked around the clock to restore vital services.

The Resilient Australia Awards are sponsored by the Australian Government in partnership with the states and territories and managed by the Australian Institute for Disaster Resilience.

Submissions for the 2019 program will open in early March 2019.
For more information, visit www.aidr.org.au/raa.

Making My Resilient Community a reality

Jacqui Douglas, Australian Institute for Disaster Resilience

If we are to build communities that thrive in the context of more frequent, severe disasters, we need to think holistically. That's the beauty of a word like 'resilience'; encompassing both preparedness and recovery; social networks and built environments; groups and individuals.

When applying resilience as a concept to a real-world community, it can be difficult to know where to start. That's the beauty of the My Resilient Community project because it is a formula for *non-formulaic* community resilience-building.

The project is a collaboration between Queensland Fire and Emergency Services, Queensland Police Service and the Moreton Bay Regional Council that:

...delivers pathways to strengthen community resilience through improving preparedness, response and recovery capacity. Emergency services and affiliated agencies connect with communities through diverse strategies to promote understanding of risks and vulnerabilities and identify skills and contributions individuals can make to further enhance community resilience.

My Resilient Community



Queensland Fire and Emergency Service, Queensland Police Service, working on Moreton Island.

Image: My Resilient Community, QFES

Practitioner approach

The spirit of the My Resilient Community is resilience done with a community, not done to a community. Before any activities are implemented, the project calls for the formation of a 'community team', which promotes community ownership and contributes to overall social cohesion.

Liane Henderson, a project co-founder, said, 'We wanted it to be community-led; bringing different community groups and leaders together, thus creating a healthy community. A healthy community is a resilient community'.

The community team is also critical in the context of the resourcing shortfall for governments in the face of more frequent disasters.

'We live in a country where there's a lot of disasters and we're not always going to be there. It's important that communities are more self-sufficient and resilient where possible,' said project co-founder, Julia Cook.

Resilient us

The community team is the vehicle for engagement that goes beyond the identification of risks. They set the priorities and project scope as well as the evaluation of strategies. In the three pilot communities of Moreton Island, Beachmere and Mount Nebo, the project team invested time in gaining a rich appreciation of the strengths in the communities, not just the problems to be solved.

Susan Trappett, project co-founder and on behalf the Moreton Bay Regional Council said, 'We got to know the members of the community so that we could work with them to really address those weaknesses and develop those strengths as much as we could.'

This approach has allowed a greater sense of ownership and individuals can champion change in their own community.

Reflecting on the importance of challenging assumptions about vulnerability, Susan Trappett said, 'It's not always the elderly, it's not always the infirm, it's you and me—everybody can have their vulnerabilities.'

'We can do a risk assessment that can tell us whether you're going to be susceptible to storms or fires or flood, but to know how people will react to those—you can't know that unless you talk to the people about their experiences and what preparation they've undertaken and what their concerns are,' she said.

Resilient community toolkit

To date, My Resilient Community has achieved an impressive list of outcomes: a memorandum of understanding with the Department of Education establishing Beachmere State School as an equipped evacuation centre, the maintenance and promotion of the Mount Nebo Early Warning System, multi-agency doorknocking sessions and community expos, the formation of community disaster management teams and a boost in volunteering numbers.

There's a common thread; cooperation not only between community and government, or community and emergency services, but between different departments and agencies. Organisations are working together to develop joint collateral, deliver training and share costs. This buy-in is also flowing out to local businesses.

The My Resilient Community team subsequently developed the Resilient Community Toolkit to assist the uptake of the initiative in other communities.

'As we speak, communities to the north-west of Brisbane are using this toolkit and have brought together all different members of the community...working on all different resilience strategies and disaster management plans. They've taken it and they've run with it. Anybody could use this project,' said Liane Henderson.

The My Resilient Community project received the 2018 Resilient Australia National Award.



Susan Trappett, Moreton Bay Regional Council, Liane Henderson, Queensland Fire and Emergency Services, Julia Cook, Queensland Police Service.

Image: Australian Institute for Disaster Resilience

A groundswell of caring for country

Jacqui Douglas, Australian Institute for Disaster Resilience

In the aftermath of devastating bushfires, the Dixons Creek Primary School community took up the challenge to think of and create ways to build resilience to future events by using local and traditional knowledge of the land.

The local primary school is an important meeting place and community centre for the people of Dixons Creek in Victoria. The devastation of the Black Saturday fires in 2009 resonated throughout the school community, directly impacting on as many as half its families. The school was permeated with a tangible sense of fear and the knowledge of suffering in the community; a number of children lost their homes.

Seven years later, two community members travelled north to Cape York to attend the National Indigenous Fire Workshop. Working with Wurundjeri elders in Victoria had inspired them to learn more about Indigenous fire practices. Run annually, the workshops take practitioners on country¹ with Indigenous elders to teach them skills in observing the land and to gain a greater appreciation for the 'cultural responsibility of looking after country'.

The community members—parents of children at Dixons Creek Primary School—saw an opportunity to bring the school, the local Wurundjeri people and the local community together through learning about Indigenous fire practices. Dixons Creek became one of many communities embracing the 'Return of the Firestick',² an organic movement to rediscover and share traditional knowledge of fire as a tool in the landscape.

The Dixons Creek Firestick project saw students in years 3–6 walk on country with local Wurundjeri Elder Uncle Dave Wandin and Ralph Hume as well as Indigenous Fire Practitioner, Victor Steffensen. Students learnt how Aboriginal people traditionally cared for the land.

Teaching those children will spread the message about what Indigenous burning is about. They will be the driving force in the future...to lead the groundswell of caring for our country in a traditional and culturally sensitive manner that is governed by the country not governed by people.

Uncle Dave Wandin, Wurundjeri Elder

The students were encouraged to experience the natural environment in a sensory way; noting what they could see and smell. They learnt the difference between the white smoke of gentle, cultural burning that supports regeneration and the black smoke of a hot, destructive bushfire.



L-R: Jennie Schoof, formally Yarra Ranges Council, Uncle Dave Wandin, Lily Ellis (student), Kylie Schabel (teacher), Shanice Banks (student), Brett Ellis, Emergency Management Victoria and school parent.

Image: Australian Institute for Disaster Resilience

Fire can help the country regenerate and get better again...[the fire in an Indigenous burn] trickles along the ground, without burning the trees. It just burns the leaves and then it gives regeneration to the grass.

Lily Ellis, Dixons Creek Primary School student

The project had a profound effect on the Dixons Creek community. Students expressed a sense of empowerment for themselves and the communities from increasing their understanding. 'I used to be scared of fire,' said student Shanice Banks. 'It's better now that I know what can happen.' Student Lily Ellis reflected that fire was 'now not as scary to people because they know it's not going to hurt them if they burn the bush before.'

¹ The term 'country' is used by Aboriginal people and Torres Strait Islander people to describe family origins and associations with particular parts of Australia.

² The National Indigenous Fire Workshop developed out of a Cape York fire management project of the Awu-Laya elders. More information is available at <https://capeyorkfire.com.au/about>.



Wurundjeri Elder Uncle Dave Wandin, teaches Dixons Creek Primary school students Chloe, Lily, Shanice and Connor about burning techniques used by Indigenous peoples.

Image: Jason South Fairfax Media

As well as alleviating fear, the project motivated behavioural change in families. As students shared their learnings at home, several parents began to apply the principles of Indigenous burning to the management of their own properties.

What we have been trying to do with this project is re-educate the community through the students. Fire can be healthy for our environment. As a community, we can face future fires...it gives us all hope.

Kylie Schabel, Teacher, Dixons Creek Primary School

Beyond families, Yarra Ranges Council saw the project's value. The Council's Jennie Schoof worked with the school to develop a book depicting the learning journey and featuring the words and drawings of students titled, 'Shhhhh the Parent Trees are talking'. At a state level, the project was supported by the Victorian Government Department of Environment, Land, Water and Planning.

The message is spreading further, with student presentations to visiting politicians, at a reconciliation event in nearby Healesville and for the Victorian Disaster Resilient Australia-New Zealand School Education Network in Melbourne. Further afield, the Firestick

project was presented to the Coastal Ambassadors program at Phillip Island.

I am hopeful that other communities can learn from our experience, that fire and our environment can be managed. Rather than being helpless, each community can make plans for their future. The Indigenous people have a great deal of knowledge about the land we live on...their knowledge should not be dismissed.

Kylie Schabel

The Firestick project received the 2018 Resilient Australia National School Award.

Climate change challenges for Queensland's emergency management sector

Matthew Thompson, Queensland Fire and Emergency Services

The Emergency Management Sector Adaptation Plan (EM-SAP) is a direct response to observed and projected effects of climate change and helps the sector identify opportunities and meet the risks communities face.

The emergency management sector is continually challenged by changes to the frequency, intensity, distribution and duration of acute events, major disasters and long-term climate-related stresses. The need to incorporate climate change into the comprehensive disaster management approach across prevention, preparedness, response and recovery is paramount.

The EM-SAP identifies sector-specific climate risks, existing climate adaptation activities, knowledge gaps and barriers to adaptation in Queensland. Some of the issues identified include:

- expected increase in the demand for sector services
- detrimental impacts on the health and wellbeing of sector staff and volunteers
- failures of infrastructure, utilities and supply chains that support service delivery
- strains on workforce availability, recruitment and retention, including volunteering
- variable community understanding, expectations and levels of resilience related to climate change
- financial implications of climate change, which may be slow onset or incurred by acute events.

Barriers to adaptation were also identified during consultation and include:

- low levels of community awareness about climate change
- costs of adaptation programs, in particular those that include infrastructure
- businesses not having climate-related risk as a standard consideration
- amplification of underlying social vulnerability and inequity
- low levels of climate change implications incorporated into land-use planning.

The EM-SAP provides a vision for the sector. It includes principles and priorities that integrate climate change adaptation actions into new and existing programs. It is a plan developed by the sector for the sector and relies on stakeholders of Queensland's Disaster Management Arrangements to actively contribute. By working together and across sectors, Queensland's emergency

preparedness can be effective and efficiently tackle the issues arising from climate change.

Eight adaptation priorities have been identified, including:

- sector-led awareness and engagement about climate change
- integrating climate change considerations into governance and policy
- improving the understanding of climate change risk and abilities to adapt
- research and development to create new knowledge and support tools
- allocate resources to support adaptation
- increase the security of critical infrastructure
- promote and enable community resilience and self-reliance
- promote volunteerism and workforce management.

The plan also describes 11 principles that guide implementation of the priorities. Three have been developed specifically for the sector.

- Adaptation should address the comprehensive approach to disaster management; prevention, preparedness, response and recovery.
- Adaptation should be considered using a systems approach, ensuring that it is responsive to local conditions and the needs of the entire community.
- Adaptation should address both acute major events and continuous incremental change.

This approach, founded on priorities and principles, will expose Queensland's current and future disaster risk and strengthen governance and investment in accordance with the *Sendai Framework for Disaster Risk Reduction 2015-2030* and the Sustainable Development Goal 13 for Climate Action.

Information about the EM-SAP including the full version of the plan and factsheets is at www.disaster.qld.gov.au/cdmp/Pages/default.aspx. For information on QFES climate change activities, contact sdu@qfes.qld.gov.au.

Improving service through valuing inclusion

Costa Haritos, Bushfire and Natural Hazards CRC

Changes in social, environmental and economic conditions and the need to partner *with* communities to build resilience, means people are the greatest resource for emergency services organisations.

Learning to leverage diversity and be inclusive is becoming a central part of organisational agendas. As such, Bushfire and Natural Hazards CRC researchers are working to understand how diversity can be effectively managed and measured. This work complements the Male Champions of Change initiative for the Fire and Emergency Service sector that is coordinated through AFAC.

Celeste Young, Victoria University, leads the Diversity and inclusion: building strength and capability project. She said, 'the notion of diversity is not new to the emergency services, however, achieving effective outcomes that are sustained for the longer term has been elusive.

'It's complex because there is no one way to *do* diversity and inclusion. If you want to be effective, you have to create an inclusive culture', she said.

The project has three main areas of interest. The first phase, understanding contexts in which diversity and inclusion exist, has been completed. The economic area includes the changing capabilities of organisations. The organisational area assesses how diversity and inclusion exists and the constraints and enablers at agency level. The community area investigates community values and the attitudes and understandings about agencies held by communities.

'Organisations often feel the diversity discourse has become 'stuck' as a deficit conversation that focuses on compliance and counting heads. There is a need to build greater understanding of the value of diversity and inclusion as an investment that will benefit current and future workforces,' Celeste said.

The research revealed that communities want to engage more with organisations but felt that the skills and capabilities they offer were not understood. Emergency management organisations were often seen as heroic and dominated by white males. Twenty-seven per cent of survey respondents agreed that men were more suited to front-line emergency response than women. This indicates the need for more education in this area. There was a small but significant number of women respondents who had ingrained stereotypes in relation to who should be part of emergency services organisations.

'There's a lot more work required to understand diverse communities and the capabilities that brings to the

table. This is important as it provides the basis for communication and working partnerships,' Celeste said.

Changes in capabilities of three case study organisations—Queensland Fire and Emergency Services (QFES), Fire and Rescue NSW (RFS NSW) and South Australia State Emergency Service (SA SES)—were analysed over ten years. Research confirmed that these organisations had diversified their services and were now more focused on their communities.

Researchers worked with the case study organisations to determine how diversity and inclusion had evolved and was understood. They identified barriers, needs, opportunities and benefits of effective diversity in an operational context. The key barrier was the command-and-control culture. This indicates a strong need to develop people-based skills, particularly at management levels.

Overall, diverse cohorts are still underrepresented in most organisations. There were effective programs in each organisation, including the QFES Transforms Through Leadership program, the RFS NSW Indigenous Fire and Rescue Employment Strategy as well as changes to their recruitment process and introducing lateral entry processes to increase women in management by the SA SES.

Heather Stuart, NSW SES, is an end-user for the project and feels the direction taken. 'The project is addressing areas that present significant challenges for the sector.' I believe that the contributions this project will make to the sector will soon become evident,' she said.

Despite the challenges, end-users like Heather Stuart regard end-user engagement has a key contributor and supporting factor in the project. 'This research is end-user-focused, and our stakeholders are very much part of the research team,' Celeste said.

With the first phase of understanding the context complete, the project will now build upon the draft framework using the implementation process developed in the first phase. Researchers will also be mapping community capabilities and undertaking economic case studies of two programs.

Find out more about this research at www.bnhcrc.com.au/research/diversityinclusion.

Unseen need in IFRC World Disaster Report 2018

Alana Beitz, Australian Institute for Disaster Resilience

Millions of people across the globe are not receiving the humanitarian assistance they desperately need, despite various commitments from government and aid organisations to ensure the world's vulnerable people are not left behind.

This is the core finding of the International Federation of the Red Cross *World Disasters Report 2018*¹ that provides a snapshot of the global humanitarian sector and identifies existing gaps in disaster assistance.

The report attributes these gaps to more than just a lack of funding. The report states that even if all projects were fully funded, many people would still be overlooked due to the process and decision-making of governments, donors and humanitarian organisations. Instead, the report identifies five 'fatal flaws' that result in people being overlooked:

- **Out of sight** - a lack of official ID and unmapped locations hide people from the humanitarian system.
- **Out of reach** - extreme topography, climate, politics and conflict restrict humanitarian access.
- **Out of the loop** - people with disabilities cannot always understand or access humanitarian support.
- **Out of money** - rapid-onset, slow-onset and long-term disasters and emergencies are often underfunded.
- **Out of scope** - non-refugee, irregular migrants and urban violence victims can fall outside traditional aid.

These concerns were identified through consultation with local volunteers and Red Cross and Red Crescent Societies around the world that stand at the forefront of disaster planning and recovery. The report points to these gaps and urges the humanitarian sector to reconsider their operations to better identify and prioritise these vulnerable groups.

An estimated 134 million people worldwide required humanitarian assistance in 2018 according to figures from the UN Office for the Coordination of Humanitarian Affairs *Global Humanitarian Overview 2018*.² This report estimates that, over the previous decade, two billion people were affected by natural hazards and 95 per cent of these were weather-related.

Some of Australia's closest neighbours are likely victims of disasters. Asia is the world's most densely populated region and disasters occur at a significantly higher rate than other locations.

During 2008–2017, 41 per cent of global disasters occurred in the Asia region and almost 80 per cent of all people affected by disasters were located in Asia. Comparatively, Australia's region of Oceania experienced the lowest global rates of disaster.

Over the last decade, 3751 natural hazards were recorded worldwide. Though fewer in number, earthquakes remained the largest contributor to death tolls. The most common natural hazard was flooding at 40 per cent, followed by storms at 27 per cent. Where data is available, the report estimates the global cost of damages from disasters in 141 countries at US\$1,658 billion, with 76 per cent of costs due to weather-related hazards.

While most disasters cannot be avoided, communities, governments and organisations can improve their preparedness and response to them. To achieve this, the International Federation of the Red Cross recommends governments, donors and humanitarian organisations allocate funds to areas such as under-supported groups, local disaster response capabilities, improved use of data and technology and adopt a shared responsibility for community resilience.

By shifting how resources are allocated in the humanitarian sector, the International Federation of the Red Cross predicts that more money and trust will be invested in local organisations that increases resilience and protects against the mounting impacts of disasters on the world's most vulnerable peoples.

The World Disaster Report 2018 is available at: <https://media.ifrc.org/ifrc/world-disaster-report-2018/>.

1 World Disasters Report. At: <https://www.ifrc.org/en/publications-and-reports/world-disasters-report/>.

2 Global Humanitarian Overview 2018. At: <https://interactive.unocha.org/publication/globalhumanitarianoverview/>.

The Emergency Service Volunteer Management Framework

Courtenay McGill, University of Western Australia, Jennifer Pidgeon, Department of Fire and Emergency Services and Professor Marylène Gagné, University of Western Australia and Curtin University

Current high turnover rates among emergency services volunteers are concerning given the pivotal role they play in emergency services organisations. Each 'lost' volunteer reflects a loss of valuable skills and experience on top of the financial loss associated with training.

Over the last five years, the Department of Fire and Emergency Services (DFES) in Western Australia has investigated ways to improve the volunteer experience and retention. One significant concern arose around the preparedness of volunteer leaders to effectively manage their brigade, group, or unit (BGU). To address this, DFES partnered with the University of Western Australia to investigate gaps in leadership capability to create a framework to manage volunteers that would provide concrete support for volunteer leaders.

Development of the framework was informed by a review of evidence-based best practice in volunteer and emergency services management, survey data from over 3800 volunteers and consultation involving interviews with DFES staff, volunteers, volunteer leaders and volunteer associations. Consultation revealed that, while volunteer leaders were operationally capable, many struggled with managing and leading people. Leaders reported being overwhelmed with the amount of work their role entailed (some spent up to 40 hours per week running their BGU on top of full-time work), struggling to deal with conflict and difficult personalities and having no succession plans. Reports from volunteers highlighted factionalism within BGUs, concerns about knowledge 'hoarding', ineffective or insufficient feedback and inflexible leadership styles.

The content of the framework was based on areas where volunteer leaders needed support as well as evidence-based recommendations around the leader behaviours that affect volunteer satisfaction. The management practices described in the framework are designed to help volunteers feel more competent, have ownership over their work and feel like they belong. Research shows that providing support in these three areas leads to improvements in volunteer motivation, satisfaction and retention. The framework was designed for use by volunteer leaders and is tailored to volunteers and emergency services workforces.

The Volunteer Management Framework and accompanying resources provide leaders with guidance in ten areas of volunteer management:

- Effective and ineffective influence tactics to use with volunteers.
- Sharing knowledge and information with volunteers and creating a knowledge-sharing culture.
- Effective delegation of both tasks and responsibilities, including a three-step process of delegation and tips for making it work.
- Including and involving all volunteers in BGU activities, seeking volunteer input and considering what to do before involving volunteers.
- Recognising and rewarding volunteer contributions through informal and more tangible means.
- Guidelines for providing good constructive feedback with specific examples.
- Tips to encourage and effectively use upwards feedback from volunteers.
- Conflict prevention, management and resolution strategies.
- Succession planning, both in managing volunteers' careers as they become less physically able and developing future leaders.
- Different leadership styles applicable to the emergency services and how to adapt leadership approaches to different situations and audiences.

The framework is available online to all volunteer leaders and DFES staff. Other volunteer-based and emergency services organisations wishing to use these resources can contact DFES for copies.

For information contact: jennifer.pidgeon@dfes.wa.gov.au.

Applying science to build resilience to tropical cyclones

Craig Arthur, Geoscience Australia

The first step in understanding risk is understanding the hazard. This means knowing the likelihood of the hazard event and its intensity. During 2018, Geoscience Australia updated the Tropical Cyclone Hazard Assessment (TCHA) to better calculate the likelihood of tropical cyclones in Australia.

The TCHA contains artificially generated tropical cyclone tracks that gives a realistic evolution of tropical cyclones over their lifetime. The update improves understandings of how cyclones weaken once they make landfall. Information from the TCHA defines the severe wind hazard posed by events based on the frequency and intensity of tropical cyclones making landfall on Australian coastlines. The 2018 update included data on 160,000 tropical cyclone scenarios for 400 locations around Australia.

The data gained from the update will be used by Geoscience Australia and other organisations to develop cyclone hazard and impact models. This is a step forward for evidence-based disaster management and evacuation plans as well as infrastructure and mitigation planning.

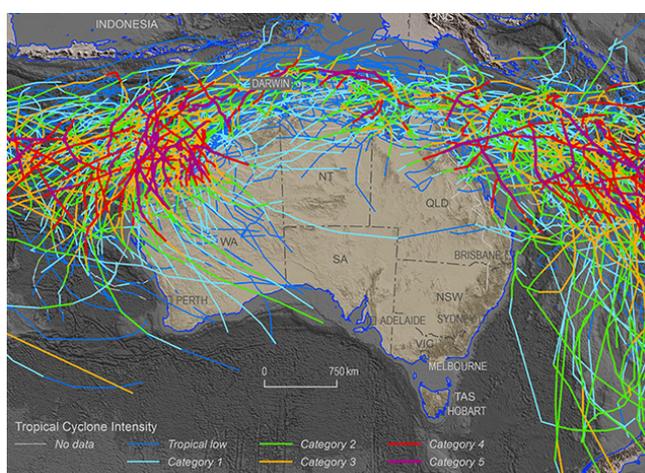
These assessments allow users to apply nationally consistent data to evidence-based disaster risk reduction activities. The TCHA provides vital information to emergency managers, infrastructure owners, town

planners and engineers to plan for and reduce the threat of tropical cyclones. It also supports the insurance and reinsurance industry to understand tropical cyclone risk as an input to pricing insurance premiums.

Data from the TCHA reveal that there are no surprises to the regions identified as being at higher risk to tropical cyclone hazard in Australia. For the 500-year average recurrence interval in the building code, the highest hazard area in Australia is along the Pilbara coastline, near Karratha in Western Australia where wind speeds have the potential to exceed 250 km-per-hour, equivalent to a Category 4 tropical cyclone. However, the TCHA shows that, in rare cases, the tropical cyclone hazard area can also extend south as far as Perth as well as down the east coast of New South Wales.

The TCHA is used in Geoscience Australia's three-year project with the Western Australia Department of Fire and Emergency Services to identify the state's vulnerability to severe wind events. Four regional centres of Broome, Port Hedland, Karratha and Exmouth were chosen for tropical cyclone hazard analysis. Geoscience Australia will model Category 3 and 5 tropical cyclones impacts on these areas to assess the potential physical damage to buildings and critical infrastructure. In addition, assessments will be undertaken for Perth, Geraldton and Carnarvon to broaden protections for coastal communities.

The TCHA along with the Probabilistic Tsunami Hazard Assessment and the National Seismic Hazard Assessment provides essential evidence-based information to government and emergency managers around Australia to help communities prepare for, mitigate against and respond to natural disasters.



Historical tropical cyclone activity across Australia between 1981 and 2017.

Image: Geoscience Australia

The Tropical Cyclone Hazard Assessment is available at www.ga.gov.au/tcha.

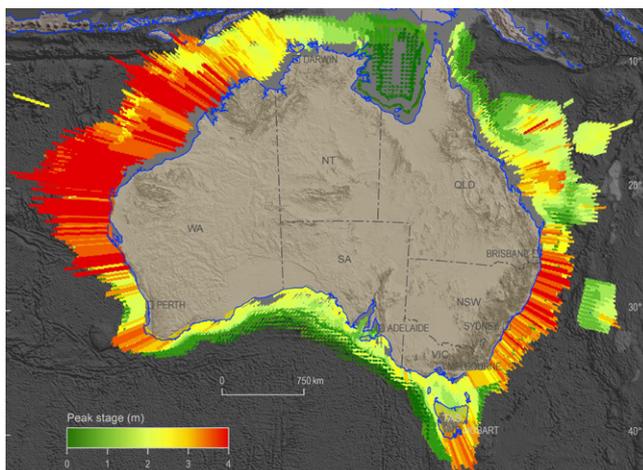
A new wave of tsunami hazard data

Dr Gareth Davies, Geoscience Australia

In 2018, Geoscience Australia updated and released the Probabilistic Tsunami Hazard Assessment (PTHA), which outlines the tsunami hazard for all of Australia and its offshore territories.

The 2018 update reflects improvements in science and technology and includes insights gained from tsunamis that have occurred since the last update a decade ago.

The PTHA includes data for more than half a million earthquake-tsunami scenarios in Australia. It reflects advances in understanding of how frequently large earthquakes that can cause tsunamis occur and the uncertainties in these frequencies. Additionally, it has data for more locations around Australia.



Probabilistic Tsunami Hazard Assessment maps help modellers to conduct tsunami studies.

Image: Geoscience Australia

The new methodologies in the 2018 update have been tested using ten years of deep ocean tsunami observational data from the Pacific Ocean to confirm they give a realistic depiction of tsunami behaviour. This data allows users to more accurately estimate the predicted tsunami hazard for specific locations. It was not included in earlier updates, as most of the tsunamis in the test-set occurred after 2008.

Although most people do not think of Australia as being vulnerable to tsunamis, there have been more than 50 recorded incidents affecting the Australian coastline since European settlement. Most of these resulted in dangerous rips and currents rather than land inundation.

Tsunamis that affect the Australian coast are caused by subduction zone earthquakes in the Indian and Pacific oceans. Subduction zones are tectonic plate boundaries where two plates converge and one plate is thrust beneath the other.

In Australia, the northwest coast in Western Australia is more likely than the east or southwest coast to experience a tsunami due to its proximity to the Indonesia tectonic plate boundary, which has a long, seismically active fault line. An example of this is where the Geraldton marina in Western Australia received damage during the 2004 Indian Ocean tsunami, which occurred in Indonesia. Effects were also felt in the Oman port, near the Persian Gulf, which was over 6000 km from the earthquake epicentre.

Tsunami studies derived from the PTHA will inform evidence-based disaster management and evacuation plans as well as infrastructure planning and mitigation strategies.

Currently, the Joint Australian Tsunami Warning Centre operated by Geoscience Australia and the Bureau of Meteorology provides at least 90 minutes warning to the Australian public and emergency managers to take action.

The PTHA is one of three national scale hazard assessments recently released by Geoscience Australia. These assessments allow users to apply nationally consistent data to underpin evidence-based disaster risk reduction activities.

The PTHA is the first step in gaining a better understanding of the tsunami hazard for specific locations around the Australian coastline and how emergency managers and infrastructure planners can reduce vulnerability to communities and the effects of tsunamis.

The Probabilistic Tsunami Hazard Assessment is available at www.ga.gov.au/ptha.

Reflections from Sendai: lessons for Australia

Dr Jane Sexton, Geoscience Australia

It's hard to believe eight years has passed since the Great East Japan Earthquake occurred that devastated so much of Japan. In November, I was very fortunate to participate in a United Nations International Strategy for Disaster Reduction meeting in Sendai, which included two days of site visits to areas hit by the tsunami.

