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BUILDING RESILIENT COMMUNITIES: EFFECTIVE MULTI-CHANNEL COMMUNICATION IN DISASTERS

Annual project report 2016-17

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END USER STATEMENT

Andrew Richards, *Manager Community Engagement, SES, NSW*

Warnings research continues to be a highly sought after commodity in the Emergency Management Industry as information plays a vital role in influencing community behavior during a disaster. Complement other pre- and post-disaster risk treatments such as resilience, mitigation, rescue, repair and recovery. Warnings also continue to be an often politicized subject of interest in inquiries and reports following significant events, with many different perspectives on their effectiveness shared between agencies, community members, politicians and key stakeholders. It is interesting to see further research into Multi-channel Communication and Warnings provide insights into how these can be further optimized to benefit each of these interest groups and how these political environments are navigated.

The project team has delivered the research reports to end-users on the back of the National Focus Groups in 2016, these contained insights into how agencies across Australia could further optimize warning messages to enhance compliance and understanding by community members affected by disasters. The project team has also undertaken a desktop analysis of Social Media in Tropical Cyclone Marcia (2015) and NSW Bushfires (2017) to enable agencies to enhance communications via these channels in disasters. Eye tracking experiments that enable better understanding of how community members interact with visual and written messages. A business resilience to share insights into how agencies can better target the business community, a key stakeholder with unique interests and needs in different disaster types and scenarios. Each of these research packages are hotly anticipated by end-users and are often promptly utilized by agencies as they seek to continually improve the way they warn communities.

I believe the project team has had some of its greatest success working closely with agencies such as QFES (Qld), CFS (SA), EMV (Vic) and DFES to enhance the structure and format of Bushfire and Flood Warning Products. These findings have been shared at key opportunities such as the Research Showcase and the AFAC Warnings Groups and it has stimulated interest in further work and prompted healthy yet rigorous discussion about changes to the status quo.

The Project Team have been active in end-user engagement throughout the period including:

- Regular research updates to key agency personnel through teleconferences with end-users; sessions with the AFAC Warnings Groups and Community Engagement Technical Group; Research Advisory Forum (2017) and CRC Showcase (2017).

- Facilitating workshops to help progress a National Framework on Flood Warnings and harmonized call to action messages (2017);

- Presented international and national research findings through AIDR events (2017)

- Sought input from end-users to accompany the research refresh (2016) and through workshops held at the Research Advisory Forum (2017).

As a result, in September 2016, end-user input shaped the direction of the project moving forward with proposed work to examine the influence of conflicting cues, multi-agency messaging, trust and readiness to act on the intended behavior of affected communities and their interpretation of warnings in the pipeline for future.

Well done team keep up the good work!

INTRODUCTION

Australia is exposed to a range of natural disasters including severe storm, fire, cyclone, flood, and to a lesser extent, earthquake and tsunami. These disasters have an estimated cost of $9 billion a year [4], alongside the more difficult to measure social impact on society and individuals' wellbeing. Governments, authorities, and organisations dedicate significant resources to encourage communities to prepare for and respond to natural hazards. However, recent events, media attention, and ongoing academic research continue to highlight cases of non-compliance. Non-compliance can include an individual's refusal to evacuate when a voluntary or mandatory evacuation message is issued, evacuating when advised not to, and travelling through hazardous areas when advised not to, to name a few. The consequences of non-compliance during a natural hazard can include personal injury or loss of life, and damage to, or loss of property. Individuals who fail to comply with instructions issued during natural hazards significantly impede the emergency response because they divert resources to compliance-enforcement, and risk the lives of emergency service workers who may be required to assist them. The consequences of non-compliance drive the need to understand how to influence individual-level compliance in a natural hazard, through more effective communication.

This project adopts a multi-hazards approach to examine the effectiveness of response and recovery communication in communities (comprising individuals, groups, and businesses) affected by natural hazards. The core project objectives are two-fold:

1. Develop methods to maximise the effectiveness of response and recovery messaging to the community during a range of natural hazard events.

2. Promote both community and disaster agency understanding of the legal motivators for maximising engagement with emergency messages and instructions.

Achieving these objectives will enable the project to deliver evidence-based message content to guide operational and communication strategy, and improve community understanding, decision-making, and compliance during the emergency response and recovery phase of natural disasters.