These site visits were profoundly moving. We heard from survivors on how the tsunami impacted on their communities and what steps they have taken, and continue to take, to recover. It was why they are telling the story and their message of hope that compels me to share their messages with the Australian emergency management community; so we may learn and improve systems so these rare but potentially severe-to-catastrophic events do not result in the loss of lives in Australia, or Australians travelling overseas.

Geoscience Australia recently released the Probabilistic Tsunami Hazard Assessment that estimates the frequency that tsunamis of any given size (wave height) occur in water depths of 100 metres around Australia. In that assessment, wave heights were routinely estimated at values on the same scale as the 2011 tsunami. Given sections of the Sendai coastline experienced a wave height of 13.7 metres, it is sobering to reflect that Australia could experience a tsunami with a similar wave height. I can now put these estimates in perspective. Images of the day are significant enough, but it is the stories of those who lost family and friends that convey more meaning than images alone. I was stunned by the courage of people to share their story and I learnt that storytelling is part of their process of healing.

The community is moving on, but they are not forgetting. Memorials mark the height of the tsunami and they carry the names of people who lost their lives. The Japanese community is motivated to share their stories so that the tsunami risk is reduced across the globe.

I have summarised my observations and learnings shared by the community members that may be relevant to Australia.

- Disaster education is paramount, recognising that children educate their parents too.
- Knowing the location of evacuation points is critical for all members of the community. There was a tragic



The God of Mercy memorial stands 13.7 metres, the height of the tsunami. The memorial is in the area where the Arahama Elementary School withstood the tsunami and served as an evacuation point, which saved all the students and some of the community.

Image: Jane Sexton

example where a community failed to agree on an evacuation point and the confusion on the day led to many deaths.

- Communities and schools undertake regular tsunami drills so that community members know the evacuation points and actions to take. They also do drills for earthquakes.
- Tsunamis can amplify in rivers and bays. There is an increased understanding to retreat to high land rather than retreating further inland.
- Plans need to be flexible. Tsunamis behave in unexpected ways and are unlikely to match the current plan. For example, one community knew a tsunami was coming and were waiting for typical indicators of the river retreating. This didn't happen.
- The risk of tsunami is accepted but people did not expect the tsunami to be so big. Prior planning did

not consider an event of such scale and communities were less prepared. Such large-scale events have caused scientists to reconsider the potential for large events occurring, which is a major impetus for Geoscience Australia to update the national offshore Probabilistic Tsunami Hazard Assessment. There are uncertainties as to what is considered the 'worst case' and it is critical to acknowledge that an event *will* be different to the one that plans are based on.

- Warnings are not perfect (and we should not expect them to be) especially for this type of hazard.
- Tsunami arrival in some locations was 40–50 minutes after the earthquake event, yet people still lost their lives. Australia receives at least a 90-minute warning; the closest source of earthquake being the Puysegur Trench at the south of New Zealand.
- Most communities in Sendai felt the ground shaking from the earthquake so knew a tsunami was possible. This typically is not the case for large-magnitude earthquakes occurring in the subduction zones that surround Australia.
- Australians travelling overseas need to be tsunami-aware. Education in Australia needs to include the domestic and international risks posed by tsunamis.
- Sharing stories for future generations plays an important role in understanding tsunami risk. Given the short-recorded history of tsunamis in Australia, there is a need to preserve Australian Indigenous oral histories to uncover stories of tsunami events that will contribute to the national understanding and awareness of the tsunami hazard.

Recovery is a long and expensive process. The Japanese government has raised the heights of sea walls; in some locations to over seven metres. There is community acknowledgment that the walls offer a level of protection to more frequent, less extreme events, but may not offer total protection from an event of the scale of the March 2011 tsunami. The government has also constructed vertical evacuation points. For example, the 11 'Hills of Hope' constructed near the Sendai airport are designed at a height beyond the tsunami water level experienced during the 2011 event. The design includes access for disabled people as well as solar panels so that evacuees can recharge mobile devices to let their family and friends know they are safe. The government has also determined where communities may remain and rebuild and where they cannot. Many families have strengthened their homes, for example raising them off the ground, to cope better in future events.

As we head to the coast, either in Australia or overseas, be tsunami-aware. Take note of your surroundings and where higher ground is and how to access it. Heed any natural warning signs and any tsunami warnings issued by local authorities.

Acknowledgments

Thanks is extended to the International Research Institute of Disaster Science, Tohoku University for being host and to the Department of Foreign Affairs and Trade for supporting attendance.



The government has built sea walls to protect coastal communities. The tsunami reached 21 metres high in this area.

Image: Jane Sexton



A 'Hills of Hope' near Sendai airport. The path at the left provides better access for disabled people. The hill is 11 metres high and exceeds the height of the tsunami recorded in this area.

Image: Jane Sexton

Tsunami in Australia: challenging assumptions, building preparedness

Amanda Lamont, Australian Institute for Disaster Resilience and Dr Jane Sexton, Geoscience Australia

University of Newcastle researchers captured media attention in 2017 with the release of a study modelling tsunami risk for the city of Sydney.¹ The study considered a range of scenarios from minor disruptions through to rare, one-in-5000-year disasters.

It's possible the study made headlines in part for the novelty factor. This is not to say Australians are flippant about tsunamis; as a nation, we have grieved the traumatic impact of tsunamis in our region. We just don't think it will happen to us.

However, the science says otherwise. The historic and prehistoric record indicates that tsunamis have affected Australia in the past and could do so again. To Australia's north and east lie thousands of kilometres of tectonic plate boundaries, where undersea earthquakes could generate tsunamis that reach Australia in a matter of hours. Given half the Australian population lives within 10 km of a coastline—not to mention the scores of interstate and international visitors to our beaches—it's imperative we take tsunami planning seriously.

That's why the Australian Institute for Disaster Resilience partnered with the Australian Tsunami Advisory Group (ATAG) to revise and refresh national guidance for tsunami emergency planning in Australia. ATAG is the leading national group for tsunami capability development, bringing together the expertise of policymakers, scientists and emergency services practitioners from around Australia.

The review produced the *Tsunami Emergency Planning in Australia Handbook*, an authoritative resource for emergency managers, local and state governments, port authorities and commercial operators in coastal areas. Replacing its 2010 predecessor, *Manual 46: Tsunami Emergency Planning in Australia*, the handbook was published on 5 November 2018 to coincide with United Nations World Tsunami Awareness Day.

The handbook outlines the causes and characteristics of tsunamis, separating fact from fiction and highlighting key terms. It introduces planners to both 'Marine Threat' and 'Land Inundation Threat'² and explores the corresponding planning considerations for coastal communities as well as more transitory 'maritime' communities – including fishers, boaters and swimmers. Maritime communities also encompass a range of

commercial and government activities, including offshore oil and gas enterprises, military exercises and tourism. The handbook steps users through the responsibilities, processes and warning types that comprise the Australian Tsunami Warning System that was established by the Australian Government after the 2004 Indian Ocean tsunami.

ATAG has actively contributed to the management of tsunami risk by promoting research, knowledge management and education. In 2018, ATAG also partnered with the Australian Institute for Disaster Resilience to develop the *Tsunami hazard modelling guidelines* that represent the most up-to-date view of tsunami hazard nationally. A key companion to the revised handbook, the guidelines present a principles-based approach to developing tsunami hazard information for different purposes; from emergency management to infrastructure development and insurance. The guidelines don't dictate the use of a particular software; they ask questions to support cooperative approaches between scientists and end users.

Stakeholder consultation was key to the development of the *Tsunami hazard modelling guidelines*. Geoscience Australia, an ATAG member, led the process in partnership with public and private sector representatives and with Commonwealth funding support through Emergency Management Australia.

1 Notzon N 2018, *What would happen if a tsunami hit Sydney? Researchers plot possible impacts*, ABC News. At: www.abc.net.au/news/2018-10-16/what-would-happen-if-a-tsunami-hit-sydney/10376680. Wilson K & Power H 2018, *A tsunami could hit Sydney – and here's what would happen if it did*, SBS News. At: <https://www.sbs.com.au/news/a-tsunami-could-hit-sydney-and-here-s-what-would-happen-if-it-did>.

2 Marine Threat and Land Inundation Threat represent distinct categories in Australia's tsunami warning system. See Chapter 3: Tsunami Emergency Planning in *Australia Handbook*. At: <https://knowledge.aidr.org.au/resources/tsunami-planning-handbook/>. More information on Australia's Total Warning System is contained in the *Public Information and Warnings Handbook*. At: <https://knowledge.aidr.org.au/resources/public-information-and-warnings-handbook/>.

The guidelines emerged from a community-driven development process that engaged different end users and recognised the impact of a range of factors on modelling approaches and decisions (such as the use case and available data). A workshop held in Canberra in 2017 brought together tsunami modelling experts from government, industry and academia.

The handbook and companion guidelines are complimented by the Probabilistic Tsunami Hazard Assessment from Geoscience Australia. This resource informs local tsunami inundation modelling, which feeds into evacuation planning and community safety.³

The Tsunami handbook is also supported by *Tsunami: The Ultimate Guide* – an online learning resource developed collaboratively by ATAG and led by Surf Life Saving Australia. The guide raises tsunami awareness through the education of school-aged children and achieved a highly commended award in the 2014 Resilient Australia Awards.⁴

The *Tsunami Emergency Planning in Australia Handbook* and the suite of companion resources is part of the Australian Disaster Resilience Handbook Collection. The Handbook Collection represents nationally agreed

principles on a range of salient disaster resilience themes; supporting organisations across Australia to adopt best-practice approaches aligned to national policy.

3 Geoscience Australia 2018, *Probabilistic Tsunami Hazard Assessment*. At: www.ga.gov.au/about/projects/safety/ptha.

4 Anderson S 2015, *Tsunami: The Ultimate Guide*, *Australian Journal of Emergency Management* vol. 30, no. 1, pp. 41–42. At: <https://knowledge.aidr.org.au/resources/ajem-jan-2015-tsunami-the-ultimate-guide>.

The Tsunami Emergency Planning in Australia Handbook is available on the Knowledge Hub at www.knowledge.aidr.org.au/tsunami-planning-handbook.

Tsunami: The Ultimate Guide is available on the Knowledge Hub at www.knowledge.aidr.org.au/tsunami-the-ultimate-guide/.



A massive tsunami left this fishing boat high and dry on the dock in Hachinohe Japan, following a 9-magnitude earthquake in 2011.

Image: Kelly Barnes

Answering the call: mental health needs of police and emergency services personnel

Georgie Harman CEO, Beyond Blue

Landmark Australian research into the mental health, wellbeing and suicide risk of 21,014 police and emergency services personnel has established national baseline measures and given agencies and stakeholders clear evidence to underpin and drive action.

The *Answering the call* national survey – Phase 2 of Beyond Blue’s National Mental Health and Wellbeing Study of Police and Emergency Services was commissioned and funded by Beyond Blue with a funding contribution from the Bushfire and Natural Hazards Cooperative Research Centre. Professor David Lawrence at the University of Western Australia led the survey in partnership with Roy Morgan Research. The research was released on 29 November 2018.

Despite several smaller-scale research studies and extensive, anecdotal evidence that police and emergency services personnel are at greater risk of experiencing a mental health condition, until now, no comprehensive, national data existed. This has created challenges in understanding the true extent of psychological distress, mental ill health and suicide risk in the sector.

This research provides a detailed and accurate picture of these issues across Australia. We now have national baseline measures of wellbeing, mental health conditions and suicide risk among police and emergency services personnel. These can be used to drive action, design strategies and support services that respond to the data, including issues that police and emergency services personnel say are important as well as measure progress.

The survey was conducted from October 2017 to March 2018 and involved current employees (operational and non-operational), current volunteers and former and retired employees working in ambulance, fire and rescue, police, and state emergency service agencies in each Australian state and territory.

Of the 36 agencies in the sector, 33 participated in the survey. In total, 21,014 respondents (14,868 employees and 5,485 volunteers) participated in the voluntary survey meaning representative samples were achieved for these groups. In addition, a sample of 661 former employees was recruited through associations of former employees and related groups.

The survey measured mental health and wellbeing outcomes across nine themes.

Who participated in this research?



21,014

total survey participants from 33 agencies



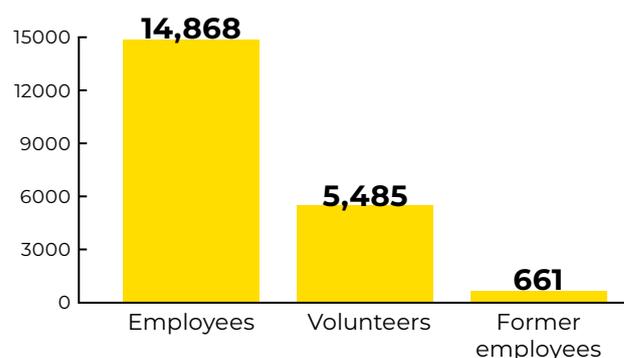
38%

Employees worked outside major capital cities



77%

Volunteers worked outside major capital cities



Prevalence of mental health and wellbeing

The survey found that ten per cent of employees had probable post-traumatic stress disorder (PTSD). Rates of PTSD ranged from 6 per cent in the state emergency services sector, 8 per cent in ambulance, 9 per cent in fire and rescue to 11 per cent in police. In comparison, the prevalence of PTSD has been estimated at 4 per cent in adults in Australia and 8 per cent in the Australian Defence Force.

5% of volunteers had probable PTSD



State emergency service volunteers



Ambulance volunteers



Fire volunteers

10% of employees had probable PTSD



State emergency services



Ambulance



Fire and rescue



Police

Prevalence of mental health and wellbeing

Different groups of people involved in the survey had their prevalence of mental health and wellbeing measured across nine different themes.

Image: Bushfire and Natural Hazards CRC

Twenty-one per cent of employees had high psychological distress and 9 per cent had very high psychological distress; much higher than the 8 per cent and 4 per cent respectively for all Australian adults.

Volunteers showed lower levels of psychological distress and probable PTSD and higher levels of positive wellbeing, with 4 per cent of ambulance volunteers, 5 per cent of fire and rescue volunteers and 6 per cent of state emergency service volunteers having probable PTSD.

Suicidal thoughts and behaviours

Suicidal thoughts and planning were more than twice as common in employees and volunteers compared to the Australian population, however rates of suicide attempts were comparable with the general population. Employees with higher levels of social support and resilience reported lower levels of suicidal thoughts and behaviours, even if they had experienced traumatic events that deeply affected them in their work or were likely to have PTSD.

Individual risk and protective factors

Employees and volunteers who had started their career in the previous two years had high levels of mental wellbeing and very low levels of psychological distress, probable PTSD and suicidal thoughts. Higher rates of psychological distress and probable PTSD were associated with greater length of service (ten years or more), low levels of social support and more exposure to traumatic events that deeply affected individuals.

More than 80 per cent of employees and 90 per cent of volunteers reported providing high levels of social support to others, as well as receiving similar support.

Substance use

Many police and emergency services employees reported high rates of alcohol consumption, which may indicate its use for coping with stress or poor mental health.

Almost 50 per cent of employee alcohol consumption exceeded National Health and Medical Research Council guidelines. Sixteen per cent of employees drank five or more drinks in a single session at least weekly, and 17 per cent drank ten or more drinks in a single session in the previous month.

Rates of illicit drug use were comparatively low. About 5 per cent of employees reported having used illicit drugs within the past year, although 13 per cent of employees with probable PTSD reported doing so. This compares to 16 per cent of Australians aged 14 and older who reported using illicit drugs over a 12-month period.¹

Risk and protective factors associated with the working environment

The workplace environment, particularly poor team culture and workplace stress factors, such as inadequate resources and unpaid overtime, had significant impacts on the mental health of employees. In fact, the study found that poor workplace practices and culture were just as debilitating as exposure to trauma.

Where higher levels of resilience were found, this was accompanied by more employees reporting that they were able to take time off after experiencing a traumatic event at work, they had briefings more frequently and

¹ 2016 National Drug Strategy Household Survey, Australian Institute of Health and Welfare.

Employees in agencies with higher average levels of resilience:



Employees able to take time off after experiencing a traumatic event at work



Employees frequently had debriefings



Employees reported that work did not affect their private life

The research will guide agencies to develop, refine and implement better and longer-term mental health and wellbeing programs.

Image: Bushfire and Natural Hazards CRC

work did not drain so much energy as to affect their private life.

Stigma

The research revealed clear disparities in the way people feel about their colleagues and how they see themselves. Employees and volunteers tended to believe that others in the workplace held negative beliefs towards those with a mental health condition or a low commitment to support those with mental health conditions. Employees held notable levels of stigma surrounding their own mental health. Thirty-three per cent of respondents felt shame about their mental health condition and 61 per cent said they would avoid telling people about their mental health condition. Despite these figures, most employees and volunteers reported they would support any colleague who experienced a mental health condition.

Seeking support

Comparatively, more people in the police and emergency services sector seek support when they need it for a mental health condition than in the Australian population overall. Barriers to seeking support commonly cited, for employees and volunteers alike, included wanting to deal with it themselves, concerns about being treated differently or being perceived as weak.

Nearly half of employees believed they had received sufficient support for their needs, which is comparable with the general population.

Workers' compensation

Most respondents making workers' compensation claims found the process to be unsupportive, stressful and reported that it had a negative impact on their recovery. Among employees with probable PTSD who made a claim, 75 per cent felt it had negative impacts on their recovery, with only 8 per cent reporting positive impacts on their recovery. More than half (52 per cent) felt they were not supported at all during the claims experience, and 63 per cent reported that they found the claims experience to be very or extremely stressful.

Former employees

Twenty-eight per cent of former employees had seriously thought about taking their own life. Of those, 66 per cent felt this way while still working in the police and emergency services sector and 62 per cent felt this way after leaving the sector.

Former employees had lower resilience and were much less likely to receive high levels of social support compared with current employees, particularly those former employees currently having probable PTSD or high rates of psychological distress.

How the research is being used

Beyond Blue has analysed the findings and made independent recommendations. Phase 3 of the study is to translate the findings into more action.

The research shows there are many common themes at a national level. We believe a nationally coordinated approach—led by the Commonwealth—to respond to the findings will lead to better outcomes for individuals and families more quickly and with less duplication. We have recommended a national centre of excellence for police and emergency services mental health to be a hub of proven and emerging best practice and outcomes, that reforms to workers' compensation are driven by a review of current practices and best-case solutions and that a scheme to support post-service employees and retirees is imperative.

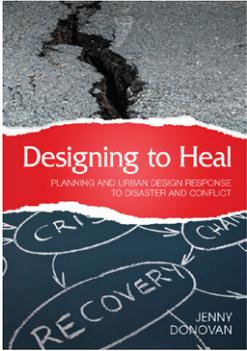
Beyond Blue has also recommended agencies review their existing health and wellbeing strategies and plans against the evidence produced by the research. Strategies should be fully integrated into core business and developed collaboratively with peak bodies, unions, employees, volunteers and their families.

While the research findings are hard to read, we now have a comprehensive national picture and data set and a clear path to respond to the mental health needs of those who put their lives on the line for others.

The full report is at www.beyondblue.org.au/pesresearch.

Designing to Heal

Reviewed by John Richardson, National Resilience Adviser, Australian Red Cross, Melbourne



Published by CSIRO Publishing

Author: Jenny Donovan

ISBN: 9780643106475

Joni Mitchell once sang, 'you don't know what you've got 'til it's gone'. This is so true in disaster-affected communities. Our mental maps and the things we take for granted are redrawn. However, early in the recovery process, the relationship

between people and their natural and built environment can be minimised in favour of meeting basic needs and replacing what is lost.

The push is often to get things rebuilt as quickly as possible, partly because decision-makers think this is what's needed, and partly it's political and not wanting to be 'too slow'. In early recovery meetings, project managers may do the sums in their head, 'x number of houses lost multiplied by 4-6 months building time, divided by the number of builders, equals recovery will be over by September'. The reality is much messier and few people are ready to make those decisions, often within the first year.

This is why Jenny Donovan's *Designing to Heal* is an important resource. It focuses on the planning and urban design questions faced by communities, planners, builders, financiers, public servants and emergency managers. It is the sort of book I would have liked to refer to when I was working with the Strathewen community in Victoria during their memorial process.

Using diverse case studies, *Designing to Heal* focuses on how planners and urban designers can assist people affected by disasters through the recovery journey and, in the process, become more resilient for future disruptions. These case studies range from conflict zones such as Northern Ireland and Ethiopia to the disaster-affected areas of Kinglake Ranges and Marysville as well as Sri Lanka. Each case study is unique in nature and through careful description, Donovan highlights quite striking examples of good and bad practice:

- Delicately balancing competing demands of remembrance, urban facility, commercial viability and security in designing the World Trade Center memorial; a highly charged and high-profile incident, where everyone feels ownership.

- How to balance the old and the new when moving a nation's capital in a small country after the volcanic eruption on Monserrat in 1995. This highlights the need to involve the private sector and create a link to the old capital while developing something that is forward-thinking.
- Re-imagining communities in conflict areas in Belfast by using the cultural importance of murals to move a dialogue of violence and conflict to peace and strength.

Donovan tackles the notion of build-it-back-better, which rolls off our tongues as a given, but she recognises that it is a balancing act; respecting the familiar, valued character and identity of a place, with addressing the problems of place. Often it is regarded as an either/or.

The book examines the oft-forgotten relationship that people have with the built and natural environment and what that means when things changes. In doing so, book places people at the centre of these issues. This may not seem revolutionary but with an increasing practice of using the military and large-scale project management firms during recovery management rather than community-led approaches, process can take priority over people.

The book is well structured and eminently readable with liberal use of images to hold the interest of readers. Donovan frames the case studies by drawing on the recovery literature and interviews with design practitioners and others to understand the context in which the projects were undertaken. She presents recovery in its non-linear messiness, which is helpful to inform otherwise linear management processes. She is also humble enough to recognise that she herself is not always right, such as the foreshore project in Hambantota, Sri Lanka. The books closing chapters identity elements of good practice in designing to heal and then ultimately what the outcomes are that should be sought (i.e. the characteristics of place that are designed to heal).

In Hobfall's *Principles of Psychosocial Support*, hope is one of the key pillars to helping people recover from trauma. Being able to listen, understand and reflect the diverse needs of a community, in a physical form, without creating unrealistic expectations, is the facilitator of hope. For urban planners, ministerial advisers and philanthropists, this is a book that should be reached for before uttering the words 'we will rebuild'.

12TH AUSTRALASIAN NATURAL HAZARDS MANAGEMENT CONFERENCE



17 - 19 JUNE 2019



AUSTRALIAN INSTITUTE OF SPORT, CANBERRA

bnhcrc.com.au

f @bnhcrc



bushfire&natural
HAZARDSCRC

Australian Disaster Resilience Conference 2019

Are we future ready?

aidr.org.au/adrc

Abstract submissions close 11 February 2019

Melbourne Convention and Exhibition Centre
28-29 August, 2019

Australian Institute for
Disaster Resilience



ABSTRACT

Critiques of current attempts to build resilience in remote communities in northern Australia have generally been criticised as top-down and failing to produce meaningful outcomes. A component of the project was scoping resilience in remote communities that highlighted the challenges with current government efforts to plan *for* rather than *with* communities. Living with hazards requires that government leave space for communities to define and articulate what it takes to build hazard-smart communities. What does it mean to be hazard-smart? Who should be responsible for building hazard-smart communities? Communities in central Arnhem Land are using participatory-action research tools to talk about what it would take to ensure the survival of people facing significant hazards. Based on experiences with Cyclone Lam, communities have identified and made suggestions for what an inclusive community-led process would look like as an emergency management framework. This paper identifies key elements providing direction on how communities and governments can work together.

Special notice:

Aboriginal and Torres Strait Islander peoples are advised that a photo in this research paper contains images/makes reference to deceased persons.

Hazard-smart remote communities in northern Australia: community-led preparedness

Dr Bevyline Sithole¹, Otto Bulmaniya Campion² and Hmalan Hunter-Xénié¹

1. Aboriginal Research Practitioners' Network, Charles Darwin University, Darwin, Northern Territory.
2. Aboriginal Research Practitioners' Network and Balngarra Clan, Malnyangarnak Outstation, Ramingining, Northern Territory.

Submitted: 23 August 2018. Accepted: 28 November 2018.

Introduction

Communities in Arnhem Land, Northern Territory, are talking about a need to 'get smart' to live with natural hazards (Sithole *et al.* 2017a, Paton 2006). Though 'getting smart' is yet to be defined, there is growing interest to effectively plan for and live with natural hazards. Paton (2006) argued that when confronting a hazard, adaptive mechanisms are established. According to Buckle (1998), communities are central to effective natural hazard management and have an expectation to be involved. According to Hossain (2013) participation that involves people in defining their own action is crucial to develop effective plans. Further, the Department of Fire and Emergency Services (2016) recognised the importance of communities as critical elements to develop resilience. However, Sithole and colleagues (2016) found that remote communities did not feel they were being given opportunities to participate. Distrust develops when engagement is limited or not clear. This leads to subsequent challenges to the authority of emergency services organisations and relevance of plans that are put in place. This paper explores the opportunities available for effective engagement by remote communities in Australia's top end to engage in hazard preparedness.

Existing research in northern Australia suggests there is limited opportunity for communities to be active under current emergency management frameworks (Morley *et al.* 2016, Sithole *et al.* 2017a). Ronan and Johnston (2005, p.12) found that despite the increase in funding and efforts to build community preparedness, communities are rarely prepared for events. While there is recognition of the value of community-led initiatives, the real value of cultural approaches to emergency management and recovery is rarely acknowledged (Kenney & Phibbs 2014).

Community-led response is aligned with the priorities and strategies for disaster risk reduction as outlined in the *Hyogo Framework for Action 2005–2015* (UNISDR 2005) and also supported in the 'Keeping Our Mob Safe' (Remote Indigenous Advisory Committee 2007) that emphasised better engagement and communications with remote communities. People in remote communities see themselves as central to effective local emergency management. They expect to have a say in the development of policies and programs that develop community-led approaches as real alternatives.

Reviews of existing emergency plans point to a limited involvement by communities and tend to focus on delivery of services. This is supported by extensive consultation undertaken with regional Northern Territory Emergency Service and with Aboriginal community partners across northern Australia. Therefore, one of the important elements of this project was to work with elders of these communities to identify what an effective emergency services-community partnership arrangement would be like, based on empowerment and enhanced understanding of governance structures. A key issue for emergency management in remote communities is to have customary governance structures involved to develop and articulate community priorities and needs. Currently, very little guidance is offered on how this can be achieved.

Generally, remote communities are at high risk to hazards (Green, Jackson & Morrison 2009, Centre for Appropriate Technology Ltd 2016). Green (2006) found that although regional populations adapt to local climate conditions via a range of responses (including physiological, behavioural, cultural and technological), extreme events can stress populations beyond adaptation limits. According to Bird and co-authors (2013), remote communities in northern Australia are exposed to several types of natural hazards. Predictions for the future warn that the frequency and intensity of hazards will increase. Thus, getting emergency management and service delivery in remote communities 'right' is a priority.

Methodology

Participatory-action research provides a useful approach to understand community issues and ideas about local action and to encourage grassroots participation. It allows communities to be meaningfully involved with the

active participation of members in defining their own solutions. Recognising the complexity of Indigenous communities and related belief systems it was important to identify the right group and the right people who have connections to places and stories and have capacity to undertake risk and response planning. This was possible by the involvement of Aboriginal people living within the community as researchers for the project. The study was undertaken by Aboriginal researchers who were trained to use participatory methods from the ARPNet Dilly Bag (Sithole 2012). They also spent extended periods in the community and gained detailed insights from a large group of people in the Ngukurr and Gunbalanya communities (Sithole *et al.* 2017a). This paper considers results of that work, which is supported by the Bushfire and Natural Hazards CRC. This project included scoping the resilience of remote communities in northern Australia, which was undertaken between 2014 and 2016 and involved consultations with communities within Arnhem Land. Results of discussions with target groups drew on the scoping study and are the basis to identify real and practical actions communities could put in place to ensure they start 'living smart' with hazards.

In each of the communities, focus group discussions and flow diagrams were the primary tools used to get people talking about their ideas for action. Consultations included groups of women, men, young people and older people. The group discussions considered two fundamental questions.

- What do you want to see happen when there is a disaster; what should the *community* do?
- What do you want to see happen when there is a disaster; what do you want to see the *government* do? ('government' means both the Northern Territory Government and the Australian Government).



Elders of the communities are eager to participate in the research to improve preparedness and resilience to local hazardous events. Note: Aboriginal and Torres Strait Islander peoples are advised that this photo contains images/makes reference to deceased persons

Image: Bevline Sithole

To facilitate discussion, community members wrote answers and ideas on cardboard. The results were clustered according to ideas and themes. Once the clusters were made, groups were asked to add more information or highlight important points with the use of probing questions. Once there was agreement, the diagram was copied to butchers paper. The resulting diagram was presented to some of the groups to check for accuracy in capturing ideas and opinions. Community members could consider the diagram and move the actions around and add more issues into the boxes. These ideas for action are presented in this paper and are the basis for developing a comprehensive community-led approach that aligns and links to the existing emergency management framework.

Developing a comprehensive community-led program

Community elders asked the vital question, 'What we gotta do to survive them fires and cyclones?' that led to communities discussing practical actions and ideas. Other related comments were, 'We gotta be smart; start thinking and acting smart for our people'. Aboriginal people consider themselves to be very resilient. However, there was acknowledgment that community coping abilities have been weakened over the years but that people had a tremendous capacity to cope with harsh situations. Discussions revealed that the perception is that 'resilience' was regarded as something the government can do for people more than what people can do for themselves. Consequently, people want to change the perception to get others involved in actions to strengthen resilience.

There was also uncertainty about government assistance offered during emergency events. One elder in Ngukurr stated, '...we don't know what government is thinking, we don't know if the government would evacuate us?' (group discussion). Another person suggested that the government must loosen its grip on emergency management arrangements to enable meaningful community engagement.

...the Government should not be taking more responsibility. We know our people and we know our land. We blackfellas mob should make our own plan for our people. Family still strong and we would look out for our people.
(Interviewee)

Frustrations with the current emergency management framework were evident. For example, '...we don't want them [government] to intervene; we gotta look after ourselves' (interviewee). Calls for communities to be more involved are growing especially because recent cyclone events have made people more aware and more fearful. Comments about the existing emergency planning framework suggest a need to improve the levels of local engagement.

..... I have seen that emergency plan. They can't have meetings about it and just go away. Who are we meeting for, for people here? We have to talk to them. If plan for the people then they must talk to people, must have training for young fellas to do some of the emergency work, not just for picking rubbish. What outcome is that, who knows? There is no transparency.
(Interviewee)

The community's call to action is not new. There are several initiatives where government and non-government organisations are working with communities to achieve improved engagement. However, this requires government to shift from 'delivery' to 'participation' in a genuinely collaborative way. One respondent explained, '...emergency planning needs to have decisions by clan leaders front and centre when they are putting plan together; they should plan for whole country' (including outstations) (group discussion).

The experience of Cyclone Lam in February 2015 played an important role in making people reassess their vulnerability. People who previously felt comfortable think they are not as safe as they thought.

Focus group discussions, key interviews and flow charting activities identified the actions that the community felt were important to effectively respond to hazards. Different diagrams compiled by the groups were merged into a composite model for a 'hazard-smart' emergency management framework (see Figure 1).

Some groups prioritised certain actions more than others depending on their interest and experience. Community relief was a significant issue for women, especially access to food, while elders and men were concerned about the adequacy of infrastructure. This was relevant because what infrastructure is in place does not really consider the cultural requirements that affect groups when they congregate or the conflicts that may exist between clans.

Hazard warning system

Aboriginal clans have intimate knowledge of country and of the hazards they face. However, this knowledge is not always publicly known nor uniformly available. Elders indicated that knowledge about hazards and the signs to help predict natural events exists and that some communities still use and depend on this knowledge. However, young people tend to discount this knowledge.

Community participants, especially the elders, felt that local knowledge of hazards is undervalued and underused. Clan groups need to consult and agree on what information should be shared and who should be identified as the holders of this information.

A hazard warning calendar can be produced that shows the signs in the environment to look for, when people should start looking for the signs and how to read and understand what the signs mean. Signs include the strength of the wind, changes in birdsong, clouds, plants especially fruiting and flowering patterns and



Figure 1: Model of a community-led emergency management framework for hazard-smart communities.

the behaviour of animals and their movements. Elders indicated they could smell changes in the air. Developing a community hazard calendar would complement existing methods of communicating hazardous events.

Rapid response capability

At times when communities need to respond to a dangerous event, there is a feeling that local organisations and governments step in and take over. One participant stated, 'they leave us in the dust'. Aboriginal people felt they lacked access to the tools and facilities they need to use, '...we don't get to hold that key'. It was apparent that there is 'not much trust between us'; between communities and service providers. In addition, some people took offence to the allocation of menial tasks to skilled local people, '...don't let us just pick the rubbish; we can do more'. Frustrations with the current emergency management framework were evident in most communities. Participants stressed the importance of government to appreciate and acknowledge capabilities within communities. In each remote community there are individuals who help out and these individuals and the rangers should be seen as a basis for constituting overall community capability. There was a suggestion to create a database of skills available in the community so that local capacity is visible. It would also identify skills gaps as areas for development. Suggestions to go further and create a properly resourced response group complete with equipment and training were repeated.

First responders in communities are crucial during hazard events to help people, especially the vulnerable and those who are suffering from addiction who may

be under extreme stress. Plans for pet care is another important consideration given the high levels of pet ownership. Several groups exist that could be involved in this role, including ranger groups. At the workshop in Ngukurr, communities suggested that capability, if developed, could be a resourced through payments made by the Northern Territory Government. This proposal could be considered against existing arrangements for volunteers that has been the favoured method of delivery to date. In Ngukurr and Gunbalanya, volunteer groups were not functioning.

Inventory of infrastructure

An inventory of suitable infrastructure including houses is an important part of knowing local capacity. The notion that shelters are adequate is problematic as some people are constrained by inter-clan conflicts and cultural relationships and may not have access. Existing policies relating to shelters assume the community to be a harmonious unit. This ignores the fact that some communities are highly fractured and it is difficult for people to share common spaces. In those situations, families stay at home rather than go to shelters. Many people also live in multiple households as part of their family 'obligation to help out'. These people face situations of overcrowding and the stresses of living in multiple households. In addition, outstation and homeland families anticipating a hazardous situation may move into communities with other families, which means the period of the emergency event is longer than is generally recognised by government planners. Issues with overcrowding and accommodation need to be part of a rapid response, including that clan leaders

and elders have information about where things are and what facilities and resources exist. Currently, where such information exists, it has been inaccessible to the community or people in outstations. The study by the Centre for Appropriate Technology Ltd (2016) provides a detailed assessment of this situation in relation to outstations and homelands in the Northern Territory.

Community relief effort

Participants discussed ideas to develop a relief fund that could be created out of contributions from royalties or other funds the community can access. Women suggested making a list of individuals who can donate resources like food and other necessities. This could be distributed to clans and the community kitchen. The availability and adequacy of food remained a considerable issue. During times of turmoil, food can be scarce and is more expensive and families cannot supplement supply with traditional hunting and collecting. Some respondents mentioned that Yugul Mangi Corporation had a good model for supporting the community and that it could be an example for others.

Rapid damage assessment group

Communities want to be able to do rapid assessment of their vulnerabilities and needs. Respondents stressed the importance of recognising and, where necessary, developing research capability where groups like the Aboriginal Research Practitioners' Network (ARPN) or Yalu Researchers (Galiwinku) are present. This would involve simple participatory tools and training some of the researchers to conduct rapid assessments. Quick assessments would inform timely decision-making through leadership levels in the communities as well as in command centres for disaster management.

Protections through ceremony

Aboriginal people see a connection between natural hazards and their occurrence. Culturally based behaviour related to caring for country includes conducting ceremonies related to the occurrence and intensity of hazards (Buergelt *et al.* 2017). Thus, there is a belief that current conception of 'caring for country', as defined by governments, researchers and others, is too restricted. There must be recognition of ceremony as a management tool and that the continued presence of Aboriginal people on country is itself an effective tool to manage hazards (Sithole *et al.* 2017a).

In some remote Indigenous groups there is loss of knowledge about how to respond, 'sing' and control events. A disrupted connection to country has weakened the relationship with the land and produced an imbalance that causes such events to happen. In some places, Indigenous groups do not look after country. Respondents indicated they felt a deep sense of responsibility that the size or severity of hazards is related to their failure to meet their obligation on country and to manage it so it is healthy. There was general

acknowledgment that there is limited awareness of 'old ways' and 'old knowledge', but there is a desire for 'old ways' to be revived to create strong communities that are resilient.

...we don't know the old ways, we are confused and we panic. Old people don't know anymore. My grandparents used to stay in Wuyagiba, when cyclone come they knew what to do, where to run, they would go to that sandy hill and mangroves, also they had songs and they would sing and that river [would] go down. People used to try and get them to come to Numbulwar, but they said no they needed to control that wind with song, and they did it. We were taken away, separated. We were not allowed to speak in language or go with our parents. I didn't learn anything from my people because the missionaries were strict. They forced you to eat fermented yeast if you spoke language.
(Interviewee)

Aboriginal people feel that government and 'outsiders' do not have a deep understanding of their connection to country and how the strength of that connection affects the way nature behaves (Buergelt *et al.* 2017). Consequently, it is important to acknowledge the roles of ceremony as a pathway to preparedness.

Family and community bonds

Disasters affect people to varying degrees. Families supporting other families is crucial during difficult times. Interviews revealed that people felt family structures were weak but, during emergency events, the family support system still worked to some degree. However, the lack of or limited knowledge of relationships and cultural ties makes this a challenge. For example, a respondent described the situation:

....family structure is weak, but it is still there, it's a big question mark there because we have young people on ganja, nobody is interested, but they are not helping, they can a bit but they are not strong. We have to share our food, but the bonds between families very weak. When the community was small, it [relationships] was controllable, but now the community has gone bigger and is out of hand, there is no respect for elders.
(Group discussion)

While the scoping study found that disasters bring families and Indigenous groups together, many—especially older people—observe a general decline in the strength of relationships within and between families and within the community. Consequently, obligation to family, kin and community is not as strong as it used to be. Ceremony was regarded as a key component to connect families and clans, but many people do not attend. There is despair about the state of families and their value in building resilience. Respondents felt the Northern Territory Government could create conditions where Aboriginal people can build and consolidate their families.

Decision-making pathways

Following workshops at Yellow Water in Ngukurr, the ARPNet worked with senior men from Arnhem Land to understand traditional leadership and decision-making (see Sithole *et al.* 2017b). At a focus group in Darwin, 15 elders from central and west Arnhem Land agreed that the responsibility for management and decision-making rests in shared responsibility between traditional owners, Mingiringiri, Djungkayi, clan groups, land managers and rangers. However, there was a variance between communities in terms of institutional roles, interactions and dynamics. According to Sithole and colleagues (2017b), emergent ranger groups have become proxies for interaction between agencies and communities and, in some instances, have become a 'de facto community'. This raises questions about identifying the most effective way to engage with communities in disaster situations. Is it clan and family groups or ceremony groups, or all groups? Consequently, it is possible that there are multiple decision-making pathways for different issues. Aboriginal people are required to fulfil complex interactions in specific roles related to decision-making. When the elders and knowledge holders described the system, it was clear there is a disconnect between Aboriginal communities and conventional emergency management systems. It was also clear that the presence of a formal emergency management framework has not always intersected positively with traditional frameworks.

Discussion

Building community-led emergency management is not new (Gil-Rivas & Kilmer 2016). However, there is no clear directions for people at the grassroots level on how engagement should be done. Paton and colleagues (2013) underscore the importance of bringing together the complementary capabilities of communities with those of other actors. Consequently, it opens the way for parallel development of ideas to improve the safety of communities; where one can talk about mainstream approaches and community-led approaches separately and unconnected. Yet there is scope for connecting the two. The model outlined in this paper presents ideas on where collaboration between the two can occur and what form that collaboration can take. For example, the rapid response capability is aligned with the existing provision to create volunteer groups in communities, while the leadership group can be linked with decision-makers in the current plan. While there is scope for collaboration and possible integration of the two plans, 'being smart' will get a plan in place to keep the community safe and create relationships with government so that parallel plans can be integrated and emergency management strengthened.

The challenge remains about how to get government to cede control for planning and executing emergency arrangements enough to allow communities to be involved. Aspects like strengthening family bonds or

conducting ceremony are regarded as essential pillars to build long-term resilience at community level but fall outside the remit of emergency management. Getting government to the table means working hard to transform mindsets and to embrace a broader, more sustainable approach to emergency management; one that has bigger outcomes in the long term. The Remote Focus initiative of Desert Knowledge Australia (DKA) (2008) suggests that government faces significant challenges in remote Australia, with implications for resource industries, environmental management and Indigenous issues (DKA 2008, McRae-Williams & Gerritsen 2010). DKA recommended that utmost importance should be placed on better engagement with, and empowerment of local communities in determining their own future, while structuring this within multiple tiers of government. The push by communities wanting a shift from the traditional service model of government is growing stronger. Within the framework of this project, there is scope to see if the elements identified can develop a comprehensive integrated model.

This paper has drawn on work already undertaken by the Bushfire and Natural Hazards CRC and related studies to highlight and discuss potential elements of the community defined framework for hazard preparedness. This new approach advocates for a 'more nuanced community-led approach'. The scoping study showed that current engagement models barely address the expectations and needs for deeper and effective engagement. Planning processes that local involvement often become dominated by technical experts like professional planners, engineers and biologists (Berke & Campanella 2006). As a result, plans that do not draw on or benefit from local knowledge may be inconsistent with local values, needs and customs. Twigg (2007) argues to focus on what communities can do for themselves and how to strengthen their capacities, rather than concentrating on their vulnerabilities or their needs in an emergency.

Conclusion

No community can ever be completely safe from natural and man-made hazards. This paper suggests that communities do not seek to be completely safe; they seek to be disaster smart. Frameworks where community competence is used, where decisions are informed by quick assessment tools and where communities feel they can respond to situations is being disaster smart. Crucially, awareness about current management frameworks can incorporate latent Aboriginal governance structures and lore. Approaches are worth exploring that respect protocols and practices, where 'message sticks' are passed on from one stakeholder group to the next and the whole community acts in concert and draws on each other's strengths. The importance of linking a community-led framework with existing emergency management frameworks is a significant step. While alignment with emergency management systems is possible, it requires investment

in building trust and understanding of how Aboriginal communities work and are structured. What is clear is that such an approach would need to be accompanied by changes in the way governments interact and deliver emergency management practices.

References

- Berke PR & Campanella TJ 2006, *Planning for post-disaster resiliency. Annals of the American Academy of Political and Social Science*, vol. 604, pp.192–207.
- Bird D, Govan J, Murphy H, Harwood S, Haynes K, Carson D, Russell S, King D, Wensing E, Tsakissiris S & Larkin S 2013, *Future change in ancient worlds: Indigenous adaptation in Northern Australia*, National Climate Change Adaptation Research Facility, Gold Coast, pp.257.
- Buergelt PT, Paton D, Sithole B, Sangha K, Prasadarao PSDV, Campion L & Campion J 2017, in *Paton D & Johnston DM (Eds.) Disaster Resilience: An integrated approach*, 2nd Ed, Springfield, Ill., Charles C. Thomas, pp.289–307.
- Buckle P 1999, *Re-defining community and vulnerability in the context of emergency management*. At: www.radixonline.org/resources/buckle-community-vulnerability.pdf.
- Centre for Appropriate Technology Ltd 2016, *The Northern Territory Homelands and Outstations Assets and Access Review. Final Report*, Australian Government.
- Desert Knowledge Australia 2008, *Remote Focus: Revitalising Remote Australia*. https://eprints.utas.edu.au/15065/1/Fixing_the_hole_in_Australia%27s_Heartland.pdf.
- Department of Fire and Emergency Services 2016, *Community engagement framework*. At: <https://www.dfes.wa.gov.au/aboutus/corporateinformation/PlansandStrategiesPublications/DFES-CE-Framework.pdf>.
- Green DL 2006, *Climate change and health: impacts on remote Indigenous communities in northern Australia*. CSIRO.
- Green D, Jackson S & Morrison J 2009, *Risks from Climate Change to Indigenous Communities in the Tropical North of Australia*, Western Australian Department of the Environment and Conservation and the Northern Territory Department of Natural Resources. At: <http://web.science.unsw.edu.au/~donnag/Risks%20from%20Climate%20Change%20to%20Indigenous%20%20%20Communities%20in%20the%20Tropical%20North%20of%20Australia.pdf>.
- Gil-Rivas V & Kilmer RP 2016, *Building Community Capacity and Fostering Disaster Resilience*. *Journal of Clinical Psychology*. March 2016. doi: 10.1002/jclp.22281
- Hossain A 2013, *Community Participation in Disaster Management*. *Antrocom Online Journal of Anthropology*, vol. 9. no. 1, pp.1973–2880.
- Kenney CM & Pihbs S 2014, *A Māori love story: Community-led disaster management in response to the Ōtautahi (Christchurch) earthquakes as a framework for action*. *International Journal of Disaster Risk Reduction*, vol. 14, no. 1, December 2015, p.46–55.
- McRae-Williams E & Gerritsen R 2010, *Mutual incomprehension: The cross cultural domain of work in a remote Australian Aboriginal community*. *The International Indigenous Policy Journal*, vol. 1, no. 2, pp.1–29.
- Morley P, Russell-Smith J, Sangha K, Sutton S & Sithole B 2016, *Evaluating resilience in two remote Indigenous Australian communities*, *Australian Journal of Emergency Management*, vol. 31, no. 4, pp.44–50.
- Paton D 2006, *Disaster resilience and building capacity to co-exist with natural hazards and their consequences in (eds) Paton D & Johnston DM 2006, Disaster resilience – an integrated approach*. Charles C. Thomas, pp.3–10.
- Paton D, Buergelt P & Campbell A 2013, *Learning to co-exist with environmental hazards, community and societal perspectives and strategies*. In Daniels JA (Ed) *Advances in environmental research*, Nova Science Publishers, vol. 43.
- Remote Indigenous Communities Advisory Committee 2007, *Keeping Our Mob Safe: A National Emergency Management Strategy for Remote Indigenous Communities*. *Australian Journal of Emergency Management*, vol. 22, no. 4. pp.39–40. At: www.austlii.edu.au/au/journals/AUJEmMgmt/2007/44.pdf.
- Ronan KR & Johnston DM 2005, *Promoting community resilience in disasters, the role of the school, youth and families*. Springer.
- Sithole B 2012, *The ARPNet Dilly Bag – a practical field guide to participatory and other research tools for use by Aboriginal Research Practitioners in Australia*. ARPNet, Charles Darwin University, Australia. At: <http://riiel.cdu.edu.au/blog/2013/11/arpnet-dilly-bag-ngukurr>.
- Sithole B, Hunter-Xénié H, Yibarbuk D, Daniels C, Daniels G, Campion OB, Namarnyilk S, Narorroga E, Dann O, Dirdi K, Nayilibibj G, Phillips E, Daniels K, Daniels A, Daniels G, Turner H, Daniels CA, Daniels T, Thomas P, Thomas D, Rami T & Brown C 2017a, *Living with Widditjth – Protocols for building community resilience*. In *Paton D & Johnston DM (Eds.) Disaster resilience: An integrated approach (2nd ed.)*. Springfield, Illinois: Charles C. Thomas.
- Sithole B, Campbell D, Sutton S, Sutton I, with Campion O, Campion M, Brown C, Daniels G, Daniels A, Brian C, Campion J, Yibarbuk D, Phillips E, Daniels G, Daniels D, Daniels P, Daniels K, Campion M, Hedley B, Radford M, Campion A, Campion S, Hunter-Xénié H & Pickering S 2017b, *Blackfella way, our way of managing fires and disasters bin ignored but I'm still here - Indigenous governance structures for fire emergency management*. Paper presented at the research forum AFAC 2017, Sydney.
- Twigg J 2007, *Characteristics of a disaster resilient community*. DFID Disaster Risk Reduction Interagency Coordination Group. At: <https://practicalaction.org/docs/ia1/community-characteristics-en-lowres.pdf>.
- UNISDR 2005, *Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters*. At: www.unisdr.org/we/coordinate/hfa.

About the authors

Dr Bevyline Sithole is Adjunct Fellow at the Charles Darwin University and research leader of the Aboriginal Research Practitioners' Network.

Otto Bulmaniya Campion is an elder and senior ranger in central Arnhem and is also researcher and board chairman for the Aboriginal Research Practitioners' Network.

Hmalan Hunter-Xénié is a research associate with Charles Darwin University and is the coordinator of the Aboriginal Research Practitioners' Network

ABSTRACT

Long-term consequences of flooding: a case study of the 2011 Queensland floods

Professor Gerry FitzGerald¹, Dr Ghasem (Sam) Toloo¹, Sara Baniahmadi¹, Professor David Crompton² and Professor Shilu Tong¹

1. Queensland University of Technology, Brisbane, Queensland.
2. Queensland Health, Brisbane, Queensland.

Submitted: 10 September 2018. Accepted: 7 November 2018.

Introduction

Flooding is the most common type of natural disaster and has caused nearly US\$153 billion in damages globally in the last decade. Floods affected over 400 billion people and accounted for almost half of all victims of natural disasters (EM-DAT 2018). A recent IPCC report stated the frequency and intensity of flooding is likely to increase in the wake of continuing climate change (IPCC 2012) and growing urbanisation may expose more people to such events (Du *et al.* 2010).

In 2010–2011, the strongest La Niña pattern observed since 1974 brought above-average rainfall to Queensland and major flooding occurred across the state in the aftermath of Tropical Cyclone Yasi. With the Brisbane River peaking at 4.46 metres, Brisbane city and surrounding areas including Ipswich, Toowoomba, the Lockyer Valley and Moreton Bay experienced significant flooding. Seventy-eight per cent of the state was severely affected (Department of Infrastructure and Planning 2017), 35 people tragically lost their lives and more than 29,000 homes and businesses were damaged. The estimated total economic losses were more than \$5 billion (Queensland Floods Commission of Inquiry 2012).

There is considerable awareness of the immediate effects of flooding, such as morbidity, mortality, the social, economic and environmental disruption and the pressure placed on health services. In the year preceding the Brisbane floods, a study documented the health impacts on those affected (Alderman, Turner & Tong 2011), which sits within the broader body of literature examining the social, psychological and physical health issues experienced soon after flooding (Ahern *et al.* 2005, Du *et al.* 2010, Reacher *et al.* 2004, Zhong *et al.* 2018, Leon 2004, Paranjothy *et al.* 2011).

What is less known are the long-term health effects of such events and the factors that influence them. To provide insight into this, a survey was conducted to explore the perceptions of health status and support received by people six years after the flood. The aim was to identify the nature of those long-term effects including perceived determinants as reported by the participants.

Devastating floods in southeast Queensland in 2011 were the combination of flash flooding in the Lockyer Valley with riverine flooding in the Brisbane metropolitan area. While there is considerable information about the immediate impact on those affected, there is less understanding of the long-term health effects that follow such events. This study explored the perceptions of health effects and support received by people affected by the 2011 southeast Queensland flood six years after the event. A cross-sectional survey of 327 people was conducted in areas affected by the floods. The questionnaire sought information about the ongoing social, economic, demographic and self-declared physical and mental health effects. The data were analysed through comparison of those unaffected with those directly affected by the floods. Residents whose households were flooded were more likely to score their health negatively than non-affected residents and had higher reported rates of trauma, injury and mental illness. Twenty-six per cent of this group reported that they still experience some adverse health effects from the floods. Managing the long-term health implications of a flood-affected population is an important public policy task. Dissatisfaction with recovery operations and perceived injustices associated with insurance and compensation arrangements may aggravate health consequences. Early recognition and intervention may assist with reducing secondary effects.

Method

The study involved surveying residents in areas of southeast Queensland affected by the 2011 floods. The method was similar to that used by Turner and colleagues (2013) who surveyed a sample of residents approximately seven months following the 2011 floods. Flood-affected areas were identified by examining local flood maps and included areas of Brisbane, Ipswich, Morton Bay, Lockyer Valley and Toowoomba. Twelve electorates were selected from these areas and a random representative sample of 3000 adult residents was obtained from the Australian Electoral Commission electoral role database for these places.

A paper-based questionnaire was mailed out to each sampled individual in January 2017 along with a reply-paid envelope. Further promotions of the study were undertaken through the public media including interviews on ABC Radio and with local newspapers. The questionnaire contained a letter asking participants for their voluntary participation and stressed the anonymity and confidentiality of the survey. The questions garnered social, economic, demographic and self-declared physical and mental health information.

The original questionnaire developed for the 2011 flood survey (Alderman, Turner & Tong 2013) was used and modified to reflect any long-term effects. Initial screening questions were included to ascertain the movement of the respondents within the flooded or non-flooded areas. Direct questions about whether people considered any ongoing effects of the 2011 flood on their physical or mental health were added. The General Health Questionnaire (GHQ-12) was used to assess the perceived health status of the participants. Differences in GHQ-12 between affected and non-affected respondents were tested using mean scores and F-test at $p < .05$.

Ethics approval was granted by the Queensland University of Technology Human Research Ethics Committee (Approval: 1500001159). Descriptive analysis was undertaken for each variable in comparing health status and perceptions of people directly affected by the floods to those who did not feel they were directly affected. Comments and responses to the final open-ended question were analysed using thematic analysis.

Results

Response rate and characteristics

Of the 3000 mailed out questionnaires, 62 were undelivered and 327 were completed and returned, yielding a response rate of 11 per cent. Overall, 51 per cent of the respondents were female with the majority being married or de facto (77 per cent), in some form of employment (49 per cent) or retired (34 per cent), owned their home (86 per cent) and were born in Australia (78 per cent). The mean age of respondents was 57, with those aged 45 years and over being over represented (78 per cent). These and other demographic indicators are outlined in Table 1.

Flood effects

Of the 327 respondents, 13 per cent ($n=43$) identified as being affected by the 2011 floods and reported a range of impacts on their property including:

- 81 per cent had damage to the outside of their property (e.g. fencing, yards)
- 26 per cent had damage to whole or part of their living areas
- 5 per cent had demolition of the whole house
- 12 per cent had damage to vehicles
- 5 per cent lost animals.

Of the 43 flood-affected respondents, 44 per cent ($n=19$) stated they did not receive any reimbursements from the government or insurance companies to cover their losses and 63 per cent ($n=12$) of this group stated they did not receive any community support (i.e. social, financial, language, physical or mental health support).

The spread of gender, marital status, education level, country of origin and ethnicity were similar between those affected and those unaffected (see Table 1), although there were some small differences observed in age, income, employment status and home ownership between the groups. Notably, among those affected, more people identified as renters (21 per cent and 12 per cent, respectively) and housekeepers or family carers (14 per cent and 3 per cent, respectively).

Participants were asked to score their general health using the 12 questions in the GHQ-12. Scores were combined for all items. The results are detailed in Table 2. They show that flood-affected respondents were more likely to score their health negatively (mean score: 27.0, SD: 6.8) than non-affected residents (mean score: 23.3, SD: 5.4; $p < .00$). Compared to those unaffected, there was a notable higher reporting of trauma or injury (12 per cent, OR=5.5, 95 per cent CI=1.7–17.2) and mental illness (21 per cent, OR=29.6, 95 per cent CI=6.6–132.5) among those affected by the floods, with 26 per cent ($n=11$) reporting they still experience some health effects from the floods including depression ($n=4$), insomnia ($n=3$), asthma ($n=2$), arthritis ($n=2$) and other health issues ($n=4$).