PROJECT BACKGROUND

The project adopts a highly collaborative, multi-disciplinary, multi-phase and multi-hazards approach to maximise both the engagement of end-users and impact on community behaviours and decision-making. Specifically, the team draw on demonstrated expertise in communication, consumer psychology and marketing, emergency management, and law. The collaborative research activities encompassed by this project focus on developing strategies that maximise the effectiveness of response and recovery messaging in the community. This research program will adopt a multi-hazards approach to:

- examine the content and delivery strategies of official emergency messages;

- develop evidence-based advice to guide trigger communications during hazards;

- analyse the effectiveness and efficiency of official emergency messages in the response and recovery phases;

- promote both community and end-user understanding of the psychological and legal motivators for maximising engagement with response plans and emergency instructions; and

- examine opportunities for application of new technology and communication systems (e.g. emerging digital and social media platforms) to maximise the comprehension and compliance of communities at risk.

Governments, authorities, and organisations dedicate significant resources to educate and encourage disaster preparedness using instructional messages. Instructional messages are the lynchpin of risk and warning communication because they persuade Australians to respond to natural hazards with specific and immediate behaviours [5]. These instructions, which vary from simple messages warning citizens not to drive through floodwater to complex messages about safe ways to evacuate from a hazard-affected district, are designed to protect community health, welfare, and safety.

An investigation of risk and warning communication research suggests three implicit assumptions influence natural hazard research and practice: (1) that community members will comply with instructions issued by governments and agencies that represent the most authoritative voice, (2) that communication campaigns are shaped by intuition rather than evidence-based approaches [6], and (3) that hazards occur as stand-alone rather than linked events [7]. These assumptions have influenced the style of existing risk and warning communication, including instructional messages. In response to these assumptions, this project proposes collaborative research that integrates industry and cross-disciplinary perspectives to provide evidence-based approaches for risk and warning communication across the response and recovery phases of a natural disaster.

Recent natural hazard events in Australia and around the world provide constant reminders of why people should prepare and how people should behave. Yet, industry experiences and research shows that community members still fail to

comply with instructions issued by government agencies [1]. In some cases, individuals ignore official emergency instructions in favour of community-generated warnings, which are often driven through digital platforms. While non-compliant behaviour is often not in the best interest of the individual or community, non-compliance is not necessarily malicious or even intentional. Individuals who fail to comply with instructions issued during natural hazards significantly impede the emergency response because they (a) divert resources to compliance enforcement, (b) risk the lives of emergency service workers who may later be required to assist them, and (c) confuse the core safety message or instruction. Further, the team do not yet have a nuanced understanding of the legal ramifications of non-compliance from perspectives of individuals, agencies, or corporations.

Consequently, this project uses several motivation theories and frameworks to explore key factors that may impede compliance with instructional messages. For example, Protection Motivation Theory [8] examines how individuals protect themselves when coping with a hazardous event. This theory suggests that an individual will appraise both the severity and probability of the threat they face, as well as the efficacy of the instructed action and their self-efficacy in performing that action, before being persuaded to act in the instructed manner. Similarly, the Motive-Opportunity-Ability framework examines an individual's motivation, opportunity, and ability to perform a desired behaviour. The framework first seeks to identify individuals' intrinsic and extrinsic motives to enact (non-) compliant behaviour. For example, individuals may be less motivated to obey an evacuation order if they perceive (rightly or wrongly) that their personal exposure to risk is low, or that the instructions have not been issued from a credible source. The framework also identifies the opportunities that individuals have to perform a compliant behaviour. For example, individuals who intend to obey an evacuation order may be inhibited by environmental mechanisms such as a means of transport or knowledge of a shelter location. Finally, the framework seeks to understand the abilities (i.e. skills and proficiencies) individuals must possess to comply with instructions. For example, individuals who do not understand instructional messages are unlikely to comply.

Finally, drawing on compliance-gaining research from communication and psychological literatures [e.g. 9, 10, 11, 12], the team propose that there are a number of ways in which a message can be framed to increase the likelihood of compliant behaviour. By using these theories and frameworks, the team take a comprehensive psychological approach to explore the individual drivers of non-compliant behaviour in order to improve risk and warning communication effectiveness. As the team develop an understanding of the drivers of non-compliance to instructional messages, they can examine the implications of this behaviour within an Australian legal framework. More specifically, the team seek to investigate the legal vulnerabilities or liabilities of the various stakeholders, such as governments and first responders, within the current legal framework across the Prevention-Preparation-Response-Recovery spectrum to determine if the legal framework creates barriers or enablers to effective communication.