Respondent commentary

The final question asked respondents to comment generally on their experience of the flood and its impact on them. Seventy-two respondents provided comments, allowing for a qualitative exploration of the responses. Several respondents commented on the stress and anxiety experienced from not being able to return to their homes or being unable to leave their homes for safety reasons. Three of the respondents stated their inhibited mobility, due to old age or a disability, had a compounding effect on their stress and anxiety and that this had continued after the flood. A common theme for five respondents was the problems, stress and anxiety experienced through the loss of communications. Specifically mentioned was being cut off from communication with loved ones they were caring for or from whom they received support because

Table 1: Demographic characteristics of the study participants.

Variable	Total %	Affected %	Unaffected %
Affected Status	100% (327)	13% (43)	87% (283)
Gender			
Male	49	40	50
Female	51	60	50
Age			
18–24 years old	4	5	4
25–44 years old	18	14	18
45–64 years old	44	63	42
65 years and older	34	19	26
Education Level			
Less than high school	4	5	4
High school	28	21	29
Some university/college/vocational	49	47	38
Graduate degree	23	2	23
Other	5	2	5
Employment Status			
Employed (full or part-time)	49	51	48
Housekeeper/family – carer	4	14	3
Retired	34	21	36
Permanently sick/living with disability	3	7	3
Student	3	0	4
Other	6	7	7
Country of Origin			
Australia	78	74	78
Other	22	26	22
Home ownership			
Renter	13	21	12
Homeowner	86	79	87
Other	1	0	1
Income per year			
\$156,000 or greater	13	12	13
\$78,000–\$155,999	27	27	27
\$52,000–\$77,999	14	7	15
\$39,000–\$51,999	8	7	8
\$26,000–\$38,999	10	5	11
\$13,000–\$25,999	12	22	10
\$12,999 or less	2	0	2
Prefer not to answer	15	20	14
Ethnicity identified			
Aboriginal or Torres Strait Islander	1	0	1
Caucasian	93	93	94
Asian	4	2	43
Other	2	5	2

of obstructed travel and interrupted access to official information and instruction due to power outages.

More than ten respondents commented on how the floods adversely impacted on their income, business operation and capacity and general financial situation; for some this resulted in long-term social and economic deprivation. A number of respondents included information on post-disaster support with several stating their dissatisfaction with recovery operations and the perceived injustice associated with insurance and compensation arrangements coordinated by local council and the Queensland Government.

Several respondents commented on adverse health reactions experienced after the floods; some were also identified in the comparative analysis. The majority demonstrated an understanding of the causal relationship to the stress of the flooding experience and its short-term and long-term consequences. An issue was highlighted by five respondents around feeling anxious and re-traumatised during periods of heavy rain regardless of flood risk. This triggered concern of being affected again. Six described that they feel more prepared for future flooding.

Several respondents commented on the positive experiences associated with the 2011 floods. These mainly centred around the provision of physical support and donations creating a sense of community value and strengthening community connectedness and resilience. For some, this created a sense of reassurance of support in the future.

Discussion

A flooding event is a traumatic experience, with health effects being likely larger and longer lasting than the immediate and short-term periods commonly examined. Flooding can interrupt health service availability, transport, equipment, clean water, food and the means to send and receive communication. These disruptions can influence short-term health effects and prolong and accentuate other diseases especially psychological illness and chronic disease (Zhong *et al.* 2018). There is also likely to be a latency period or delayed onset of symptoms. While these effects and symptoms may diminish over time as part of the normal recovery process, the emotional drain of the event can be particularly severe for those whose experience was frightening and traumatic. The results of this study explored the nature of these health issues.

Effect of the Queensland floods

In the context of the 2011 southeast Queensland floods, the results compliment and build on the research of Alderman and colleagues (2013) and Turner and colleagues (2013) by offering a longer-term perspective on a population experiencing a similar exposure and noting possible ongoing effects. The 2011 survey reported that direct flood exposure had significant effects on the perceived physical and psychosocial health outcomes of residents in flood-affected areas.

Those affected were more likely to report poor overall and respiratory health, psychological distress, poor sleep quality and probable PTSD. Expanding on this, Turner and colleagues (2013) reported possible increases in tobacco, alcohol and medication usage by those affected by the floods.

General health

The results are echoed in several studies examining longer-term health effects following floods. These studies suggest that flood victims may experience poorer health outcomes and are more vulnerable than the general population. For instance, studies suggest that floods may decrease a population's general health status and raise the frequency of visits to medical providers (Zhong *et al.* 2018, Assanangkornchai, Tangboonngam & Edwards 2004, Turnstall *et al.* 2006). Chronic diseases have been identified as long-term health issues related to floods (Reacher *et al.* 2004, Gautam *et al.* 2009, Jiao *et al.* 2012) with evidence showing some patients with chronic medical conditions reduced their treatment after floods and this contributed to poorer health outcomes (Kessler 2007, Tomio, Sato & Mizumura 2010). In a Korea-based study, flooding was identified as a significant factor in the reduction of quality of life with the largest reductions found in physical and social functioning (Heo *et al.* 2008).

Psychosocial health

Trauma exposure from floods has been reported in several studies as a risk factor for developing adverse psychosocial outcomes in both high and low-resourced countries (Zhong *et al.* 2018, Assanangkornchai, Tangboonngam & Edwards 2004, Heo *et al.* 2008, Neria, Nandi & Galea 2008, Norris *et al.* 2004, Reacher *et al.* 2004). Similarly, studies evaluating flooding in the UK in 2007 found a two- to five-fold increase in mental health symptoms of people affected by the floods. This was influenced by the severity of flooding, the level of disruption to essential services and how the community recovered. Increased incidence of anxiety, depression and PTSD was observed and, in keeping with much of the research, females were more likely to experience psychological distress (Carroll *et al.* 2010, Paranjothy *et al.* 2011).

Psychological consequences have also been documented for other types of disasters. Parts of Australia are prone to bushfires and studies show a heightened level of psychological distress long after these events. For example, the Black Saturday bushfires in Victoria in February 2009 resulted in 173 fatalities and widespread damage and destruction to buildings and infrastructure. Five years on, higher rates of psychological problems have been recorded for those living in severely affected regions than for those living in less-affected areas and the general population (Bryant *et al.* 2018). Similarly, a study in South Australia on the mental health of adults who experienced a major bushfire in their childhood, found evidence of significantly higher rates of some mental disorders among the survivors than in the control group (McFarlane & Van Hooff 2009).

The dominant factors associated with persistent and severe mental health issues included death of someone close, not receiving mental health assistance (Bryant *et al.* 2018), lack of or weakened social supports (Bryant *et al.* 2017) and exposure to subsequent life stressors or traumatic events (Bryant *et al.* 2018, McFarlane & Van Hooff 2009).

Response and recovery

Immediately following the floods, the Queensland Government established the Queensland Reconstruction Authority Board that was tasked with managing the rebuild and repair of infrastructure in flood-affected areas (Britton 2011). A commission of inquiry was launched to investigate the disaster and recovery efforts (e.g. reinstating essential services), provision of urgent and emergency services (e.g. evacuations, search and rescue) as well as community preparedness and possible preventative measures (Queensland Floods Commission of Inquiry 2012). While the Commission's report praised the government's efforts, it did note inadequacies and made recommendations to improve responses to similar events including improvements to flood planning and information dissemination and clarifying terms of insurance, building codes and communications.

Studies of the long-term effects of disasters confirm that people and communities, particularly in developed countries, are resilient and that despite facing traumatic events and distress, their psychological health improves over time. However, for some people the psychological consequences may linger, especially if the person is not well supported or connected (Bryant *et al.* 2017) or if they experience other life stressors. Therefore, while the Queensland Floods Commission recommendations may maximise the community's preparedness and minimise the damage for future events, this study showed a need to improve the identification and provision of long-term services for people affected by disasters that will alleviate additional suffering and adverse health conditions.

Challenges

This study considered some of the longer-term physical and psychosocial health impacts but there are some challenges that limit a comprehensive assessment of these and their links to other factors and determinants. The cross-sectional design of the study limits the utility of the findings compared to a longitudinal study design (e.g. Bryant *et al.* 2018, McFarlane & Van Hooff 2009). However, this study was conducted anonymously and was not designed as a cohort study. In addition, the response rate of 11 per cent represented a sample of those affected by the floods of 43, which was insufficient for generating strong statistical conclusions. A rigorous survey follow-up process could have increased the overall responses received. Challenges arose from the survey being conducted six years after flood exposure. This left room for re-call bias and perhaps important consequential effects were missed, which, although initially observable, could have resolved in the interim time period.

The degree of flood exposure and a person's role during a flood event are important risk factors for long-term health outcomes (Assanangkornchai, Tangboonngam & Edwards 2004, Heo *et al.* 2008, Norris *et al.* 2004, Reacher *et al.* 2004). When it comes to psychosocial aspects, research highlights that vulnerability to developing a mental health disorder during and preceding a flood is exacerbated by other factors including a person's ethnicity, age, previous exposure to trauma, homelessness, access to social supports, socioeconomic status, pre-existing mental health condition and experience of loss and trauma (Alderman, Turner & Tong 2012). The scope of this study did not account for assessments of the type and degree of exposure nor other possible confounding factors such as the effect of home ownership, exposure to other major weather events and the stress of dealing with insurance companies.

Sampling bias was encountered in this study as a proportion of the affected population had moved away from the area. The sample derived from the electoral role may have excluded residents who reside in the sampled areas but who do not have a fixed address. The inclusion of these groups is important for future studies especially as these residents could be considered as vulnerable.

Implications and recommendations

Flood events are felt most strongly by the people who live in affected areas. As observed in the study and others, these people are at higher risk of experiencing psychological distress and ongoing mental health issues. It is important that this is recognised, including possible delayed onset, by health care providers and that programs are put in place to appropriately respond.

Managing the long-term health of a flood-affected population is an important public policy task. The dissatisfaction with recovery operations and the perceived injustices associated with insurance and compensation and government arrangements indicate that building trust is vital to this process. Emergency and disaster management policy must be responsive to community needs and address the gaps in government and insurance company obligations. To achieve this, a monitoring system is recommended that captures and records data on flood-affected people after flood events that includes health status. This would assist in a greater understanding of how communities in flood-prone areas are coping and would provide data for longitudinal study.

Acknowledgments

Financial support was provided through the Trauma and Disaster Management Research Grant Scheme funded by the National Critical Care and Trauma Response Centre Trust Fund. The authors thank Dr Sophie Zhong and Emily Bailey for their assistance.

References

- Ahern M, Kovats R, Wilkinson P, Few R & Matthies F 2005, *Global health impacts of floods: epidemiologic evidence*, *Epidemiologic Reviews*, vol. 27, pp.36–46.
- Alderman K, Turner L & Tong S 2013, *Assessment of the health impacts of the 2011 summer floods in Brisbane*, *Disaster Medicine and Public Health Preparedness*, vol. 7, no. 4, pp.380–386.
- Assanangkornchai S, Tangboonngam SN & Edwards J 2004, *The flooding of Hat Yai: predictors of adverse emotional responses to a natural disaster*, *Stress and Health*, vol. 20, pp.81–89.
- Britton H 2011, *Queensland Flood Recovery Brief*. At: www.hawkerbritton.com/images/data/Queensland%20Flood%20Recovery%20Brief.pdf.
- Bryant RA, Gallagher C, Gibbs L, Pattison P, MacDougall C, Harms L, Block K, Baker E, Sinnott V, Ireton G, Richardson J, Forbes D & Lusher D 2017, *Mental Health and Social Networks after disaster*, *American Journal of Psychiatry*, vol. 174, no.3, pp.277–285.
- Bryant RA, Gibbs L, Gallagher HC, Pattison P, Lusher D, MacDougall C, Harms L, Block K, Sinnott V, Ireton G, Richardson J & Forbes D 2018, *Longitudinal study of changing psychological outcomes following the Victorian Black Saturday bushfire*, *Australian & New Zealand Journal of Psychiatry*, vol. 52, no. 6, pp.542–551.
- Carroll B, Balogh R, Morbey H & Araoz G 2010, *Health and social impacts of a flood disaster: responding to needs and implications for practice*, *Disasters*, vol. 34, pp.1045–1063.
- Department of Infrastructure and Planning 2017, *South East Queensland Regional Plan 2017–2031*, Brisbane, Australia. At: <https://planning.dsdmp.qld.gov.au/planning/better-planning/state-planning/regional-plans/seqrp>.
- Du W, Fitzgerald G, Clark M & Hou X-Y 2010, *Health impacts of floods*, *Prehospital and Disaster Medicine*, vol. 25, pp.265–272.
- EM-DAT 2011, *Disaster Profiles*, *International Disaster Database*. At: www.emdat.be/database.
- Gautam S, Menachem J, Srivastav SK, Delafontaine P & Irimpen A 2009, *Effect of hurricane Katrina on the incidence of acute coronary syndrome at a primary angioplasty center in New Orleans*, *Disaster Medicine and Public Health Preparedness*, vol. 3, pp.144–150.
- Heo J, Kim M, Koh S, Noh S, Park JH, Ahn JS, Park KC, Shin J & Min S 2008, *A prospective study on changes in health status following flood disaster*, *Psychiatry Investigation*, vol. 5, pp.186–192.
- IPCC 2012, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) in Field CB, Barros V, Stocker T, Qin D, Dokken DJ, Ebi KL, Mastrandrea MD, Mach KJ, Plattner GK, Allen SK, Tignor M & Midgley PM (eds.) A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, NY, USA.
- Jiao Z, Kakoulides SV, Moscona, Whittier J, Srivastav S, Delafontaine P & Irimpen A 2012, *Effect of hurricane Katrina on incidence of acute myocardial infarction in New Orleans three years after the storm*, *The American Journal of Cardiology*, vol. 109, pp.502–505.
- Kessler RC 2007, *Hurricane Katrina's impact on the care of survivors with chronic medical conditions*, *Journal of General Internal Medicine*, vol. 22, pp.1225–1230.
- Leon GR 2004, *Overview of the psychosocial impact of disasters*, *Prehospital and Disaster Medicine*, vol. 19, pp.4–9.
- McFarlane AC & Van Hooff M 2009, *Impact of childhood exposure to a natural disaster on adult mental health: 20-year longitudinal follow-up study*, *British Journal of Psychiatry*, vol. 195, pp.142–148.
- Neria Y, Nandi A & Galea S 2008, *Post-traumatic stress disorder following disasters: a systematic review*, *Psychological Medicine*, vol. 38, pp.467–480.
- Norris FH, Murphy AD, Baker CK & Perilla JL 2004, *Postdisaster PTSD over four waves of a panel study of Mexico's 1999 flood*, *Journal of Traumatic Stress*, vol. 17, pp.283–292.
- Paranjothy S, Gallacher J, Amlôt R, Rubin GJ, Page L, Baxter T, Wight J, Kirrage D, McNaught R & Palmer SR 2011, *Psychosocial impact of the summer 2007 floods in England*, *BMC Public Health*, vol. 11, pp.145–153.
- Queensland Floods Commission of Inquiry 2012, *Final Report*. Brisbane, Australia. At: www.floodcommission.qld.gov.au/publications/final-report/.
- Reacher M, McKenzie K, Lane C, Nichols T, Kedge I, Iversen A, Hepple P, Walter T, Laxton C & Simpson J 2004, *Health impacts of flooding in Lewes: a comparison of reported gastrointestinal and other illness and mental health in flooded and non-flooded households*, *Communicable Disease and Public Health*, vol. 7, pp.39–46.
- Turner L, Alderman K, Huang C & Tong S 2013, *Impact of the 2011 Queensland floods on the use of tobacco, alcohol and medication*, *Australian and New Zealand Journal of Public Health*, vol. 37, no. 4, pp.396–412.
- Tomio J, Sato H & Mizumura H 2010, *Interruption of medication among outpatients with chronic conditions after a flood*, *Prehospital and Disaster Medicine*, vol. 25, pp.42–50.
- Zhong S, Yang L, Toloo S, Wang Z, Tong S, Sun X, Crompton D, FitzGerald G & Huang C 2018, *The long-term physical and psychological health impacts of flooding: A systematic mapping*, *Science of the Total Environment*, vol. 626, pp.165–94.

About the authors

Professor Gerry FitzGerald is a professor at the Queensland University of Technology and discipline leader of health management and disaster management.

Dr Ghasem (Sam) Toloo is a sociologist at the Queensland University of Technology with interest and experience in health and society.

Sara Baniahmadi is a research assistant at the Queensland University of Technology.

Professor David Crompton is Executive Director of Metro South Addiction and Mental Health Services and coordinator for the Centre for Neuroscience, Recovery and Mental Health.

Adjunct Professor Shilu Tong is an epidemiologist at the Queensland University of Technology with interest in environmental health, particularly health associated with climate change effects.

ABSTRACT

This article examines findings from a 2018 project in Cairns, Far North Queensland, on insurance and risk perception. Using a mixed-methods approach, the study explored how people regard insurance, if at all, and how they use it to reduce their risk of financial loss following a disaster event. Results suggest that while most home owners hold insurance, renters are less likely to have contents insurance leaving them financially vulnerable if losing their property. Cost of insurance is considered one barrier to taking out insurance, however, other issues such as risk perception, self-efficacy and trust in insurers are issues for both home owners and renters. The paper furthers knowledge of underinsurance in disaster-prone areas and provides vital information for understanding motivation to withdraw from insurance.

Underinsurance in cyclone and flood environments: a case study in Cairns, Queensland

Dr Nick Osbaldison¹, Dr Connor McShane² and Raechel Oleszek¹

1. James Cook University, Cairns, Queensland.
2. James Cook University, Townsville, Queensland.

Submitted: 6 July 2018. Accepted: 6 September 2018.

Introduction

In Australia, the issue of insurance is of interest to both academics and the public especially as premiums rise across the country. For academics, recent focus has been on why people underinsure to reduce premiums or otherwise opt out of insurance altogether (Booth & Williams 2012, Booth & Tranter 2017, Eriksen & Gill 2010). This increases their financial vulnerability and highlights a growing problem in Australia of people who are exposed to property loss with no safety net in place (Booth & Harwood 2016). Much public discussion has been about the uptake of insurance in disaster-prone areas, particularly for bushfires and cyclones. Events such as the Canberra bushfires of 2003 showed that underinsurance and non-insurance needs to be addressed as part of a household's disaster preparation (Latham, McCourt & Larkin 2010). In the aftermath of the fires, it was estimated that 27–87 per cent of properties were underinsured, which reduced 'rebuilding costs' by 10 per cent (Latham, McCourt & Larkin 2010, p.17). Underinsurance meant people affected by the fires could not rebuild or re-establish themselves as quickly or as completely as they otherwise might. Across Australia, it is estimated that '7% of properties' and a further '28% of contents' are underinsured (Schuster 2013, p.136).

The cost of insurance continues to increase particularly in northern Australia (Treasury 2015, Australian Government Actuary 2014, Booth & Williams 2012). Premiums in north Queensland increased around 80 per cent between 2005 and 2013 (Australian Government Actuary 2014) due to cyclone and flood events and the presence of infrastructure and populations exposed to natural hazards. These increases are out of proportion in comparison to the rest of Australia where, in the same period, premiums for people living in Brisbane increased by 45 per cent and Sydney and Melbourne increased approximately 12 per cent (Australian Government Actuary 2014).

As noted, much of this rise can be attributed to major cyclone events such as Cyclone Larry (2005), Cyclone Yasi (2011) and Cyclone Debbie (2017). Northern Queensland was also hit by ex-Tropical Cyclone Nora in 2018 that caused coastal flooding from Cairns down to Mackay. Factored into the increases in premiums is the requirement for insurers to build a sufficient pool of money to negate future losses based on probability.

Research in Australian southern states that are prone to bushfire shows that insurance is negotiated differently and, at times, trust in the institution of insurance can be quite low (Booth & Harwood 2016, Eriksen & Gill 2010). Research into flood mitigation suggests that this lack of trust is problematic for purchasing insurance as the benefit of receiving insurance support following an event needs to outweigh the cost of the initial outlay of premiums (Poussin, Botzen & Aerts 2014). In addition, Booth and Williams (2012, p.40) suggest that 'low income earners' may be unable to purchase insurance for their property and belongings. When examining disaster preparedness and mitigation, attention to who can and who cannot participate in insurance needs to be included as a focus.

This paper details the results of a study conducted in Cairns, Far North Queensland, looking at three themes. First, people who rent are less likely to take out insurance for their belongings. Second, decisions not to take out insurance are not always related to cost but can relate to other issues like efficacy and risk perception. Finally, trust in insurers and information flow has a role to play in underinsurance and non-insurance.

Method

This research used a mixed-methods approach of quantitative (surveys) and qualitative (interview) data (Creswell 2014). Research was conducted in Cairns, which has a population of 156,901 (ABS 2016a). For the quantitative survey, participants were recruited via letter drops in randomly selected streets across Cairns, leaflets distributed at community events and the Cairns Disaster Coordination Centre and promoted online through community groups. In total, 113 participants completed the survey answering questions about their insurance status, demographics and questions about their attitudes to insurance. This is a relatively small sample size and caution was applied to quantitative results. The research was approved by the James Cook University Ethics Committee (H6801).

Following the survey, 20 participants (9 males and 11 females) were interviewed. 'Occupations' of respondents included students, professionals, parents at home and retired people (Table 1). These semi-structured interviews examined issues including confidence in insurance companies and personal risk perceptions. Surveys were conducted face-to-face and via phone. Strauss's (1999)

Table 1: Selected information for survey participants.

Participant number/ pseudonym	Occupation	Location	Age bracket	Tenure	Insurance level	Family status
P1 – Clarissa	Student	Nth Beach	40–50	Owner	Home/ Contents	Couple
P2 – Jeffrey	Professional	Northern Beaches	60–70	Owner	None	Couple
P3 – Matthew	Student	Northern Beaches	60–70	Owner	Home/ Contents	Couple
P4 – George	Student	Northern Beaches	20–30	Renter	None	Couple
P5 – Harry	Student	Northern Beaches	30–40	Owner	Home only	Couple
P6 – Harriet	Professional	Northern Beaches	50–60	Owner	Home/ Contents	Couple
P7 – Brendan	Student	Northern Beaches	30–40	Renter	None	Couple
P8 – Sally	Professional	Northern Beaches	50–60	Owner	Home/ Contents	Couple
P9 – Jordan	Professional	Northern Beaches	50–60	Owner	Home/ Contents	Couple
P10 – Gregory	Student	Northern Beaches	20–30	Renter	None	Couple children at home
P11 – Marissa	Parent at home	Northern Beaches	20–30	Renter	None	Couple children at home
P12 – June	Professional	Cairns west	40–50	Owner	Home/ Contents	Couple children at home

Participant number/ pseudonym	Occupation	Location	Age bracket	Tenure	Insurance level	Family status
P13 – Bridget	Parent at home	Cairns west	40–50	Renter	Contents	Couple children at home
P14 – Olivia	Professional	Cairns west	40–50	Owner	Home/ Contents	Couple children at home
P15 – Kathryn	Professional	Northern Beaches	30–40	Renter	None	Single parent
P16 – Annalise	Self-employed	Cairns west	50–60	Owner	Home/ Contents	Couple
P17 – Audrey	Self-employed	Northern Beaches	50–60	Renter	None	Single
P18 – Celia	Professional	Northern Beaches	50–60	Owner	Home/ Contents	Couple
P19 – John	Retired	Northern Beaches	60–70	Owner	Home/ Contents	Couple
P20 – Roger	Labourer	Cairns west	60–70	Owner	Home/ Contents	Couple

open coding for analysing data was used to organise data into themes.

Areas around Cairns include a diverse natural environment with mountains to the west and open ocean to the east. When overlaid with demographic data like income, areas like the Northern Beaches show higher income levels than Manunda and Manoora (Table 2). Yorkeys Knob and Machans Beach are on some of the most exposed coastline in Cairns. According to the *Social Indicators for Relative Socio-Economic Advantage and Disadvantage*, populations in these areas score a two out of five ranking for relative socio-economic disadvantage (ABS 2016b). In contrast, Kewarra Beach appears wealthy. This is possibly due to the higher property values of elevated areas opposed to lower areas nearer to the coast and perhaps more exposed to storms. When it comes to insurance, these income inequalities cannot be ignored as it demonstrates who can potentially outsource risk for their property and who cannot.

Findings

Theme 1: Renters and not insuring

A fundamental aim of this research was to investigate narratives within local media that householders do not insure or underinsure to reduce costs. The absence of contents insurance implies that people are self-insuring for possessions. Non-insurance refers to either home owners or renters not holding any form of insurance policy for their possessions or home structures (vehicles excluded). Survey results showed evidence of non-insuring particularly by renters (see Table 3). Home owners with mortgages and outright owners were more likely to have home and contents insurance, however, 16 per cent (n=12) appear to be underinsured. Understanding whether other respondents underinsured

was difficult to ascertain. Respondents were questioned on insurance value (e.g. how much the property and contents were insured for) however, no measure was used to ascertain underinsurance. Of significance, Table 3 shows that a considerable percentage of renters held no insurance at all (67 per cent (n=26)).

The decision not to insure at all is potentially the result of increasing insurance costs. As such, a variable related to why people do not insure was included (Table 4). Only renters are represented in this section. Data shows that the most common answer was 'do not feel the need' (46 per cent (n=12)) with other options including affordability, lack of knowledge, lack of trust and self-insuring.

It is important to understand and explore why people who rent are less likely to insure their belongings. As demonstrated by Booth and Williams (2012, p.41), risk mitigation is 'a matter of personal choice for individuals, households and businesses'. Decisions around why people choose not to insure was the focus of the interviews conducted in this project.

Past research indicates that risk perception has impact on motivation to mitigate dangers (Grothmann & Reuswig 2006, Kanakis & McShane 2016). However, intervening in this is the concept of both self and response efficacy. Bandura (1982) defined self-efficacy as the confidence a person has in their ability to achieve successful outcomes in new or challenging situations. This type of efficacy has significant impact on personal responses to risk. People with high self-efficacy may disregard dangers due to a high degree of self-confidence that they will fare well in precarious situations. On the other hand, response efficacy indicates an individual's confidence that actions (e.g. insurance) will manage the threat or problem (Grothmann & Reuswig 2006). Additionally, if a cost-benefit analysis

Table 2: Selected median household incomes (per week) in the Northern Beaches and Cairns.

Suburb	2011 median income (4 per week)	2016 median income (4 per week)	Percentage change over five years
Palm Cove (Northern Beaches)	1051	1280	17.42
Clifton Beach (Northern Beaches)	1284	1410	8.93
Kewarra Beach (Northern Beaches)	1389	1548	10.27
Yorkeys Knob (Northern Beaches)	938	1025	8.48
Machans Beach (Northern Beaches)	1167	1367	14.63
Edge Hill (Cairns)	1165	1396	16.55
Manunda (Cairns)	755	882	14.39
Manoora (Cairns)	802	894	10.29
Mooroobool (Cairns)	1162	1325	12.30
Australia (Baseline)	1234	1438	14.19

Source ABS 2011, 2016.

Table 3: Tenure types of participants and their insurance status.

Tenure type	Home and contents insurance	Home insurance only (no contents)	Contents insurance only	No house or contents insurance at all	Total
Outright home owner	27	3	2	0	32
Home owner with mortgage	35	6	1	0	42
Renter	0	0	13	26	39
Total	62	9	16	26	113

Table 4: Reasons given by renters for not insuring.

Tenure type	Do not feel need	Cannot afford premiums	Can afford premiums but feel they are too high	Never insured contents or property before	Do not trust insurers	Do not know if need to insure	Self-insuring
Renters	12	5	1	3	1	3	4

is conducted, insurance may be deemed unnecessary when cost is weighed up against what is potentially lost. Interviewees (mostly renters) felt that they had little to lose and therefore did not require property insurance.

Self-efficacy is shaped by past experiences (Bandura 1982). Several participants in the qualitative interviews demonstrated this in their responses. For instance, Kathryn, a single mother who lives in the Northern Beaches area, held no insurance at the time of interview and felt her family would be fine if a disaster struck.

When I left home we sold everything we owned and put our possessions in the car and we drove here and we started a new life [...] we'd do it again. It'd be difficult, but we don't live that materialistic life for it to be a big problem [...] yeah if a cyclone comes I do what I can do, whatever happens, happens.
(Kathryn)

While Kathryn admitted that cyclones are a threat, she negated this through a confidence that, like prior experiences, she could simply start again. Kathryn also demonstrated a cost-benefit analysis. Her possessions were not enough to warrant any insurance, despite having three children.

Others in the sample felt little urgency to insure their property (mostly contents) despite having experienced cyclones previously. Among these interviews, many expressed confidence and little worry for cyclones. For example, George, a former tradesperson who lived in Cairns all his life, does not have insurance and felt little concern despite experiencing 'three or four' in his lifetime

Yeah they're just exciting, like there's a buzz about the place, like when it's happening. I've always been taught it'll be alright here; go to the small room in the house and sit it out.
(George)

George also argued that past cyclones brought his community together in 'social solidarity' in that 'before, during and after' he shared his home with others and had 'drinks' together. Demonstrated in his interview is both confidence in his ability to cope with the risk (self-efficacy) and confidence in his choice to not insure to mitigate the risk (response efficacy).

Very few respondents interviewed who did not insure (or underinsured) suggested that cost was a major reason despite survey data suggesting so. This requires further investigation especially in regional cities or townships vulnerable to natural disasters. As Booth and Tranter (2017, p.11) explain, the lack of insurance or underinsurance could be a 'signal' of widening inequality. In the survey sample, renters were mostly non-insured and represent some of the most financially poor in the Cairns community.

Theme 2: Place-based risks and threat

Where people lived in Cairns also played a role in shaping what participants identified as risks. To assess this, a likert scale was used. Participants who lived in the

Northern Beaches were compared with those who lived closer to Cairns using an independent samples t-test (Table 5). Northern Beaches respondents expressed more concern related to flooding and tidal surges than survey respondents who lived in suburbs nearer the city. Conversely, crime was a significant worry factor for respondents living in these core Cairns suburbs.

Even though flooding and tidal surges were a concern for participants from the Northern Beaches, the scores reflect only minor worry (2=a little worried). Crime on the other hand was a large concern for core suburb residents. Furthermore, climate change appeared as the largest worry for participants. This possibly relates to education background with 62 per cent (n=70) of the survey sample being tertiary graduates or higher.

Risk perception is shaped by both place identity and how dangers are understood. Wester-Herber (2004, p.114) argued that identity with place is 'valuable' and the 'time and energy that has been invested into the land that cannot easily be replaced or insured against'. While natural disasters pose a threat to lifestyles, these are weighed up against the positives of living in vulnerable places. Respondents in the interviews demonstrated this. While cyclones did worry participants, lifestyles, especially near the coast, were deemed important enough to warrant such risks. Several considered threats to their local natural amenity as more important to discuss than the threat of cyclones. For example, Harriet, a middle-aged professional who lived on the foreshore, complained about overdevelopment in her suburbs.

You're seeing these flat housing developments that have been going up in areas like Kewarra Beach and Trinity Beach that are perhaps carbon copies, you know I find them to be very soulless [...] This morning as I was going into Trinity Beach they were putting up a fence, so it's clear that all that land up towards Earl's Hill there is going to be developed. So it just hasn't stopped! I've never seen anything so dramatic.
(Harriet)

As a domestic migrant or 'seachanger' from a southern state, Harriet's concern is not unique (Osbaldiston 2012). People seeking natural beauty are often frustrated with encroaching development on their lifestyles.

Another major concern for the interviewees was crime, as noted in the survey data. Repeatedly, juvenile delinquency was cited as a major worry. Bridget, a young mother who had lived in Cairns for over a decade, expressed this concern. While she argued that 'natural disasters you accept, and you choose to live here knowing that', she complained that, 'crime (youth) is a bit of a blow-up recently and I don't think that's acceptable [...] I firmly place the blame on parents'. Property theft, especially of vehicles, frequently appeared in participant interviews. Interviewees expressed that the threat of crime represented a breakdown of social cohesion whereas, interestingly, cyclones had potential to bring communities together.

Theme 3: Trust in the insurance industry

Trust in institutions (e.g. governments, corporations, science) as well as personal trust of other people has been argued to be declining in recent times. However, Booth and Tranter (2017, p.10) suggest that ‘those who generally trust others are more likely to have insurance’. This survey was designed to measure trust in insurers only. A likert scale on how confident participants were in their insurer to cover them in certain conditions was constructed (see Table 6).

The data shows that confidence in insurers to cover participants is low-to-medium across all conditions selected. Confidence was especially low for flooding events and much lower than theft or cyclone damage. This may reflect the media reports following the 2011 Brisbane floods about lack of insurance coverage where several insured people discovered that their insurer did not cover them for riverine inundation (van den Honert

& McAneny 2011). This could also indicate a wider community backlash against the insurance industry for rising costs of premiums (Treasury 2015).

The qualitative interviews provided further insight. Participants spoke negatively about the insurance industry in areas of distrust through to corporate practices. While most home owners had no choice but to insure their properties (due to mortgage requirements), several participants complained of conflicts with their selected insurer over premium costs and a lack of information sharing. Specifically, respondents indicated they had received unsatisfactory reasons for rising premiums. One participant said she was told that ‘recent environmental things’ had contributed to her dramatically increased premium. When she pressed her insurer on what these were, she did not receive any further information. Others such as Olivia, a middle-aged professional who owned several properties, blamed the insurance industry for improper business practices.

Table 5: Responses to questions on worry with associated t-test results between the Northern Beaches and Cairns suburbs (Means (M), Standard Deviation (SD)).

Variable	Northern Beaches (1= not worried at all to 5= extremely worried)	Cairns core suburbs	t-test results (df), p value
Tropical cyclones	M=3.10, SD=1.323	M=2.63, SD=1.030	1.951 (110),.054
Flooding	M=2.76, SD=1.303	M=2.20, SD=1.305	2.175 (109),.032*
Tidal surges (such as king tides)	M=2.72, SD=1.335	M=1.90, SD=1.128	3.296 (110),.001**
Overdevelopment	M=2.82, SD=1.639	M=2.50, SD=1.617	.993 (110),.323
Crime	M=2.81, SD=1.450	M=3.63, SD=1.580	-2.775 (110),.006*
Local economic conditions	M=3.13, SD=1.532	M=3.05, SD=1.552	.248 (110),.804
Climate change	M=3.83, SD=1.818	M=4.00, SD=1.617	-.495 (108),.622

*- significant at $p<.05$; **-significant at $p<.01$

Table 6: Responses to questions on confidence in insurance companies for insured people on selected risks (Means (M), Standard Deviation (SD)).

Variable	Number of respondents	Confidence in insurer (1= not confident to 6= extremely confident)
Fire	87	M=3.57, SD=1.537
Flooding generally	85	M=2.92, SD=1.490
Flooding via waterway (river, creek)	86	M=2.58, SD=1.499
Flooding via ocean (storm surge)	86	M=2.36, SD=1.471
Cyclone damage	86	M=3.35, SD=1.501
Storm damage	85	M=3.20, SD=1.454
Theft	86	M=3.51, SD=1.686
Accidental damage	86	M=2.78, SD=1.690

My take on it [...] this is my instinct, is that, those significant events, south-east corner events, and again this is my perception of (insurers name) are massive claims load and (insurer) didn't manage their affairs properly to cover the costs and I become the victim of their bad business practices [...] they say to me on the phone 'the risk has increased' and my argument is, the risk has not increased.
(Olivia)

The study also found that some renters who did not insure also expressed distrust of the insurance industry. This aligns with Booth and Tranter (2017, p.11) that lack of information is linked to underinsurance in Australia. Further research is recommended to confirm this.

Conclusion

This paper explores the question of insurance, risk perception and trust by people in disaster-prone areas around Cairns. There are limitations to the work that require further investigation especially on the role of efficacy and trust in the decision to insure property. Despite this, the paper has provided some clear themes for further research including that renters are less likely to insure property (contents) than home owners. Cost of insurance, trust in the industry and confidence in capacity to deal with challenging circumstances were all contributing factors to non-insurance. Renters also represent some of the poorest in the community of Cairns. More data, especially in low socioeconomic places, are required to understand this further.

This paper also presents evidence on place identity and trust as factors in underinsurance and non-insurance. Consistent and ongoing daily dangers such as crime impact on people's worries rather than natural disaster risks such as cyclones. There is also evidence in this research of distrust between people and the institution of insurance. The ability for insurers to justify their costs to consumers appropriately appeared as a significant concern to participants. As noted from the interview data, individuals will make their own judgements on issues like rising premium costs. The results of this study will need to be investigated further to take into account preparedness for large-scale natural disasters, assess local resilience and deepen discussions on adaptation for climate change along Australia's coastlines.

References

- Australian Bureau of Statistics 2016a, *Census Data – Cairns local government area*. At: http://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/communityprofile/306?opendocument.
- Australian Bureau of Statistics 2016b, *SEIFA data*. At: www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2033.0.55.001-2016-Main%20Features-Interactive%20Maps-7.
- Australian Government Actuary 2014, *Report on home and contents insurance prices in North Queensland, Commonwealth of Australia, Canberra*.
- Bandura A 1982, *Self-efficacy mechanism in human agency*. *American Psychologist*, vol. 37, no. 2, pp.122–147.
- Booth K & Harwood A 2001, *Insurance as catastrophe: a geography of house and contents insurance in bushfire-prone place*. *Geoforum*, 69, pp.44–52.
- Booth K & Tranter B 2017, *When disaster strikes: Underinsurance in Australian households*. *Urban Studies*, vol. 55, no. 14, pp.3135–3150.
- Booth K & Williams S 2012, *Is insurance an under-utilised mechanism in climate change adaptation? The case of bushfire management in Tasmania*. *Australian Journal of Emergency Management*, vol. 27, no. 4, pp.38–45.
- Creswell J 2014, *Research design: qualitative, quantitative and mixed-methods approaches*, Sage, London.
- Eriksen R & Gill N 2010, *Bushfire and everyday life: examining the awareness-action 'gap' in changing rural landscapes*. *Geoforum*, 41, pp.814–825.
- Grothmann T & Reusswig F 2006, *People at risk of flooding: why some residents take precautionary action while others do not*. *Natural Hazards*, vol. 38, pp.101–120.
- Kanakis K & McShane C 2016, *Preparing for disaster: preparedness in a flood and cyclone prone community*. *Australian Journal of Emergency Management*, vol. 31, no. 2, pp.18–24.
- Latham C, McCourt P & Larkin C 2010, *Natural disasters in Australia: issues of funding and insurance*. Paper presented to the Institute of Actuaries of Australia Seminar, 7–10 November, 2010. At: <https://actuaries.asn.au/library/events/GIS/2010/NaturalDisastersInAustralia-Paper.pdf>.
- Osbaldiston N 2012, *Seeking authenticity in place, culture and self*, Palgrave Macmillan, New York.
- Poussin JK, Botzen WJW & Aerts JCJH 2014, *Factors of influence on flood damage mitigation behaviour by households*. *Environmental Science and Policy*, vol. 40, pp.69–77.
- Schuster S 2013, *Natural hazards and insurance*. In Palutikof J, Boulter SL, Ash AJ, Smith M, Parry M, Waschka M & Guitart D (eds) *Climate adaptation futures*, John Wiley and Sons, Oxford.
- Strauss A 1999, *Basics of qualitative research: grounded theory procedures and techniques*, Sage, Thousand Oaks, CA.
- Treasury 2015, *Northern Australia insurance premiums taskforce: final report*, Commonwealth of Australia, Canberra.
- van den Honert R & McAneney J 2011, *The 2011 Brisbane floods: causes, impacts and implications*. *Water*, vol. 3, pp.1149–1173.
- Wester-Herber M 2004, *Underlying concerns in land-use conflicts – the role of place identity in risk perception*. *Environmental Science and Policy*, vol. 7, pp.109–116.

About the authors

Dr Nick Osbaldiston is a sociologist at James Cook University, Cairns. He researches migration studies, climate change adaptation and cultural sociology.

Dr Connor McShane is a lecturer at James Cook University, Townsville. Her research interests are in rural health, sustainability and development.

Raechel Oleszek is a graduate student at James Cook University, Cairns. Her research is in community practices, international development, environmental sustainability and risk perception in local communities.

ABSTRACT

In Australia, the *National Strategy for Disaster Resilience* mandates that emergency management authorities use effective community engagement to develop trust and respect with community members to provide effective, inclusive disaster management practices. Using these principles, researchers from the University of Tasmania reconceptualised the term 'community' as a 'community of practice' and facilitated a multi-disciplinary workshop giving authorities, managers, planners and responders a forum to meet and collaborate to identify strengths, collective capacities and needs. The workshop was attended by 48 stakeholders dealing with emergencies and identified more than 30 research and 20 training needs as well as potential funding opportunities. The workshop also identified a fertile area for research and training given the critical mass of interested academics with experience and expertise in natural hazards fields. Attendees identified the latent potential for interdisciplinary, cross-sectoral collaboration and tapped into potential resources that address disaster management needs. This process has the potential to produce similar results nationally by enabling place-based disaster research to be identified by those who need it most.

Reconceptualising 'community' to identify place-based disaster management needs in Tasmania

Dr Sandra Astill, Dr Stuart Corney, Dr Rebecca Carey, Stuart Auckland and Dr Merylin Cross, University of Tasmania, Hobart, Tasmania.

Submitted: 28 October 2018. Accepted: 26 November 2018.

Introduction

The *National Strategy for Disaster Resilience* (Commonwealth of Australia 2013) mandates community engagement as a vital tool to identify the risks, strengths and capacities of communities prone to natural disasters. Despite this, emergency management authorities seldom have opportunities to openly discuss their needs, strengths and limitations in a community engagement environment. 'Community engagement' is regarded as a vital tool to develop mutual trust and respect between emergency management organisations and community members to achieve cooperative, harmonious and mutually supportive decision-making (Bryson & Mowbray 1981, p.256). Defining a community as a group of people linked by social and common ties and perspectives, who engage in joint action within geographical localities (MacQueen *et al.* 2001, p.1930), community engagement is actually a process that identifies specific capacities, strengths and priorities of communities, allowing a partnership of agencies and service.

This paper discusses the outcomes of an interdisciplinary and cross-sectoral workshop that reconceptualised the term 'community' as that of a 'community of practice'. The workshop was an opportunity for emergency managers in Tasmania to have a voice and identify their specific needs. The demographic features of Tasmania, and its vulnerability to an array of natural hazards, often results in emergency services organisations facing a complex web of issues not experienced in other states and territories. Collaboration during the workshop by the stakeholders identified and prioritised research gaps, teaching and training needs and potential funding opportunities. Feedback from the 'community of practice' identified the potential role that the University of Tasmania can play in filling gaps in knowledge and practice that hamper effective disaster management in Tasmania. Collaboration between the university and stakeholders can increase the capability of those working in the field and foster relationships and leverage partnerships that assists emergency management planning and practice.

Background

Tasmania is exposed to an array of hazards including bushfire, flood, severe storm, landslide, tsunami, earthquake, heatwave, coastal inundation and

pandemic influenza (Tasmanian Government 2016). A reminder of this was the damage and havoc created by flash flooding in Hobart in May 2018 (Australian Broadcasting Commission 2018). Tasmania also has a history of severe bushfire seasons that are faced by many small, and sometimes more isolated, communities. The existing body of research identifies factors influencing how people prepare for, respond to and recover from natural disasters that include age, health, social connectedness and access to services (Cherry *et al.* 2010, Cutter & Finch 2008, Fernandez *et al.* 2002, Horney *et al.* 2012). However, Tasmania faces additional challenges. The population is ageing faster than others in Australian states and territories (Australian Bureau of Statistics 2016) and almost 20 per cent of Tasmanians are over the age of 65 years. Issues of ageing are compounded by social and health indicators that align the state with those of rural and remote Australia (Tasmanian Government 2013). Such statistics have serious implications for natural disaster preparation and recovery, particularly considering that Tasmania has a highly decentralised population (Tasmanian Government 2012).

Community engagement

To deal effectively with issues that could compromise the safety of individuals and communities during a disaster, emergency managers and planners must identify vulnerable populations early. In Australia, agencies are mandated to engage proactively with communities through a process of engagement, described by the *National Strategy for Disaster Resilience* as '... the process of stakeholders working together to build resilience through collaborative action, shared capacity building and development of strong relationships built on mutual trust and respect' (Commonwealth of Australia 2013, p.2). To this end, community engagement is a vital process to identify community perceptions and concerns and establish effective policies and actions related to disaster risk reduction (Teo *et al.* 2017, p.38).

Typically, the term 'community', when used within emergency management contexts, has meant populations residing in a disaster-prone area. To date, the term 'community' has not put the focus on those trying to manage disasters and the resulting effects. This highlights a gap in the processes used to understand what information emergency managers and planners need to improve their capacity and capability to respond. It also highlights that emergency management, which encapsulates planning, organisation, coordination and implementation of measures necessary to prevent, mitigate, respond to, overcome and recover from an emergency (Tasmanian Government 2006) is not a homogenous process. Unique circumstances create unique issues that are often relevant to unique locations. Tasmania is an example.

To address this, a bottom-up, inclusive, community engagement process, typically used when engaging with communities located in exposed and disaster-

prone locations, was used to identify the needs of those at the frontline of emergency management. This process is a key component of the *National Strategy for Disaster Resilience* Community Engagement Framework (Commonwealth of Australia 2013, p.3) that outlines the importance of this approach to achieve community and organisation resilience. The strategy acknowledges the importance of local programs that recognise an agency's operational requirements. Of equal importance is balancing specialist expertise with community expertise for planning, decision-making, preparation and response and recovery activities. Such processes operate on three fundamental principles:

- an understanding of a community's capacity, strengths and priorities
- recognising a community's uniqueness and complexity
- partnering with a community to support existing networks and resources.

The strategy stresses that in order to understand a community's capacity, strengths and priorities, people involved in the community engagement process must respect and use local knowledge, resources (economic, physical, social and environmental) and tap into existing networks (Commonwealth of Australia 2013, p.4). This must be accompanied by an appreciation and assessment of the risks faced and an understanding of the levels of community awareness and preparedness that exist (Commonwealth of Australia 2013, p.4).

The strategy outlines that effective community engagement must recognise the complexities involved in engaging with a community and recommends engagement activities that consider a community's unique and diverse characteristics. Actions should be meaningful, inclusive and consider differing perceptions of risk. Plans should be flexible and identify and address barriers, as well as recognise that communities evolve and change over time. Understanding differences in perceptions of risk is important. As such, the strategy acknowledges the importance of considering aspects of age, gender, culture, physical abilities, geographical locations, access to services and social disadvantage within the community (Commonwealth of Australia 2013, p.7). The strategy also highlights the importance of building on existing social capital, developing initiatives that engender local action and partnering with the community; fostering relationships with community leaders and respecting community choices.

Reconceptualising 'community'

Using the *National Strategy for Disaster Resilience* community engagement principles, it was clear that such a process was capable of identifying the needs and capacity of any community. The only challenge was to reconceptualise the term 'community' to the collective group of individuals, organisations, government departments, not-for-profit organisations and volunteers who are called to action when assistance is needed. Therefore, the 'community' within this community

engagement process, became a 'community of practice' with a membership of emergency management organisations, managers, planners, volunteers and responders charged with keeping people, property and environments safe during times of extreme events.

Here, 'community of practice' included emergency services personnel, such as the Tasmania Fire Service and the State Emergency Service, local government disaster managers, government representatives from the Tasmanian Department of Health, Tasmania Networks, the Tasmanian Department of Premier and Cabinet, Mineral Resources Tasmania, the Department of State Growth and the Tasmanian Climate Change Office. Representatives from the Red Cross, the Bureau of Meteorology and the CSIRO were also included as were local hydrologists, engineers and academics from the university; representing 14 disciplines with natural disaster interests.

The aim of the community engagement process was to discover the issues faced in relation to emergency services delivery in Tasmania; what was needed to improve service delivery, what collaborations would improve practice, what those collaborations would look like and what role the university could play to facilitate these. The workshop allowed quick identification of the priority needs for Tasmania that align with the 2016 Tasmanian State Natural Disaster Risk Assessment (White *et al.* 2016). The risk assessment report is a place-based risk assessment of Tasmania's vulnerability to a range of priority natural hazards, including the risks Tasmania specifically faces associated with a changing climate including heatwave and coastal inundation. The report builds understanding and awareness of the natural hazards that have the greatest potential to impact on the state. This will assist Tasmania to be better prepared for, respond to and recover from natural disasters.

The workshop created linkages and opportunities between the university and the community by working together on Tasmanian-focused natural hazard projects and initiatives. The aim is to strengthen the capacity of these 'communities of practice' while giving voice to local disaster authorities to guide future natural hazard research initiatives.

The 'community of practice'

Almost 50 stakeholders attended the workshop held in Hobart in August 2018. Topics included risk assessment, the changing profile of risk caused by changes to the climate, theories of adaptive and resilience capacity of individuals and communities to natural hazards, community engagement strategies and issues related to providing health services in rural settings during a natural hazard event. Group discussions elicited research needs, teaching and training gaps specific to emergency planning as well as funding opportunities.

Participants discussed what they needed to enable them to fulfil their roles, improve their capacities and practices and identified who they needed to collaborate with to achieve goals and instigate positive change.

Within two hours, participants identified 34 research needs, 24 teaching and training needs, and 31 potential funding sources. Interestingly, many of the research and training needs identified were specific to Tasmania, including the state's demographic challenges, particularly in relation to evacuation, volunteerism and rural health service provision. Gaps between state and local government policy expectations and frontline emergency management capabilities were also of concern, along with the need for hazard modelling and mapping, the mental health of ageing emergency responders and problems associated with Tasmania's low literacy levels and the effect that has on hazard communication. The training gaps included specific natural hazard training in the current nursing curriculum and the need for courses on land rehabilitation, hydrology, fire management and land-use planning. Participants also called for the development of a Tasmania-focused natural hazard HUB to coordinate research between academics, practitioners and partner networks.

Conversations were rigorous, demonstrating a genuine interest in working together. Attendees had a strong sense of cooperative goodwill, generosity and collegiality. Post-workshop evaluation surveys identified a number of additional research ideas and some projects have entered planning stages. The success of the workshop and energy generated had fed into a collaborative community-based forum on bushfire preparedness in two ageing communities and a natural disaster symposium for academics and external stakeholders undertaking natural hazards research. This will showcase the breadth of research activity on natural hazards being undertaken and foster the continuation of collaboration and information sharing.

Outcomes

The Bushfire and Natural Hazards CRC has undertaken and produced a significant body of work (<http://www.bnhcrc.com.au/research/cluster/communications-warnings>). To expand on this, the workshop identified research, training and potential funding opportunities specific to Tasmania. This will increase the probability that Tasmania is well-positioned to fill gaps and meet emerging needs in emergency preparedness, response and recovery. Many attendees expressed that the partnership support of the university would increase the capacity of those working in the emergency management field and foster relationships and partnerships that would help the community of practice build the resilience and wellbeing of individuals and communities in Tasmania.

Qualitative researchers understand that complex personal and social problems are best solved by drawing on multiple viewpoints and that those viewpoints are expressed best by people with lived experience (Lapan, Quartaroli & Riemer 2001). The methods used to collect those viewpoints form the basis of inclusive community engagement processes used by emergency managers working within communities. It is logical that people working in the field as a community of practice allows

for their unique viewpoints and experiences to be heard and actions identified. Accordingly, research institutions are well-positioned to both inform future research and training and improve the capacity of those in harm's way, particularly when strengthened by partnerships with those working at the coalface.

Conclusion

The multi-disciplinary, cross-sectoral workshop on natural hazards and disasters identified a fertile area for research and training. Key to the success of the workshop was that it brought together complementary knowledge and skill sets of research teams that included disaster management, geo-spatial mapping, health-impact assessment and community resilience with the wide range of stakeholders planning for, preparing and responding to events when they occur. This community-of-practice process has the potential to produce good results nationally, by enabling place-based disaster research to be identified by those who need it and use it.

Acknowledgments

This paper was authored by the University of Tasmania from the faculties of Earth Science, Antarctic Climate and Ecosystems Corporate Research Centre and the Centre for Rural Health. Team member research includes natural hazards and the impact on populations and the environment.

References

- Australian Broadcasting Commission 2018, *Hobart weather: Record rain, flash flooding inundates CBD and parts of southern Tasmania*. At: www.abc.net.au/news/2018-05-11/hobart-weather-flash-flooding-record-rainfall/9750032 [11 September 2018].
- Australia Bureau of Statistics 2016, *Census of Population and Housing: Reflecting Australia – Stories from the Census, 2016*, Australian Bureau of Statistics Cat: 2071.0. At: www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0~2016~Main%20Features~Ageing%20Population~14 [12 September 2018].
- Bryson L & Mowbray M 1981, *Community: The spray-on Solution*, *Australian Journal of Social Issues*, vol. 16, no. 4. pp.255–266.
- Cherry, KE, Galea S, Su LJ, Welsh DA, Jazwinski SM, Silva JL & Erwin MJ 2010, *Cognitive and psychosocial consequences of Hurricanes Katrina and Rita among middle aged, older, and oldest old adults in the Louisiana Healthy Aging Study*, *Journal of Applied Social Psychology*, vol. 40, no. 10, pp.2463–2487.
- Commonwealth of Australia 2013, *National Strategy for Disaster Resilience: Community Engagement Framework*. At: <https://knowledge.aidr.org.au/media/1761/handbook-6-national-strategy-for-disaster-resilience-kh-final.pdf> [10 September 2018].
- Cutter SL & Finch C 2008, *Temporal and spatial changes in social vulnerability to natural hazards*, *Proceedings of the National Academy of Sciences*, vol. 105, no. 7, pp.2301–2306.
- Fernandez LS, Byard D, Lin CC, Benson S & Barbera JA 2002, *Frail elderly as disaster victims: emergency management strategies*, *Prehospital and Disaster Medicine*, vol. 17, no. 2, pp.67–74.
- Horney JA, MacDonald PDM, Willigen M & Kaufman JS 2012, *The importance of effect measure modification when using demographic variables to predict evacuation*, *Risk, Hazards & Crisis in Public Policy*, vol. 3, no. 1, pp.1–19.
- Lapan S, Quartaroli M & Riemer J 2011, *Qualitative Research: An Introduction to Methods and Design*, vol. 37, 1st edn, John Wiley & Sons, CA.
- MacQueen K, McLellan R, Metzger D, Kegeles S, Strauss R, Scotti R, Blanchard, L & Trotter, R 2001, *What is community? An evidence-based definition for participatory public health*. *American Journal of Public Health*, vol. 91, no. 2, pp.1929–1938.
- Tasmanian Government 2006, *Emergency Management Act 2006*. At: www.legislation.tas.gov.au/view/whole/html/inforce/current/act-2006-012 [11 September 2018].
- Tasmanian Government 2012, *Rural and Isolated Communities: Guide to Engagement*, Department of Premier and Cabinet. At: www.dpac.tas.gov.au/_data/assets/pdf_file/0003/227595/Engaging_rural_and_isolated_communities.pdf [13 September 2018].
- Tasmanian Government 2013, *Health Indicators Tasmania 2013, Population Health*, Department of Health and Human Services. At: www.dhhs.tas.gov.au/_data/assets/pdf_file/0019/132283/Health_Indicators_Tasmania_2013.pdf [13 September 2018].
- Tasmanian Government 2016, *2016 Tasmanian State Natural Disaster Risk Assessment: All Hazards Summary*. At: www.ses.tas.gov.au/assets/files/EM%20Publications/disaster_resilience/TSNDRA-2016-All-Hazard-Summary.pdf [12 September 2018].
- Teo M, Lawie M, Goonetilleke A, Ahankoob A & Dellami K 2007, *Engaging vulnerable populations in preparedness and response: a local government context*, *Australian Journal of Emergency Management*, vol. 33, no. 1, pp.38–47.
- White C, Remenji T, McEvoy D, Trundle A & Corney S 2016, *Tasmanian State Natural Disaster Risk Assessment*, University of Tasmania. At: www.ses.tas.gov.au/assets/files/EM%20Publications/disaster_resilience/TSNDRA-2016.pdf [11 September 2018].