Following an analysis of the peer reviewed literature, policy documents, legislation, inquiry and industry reports, the researchers will draw on multiple and mixed methods including focus groups with the community and experiments to

evaluate the effectiveness of risk and warning communication. This project will explore emergency message content, timing, mode of delivery, and the interplay of 'unofficial' information with concurrent 'official' messaging to promote better understanding of the psychological and legal motivators for maximising compliant community response in the face of a natural hazard.

The results will inform the development of best practice principles for risk and warning communication and recommended changes to the regulatory framework. The messages recommended would take into consideration the legal issues emergency agencies may face when communicating with the community. As major natural disasters have a significant economic impact on society, even small changes in protective behaviours can be valuable [2]. Informed emergency messaging can subsequently reduce the costs associated with disasters, which are largely attributed to the public response to the disaster [3], and could potentially save lives.

RESEARCH ACTIVITIES IN 2016/7

This section will review the primary project activities for the period from July 2016 to June 2017.

EXPERIMENTS ON MESSAGE COMPLIANCE

The aim of conducting experiments on message compliance is to quantitatively test insights derived from national focus groups in order to improve the effectiveness of warning messages. The experiments aimed to optimise warning messages using theoretical insights from psychology, marketing, and behavioural economics. In conducting these experiments, our objective was to develop research evidence on the effectiveness of instructional messages that end users can integrate with their professional judgement to optimise how instructions are issued to members of the community during the response and recovery phase of natural disasters.

Using a mock flood warning message as a baseline, the experiments manipulated design factors such as formatting, message order, temporal cues, and the presence of responders. A total of 77 experiments were run, with a total sample size of 3615 Australians. The broad findings showed that in the preparation phase, a fully formatted message (e.g., one that uses bolding, textboxes for instructions, etc.) significantly increased behavioural intentions to evacuate, which is a desirable protective action. When alerting the community to watch for flooding, omitting the official event description (provided by the Bureau of Meteorology) increases the sense that the message is sensationalised. Additionally, by putting the instruction before this official event description, the message is more likely to trigger a social expectation to stay informed about the event. Finally, when asked to prepare for flooding, a short, specific update time (e.g., The next update will be provided at 10.15am [after a 10.00am warning]) triggered a sense of information sufficiency and information usefulness. Interestingly, when preparing to evacuate and using vague, long update statements (e.g., in about one hour), positive emotions such as hopefulness and optimism were generated. Combined with the focus group findings, this finding may demonstrate an optimism bias that might occur during hazards.

EYE-TRACKING EXPERIMENTS

The aim of the eye-tracking research is to examine how people search visually for information and how risk tolerance affects behaviour. The studies employed eye-tracking technology to monitor and record participants' eye movements as they processed the stimulus (i.e., emergency warning messages of varying threat levels). The study involved multiple phases and comprised 60 participants across both phases.

Findings show that participants spent the highest percentage of time reading the background information followed by the instructions, and for low-risk messages, the potential impact of the event. For an 'Evacuate Now' message, participants spent more time in the instructions text than the 'Watch for Flooding' message. After viewing the message, participants were asked to recall if they had seen an image with the message. The presence of an image was correctly reported for

59% of the participants while 41% incorrectly reported seeing/not seeing an image.

The findings from this study suggest that participants did not universally find images assisted within planning their response. Inconsistencies in participants' report of viewing an image were noticeable, with 41% incorrectly identifying the image. This conflicts with our earlier qualitative findings that indicated a community preference for visual images within emergency warning messages. Participants in this study did, however view the image more often for higher risk messages.

BUSINESS RESILIENCE WORK PACKAGE

The aim of the business resilience work package is to examine needs of small businesses during hazards in combination with emergency management organisations' appetite to adapt messages. Natural hazards affect communities, which comprise households and businesses. To help protect communities, much research and practice in risk and warning communication focuses on the informational needs of householders. However, businesses play a significant role in communities before, during and following natural hazards. In Australia, the total economic cost of natural disasters is forecast to increase from $6.3 billion annually in 2012 to $23 billion by 2050, even without considering the potential impacts of climate change (Deloitte Access Economics, 2013). The Council of Australian Governments (COAG) recognises the fundamental role played by businesses in supporting community resilience (Extracted from National Strategy for Disaster Resilience Commonwealth of Australia, 2011, p. V).

This work package comprised: 1) resource audit to examine resources available to support small business responses to natural hazards, 2) focus groups and interviews with emergency management organisations and businesses in relation to their information needs, and 3) a survey testing existing and modified messages designed to target small businesses.