About the authors

Dr Sandra Astill is a human geographer at the University of Tasmania. Her research interests are on the impact of policy on vulnerable people prone to disasters.

Dr Stuart Corney is a lecturer and researcher in climate effects at the University of Tasmania. His research interests include understanding the way climate change is likely to be felt at the community level.

Dr Rebecca Carey is an earth scientist at the University of Tasmania. Her research interests are on risk mitigation strategies for geological hazards.

Stuart Auckland is a researcher and lecturer at the University of Tasmania. His areas of expertise include rural community development and community health.

Dr Merylin Cross is a social researcher at the University of Tasmania. Her interests are in rural health, interdisciplinary collaboration and disaster preparedness as well as response and recovery.

ABSTRACT

Little is known about the (in)actions of Australian householders in terms of their disaster risk reduction (DRR) practices. The degree to which top-down, educative methods are effective at prompting householder actions is questioned by practitioners and disputed within the academic literature. However, these methods remain the dominant forms of 'engagement' applied within the emergency services sector. This paper presents the initial findings of an alternative method for engaging householders, which builds relationships between emergency services organisations and the public. A total of 74 Community Engagement for Disaster Risk Reduction (CEDRR) door-knock surveys were conducted with householders in Victoria by volunteers from the Victoria State Emergency Services (VicSES) and Australian Red Cross in partnership with researchers from the University of Melbourne. These findings provide valuable insights into householder (in)action and show intentions and actions resulting from CEDRR engagements. The findings demonstrate there can be effectiveness when engagement is rooted in relationships. This paper offers an empirically supported method that challenges the prevailing educative methods.

'(In)action': rethinking traditional understandings of disaster risk reduction

Isabel Clare Cornes¹, Dr Brian Cook¹, Dr Paula Satizábal¹ and Dr Maria de Lourdes Melo Zurita²

1. University of Melbourne, Melbourne, Victoria.
2. University of New South Wales, Sydney, New South Wales.

Submitted: 5 July 2018. Accepted: 27 September 2018.

Introduction

Without considering the probable impacts of climate change, the tangible and intangible effects of natural disasters in Australia is expected to average \$33 billion annually by 2050 (Deloitte Access Economics 2016, p.12). While predominantly catalysed by hydrometeorological events, disasters are not 'natural' (O'Keefe, Westgate & Wisner 1976) and their costs are not inevitable. Rather, they are the result of entwined social, economic and political factors (Wisner *et al.* 2004). The extent to which householders can influence many of these structural factors is contested. The *National Strategy for Disaster Resilience* (Commonwealth of Australia 2011) states that DRR is based on individuals 'taking their share of responsibility' (p.5). In the context of increased risk, the role of government and the emergency services sector is framed as supporting community DRR actions through top-down education and engagement to achieve behaviour change. However, these approaches are implicitly based on a Knowledge Deficit Model (KDM), which considers lack of knowledge as the main cause of public inaction and the provision of information fundamental to behaviour change (Wynne 2006, Cook & Overpeck *in press*). This framing has long been recognised as ineffective (Paton, Smith & Johnston 2005, State of Victoria 2012), prompting the development of alternative approaches.

This paper presents the findings of 74 face-to-face surveys using the interactive CEDRR methodology, conducted with householders in the City of Whittlesea Council local government area in Victoria. The interactions were led by volunteers from VicSES and the Australian Red Cross in partnership with researchers from the University of Melbourne. These findings are part of an ongoing study assessing the effectiveness of relationship-building activities undertaken between the emergency services sector and the public. This approach is a form of participatory engagement that does not rely on information transfer nor the assumption that information will prompt behaviour change (Cook & Overpeck *in press*). The hypothesis is that nurturing relationships that can be activated by the public may be more effective in generating behaviour change than practices rooted in educative approaches. These relationships may enable a better understanding of the contextual and household decisions that influence their (in)actions.

The findings are of particular interest for practitioners and help emergency services organisations advance their understanding of the rationalities of

householders and reorient engagement activities to support householder decision-making. The findings showed positive impacts from the CEDRR engagement and indicated a need to move away from notions rooted in the KDM concerning householder '(in)actions' in both research and in practice.

(In)action: beyond the Knowledge Deficit Model

Householders are at the frontline of preparation, response and recovery for emergency and disaster events. However, comparatively little is known about their actions and inactions. Despite the acknowledgment that community engagement is a critical part of disaster resilience (Webber *et al.* 2017), education and information dissemination is largely based on predetermined 'expert' objectives and remains the predominant form of 'engagement' in Australian risk management (Elsworth *et al.* 2010). Education, defined in the context of disaster resilience by Dufty (2011, p.36), involves 'planned activities that lead to a prescribed outcome'. Unlike its more collaborative use within the education literature (Freire 1968), education within DRR is a predominantly unidirectional flow of knowledge from 'experts' to the 'public' (Irwin 1995, p.144). The *Victorian Emergency Management Reform White Paper* states:

while significant improvements have been made in the last 10 years, evidence from the VBRC, Floods Review, research and agency experience indicates that the current reliance on information dissemination only helps a limited number of people who are at risk. (State of Victoria 2012, p.7).

Underlying this approach is the assumption that householders fail to understand risk (Irwin, Dale & Smith 1996) and are perhaps ignorant or unaware and, as a result, are unprepared. Current engagement activities have been unable to escape the KDM and there are few examples of alternative participatory approaches (Elsworth *et al.* 2010). Further, attempts to scale examples of successful participatory engagement have failed to be effective in other contexts (Phillips 2015). Following Arnstein's (1969) *Ladder of Participation* and the IAP2 International Federation (2014) *Public Participation Spectrum*, the most effective forms of participation result in the empowerment of the public; 'informing', 'consulting' and 'educative' approaches are deemed tokenistic because power remains with 'experts'. This understanding of participation distinguishes between methods that focus on information transfer and those that implement effective participation for change. Those methods reliant on information transfer are not judged as meaningfully participatory.

Education as 'engagement' is used by emergency services organisations when using information flyers, advertising campaigns and community forums as primary communication methods for more traditional DRR actions. These actions, reliant on being prompted

by awareness raising, include having a documented home escape plan (Cook & Melo Zurita 2016), a working smoke alarm, a fully stocked emergency kit, backups of important documents, first aid training as well as insurance coverage (Victoria State Emergency Service 2018). There is little rigorous and representative state or national data regarding the adoption of these measures by householders, nor studies that analyse the adoption of these actions following 'awareness raising'. The most recent assessment of household preparedness for emergencies was conducted by the Australian Bureau of Statistics (ABS) in NSW, Queensland, Victoria and the ACT in 2007 (ABS 2008). Examining these statistics based on 'traditional' household actions, Nicolopoulos and Hansen (2009, p.66) identified the need to develop context-specific preparedness programs because a one-size-fits-all approach to DRR is not effective. While these traditional actions in themselves are important and form part of any DRR program, the prevailing focus on information transfer to prompt action may overshadow alternate forms of engagement with householders that accomplish similar objectives but that do not rely on the KDM.

While the language of community participation and engagement is prevalent in policy within the emergency services sector, there are few examples of engagements that do not rely on the KDM (Elsworth *et al.* 2010) and little research exploring the effectiveness of the efforts that rely on educative approaches. The *Community Engagement Framework* for the NSDR highlights 'an approach that seeks to empower communities is relatively new in the emergency management sector' (Commonwealth of Australia 2013, p.3). Arbon and colleagues (2013) developed a tool for government, non-government and community groups to measure and identify householder resilience that facilitated conversations with those identified as likely to be vulnerable. Their purpose was to provide relevant information, raise awareness and promote the uptake of existing support services. This effectively reimplements a KDM approach with a participatory 'vener'. The program targeted vulnerable householders rather than a randomised whole-community approach, which may inhibit extrapolation of findings. Webber and colleagues (2017) sought to apply participatory approaches in workshops in three NSW localities. This attracted a small, non-representative sample of community members. The engagement approach and understanding of community perspectives used were predefined by 'expert' reference groups.

Within this educative paradigm of DRR, actions taken by householders are judged relative to expert-determined benchmarks. This results in an action-inaction divide that ignores the often logical, rational and conscious decisions 'to not' implement a particular response. Emerging research challenges the assumption that lack of information and awareness are the main contributors to (in)action in households (Meusburger & Werlen 2017, Slovic *et al.* 2004). Further compounding this, engagement activities delivered via educative methods have not been shown to affect behaviour

change (Abunyawah, Gajendran & Maund 2018). Thus, the prevalence of the KDM approach and associated knowledge practices, alongside the absence of evidence to support its effectiveness, suggest that the language of engagement and participation has, to date, been unable to overcome the entrenchment of KDM forms of participation.

The CEDRR methodology was developed in response to the challenges raised by practitioners and within the literature, and to collect rigorous data to explore participation in greater detail.

Building relationships rather than awareness

The CEDRR methodology was developed to facilitate effective and participatory community engagement between emergency services personnel and the public, placing relationship building at its core rather than information transfer. The methodology uses interactions founded on mutual respect and equality. Ideally, trust results from the interactions rather than being presupposed. There is care and a long-term commitment to mutual betterment as well as continuous efforts to use dialogue to contribute to mutual learning (Freire 1968).

CEDRR views face-to-face dialogue as the basis for engagement. The method draws from the psychological literature on the Hawthorne effect (McCambridge, Wittonn & Elbourne 2014), which demonstrates that the act of engagement has a potentially significant, and often overlooked, impact on the behaviour of all participants, as opposed to the content of the engagement (e.g. information transfer). Research by Brockman and Kalla (2016) on reducing transphobia and Bond and colleagues (2012) on political mobilisation, demonstrate the possibilities of such methods and highlights the significant role of face-to-face relationship building in facilitating attitudinal and behavioural change. Research by Aldrich (2012) on the role of social capital highlights the importance of social networks and relationships in response and recovery phases. Drawing together the work by Bourdieu (1986) on forms of capital and recent participatory research (Chilvers & Kearnes 2016, Cooke & Kothari 2001), the method does not presuppose 'what publics want' or 'what publics should do'. Rather, nurturing social relationships (Melo Zurita *et al.* 2017) is something that the public can activate if they choose and on their terms.

The face-to-face survey used to initiate the relationship building involved pairs of emergency service personnel. The CEDRR survey was delivered via a tablet connected to the 4G network and took a minimum of ten minutes to complete, depending on the level of enthusiasm. The interaction involved back-and-forth dialogue between the interviewer and the householder to establish perceptions and to provide opportunities for mutual learning. The survey was comprised of questions regarding 'traditional' risk-reduction actions in addition to allowing the interviewees to identify and add other responses relevant to their circumstances,

which updated in real time. This allowed assessment of the state of preparedness of households in addition to raising of 'non-traditional' concerns and actions. Householders could volunteer to participate in a follow-up interview. The CEDRR methodology facilitated interaction between emergency services volunteers and householders and sought to build a relationship; relying less on awareness, cognition and commitments.

The survey is at www.communityriskreduction.org.au. The aggregated data is available to view online and is anonymised in accordance with University of Melbourne's ethics policy. This research was approved by the University of Melbourne Human Ethics Committee (1750250.1).

Case study

Whittlesea is a township situated in the northern suburbs of Melbourne, Victoria. It is a rapidly growing and large municipality (489km²) with a population of 207,881 that is estimated to increase to 333,700 by 2036 (City of Whittlesea Council 2017, p.88). It is culturally diverse, with 49 per cent of residents speaking a language other than English at home and 42 per cent of residents having been born overseas (City of Whittlesea Council 2017, p.14). Householders within the local government area are exposed to a variety of hazards, particularly bushfire, grassfire and flooding as well as a number of hazards identified in the CEDRR survey. Recent events affecting Whittlesea include the 2009 Black Saturday bushfires, the 2013 and 2015 Epping grassfires and significant flash flooding following storms in December 2016.

Survey sample

Households were identified based on a random sample of 70,987 private residences across 18 suburbs that comprise Whittlesea (ABS 2017). The randomised data points were allotted in clusters of six residences that were systematically visited until a resident was available and willing to take the survey. This became the data point for the cluster. Of the 476 households door-knocked, 74 householders were home and willing to complete the survey, representing a 16 per cent completion rate. Surveys were conducted over three weekends between February and May 2018. Of the 74 completed surveys, 64 provided demographic data. While demographic data is useful for contextualising the household, it is important to recognise its limitations in effectively predicting the vulnerability and (in)actions of householders (Nicolopoulos & Hansen 2009).

Demographic characteristics of respondents were:

- 48 per cent identified as female
- the median age of participants was 35–44 years
- 73 per cent owned their own home; the remainder rented

- 49 per cent had lived at the current address for more than five years
- 47 per cent had lived in Australia their entire lives, 35 per cent had lived in Australia more than 10 years and 17 per cent less than 10 years
- 24 per cent were single-person households, 8 per cent were single with dependents, 37 per cent were two-person households and 31 per cent were two-person households with dependents
- 19 per cent considered themselves part of a group particularly vulnerable to large-scale emergencies or disasters
- 68 per cent identified as 'Caucasian', 17 per cent identified as 'Asian', 5 per cent identifies as 'African', 5 per cent identified as 'Multiracial' and 5 per cent as 'Other'
- while English was the predominantly spoken language, 25 per cent indicated other languages including Macedonian, Punjabi, Persian, Arabic, Mandarin, Greek, Hindi and Sinhalese
- the median annual income of this sample was \$65,000–\$77,999.

Results

Broadening traditional understandings of risk and (in)action

Survey participants identified a range of 'large-scale emergencies' they expected to face in the coming ten years. Responses included commonly understood emergencies such as bushfires, grassfires, house fires, flooding, wind and storm. These accounted for 44 per cent of responses. In addition, respondents considered crime, airline crash, building collapse, medical emergencies, terrorism, power outages, car accidents, getting lost, bomb scares, increased traffic, incidents involving kangaroos and pet-related emergencies as 'large-scale emergencies' that they expected to experience. This range of 'non-traditional' responses gives insight into the values shaping the actions of householders, their perceptions of risk and the context in which they live. Further, it suggests the relational nature of risk perception (Kamstra *et al.* 2018). For future emergencies, 23 per cent of respondents stated that they expected to experience 'none', while 11 per cent stated they 'don't know' which emergencies they may experience. In addition, 66 per cent of respondents believed climate change would contribute to an increased frequency and severity of large-scale emergencies that they expect to experience. It is worth noting that a number of householders identified 'large-scale emergencies' unrelated to climate. While some householders did not expect to experience any large-scale emergencies, they did believe that climate change was going to have a future impact on emergencies. Given the inherent uncertainty of risks and the effects of climate change, this mix of responses is not surprising and not insignificant, with similar discrepancies outlined in previous research (Cornes & Cook 2018).

In total, 28 per cent of householders stated they had done 'nothing' to prepare for a large-scale emergency. The responses for preparatory actions undertaken from the remaining respondents were diverse. These included actions such as having spoken to children, cutting down trees, installing safety switches, window shutters, security alarm systems, insurance, clearing leaves away from the property, clearing gutters and having a fire extinguisher or fire blanket. On average, householders identified two preparatory actions. These findings are interesting given that the majority of householders believed they were exposed to 'few' or 'average' amounts of risk on a daily basis.

Survey interactions identified inconsistencies in responses. For example, only 11 per cent of respondents indicated they had a smoke alarm when asked about the preparedness actions they had taken. However, 81 per cent of respondents had checked their smoke alarm battery in the last 12 months. This inconsistency raises the challenge of how DRR (in)actions are understood by householders, especially when contrasted with the ways emergency services personnel define actions and knowledge. Such findings can be considered in light of previous research using the CEDRR methodology in which actions and experiences were identified in follow-up interviews that were not given during the initial survey (Cornes & Cook 2018). This could possibly be due to the 'cold-call' nature of the door-knocking method and because people tend not to actively consider DRR during daily life.

Intentions

Commitments or intentions to act and to engage with an issue is key to behaviour change. In the survey, respondents were asked whether they intended to undertake 'traditional' risk reduction activities as a result of participating in the interaction. Some householders acted immediately with the support of the emergency service volunteers. A significant number made verbal commitments or intentions to undertake activities. These are significant contributors to household resilience resulting from CEDRR engagements.

Of the 19 per cent of respondents who indicated that they had not checked their smoke alarm in the last 12 months, 4 per cent checked their smoke alarm immediately as a result of the survey. In total, 41 per cent of respondents had an existing escape plan. An additional 4 per cent completed a plan with the assistance of the emergency services volunteers and 35 per cent stated they intended to create a plan as a result of the survey. Interestingly, 4 per cent of respondents who checked their smoke alarm immediately were different from the 4 per cent who completed the home escape plan immediately as a result of the engagement. However, 20 per cent of respondents stated they were not interested in creating a home escape plan. This may stem from householders living alone, having no dependents or being very familiar with their property. Another, 18 per cent had an emergency kit in the home at the time of the survey, 35 per cent stated that they intended to assemble one and 4 per cent stated they did

not need one. The majority of households had a first-aid kit and 4 per cent indicated the intention to purchase a first-aid kit. In addition to 59 per cent being able to perform first aid, 8 per cent stated they intended to enrol in a course as a result of the survey. A further 35 per cent intended to update their first aid certification and 14 per cent stated they would consider updating their first aid certification as a result of the survey.

While it is recognised that such intentions are not actions, the verbal commitment or 'intention to prepare' is a significant contributor to behaviour change (Paton, Smith & Johnson 2005, p.27). The follow-up component of the research, which is underway in 2018, will assess whether these commitments and intentions resulted in actions. Importantly, 85 per cent of householders agreed to a follow-up visit. This suggests that participants valued the engagement and are willing to participate further.

Building relationships

While the CEDRR methodology provides useful data to understand the perceptions and (in)actions of people, its objective is the facilitation of meaningful dialogue between householders and their local emergency services organisations, which provides opportunities to build relationships. The input of householder responses creates an environment of participation and co-production of knowledge (Chilvers & Kearnes 2016). Interactions that occur with the public in a dignified manner (Hicks 2011) create opportunities to form relationships and networks that the public has the option to (re)activate if, and when, they choose. The positive responses to the request for a follow-up interview suggests that the majority of householders are open to building relationships with their local emergency services organisations.

These findings demonstrate that building relationships can provide vital, locally specific information to help contextualise householder choices for (in)action. It is important to avoid assumptions that the rationality for (in)action in households is reflective of a level of awareness, ignorance or education. This CEDRR survey was an opportunity for the public to draw on relationships with emergency services and to change their behaviour on their own terms. Furthermore, with subsequent visits planned, there will be further opportunities to nurture the relationships, which may contribute to householders taking further actions.

Conclusion

These preliminary results offer an assessment of the effectiveness and relevance of relationship building as a method of participatory engagement that contrasts with existing top-down, educative approaches. The immediate actions taken, in addition to verbalised intentions to act and the openness towards future interactions, suggest tangible outcomes from this engagement activity that contributes to the resilience of householders. Additionally, this research challenges prevailing notions of (in)action, reason and rationality in relation to householder vulnerability and resilience.

Given the predicted costs of future disasters, effective engagement activities that acknowledge the complexities of householder (in)action and that encourage public-chosen and led actions is critical for building resilience into the future.

Acknowledgments

The authors thank the Victoria State Emergency Service and volunteers (Gary, Seb, Clementine, Gavin, Tony, Cynthia, Kelly, Louise, Chantel, Sanjeev, Steve, Lisa, Will, Les and Sabrina), the Australian Red Cross (Jess and Wil), the Whittlesea SES Unit and the City of Whittlesea Council as well as Learning Environments at the University of Melbourne and University of New South Wales for providing support for CEDRR. This research is funded by the University of Melbourne Engagement Grant, Victoria State Emergency Service, Melbourne Water and the Australian Government Research Training Program Scheme.

References

- Aldrich DP 2012, *Building Resilience: Social Capital in Post-disaster Recovery*. The University of Chicago Press: Chicago.
- Australian Bureau of Statistics 2008, 4818.0.55.001 - Household Preparedness for Emergencies: NSW, Vic., Qld and ACT, Oct 2007. At: www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4818.0.55.001Main+Features1Oct+per+cent202007?OpenDocument [1 May 2018].
- Australian Bureau of Statistics 2017, 2016 Census Quickstats: Whittlesea (C). At: www.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA27070 [1 May 2018].
- Abunyawah M, Gajendran T & Maund K 2018, *Conceptual framework for motivating actions towards disaster preparedness through risk communication*. *Procedia Engineering*, vol. 212, pp.246–253.
- Arbon P, Cusack L, Gebbie K, Perera S & Verdonk S 2013, *Developing a process and tool for building resilience in vulnerable households*. At: www.flinders.edu.au/centres-files/TRI/pdfs/hrc1.pdf [25 May 2018].
- Arnstein SR 1969, *A ladder of citizen participation*. *Journal of the American Institute of Planners*, vol. 35, no 4, pp.216–224.
- Bond RM, Fariss CJ, Jones JJ, Kramer ADI, Marlow C, Settle JE & Fowler JH 2012, *A 61-million-person experiment in social influence and political mobilization*. *Nature*, vol. 489, no. 741, pp.295–298.
- Bourdieu P 1986, *The forms of capital (English version)*. In Richardson JG (ed). *Handbook of theory and research for the sociology of education*. Greenwood Press, New York, pp.241–258.
- Broockman D & Kalla J 2016, *Durably reducing transphobia: a field experiment on door-to-door canvassing*. *Science*, vol. 352, no. 6282, pp.220–224.
- Chilvers J & Kearnes M 2016, *Remaking participation: Science, environment and emergent publics*. Routledge: Oxon. *Remaking Participation: Science, Environment and Emergent Publics*, Routledge, Oxford, UK.
- City of Whittlesea 2017, *Annual Report 2016–2017*. At: www.whittlesea.vic.gov.au/media/3022/201718-annual-report.pdf [12 April 2018].

- Commonwealth of Australia 2011, *National Strategy for Disaster Resilience*. At: www.homeaffairs.gov.au/emergencymanagement/Documents/national-strategy-disaster-resilience.pdf [1 March 2018].
- Commonwealth of Australia 2013, *National Strategy for Disaster Resilience: Community Engagement Framework. Handbook 6*. At: www.emergency.nsw.gov.au/Documents/publications/National-Strategy-for-Disaster-Resilience-Community-Engagement-Framework.pdf [14 April 2018].
- Cook B & Melo Zurita MdL 2016, *Planning to learn: an insurgency for disaster risk reduction (DRR)*. *International Journal of Disaster Risk Reduction*, vol.19, pp.265–272.
- Cook B & Overpeck J Accepted, *Relationship-building between climate scientists and publics as an alternative to information transfer*. *Wiley Interdisciplinary Reviews: Climate Change*.
- Cooke B & Kothari U 2001, *The case for participation as tyranny*. In Cooke, B & Kothari (eds) *Participation: The New Tyranny?* Zedd Books: London, pp.1–15.
- Cornes IC & Cook B 2018, *Localising climate change: heatwave responses in urban households*. *Disaster Prevention and Management: An International Journal*, vol. 27, no. 2, pp.159–174.
- Deloitte Access Economics 2016, *The economic cost of the social impact of natural disasters*. *Australian Business Roundtable for Disaster Resilience and Safer Communities*. At: [www.australianbusinessroundtable.com.au/assets/documents/Report per cent20- per cent20Social per cent20costs/Report per cent20- per cent20The per cent20economic per cent20cost per cent20of per cent20the per cent20social per cent20impact per cent20of per cent20natural per cent20disasters.pdf](http://www.australianbusinessroundtable.com.au/assets/documents/Report%20-%20per%20social%20costs/Report%20-%20The%20economic%20cost%20of%20the%20social%20impact%20of%20natural%20disasters.pdf) [27 March 2018].
- Dufty N 2011, *Engagement or education?* *Australian Journal of Emergency Management*, vol. 26, no. 2, pp.35–39. At: www.knowledge.aidr.org.au/resources/ajem-jul-2011-engagement-or-education/.
- Elsworth G, Gilbert J, Stevens K, Robinson P & Rowe C 2010, *Guidelines for the development of education, awareness and engagement programs*. *Australian Emergency Manuals Series. Manual 45*. At: www.nlaf.org.au/public_resource_details.php?resource_id=617 [15 August 2018].
- Freire P 1968 (translated 1970), *Pedagogy of the oppressed*. *Bloomsbury Publishing: USA*. Hicks D 2011 *Dignity: the essential role it plays in resolving conflict*. *Yale University Press: New Haven*.
- IAP2 International Federation 2014, *IAP2's public participation spectrum*. At: www.iap2.org.au/Tenant/C0000004/00000001/files/IAP2_Public_Participation_Spectrum.pdf [5 September 2018].
- Irwin A 1995, *Citizen Science: a Study of People, Expertise and Sustainable Development*. *Routledge: London*.
- Irwin A, Dale A & Smith D 1996, *Science and Hell's kitchen: the local understanding of hazards issues*. In Irwin A & Wynne B 2009, *Misunderstanding Science? The Public Reconstruction of Science and Technology*, pp.45–64. *Cambridge University Press: Cambridge*.
- Kamstra P, Cook B, Edensor T & Kennedy DM 2018, *Re-casting experience and risk along rocky coasts: A relational analysis using qualitative GIS*. *The Geographical Journal*. At: <https://doi.org/10.1111/geoj.12277>
- McCambridge J, Witton J & Elbourne DR 2014, *Systematic review of the Hawthorne effect: new concepts are needed to study research participation effects*. *Journal of Clinical Epidemiology*, vol. 67, pp.267–277.
- Melo Zurita MdL, Cook B, Thomsen DC, Munro PG, Smith TF & Gallina J 2017, *Living with disasters: social capital for disaster governance*. *Disasters*, vol. 42, no 3, pp.571–589.
- Meusbürger P & Werlen B 2017, *Knowledge, action, and space: an introduction*. In Meusbürger P, Werlen B & Suarsana L (eds). *Knowledge and Action*. *Springer International Publishing*. At: www.springer.com/la/book/9783319445878.
- Nicolopoulos N & Hansen E 2009, *How well prepared are Australian communities for disasters and fire emergencies?* *Australian Journal of Emergency Management*, vol. 24, no. 1, pp.60–66. At: www.knowledge.aidr.org.au/resources/ajem-feb-2009-how-well-prepared-are-australian-communities-for-natural-disasters-and-fire-emergencies/.
- O'Keefe P, Westgate K & Wisner B 1976, *Taking the naturalness out of natural disasters*. *Nature*, vol. 260, no. 5552, pp.566–567.
- Paton D, Smith L & Johnston D 2005, *When good intentions turn bad promoting natural hazard preparedness*. *Australian Journal of Emergency Management*, vol. 20, no. 1, pp.25–30. At: www.knowledge.aidr.org.au/resources/ajem-feb-2005-when-good-intentions-turn-bad-promoting-natural-hazard-preparedness/.
- Phillips R 2015, *Country Fire Authority and new Engagement Approaches – Evaluation*. *Centre for Sustainable Organisations and Work*. At: <http://mams.rmit.edu.au/9smnqobtz8gs.pdf> [12 August 2018].
- Slovic P, Finucane ML, Peters E & MacGregor DG 2004, *Risk as analysis and risk as feelings: some thoughts about affect, reason, risk and rationality*. *Risk Analysis*, vol. 24, no. 2, pp.311–322.
- State of Victoria 2012, *Victorian Emergency Management Reform White Paper*. At: www.dpc.vic.gov.au/images/images/featured_dpc/victorian_emergency_management_reform_white_paper_dec2012_web.pdf [13 July 2018].
- Victoria State Emergency Service 2018, *Emergency Toolkit: A Guide to Staying Safe*. At: www.ses.vic.gov.au/documents/112015/135368/Emergency+Toolkit-pdf/4f569017-36e6-4cb1-982a-67003016699b [3 April 2018].
- Webber D, Gissing A, Dufty N & Bird D 2017, *Community participation in emergency planning: NSW State Emergency Service case study*. *Australian Journal of Emergency Management*, vol. 32, no. 2, pp.28–34. At: www.knowledge.aidr.org.au/resources/ajem-apr-2017-community-participation-in-emergency-planning-nsw-state-emergency-service-case-study/.
- Wisner B, Blaikie P, Cannon T & Davis I 2004, *At Risk: Natural hazards, people's vulnerability and disasters*. *Routledge: New York*.
- Wynne B 2006, *Public engagement as a means of restoring public trust in science - hitting the notes, but missing the music?* *Public Health Genomics*, vol. 9, no. 3, pp.211–220.

About the authors

Isabel Clare Cornes is at the University of Melbourne researching household risk, (in)actions, behaviour change and the role of social capital.

Dr Brian Cook is a senior lecturer at the University of Melbourne. His research examines the role of scientific knowledge in environmental governance relating to water and flood management.

Dr Paula Satizábal is a research assistant at the University of Melbourne. Her research examines how political economic processes shape environmental governance institutions, power and knowledge and how communities respond.

Dr Maria de Lourdes Melo Zurita is a geographer at the University of New South Wales. Her interests include feminist approaches to disaster risk reduction, participation and community engagement..

ABSTRACT

Community service providers deliver vital services to vulnerable populations. In the wake of a disaster, community service providers go beyond their normal service offerings to meet the added needs of clients. Research to date indicates that 25 per cent of community service providers effected by a disaster would not be able to reopen after a disaster, reducing the access to vital services. This paper discusses the disaster impacts on service providers for people experiencing homelessness and the possible ways to mitigate severe effects. To investigate the effects of disasters and barriers to preparedness, a survey was conducted and completed by 161 homeless service providers in Australia. A further 45 interviews were conducted. The results indicated that these service providers experience greater client demand for services and are heavily burdened during stressful and traumatic times. An increase in client presentations puts financial pressure on these organisations as well as on staff workload and staffing demands. Identifying these stresses and limitations, homeless service providers identified five initiatives to be better prepared. Initiatives include increased funding; training for staff, volunteers and clients; funds for identified infrastructure recovery; material support for clients and good inter-agency collaboration.

Disaster preparedness: services for people experiencing homelessness and the pressure-cooker response

Elizabeth Osborn¹, Dr Danielle Every¹ and John Richardson²

1. Central Queensland University, Adelaide, South Australia.
2. Australia Red Cross, Melbourne, Victoria.

Submitted: 2 August 2018. Accepted: 2 September 2018.

Introduction

When disaster strikes, community service providers deliver vital services for the safety and wellbeing of vulnerable people (Edgington *et al.* 2014). Severe weather events can cause injury, death and psychological trauma that endures long after the event (Baum, Flemming & Davidson 1983). The effects of disaster events are now understood to be dependent on an individual's exposure to risk, their preparedness and their ability to recover within their social, political and economic situation (Peek & Stough 2010). In particular, marginalised populations (i.e. children, the elderly, people with a mental illness, people with addictions and people experiencing homelessness or poverty) rely on daily support from community service providers and require significant and particular support after a disaster (Vickery 2015a, Ritchie, Tierney & Gilbert 2008). Marginalised populations are particularly vulnerable to the physical and psychological effects of disaster events due to a number of risk factors including low literacy rates, lack of material resources (i.e. adequate shelter, access to services and transport) and few social resources (Edgington *et al.* 2014, Fothergill & Peek 2004). Together, these factors restrict an individual's coping capacity and increases their need for support during a disaster. In addition, negative attitudes held within the community may lead homeless people being denied access to conventional means of support at these critical times (Vickery 2015a). Further, extended exposure to extreme weather conditions means individuals experiencing homelessness are subject to health complications, increased mental health pressures and possible illness and death (Martins 2008, Moore, Manias & Gerdtz 2011, Cusack *et al.* 2013).

Chamberlain and MacKenzie (1992) define primary homelessness as having no fixed address and no current accommodation. However, homelessness can also include transient living, being threatened with the loss of accommodation, living in temporary accommodation and living in adverse conditions such as overcrowded housing (Chamberlain & Johnson 2001).

Community service providers undertake other activities including food and rental assistance, employment pathways, health services and human services such as counselling, daily living skills and case management (Ritchie, Tierney & Gilbert 2008, Chikoto, Sadiq & Fordyce 2013, Tierney 2013). These organisations are usually stretched to meet the everyday needs of clients in areas of case management, food distribution and emergency accommodation (Vickery 2015a). These services are often delivered on limited government funding (Tierney 2013, Mosley 2012). Consequently, disasters produce additional stress and workload particularly for underprepared and under-resourced community service providers that may be ill-equipped to deliver disaster preparedness and response programs (Tierney & Gilbert 2008, Tierney 2013).

Community service providers are a vital lifeline for people experiencing homelessness and are considered a trusted source of information. Individuals experiencing homelessness are more likely to seek support from these service providers than from more mainstream community channels (Ritchie, Tierney & Gilbert 2008, Eisner 2010, Edgington 2009). It is estimated that client presentation to service providers increases by 30 per cent due to disaster events (Mallon *et al.* 2013). The call on these services during disasters can far exceed their normal functions, resources and funds (Gin *et al.* 2015).

While it is recognised that community service organisations provide vital services to marginalised groups, the emerging literature in the US and in Australia reveals significant impacts on operations and gaps in knowledge that can hamper the effective return to normal after disaster events. In Australia, Mallon and colleagues (2013) investigated how extreme weather and climate change impacts on community service providers, including homeless service providers. Barriers to their preparedness were identified as a lack of financial resources and specialised knowledge and skills (Mallon *et al.* 2013).

Vickery (2015a) investigated the effects of disasters on homeless service providers after the Colorado floods in 2013 and found that inter-agency and client communication was reduced; impacting on the quality of service and support to clients. The research showed there was an increase in demand for staff and an increased need for advocacy to meet client needs. Gin and colleagues (2015) identified that service providers were constrained by time, funding and sufficient training and resources to adequately prepare for a disaster.

These US studies are useful to understand the effects and barriers experienced, however, they are limited in application to the Australian context due to their relatively small samples ($n=14$ and $n=12$, respectively) and focus on one disaster in a confined area in the US. Australia and the US have marked differences in service provision models and government funding structures. As such, this study investigated the gaps in disaster preparedness of service providers in Australia by considering two specific research questions:

- How do disasters in Australia impact on homeless service providers?
- What do staff of homeless service providers believe is needed to help improve their organisations' preparedness capabilities?



A simple storm can cause physical and psychological damage for people experiencing homelessness.

Image: Reproduced with permission, Hutt Street Centre, Adelaide

Method

This research used a mixed-method approach that combined a quantitative survey of homeless service providers with qualitative data. Interviews were conducted with emergency services personnel, volunteers, homeless service providers and a number of their clients. Survey and interview was approved by Central Queensland University Human Research Ethics Committee (H16/02-025 and H16/03-046).

Data collection

Quantitative and qualitative data were collected through two sources:

- a survey available online and in hard copy to all housing and homeless services in Australia
- interviews with service providers, clients and emergency services personnel in five geographic locations that had recently experienced extreme weather events.

Survey

Approximately 500 invitations to participate in the survey were sent to Australian service providers via emails and follow-up phone calls, a Facebook page, mailed invitation (with return stamped envelope) and industry newsletters and blogs (e.g. the Red Cross, Victorian Council of Social Service, Council for Homeless Persons and Homelessness Australia). A total of 163

responses was received; a response rate of 32 per cent. An invitation via email was also sent to a selection of homeless service providers in New Zealand. Due to the low response rate (n=2), these were later removed from analysis.

The survey included 32 closed and open-ended questions. Topics included:

- the type of weather and disaster risks in the area
- the physical and psychological effects of the weather on clients and services
- the costs of responding to emergency events as well as levels of physical and emotional preparedness.

This paper reports on one part of the data collected in the survey; the six questions related to impacts on services and resources needed to respond effectively.

Interviews

The quantitative data gathered through the survey were complemented by in-depth, one-on-one and group interviews with emergency and homeless service providers. A total of 45 people were interviewed (15 people experiencing homelessness, 20 homeless service providers and 10 emergency services personnel). Locations were Adelaide, Sydney, the northern rivers area and the Blue Mountains area of New South Wales and areas in northern Tasmania. Each of these locations had experienced severe weather events in the previous six months.

Homeless service providers in each area were contacted prior to the fieldwork via email or in person during fieldwork to request interviews with staff. Participating agencies and their clients provided informed consent. Participating agencies received five \$20 Woolworths vouchers to distribute as needed.

Interviews with homeless service providers drew out their experiences during extreme weather, how they prepared, who they helped and how, what was challenging, what worked well and what they needed for their clients for future events. Similarly, interviews with emergency services personnel included how they worked within homelessness communities, what they observed during the recent events, the challenges to providing support as well as any future directions in the planning, response and recovery phases.

Results

Cost of extreme weather

Of the respondents, 46 six per cent of service providers indicated that responses to extreme weather events cost each agency up to \$1000 to assist clients. Further, 38 per cent of service providers indicated that assisting people effected by extreme weather required up to 50 hours of extra staffing and support. The survey results

Table 1: Descriptive data for service providers for extreme weather preparedness and management.

Categories	Percentage	N
How much do you estimate it cost your agency to assist people affected by this extreme weather?		
\$0 to \$1000	31	20
\$1,000 to \$5000	31	20
\$5001 to \$10,000	12	8
10,001 to 20,000	6	4
Over \$20,000	20	13
Total	100	65
How many hours do you estimate it cost your agency in staff time to assist people impacted by this extreme weather?		
0 to 50 hours	38	25
51 to 100 hours	31	20
101 to 250 hours	9	6
Over 250 hours	22	14
Total	100	65
How much do you estimate it costs your agency each year to assist people to prepare for extreme weather?		
\$0 to \$1000	46	27
\$1001 to \$5000	36	21
\$5001 to \$10,000	8	5
Over \$10,000	10	6
Total	100	59
How much staff time do you estimate is devoted each year to assist people to prepare for extreme weather?		
0 to 50 hours	59	35
51 to 100 hours	20	12
101 to 250 hours	9	5
Over 250 hours	12	7
Total	100	59

N=number of participants.

Figures have be rounded to whole numbers.

showed that 82 per cent of services required up to \$5000 to implement disaster preparedness programs.

Qualitative data

Research question 1: Impacts of disaster on homeless service providers

The survey confirmed that there was a significant financial burden on homeless service providers during disasters. The interviews and open-ended questions in the survey highlighted the increase in demand for client support.

We were very busy and couldn't keep up with the demand for dry shoes and clothes, trying to dry enough towels for showers. [There was] nowhere to send people for accommodation.
(Service provider staff)

As with other studies (Mallon *et al.* 2013), homeless service providers operate well beyond their funding capacity and normal scope of services.

[Our] service continued to provide support services (i.e. emergency relief, counselling, accommodation). [The] increase in demand required operation outside of [our] funded service agreement to meet [the] needs of all people requiring assistance.
(Service provider staff)

Homeless service providers indicated that the increase in demand for services and support lasted long after the disaster had occurred.

Increased demand for services required extra funding from state government, for one day per week for 12 months. [The] services [required] included personal counselling and visiting schools.
(Service provider staff)

Similarly, as client demand increased, so did the need for staff to meet client need and staff worked longer hours to compensate. Managers and colleagues indicated that extra calls on resources had to be balanced with the emotional drain on staff.

There was a massive impact on staff who deliver wide-ranging services from roads to drainage, to warning to evacuation centres during the immediate aftermath; 24/7 operations were provided for several weeks. Massive amounts of overtime were incurred. Massive amounts of exposure to very challenging situations for staff.
(Service provider manager)

Homeless service providers struggled to provide the extra staff hours as the extreme weather event prevented staff from attending work sites and performing their job role.

So in terms of staffing, on those days you'll probably have an increased need for staff but probably have less staff turning up for work. So that's one thing to

think about; back-filling staff.
(Service provider manager)

Mallon and colleagues (2013) highlighted the increased need for staffing during an extreme weather event. They found that organisations would only function at full capacity for one day with limited staffing.

Homeless service providers' outreach and communication activities were also affected. The implications for clients can be long lasting, especially if compounded by the loss of infrastructure or forced suspension of service provider operations.

We were unable to conduct our usual home visits to provide support due to poor road conditions. We contacted each of our clients by phone to check on how they were coping.
(Service provider staff)

Communication with customers (clients) was difficult during the period of the emergency as mobile phone towers had been ravaged by the fire.
(Service provider staff)

In some cases, services that marginalised populations relied on remained affected for up to a year.

[We] closed our service for four months and we're opened but trading at half capacity. A year later we were back to full operational capacity.
(Service provider)

Inter-agency sharing

Sharing up-to-date information and response planning is critical among community service providers. A National Disaster Resilience Roundtable Report (Australian Red Cross 2014) indicated that disaster and extreme weather events requires strong inter-agency collaboration between stakeholders from government, academia and not-for-profit organisations. The report recognised the role of community service providers in disasters. Service providers advocated for open dialogue between stakeholders to support collaboration, accountability and effective breakdown of responsibility and roles based on the needs of the community (Australian Red Cross 2014).

The desire for greater inclusion in emergency planning and greater inter-agency preparedness and communication was also prominent in this study.

To activate a plan you should pull together your own crisis management team or response team and these are the key people that you would get together to plan how you're going to respond.
(Service provider staff)

The lack of information became a source of anxiety for both service providers and their clients.

People are not so sure ...[they are] feeling anxious about certain things, because of evacuation stress...

also workers can have high levels of anxiety because it's not something that we do on a regular basis.
(Service provider staff)

Systemic issues arose when trying to work with other service providers without the necessary facilities to use the resources provided for disaster response.

Without power it was impossible to service our clients adequately. Food and petrol vouchers could not be distributed because the stores could not process them. Banks could not dispense cash. In fact, most stores closed their doors because they could not service the customers. Food was offered at random to clients as it thawed. Phones went flat. Night time came. No power. Some people had candles but these can be dangerous. Most people rely on electricity for cooking. If clients are homeless they don't have access to gas barbecues.
(Service provider staff)

Improved preparedness by service providers relies on meeting and connecting with other agencies. Edgington and co-authors (2014) indicated that preparedness for extreme weather events was dependent on effective inter-agency collaboration and communication. Collaboration enables distribution of roles in order to coordinate and mobilise disaster management and preparedness plans (Australian Red Cross 2014). In support of this, the US research found that pre-existing connections between service organisations proved helpful during and after the floods to identify client needs and find sources of shelter for the homeless community (Vickery 2015b). In the US, a network of agencies is established to oversee and maintain disaster preparedness and recovery plans (Edgington *et al.* 2014). Participants in this research, particularly community service providers, indicated this would be beneficial.

[I think we should] arrange a community engagement action group made up of people who have experienced homelessness and who are prepared to focus on systemic change. This could be championed via peak bodies.
(Service provider)

The need for service providers to work with each other and with emergency services organisations was highlighted by the lack of knowledge about how to prepare for disasters. The burden placed on homeless service providers to respond to the everyday needs of clients and their capacity to learn and adequately inform clients about disaster preparedness is significantly reduced. Inter-agency collaboration can reduce the burden on service providers and clear roles and responsibilities can be established prior to events (Australian Red Cross 2014)

Research question 2: What resources are needed to increase homeless service provider's disaster preparedness?

Preparedness can reduce the negative effects of disasters on homeless service providers. Respondents indicated a need for many resources to adequately

prepare for disasters. The majority indicated more funding was required to design and implement disaster preparedness plans and extreme weather management. In order to plan and implement disaster preparedness programs (planning committees, educational programs, training), 32 per cent of service providers indicated they required up to \$5000 of additional funding per service.

In order to action preparedness plans within services, additional financial assistance was required alongside training and support for both staff and clients. As such, 59 per cent of homeless service providers required up to 50 additional staffing hours in order to create and implement effective disaster preparedness plans.

The financial support to assist, training and time in the field would also be beneficial.
(Service provider)

Extra staffing would be required.
(Service provider)

Good training and equipment for staff to educate and assist clients who might experience disasters.
(Service provider)

It is also important to provide education for volunteers. Volunteers are a valuable source of support for community service providers in the daily delivery of many programs that support individuals experiencing homelessness. These include second-hand stores, soup kitchens and administration support (Millette & Gagné 2008). Volunteers can also make up the majority of disaster response teams.

[We need] volunteers to assist when needed, training materials and info and time to attend training. Experience[d] trainers to deliver training.
(Service provider)

As well as training for staff, training is also an effective way to help vulnerable groups prepare for disasters (Baker & Cormier 2013). Survey respondents indicated that delivering such programs to the homeless community is critical. Training programs for homeless communities raise awareness for managing risks and accessing support, mitigating the negative consequences of exposure to natural disasters

[For people experiencing homelessness] training, educational brochures, pamphlets, water bottles, towels, socks, singlets, etc. [All] would be of great practical use.
(Service provider)

Prepare people for extreme heat and cold and bushfires, provide drop in sessions leading into summer and winter with information and supply emergency kit items as our clients can't afford to buy them.
(Service provider)

During disasters, there is an increased call for material goods to provide to clients. Community service providers often rely on donations to meet day-to-day client needs. However, funding is needed to provide clothing, linen (blankets, towels and sheets), temporary shelters (tents

and swags), food (hot food and water) and safety items (raincoats, covered shoes, hats and sunscreen).

Have emergency packs containing battery radios, candles, food, water, etc.
(Service provider staff)

Times of disaster heighten the need for communication to alert clients of danger and provide services, even when prevented from being physically present because of damage to infrastructure. People who are homeless may not have the ready access to mobile phones nor the capacity to contact others.

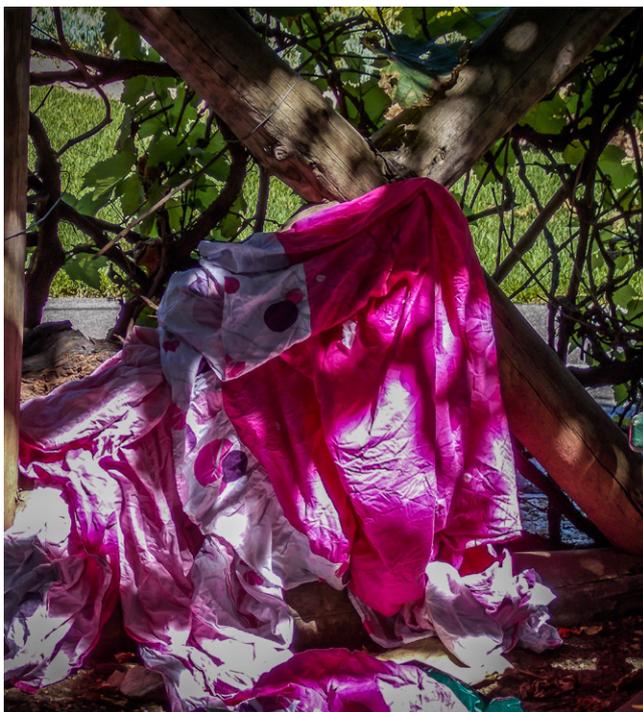
A high priority is adequate infrastructure, without which clients and staff are exposed to extreme weather for longer (Mallon *et al.* 2013). These include dedicated safe and culturally appropriate spaces for clients as well as for pets, that are both short- and long-term solutions to the housing crisis.

Have a dedicated appropriate space for people which is also culturally appropriate.
(Service provider staff)

Better access to appropriate and affordable crisis, medium term and long-term housing.
(Service provider staff)

Additionally, service providers identified having alerting systems to reach those who don't have access to conventional means of contact.

Radio alerts, text messaging and signage in areas where homeless people congregate.
(Service provider staff)



People experiencing homelessness can lose all their possessions and need immediate material assistance.

Image: Reproduced with permission, Hutt Street Centre, Adelaide

Conclusion

Community service providers deliver vital services to vulnerable people and, in the wake of a disaster, they go beyond service provision agreements to meet the needs of clients so that safety and wellbeing is maintained. Gaps in current research warranted investigation into the effects of disasters on homeless service providers in Australia.

Homeless service providers indicated five ways to implement disaster preparedness plans:

- Financial support for additional staffing hours for disaster planning and response, as well as material (e.g. clothing, food and protective gear) and staff training for emergency response.
- Training for staff, volunteers and clients:
 - Staff and volunteers: disaster response protocols at state and local levels; developing and implementing a preparedness plan, business continuity plan as well as the effective communication of plans to clients; managing communication losses to continue to provide services for clients (e.g. to use outreach services when there is no phone access).
 - Clients: understanding warnings; identifying safe places in a disaster (e.g. higher ground for those in flood zones); on-foot evacuation planning; keeping medications safe; staying in touch with others and where to go for help and support.
- Material support for clients including emergency packs, mobile phones, swags, water and food.
- Infrastructure that is specific for homeless people in evacuation centres (e.g. trauma care, connections with homeless service providers, substance-withdrawal support); alternative alerting systems for people without phones or televisions (e.g. siren) and transportation to move people to safety.
- Inter-agency communication and collaboration:
 - Augmenting existing formal channels of communication where these exist (e.g. where homeless service providers are included on emergency planning committees) or establish these and other homeless service partnerships if they do not; foster informal channels of communication (e.g. emergency services personnel attending a community conference to ask people about their experiences and share their knowledge).
 - Championing emergency planning committees by peak bodies in the homeless sector to include representatives from homeless service providers to draw on knowledge (e.g. include homelessness in emergency plans and information about where people experiencing homelessness are located to assist in their evacuation).
 - Developing cross-agency business continuity planning and disaster planning to share resources and coordinate actions to create clear roles for each organisation when a disaster occurs.

People experiencing homelessness have particular vulnerabilities. During a disaster, homeless service providers deliver vital services that mitigate a number of negative consequences of exposure to extreme weather including increased mental health symptoms, illness and death. Disasters negatively compound the pressure-cooker situation that homeless service providers manage on a daily basis.

This research highlights specific impacts and barriers to services preparing and managing the impacts of extreme weather. Adding to the body of knowledge specific practical applications to mitigate these risks. Indeed, these applications can be realised through close collaboration between individuals, services and government that encourages and supports preparedness.

References

- Australian Red Cross 2014, *Beyond the Blanket: The role of not-for-profits and non-traditional stakeholders in emergency management. 2nd National Disaster Resilience Roundtable Report*. Melbourne, Australia. At: www.redcross.org.au/getmedia/e93ca7b3-efa5-4874-b75d-8b62a7fa908e/2014-Disaster-Resilience-Roundtable-report_1.pdf.aspx [7 June 2018].
- Baker LR & Cormier LA 2013, *Disaster preparedness and families of children with special needs: a geographic comparison*. *Journal of Community Health*, vol. 38, pp.106–112.
- Baum A, Fleming R & Davidson LM 1983, *Natural disaster and technological catastrophe*. *Environment and Behavior*, vol. 15, pp.333–354.
- Chamberlain C & Johnson G 2001, *The debate about homelessness*. *Australian Journal of Social Issues*, vol. 36, pp.35–50.
- Chamberlain C & Mackenzie D 1992, *Understanding contemporary homelessness: Issues of definition and meaning*. *The Australian Journal of Social Issues*, vol. 27, pp.274.
- Chikoto GL, Sadiq A-A & Fordyce E 2013, *Disaster mitigation and preparedness: Comparison of nonprofit, public, and private organizations*. *Nonprofit and Voluntary Sector Quarterly*, vol. 42, pp.391–410.
- Cusack L, Van Loon A, Kralik D, Arbon P & Gilbert S 2013, *Extreme weather-related health needs of people who are homeless*. *Australian Journal of Primary Health*, vol. 19, pp.250–255.
- Edgington S 2009, *Disaster planning for people experiencing homelessness*. Nashville: National Health Care for the Homeless Council, Inc. At: www.nhchc.org/disasterplanning.pdf [1 June 2018].
- Edgington S, Canavan D, Ledger F & Erasing RL 2014, *Integrating homeless service providers and clients in disaster preparedness, response, and recovery*. *National Health Care for the Homeless Council. September 2014*. At: www.nhchc.org/ [02 June 2018].
- Eisner R 2010, *Building disaster resilient organizations in the non-government sector*. *Journal of disaster research*, vol. 5, pp.503–508.
- Fothergill A & Peek LA 2004, *Poverty and disasters in the United States: A review of recent sociological findings*. *Natural Hazards*, vol. 32, pp.89–110.
- Gin JL, Kranke D, Saia R & Dobalian A 2015, *Disaster preparedness in homeless residential organizations in Los Angeles County: Identifying needs, assessing gaps*. *Natural hazards review*, vol. 17, pp.1–8.
- Mallon K, Hamilton E, Black M & Beem B 2013, *Adapting the community sector for climate extremes*. *National Climate Change Adaptation Research Facility, Gold Coast*. At: www.nccarf.edu.au [2 June 2018].
- Martins DC 2008, *Experiences of homeless people in the health care delivery system: a descriptive phenomenological study*. *Public Health Nursing*, vol. 25, pp.420–430.
- Millette V & Gagné M 2008, *Designing volunteers' tasks to maximize motivation, satisfaction and performance: The impact of job characteristics on volunteer engagement*. *Motivation and Emotion*, vol. 32, pp.11–22.
- Moore G, Manias E & Gerdtz MF 2011, *Complex health service needs for people who are homeless*. *Australian Health Review*, vol. 35, pp.480–485.
- Mosley JE 2012, *Keeping the lights on: How government funding concerns drive the advocacy agendas of nonprofit homeless service providers*. *Journal of Public Administration Research and Theory*, vol. 22, pp.841–866.
- Peek L & Stough LM 2010, *Children with disabilities in the context of disaster: A social vulnerability perspective*. *Child development*, vol. 81, pp.1260–1270.
- Ritchie L, Tierney K & Gilbert B 2008, *Disaster preparedness among community-based organizations in the City and County of San Francisco*. *Natural Hazards Center, Institute of Behavioral Science, University of Colorado, Boulder, CO*. At: <https://hazards.colorado.edu> [1 June 2018].
- Shinn M 2007, *International Homelessness: Policy, Socio Cultural, and Individual Perspectives*. *Journal of Social Issues*, vol. 63, pp.657–677.
- Tierney K 2013, *A Frayed Safety Net: Community-Based Organizations and Disaster Vulnerability*. *Annual meeting of the Society for Applied Anthropology, Denver, March, 2013*. At: <https://hazards.colorado.edu> [6 June 2018].
- Vickery J 2015a, *Compounded vulnerability: Homeless service organizations during disaster*. *PHD thesis, Sociology Graduate Theses and Dissertations, University of Colorado at Boulder*.
- Vickery J 2015b, *Every day is a disaster: Understanding the challenges faced by homeless service organizations in disaster planning and response*. *Natural Hazards Observer. Natural Hazards Center, University of Colorado, Boulder, Colorado*, vol. XL, pp.10–13.

About the authors

Elizabeth Osborn is a research assistant at the Appleton Institute, Central Queensland University. She has considerable experience working within the homeless sector and has worked in youth work, outreach case management and counselling.

Dr Danielle Every is a senior lecturer at the Appleton Institute, Central Queensland University. Her research explores community experiences of bushfires, climate change and disasters, particularly with people who are homeless.

John Richardson is the National Coordinator, Preparedness for Australia Red Cross. He established Emergency RediPlan and the Red Cross household preparedness program. He is an Honorary Fellow of the University of Melbourne as part of the Beyond Bushfires Research Team.

ABSTRACT

Resilience in the Philippines through effective community engagement

Carla Selina Baybay and Dr Richard Hindmarsh, Griffith University, Brisbane, Queensland.

Submitted: 27 July 2018. Accepted: 12 November 2018.

Introduction

This paper presents findings from a larger study on investigating effective community engagement approaches in relation to climate change adaptation (CCA) and disaster risk reduction and management (DRRM) for coastal communities in the Philippines. Here, effective involves participatory, timely, jurisdictionally coherent, government and community action plans (Yoseph-Paulus & Hindmarsh 2018).