The audit identified that online resources available to business owners/managers vary greatly in context, content, style and format. Some resources are open to interpretation and assume knowledge of Business Owners/Managers. Taken together, the current state of online resources presents a challenge for Business Owners/Managers who may struggle to translate ideas into practice. The focus groups and interviews revealed some gaps between the informational needs of businesses and the provision of that information by the emergency management organisations selected. While local disaster management group saw opportunities to actively integrate and work with businesses, other organisations were reluctant to change current practices. The survey tested refinements to existing messages for flood and bushfire events by adding 'businesses' within text and/or adding instructions for businesses, and/or adding impacts for businesses. Overall, business-specific messages for bushfires were considered more relevant by small business owners and would help convince them to protect their business. However, for flood events, there were no significant differences in the factors identified above.

SOCIAL MEDIA

The social media research work undertaken in 2016/17 involved case-based research and surveys. The case-based research examined TC Marcia in 2015 extending the analysis of tweet content to examine the flow and type of information shared online. A similar approach was applied to the 2017 NSW bushfires based on end-user requests for multi-hazard research.

A survey was designed and implemented to examine multi-channel messaging and message sequencing from a single source. Specifically, the survey examined community responses to official warnings and Facebook posts. The survey comprised existing and modified messages and examined the differences in protective action based on the sequencing of the messages (either official warning then Facebook or Facebook then official warning), the use of a text-based image with a Facebook post, and the enhancement of content within the messages.

This study examined how participants used information sources and platforms, self-reported their knowledge, information needs, and capabilities, and responded to message stimuli for both bushfire and flood events. The results show strongly that participants prefer to receive official warnings last. Further, findings show value in the inclusion of efficacy-enhancing messages, which may increase the length of a message but also appear to improve their effectiveness. The results also show a difference in participants' use of information sources and platforms, suggesting the important role for multi-agency messaging. Interestingly, participants evaluated bushfire and flood messaging differently. While this study did not set out to compare participant reactions to different hazard types, which may be perceived by participants as have different levels of impact, it is interesting to note the differences.

RESEARCH ADVISORY FORUM

As part of the BNHCRC project, the team attended the 2017 Research Advisory Forum (RAF) in Perth, WA in April. In attendance at the RAF were Professor Vivienne Tippett and Associate Professor Amisha Mehta. During the RAF, the team presented eye-tracking and business resilience findings and sought input for the final project for phase one of the research, the social media survey.

WORKSHOPS AND EXPERT DISCUSSIONS IN 2016/7

Beyond the workshops and RAF, the team has also engaged in many workshops and expert discussions with end-users and other emergency management practitioners to disseminate research findings. These are discussed below.

AFAC WARNINGS GROUP AND COMMUNITY SAFETY GROUP

Associate Professor Dominique Greer and Dr Paula Dootson presented at the AFAC Technical Group (9 November 2016), the AFAC Warnings Group (10 November 2016), and the Flood Warnings Group (11 November 2016) in Melbourne. Outcomes of these meetings included:

- Attaining a permanent observer seat in all three groups for the BNHCRC project.
- End users discussed how they had been implementing findings from our one-on-one reviews of their warnings.
- A formal request from the AFAC Warnings Group for Dr Greer and Dr Dootson to run a workshop in February 2017 (prior to the next Technical Group meeting) to assist with quantitative research program design for agency-specific projects to ensure quality data is being collected. Both accepted this offer.
- A formal request from the AFAC Warnings Group, specifically Amanda Leck, to have the BNHCRC team assist the development of national doctrine for emergency warnings in Australia. This offer was accepted by Dr Greer on behalf of the team and she now attends sub-committee meetings to assist with this process.

The project was praised across all three meetings for offering practical solutions to end user problems.

WORKSHOP WITH SUBSET OF AFAC NATIONAL WARNINGS GROUP

On 20 February, Associate Professor Dominique Greer and Dr Paula Dootson conducted a workshop with a subset of the AFAC National Warnings Group. The aim of this meeting was to assist the committee to achieve their objectives by understanding the research questions they need answered in order to move towards nationally consistent warnings frameworks for all hazards, and ensuring that quality data will be collected to meet that need. Dr Greer and Dr Dootson formulated a brief summary report of key ideas for the broader committee and presented their review at the next Warnings Group meeting on 26 April 2017.

BUREAU OF METEOROLOGY PRESENTATION

Associate Professor Amisha Mehta and Associate Professor Dominique Greer disseminated the findings of the project to date to staff at the Bureau of Meteorology in Brisbane on 13 February 2017. Approximately 45 people from across Australia attended the session in person or via teleconference. The researchers were invited to follow up this presentation with a meeting of key stakeholders who are interested in reviewing how BoM produce warnings in 2017.