There is an increasing understanding in the Philippines of the interrelationship between CCA and DRRM, the latter including emergency response and management (Fernandez *et al.* 2012, Republic of the Philippines 2010). This understanding reflects international trends of integrating CCA with DRRM (e.g. Mitchell & van Aalst 2008, UNISDR 2015). The Philippines is vulnerable to weather-related disasters like storm surges, tsunamis and flooding (Needham 2015). Poverty and inadequate social, technological and financial capacities contribute to this vulnerability (UNFCCC 2007, World Bank 2013). Most of the population lives in coastal communities and they depend on coastal resources for food and their livelihoods. These communities are the most vulnerable to flooding and coastal erosion.

Community interactions that occur during weather-related disasters have always existed in the Philippines using traditional community-based activities informed by local knowledge (Bankoff 2012). In 1978, community disaster reduction and management was institutionally recognised through the Community Disaster Preparedness Program under *Presidential Decree No. 1566*. However, a top-down, reactive approach to disaster management prevailed, despite the community-based approaches (Fernandez *et al.* 2012, Heijmans & Victoria 2001). In 1984, community-based disaster management was pioneered and promoted in the non-government sector through the Citizens' Disaster Response Network (Bankoff 2012, Heijmans & Victoria 2001).

Given current climate change affecting the Philippines, it lacks effective CCA and DRRM policies for coastal communities. Ancheta and colleagues (2010) indicate that continuing reactive and ineffective policy styles of community engagement for CCA and DRRM needs to change to proactive community-based approaches. Proactive responses complement the development and implementation of CCA and DRRM in the Philippines. The first is the *Climate Change Act of 2009* and *Disaster Risk Reduction and Management Act of 2010*; both mention community engagement as essential

This research is important to assist the Philippines develop more effective community engagement adaptation approaches and policies to better respond locally to climate change and disaster risk management. To explore this, a literature review was undertaken followed by interviews and focus group discussions with local experts and community representatives. Findings from the literature review were that strong (active and inclusive) community engagement approaches to climate change and disaster risk management were more effective than weak (passive and consultative) approaches. These results were compared to fieldwork interviews and focus group discussions in two typhoon-prone Philippine provinces. Findings revealed that while strong and weak community engagement approaches exist in the Philippines, respondents at provincial and local levels supported the development of strong community engagement that involved capacity building and open information and dialogue. Meaningful engagement with stakeholders and across sectors that embraced Filipino community engagement customs and characteristics were emphasised.

(Republic of the Philippines 2009, 2010). The second is the 2011–2028 *Philippine National Disaster Risk Reduction and Management Plan* that strengthens CCA and DRRM capacities (nationally and locally) through good governance principles (NDRRMC 2011, also CEC 2001). For example, principles of transparency, enhanced participation and policy coherency are applicable to contemporary international community engagement. When applied, they could help redress weaknesses in current Philippine CCA and DRRM community engagement related to fragmented and uncoordinated government planning with inadequate capacity to meaningfully engage coastal communities (Ancheta *et al.* 2010, World Bank 2013).

This paper reviews the international literature on community engagement approaches to CCA and DRRM in developing and developed countries. It describes methods and results of interviews and focus group fieldwork on the effectiveness of existing local community engagement approaches for CCA and DRRM with local experts and communities in the Philippine coastal zone. It also compares the literature review and fieldwork findings to recommend effective CCA and DRRM forms of community engagement.

Literature review

Community engagement is frequently considered as the mutual interaction between government and community members to increase information and community input for policy formulation; in turn, to support government services to facilitate consensual government and community goals (Cavaye 2004, Meikle & Jones 2013). Community engagement can range from 'weak' to 'strong' as shown in the public participation spectrum of the International Association for Public Participation (IAP2) (IAP2 2007, Hindmarsh 2012, Nkoana *et al.* 2017). Weak forms comprise information dissemination and consultation while stronger forms include active and inclusive engagement (Cavaye 2004, Quick & Feldman 2011). The latter is a collaborative partnership

approach and is more meaningful (and effective) for both communities and policy development. Strong engagement increases the legitimacy of government actions through the generation and sharing of diverse ideas and knowledge that provides for equitable and effective decision-making (Benham 2017, Cavaye 2004).

Strong community engagement provides the best opportunity for including local community knowledge, perspectives of place and local values and attitudes in decision-making processes. This produces more effective policy outcomes that engenders local support, ownership and substance (Cavaye 2004, Devine-Wright 2005, Hindmarsh 2010, Nkoana *et al.* 2017, Samaddar *et al.* 2015). Important elements include early involvement in planning and implementation, integration of stakeholder knowledge, openness and transparency of information, dialogue and partnerships with government, business and non-government organisations (Gero *et al.* 2010, Hindmarsh 2012, Quick & Feldman 2011).

Conversely, weak (or less inclusive) community engagement approaches focus on disseminating top-down information and gathering feedback on government proposals or issues through consultation via town hall meetings, surveys and committees. They tend to reflect normal business over time and lack willingness or knowledge to develop stronger approaches (Aldunce *et al.* 2016, Cavaye 2004, Hindmarsh 2012, Nkoana *et al.* 2017). Typically, they feature fragmented planning and policy processes that result in poor coordination and policy implementation. They perpetuate cultural barriers to participation involving cultural leadership, beliefs and perspectives; community marginalisation and lack of supportive resources (McMartin *et al.* 2018, Samaddar *et al.* 2015, Zafrin *et al.* 2014). The burgeoning international literature supports the view that strong community engagement is highly effective to address the interrelated social and environmental complexities of CCA and DRRM (e.g. Schlosberg *et al.* 2017, Tanwattana 2018).



Fishing is one of the primary sources of livelihood for coastal and island communities.

Images: Carla Baybay

Methods

Fieldwork investigation involved local experts and community representatives in four coastal communities of Sorsogon City (Sorsogon Province) and five coastal communities in the Municipality of Lavezares (Northern Samar Province). Both provinces are situated in typhoon-prone areas in the eastern seaboard of the Philippines (Figure 1).

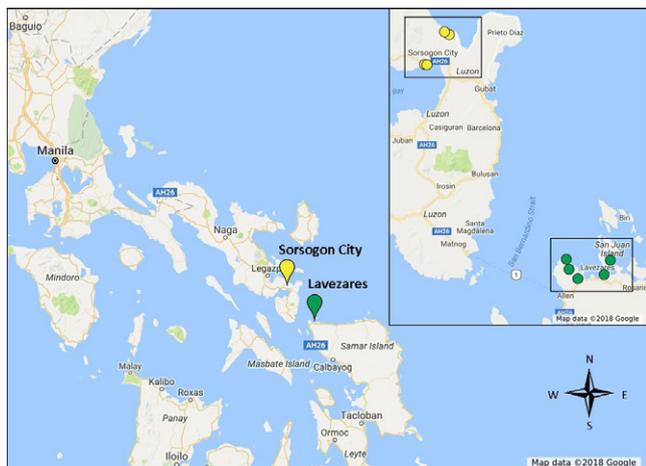


Figure 1: Fieldwork sites of Sorsogon and Northern Samar provinces.

The selection of these two neighbouring provinces as fieldwork sites was based on:

- both provinces being identified at 'very high risk' or 'high risk' to climate change and weather-related hazards (World Bank 2013)
- both provinces having existing community-based approaches to CCA and DRRM
- the recommendations of key local government officials regarding community attendance to, and participation in, local CCA and DRRM activities, including developing plans and the quality of community leadership.

These recommendations were made by local government officials in a preliminary meeting prior to the interviews and focus group discussions to identify which communities would best fit the research aims. Data were collected from local experts and community representatives on their views of effective and ineffective approaches to CCA and DRRM. The research was undertaken between October and November 2017 in two stages:

- Twenty-four face-to-face semi-structured interviews were conducted with local experts (11 in Sorsogon City and 13 in Lavezares) from relevant local government agencies, non-government organisations, community and other organisations (including fisherfolk, farmers and women's organisations) and community councils.
- Twelve focus group discussions were held with coastal community representatives from community councils, volunteer groups, CCA and DRRM groups

and emergency response teams. This involved seven focus groups in Sorsogon City (44 participants) and five focus groups in Lavezares (53 participants).

All respondents were involved in a range of CCA and DRRM activities such as planning, implementation and evaluating plans, projects, programs, policies and activities at provincial, city, municipal and community levels. The interviews were conducted in English or Filipino or both, depending on the preference of the respondent, while the focus group discussions were conducted in Filipino. The data were translated to English during transcription. To prevent loss of meaning in translation, key words or phrases from the responses that were considered important were retained in Filipino (cf. Vallance & Lee 2005). Footnotes were added to explain the context of these responses alongside the closest interpretation of the key words or phrases based on Philippine literature (i.e. *bayanihan*). The interview and focus group records were listened to a second time to ensure that nothing was missed in the transcription and translation processes.

NVivo software was used to organise concept-driven codes derived from the research questions, conceptual framework and fieldwork questionnaire. Data-driven codes were generated through repeated reading of transcripts and were organised into themes and sub-themes by identifying patterns and distinct features from data that addressed the research aim.

The results represent the structure of the interview and focus groups. Respondents were asked to contribute to the following themes:

- current community engagement approaches
- challenges to achieve effective community engagement
- recommendations for effective community engagement.

The responses were organised by theme and by data type (local expert interview respondents and focus group community representatives together, when or where occurring).

Results

Theme 1: Current community engagement approaches

According to city and municipal officials and community representatives in each province, coastal community engagement comprised 'participatory processes' and 'multi-sectoral approaches'. This supported existing CCA and DRRM plans in Sorsogon City and Lavezares and included dialogue, public consultations, meetings, seminars, community assemblies, volunteer groups and emergency response teams. Engagement activities focused on capacity building, research and planning, community-based environmental activities, infrastructure improvements, information dissemination and CCA and DRRM policy implementation through government and non-government programs and projects.



Information about tsunami warnings is placed in obvious places within the community.

Image: Carla Baybay

Theme 2: Challenges to achieve effective community engagement

Three sub-themes emerged from the data.

Weak engagement with community: Sorsogon City local expert respondents indicated that communities had poor commitment to engagement and this added to their distrust of community officials. Respondents from both provinces indicated there was poor community attendance and participation in CCA and DRRM activities due to priorities of daily life and livelihoods or uncooperativeness. Community representatives from both provinces reported that uncooperative communities held negative attitudes about participation because they were not informed about CCA and DRRM issues nor how to participate. In addition, local people held particular political preferences about the person implementing the program and this could affect their participation.

Limited decision-making: several local expert respondents from both provinces, as well as community representatives, regarded CCA and DRRM engagement practices as limited because they involved top-down implementation of plans and dissemination of information to communities and submission of required local government and community reports related to CCA and DRRM projects and activities (especially in Lavezares). Similarly, decision-making for community programs and projects was left to city and municipality officials and staff, often with no community validation occurring through adequate community consultation and information sharing.

Underdeveloped policy: local expert respondents and community representatives from both provinces raised several sub-themes. These were lack of political will; limited budgets; limited infrastructure for CCA and DRRM preparedness; insufficient CCA policy knowledge, implementation and evaluation as well as inadequate integration of CCA and DRRM policies exacerbated by a lack of coordination among government agencies. Of the two provinces, Lavezares experienced these situations the most.

Theme 3: Recommendations for effective community engagement

Three subthemes emerged from the research.

Improving community activities, knowledge, skills and resources: local expert respondents recommended increased CCA and DRRM budgets for this area. In contrast, community representatives recommended empowering community officials and fostering better stakeholder and sector partnerships as part of stronger community planning and capacity building. As one local interview respondent emphasised, 'all communities becoming resilient, safe, secure and adaptive'.



One of several DRRM capacity building trainings that local government conducts for local communities and other sectors.

Image: Carla Baybay

Stronger community engagement through adoption of local culture and practice: local expert respondents and community representatives from both provinces recommended that Filipino characteristics of unity, solidarity, helpfulness, industriousness and resilience practiced in communities could be incorporated into community engagement activities. Additionally, that the Filipino custom of *bayanihan* be adopted in its traditional representation as a voluntary community effort to achieve unity, cooperation, solidarity and generosity.

Strong policy development: local expert respondents and community representatives from both provinces recommended stronger policy and community engagement particularly regarding government leadership and support. As one community representative expressed, 'if there is ... effective leadership, then there is effective governance'. Strong policy relied on knowledge integration, particularly information and open dialogue between governments and with communities. This would lead to improved community awareness of CCA and DRRM policies, alongside better policy implementation. As such, more meaningful and better resourced community engagement would deliver integrated local CCA and DRRM plans and policies. Another recommendation was to modify several overly technical approaches and language in policies that diluted the social context and was hard to understand and relate to by community members.

Discussion

This research considered aspects of effective community engagement to increase the CCA and DRRM capacity and resilience of two coastal communities in the Philippines. Local experts and community representatives indicated preferences for strong community engagement approaches for CCA and DRRM; supporting the international literature.

Existing community engagement is weak and ineffective particularly in areas of CCA and DRRM. Features of weak community engagement included insufficient information for community awareness, community non-participation, limited top-down decision-making, lack of community inclusion and program validation and underdeveloped policy in areas of planning, budgets and engagement (McMartin *et al.* 2018, Samaddar *et al.* 2015, Zafrin *et al.* 2014). Also criticised were the fragmented and uncoordinated government practices (see also Yoseph-Paulus & Hindmarsh 2018) as well as ineffective policy implementation and integration of CCA and DRRM policies.

Although Lavezares was the weaker in these areas, Sorsogon City also experienced many challenges to effective community engagement, specifically, underdeveloped policy and the lack of political will to prioritise CCA and DRRM at government and community levels. Weak and reactive approaches to CCA and DRRM were prevalent in Lavezares and that impeded the community from adopting more proactive responses.

Many recommendations were made by the local expert respondents and community representatives that align to strong community engagement. These included improving community activities, knowledge, skills and resources as well as better government leadership and support (see also Benham 2017, Cavaye 2004, Gero *et al.* 2010, Hindmarsh 2012, Quick & Feldman 2011) and adoption of local culture and practices (Kanakis & McShane 2016, Mercer *et al.* 2009) underpinned by strong policy development. Of importance was adopting the Filipino custom of *bayanihan*, which stresses collective action within communities (Labonne & Chase 2011).

To deliver strong policy development, areas explored were stronger government leadership and support, knowledge integration between government and communities, improved community awareness, better policy implementation and enhanced community engagement to develop plans with emphasis on social context and everyday language. These recommendations indicated the active role local communities seek to (and should) have in CCA and DRRM.

Conclusion

This evidence supports the development and integration of strong community engagement approaches for CCA and DRRM in the Philippines that would also embrace

the good governance principles of the *Philippine National Disaster Risk Reduction and Management Plan*. Of importance are capacity building, open information and dialogue mechanisms and meaningful partnerships with stakeholders. This would involve inclusion of community knowledge and perspectives as well as traditional Philippine community engagement customs and characteristics.

Acknowledgments

This research received funding support from the Endeavour Leadership Program of the Australian Government and the School of Environment and Science, Griffith University. The field research supported by Sorsogon City and Municipality of Lavezares is also gratefully acknowledged.

References

- Aldunce P, Beilin R, Handmer J & Howden M 2016, *Stakeholder participation in building resilience to disasters in a changing climate, Environmental Hazards*, vol. 15, no. 1, pp.58–73.
- Ancheta C, Bojo J, Dato V, Heister J, Kariuki M, Morton J, Trohanis Z, Tuyor J, Villaluz M, Virtucio F, Wedderburn S & Zhang Y 2010, *A strategic approach to climate change in the Philippines*, World Bank. At: <http://documents.worldbank.org/curated/en/252751468093838857/A-strategic-approach-to-climate-change-in-the-Philippines>.
- Bankoff G 2012, *Storm over San Isidro: 'civic community' and disaster risk reduction in the nineteenth century Philippines*, *Journal of Historical Sociology*, vol. 25, no. 3, pp.331–351.
- Benham C 2017, *Aligning public participation with local environmental knowledge in complex marine social-ecological systems*, *Marine Policy*, vol. 82, pp.16–24.
- Cavaye J 2004, *Governance and community engagement: the Australian experience*, in W Lovan, M Murray & R Shaffer, (eds), *Participatory governance: planning conflict mediation and public decision making in civil society*, pp.85–101. Ashgate Publishing, United Kingdom.
- Commission of the European Communities (CEC) 2001, *European Governance: a white paper*, Brussels. At: http://europa.eu/rapid/press-release_DOC-01-10_en.htm.
- Devine-Wright P 2005, *Beyond NIMBYism: towards an integrated framework for understanding public perceptions of wind energy*, *Wind Energy*, vol. 8, pp.125–139.
- Fernandez G, Uy N & Shaw R 2012, *Community-based disaster risk management experience of the Philippines*, in R Shaw, (ed), *Community-based disaster risk reduction (Community, environment and disaster risk management)*, vol. 10, pp.205–231. Emerald Group Publishing Limited, United Kingdom.
- Forino G, Medling J & Brewer G 2015, *A conceptual governance framework for climate change adaptation and disaster risk reduction integration*, *International Journal of Disaster Risk Science*, vol. 6, pp.372–384.
- Gero A, Meheux K & Dominey-Howes D 2010, *Disaster risk reduction and climate change adaptation in the Pacific: the challenge of integration*, University of New South Wales Press, Sydney.

- Heijmans A 2009, *The social life of community-based disaster risk reduction: origins, politics and framing*, Disaster Studies Working Paper No. 20, Aon Benfield UCL Hazard Research Center, London.
- Heijmans A & Victoria L 2001, *Citizenry-based & development-oriented disaster response: experiences and practices in disaster management of the Citizens' Disaster Response Network in the Philippines*, Centre for Disaster Response Preparedness and Citizens' Disaster Response Centre. At: www.proventionconsortium.org.
- Hindmarsh R 2010, *Wind farms and community engagement in Australia: a critical analysis for policy learning*, *East Asian Science, Technology and Society: An International Journal*, vol. 4, pp.541–563.
- Hindmarsh R 2012, 'Liberating' social knowledges for water management, and more broadly environmental management, through 'place-change planning', *Local Environment: The International Journal of Justice and Sustainability*, vol. 17, no. 10, pp.1121–1136.
- International Association for Public Participation (IAP2) 2007, *IAP2's public participation spectrum*. At: www.iap2.org.au/Tenant/C0000004/00000001/files/IAP2_Public_Participation_Spectrum.pdf.
- Kanakis K & McShane C 2016, *Preparing for disaster: preparedness in a flood and cyclone prone community*, *Australian Journal of Emergency Management*, vol. 31, no. 2, pp.18–24.
- Labonne J & Chase R 2011, *Do community-driven development projects enhance social capital? Evidence from the Philippines*, *Journal of Development Economics*, vol. 96, pp.348–358.
- Lassa J & Sembiring M 2017, *NTS Insight, No. IN17-01. Towards policy integration of disaster risk, climate adaptation, and development in ASEAN: a baseline assessment*, RSIS Centre for Non-Traditional Security Studies, Singapore.
- McMartin D, Sammel A & Arbuthnott K 2018, *Community response and engagement during extreme water events in Saskatchewan, Canada and Queensland, Australia*, *Environmental Management*, vol. 61, pp.34–45.
- Meikle H & Jones D 2013, *Pedagogy of oppressed community engagement: socially inclusive visioning of urban change*, in K Ruming, B Randolph & N Gurrin, (eds), *State of Australian Cities 2013: proceedings of the State of Australian Cities 2013 conference*, State of Australian Cities, Sydney, pp.1–13.
- Mercer J, Kelman I, Suchet-Pearson S & Lloyd K 2009, *Integrating indigenous and scientific knowledge bases for disaster risk reduction in Papua New Guinea*, *Geografiska Annaler: Series B, Human Geography*, vol. 91, no. 2, pp.157–183.
- Mitchell T & van Aalst M 2008, *Convergence of disaster risk reduction and climate change adaptation: a review for DFID*. At: www.preventionweb.net/files/7853_ConvergenceofDRRandCCA1.pdf.
- National Disaster Risk Reduction and Management Council (NDRRMC) 2011, *National Disaster Risk Reduction and Management Plan 2011–2028*. At: www.ndrrmc.gov.ph/attachments/article/41/NDRRM_Plan_2011-2028.pdf.
- Needham H, Keim B & Sathiaraj D 2015, *A review of tropical cyclone-generated storm surges: global data sources, observations, and impacts*, *Reviews of Geophysics*, vol. 53, pp.545–591.
- Nkoana E, Waas T, Verbruggen A, Burman C & Hugé J 2017, *Analytic framework for assessing participation processes and outcomes of climate change adaptation tools*, *Environment Development and Sustainability*, vol. 19, no. 5, pp.1731–1760.
- Quick K & Feldman M 2011, *Distinguishing participation and inclusion*, *Journal of Planning Education and Research*, vol. 31, no. 3, pp.272–290.
- Republic of the Philippines 2009, *Climate Change Act of 2009, Government of the Republic of the Philippines*. At: www.ifrc.org/Docs/idrl/735EN.pdf.
- Republic of the Philippines 2010, *Philippine Disaster Risk Reduction and Management Act of 2010, Government of the Republic of the Philippines*. At: www.ifrc.org/docs/idrl/878EN.pdf.
- Samaddar S, Yokomatsu M, Dayour F, Oteng-Ababio M, Dzivenu T, Adams M & Ishikawa H 2015, *Evaluating effective public participation in disaster management and climate change adaptation: insights from Northern Ghana through a user-based approach*, *Risk, Hazards & Crisis in Public Policy*, vol. 6, no. 1, pp.117–143.
- Schlosberg D, Collins L & Niemyer S 2017, *Adaptation policy and community discourse: risk, vulnerability, and just transformation*, *Environmental Politics*, vol. 26, no. 3, pp.413–437.
- Tanwattana P 2018, *Systematizing community-based disaster risk management: case of urban flood-prone community in Thailand upstream area*, *International Journal of Disaster Risk Reduction*, vol. 28, pp.798–812.
- United Nations Framework Convention on Climate Change (UNFCCC) 2007, *Climate change: impacts, vulnerabilities and adaptation in developing countries*. At: <https://unfccc.int/resource/docs/publications/impacts.pdf>.
- United Nations International Strategy for Disaster Reduction (UNISDR) 2009, *2009 UNISDR terminology on disaster risk reduction*, Geneva. At: www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf.
- UNISDR 2015, *Sendai Framework for Disaster Risk Reduction 2015–2030*. At: https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf.
- Vallance RJ & Lee M-H 2005, *NVivo as an aid towards analytic rigour when researching in non English languages and cultures, paper presented to the 6th International Strategies in Qualitative Research Conference, Durham, 21–23 September 2005*. At: <https://pdfs.semanticscholar.org/7f93/0443ee2f5417191f298d12548c3ba8f7d41c.pdf>.
- World Bank 2013, *Getting a grip on climate change in the Philippines: extended technical report*, World Bank. At: <https://openknowledge.worldbank.org/handle/10986/16543>.
- Yoseph-Paulus P & Hindmarsh R 2018, *Addressing inadequacies of sectoral coordination and local capacity building in Indonesia for effective climate change adaptation*, *Climate and Development*, vol. 10, pp.35–48.
- Zafrin S, Rosier J & Baldwin C 2014, *Queensland's coastal planning regime: the extent of participation in coastal governance*, *Planning Practice and Research*, vol. 29, no. 4, pp.331–349.

About the authors

Carla Selina Baybay is a senior doctoral researcher at Griffith University. Her research is on building effective community engagement for climate change adaptation and disaster risk reduction.

Dr Richard Hindmarsh is a professor at Griffith University. His research focuses on environmental politics and policy, science, technology and society studies including controversial science and technology, community engagement and climate change adaptation.

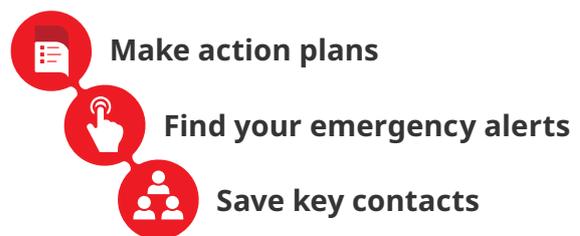
Emergencies can happen to anyone

Protect your loved ones and download the Get Prepared app

Get Prepared app

Get Prepared is an app that helps you connect with your support people, accomplish simple tasks to make you and your loved ones safe and protect the things that matter most to you.

- Establish a quick and easy network of support with your three top contacts.
- Make a plan using simple checklists across a range of preparedness actions.
- Save your emergency plan to print and share with others.

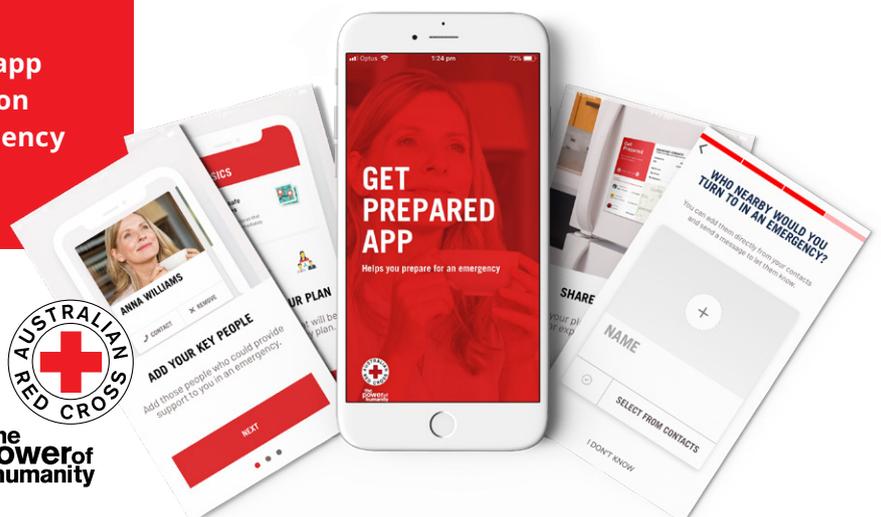


Get Prepared is an easy-to-use app that helps you access information and tools to complete an emergency plan.



the power of humanity

in partnership with 



Disaster Resilience Glossary

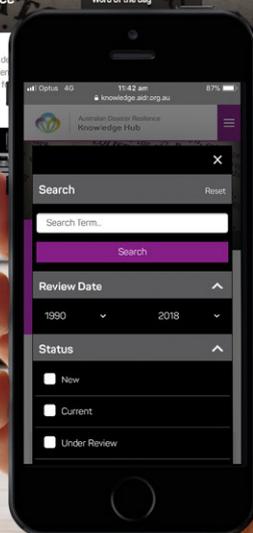
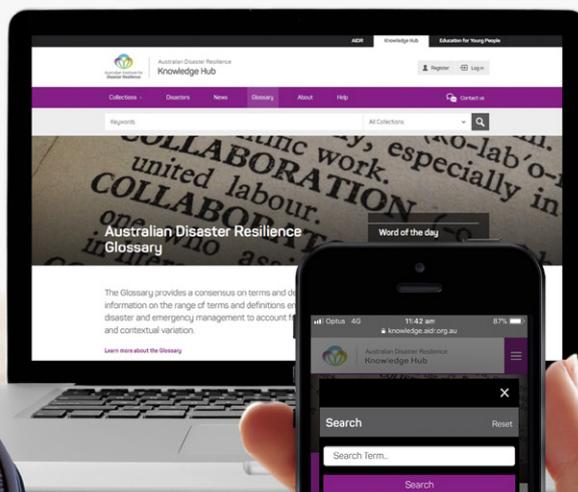


The Australian Disaster Resilience Glossary is an integrated online glossary of disaster resilience and emergency management terms and definitions.

Its purpose is to allow consistency and avoid ambiguity in the definition and use of words and terms associated with disaster resilience and emergency management. The Glossary also accounts for jurisdictional and contextual variations where required.

🔍 Search disaster resilience terms and definitions...

Search



View the glossary and provide feedback online: knowledge.aidr.org.au/glossary



Australian Government
Department of Home Affairs

the power of
humanity



bushfire&natural
HAZARDS CRC