IGEM QUEENSLAND DISASTER MANAGEMENT LEXICON WORKING GROUP

Associate Professor Dominique Greer continues her membership of the IGEM Queensland Disaster Management Lexicon Working group.

IGEM ADVISORY PANEL

Associate Professor Amisha Mehta continues her membership of the IGEM Advisory Panel.

INTERNATIONAL ENGAGEMENT

National Consortium for the Study of Terrorism and Responses to Terrorism (START), University of Maryland, USA

A formal collaboration now exists between QUT and Associate Professor Brooke Liu, who joins the QUT Business School as an Adjunct Professor from 2017 to 2020. Dr Liu serves as the Director of Study of Terrorism and Responses to Terrorism's (START) Risk Communication & Resilience Program. Her research investigates how effective risk and crisis communication can optimally prepare the public to respond to and recover from disasters. In recent years, her research has focused on the unique roles that governments' social/new media can play in building community resilience.

CONFERENCES

The team has presented at two conferences across the health, communications, and emergency management fields. The presentations, locations, and presenters are listed below.

WORLD CONGRESS ON DISASTER AND EMERGENCY MEDICINE 2017

Professor Vivienne Tippett presented an extended abstract titled, *Understanding the impact and visual imagery in emergency warning* messages.

EMERGENCY MEDIA AND PUBLIC AFFAIRS CONFERENCE 2017

Associate Professor Amisha Mehta presented an overview of the project's research findings at the EMPA conference in June in Sydney.

UTILISATION

Through discussions with end-users, a number of opportunities have been identified for utilising the research conducted on this project. Provided here is a summary of the types of utilisation being undertaken over the coming year.

END-USER MESSAGE REVIEW - EMERGENCY VICTORIA

Following a review of South Australia's Country Fire Service messages in June 2016, we conducted a review of existing and newly developed templates for Emergency Management Victoria, which included bushfire emergency warnings and Victoria State Emergency Services messages on flood and severe storm. Specifically, 14 warnings were reviewed:

- Seven existing templates: Advice – hazmat, Advice – smoke, Advice – all clear, Community Update – blue green algae, Emergency Warnings – bushfire, Recommendation to Evacuate – bushfire, Watch and Act – hazmat.

- Seven proposed new templates: Flood – minor, Severe Weather, Dam Failure – Community Update, Advice – smoke, Watch and Act: Rural Grassfire, PeriUrban Grassfire, Bushfire.

Suggestions made as a result of this review included (but was not limited to) designing messages for each channel (community versus media), altering the order of information, use of headings, use of visuals, reconsidering any assumptions of preparation, and considering synthesising information to reduce message length. The feedback was provided to EMV via email. A follow-up teleconference was held (16 September 2016) to answer additional queries EMV has regarding the redesign of their warnings for the upcoming hazard season. The feedback from end-users was positive and they indicated all of the suggestions would be taken on board in their internal review of their emergency warnings.

END-USER MESSAGE REVIEW - NSW SES

On September 15th, end-user Andrew Richards requested a review of New South Wales State Emergency Services (NSW SES) warning templates. The review was undertaken on 27 September 2016, for 13 flood bulletins, five evacuation warnings, four evacuation orders, and four all clear messages. The warnings review also included an evacuation warning and order for dam failure, and an evacuation order for tsunami. These were warnings provided to the researchers in February 2015 as part of general information sharing by end-users and the BNHCRC project team. Suggestions made from the findings of this review included (but was not limited to) ordering of information, use of headings, use of visuals, removal of operational and technical language, direct links for further information about the event, and personalising messages by using second-person (i.e., 'you should') in place of third-person plural (i.e., 'residents should'). The feedback was provided to NSW SES via email.

CALLS-TO-ACTION MESSAGES TO SUPPORT FLOOD WARNINGS

In April 2017, Associate Professor Amisha Mehta developed and delivered a workshop that brought together national approaches to communicating instructional messages to community members during flood events. This work has been adopted and used in agency messaging by Tasmania SES, among others.

LEGACY CONTENT

While the previous utilisation opportunities are quite practical, the team are currently preparing end-user focused hazard notes for each work package as an evidence base for the practical utilisation of the research. The full research reports are available via email and results will be disseminated via agreed channels.

MEDIA AND RECOGNITION

There are a number of media and recognition pieces to report this period, including:

- In July 2016 the research team was awarded the Outstanding Achievement in Research Collaboration Award from the BNHCRC and their independent International Science Advisory Panel, reflecting a superior level of engagement with our end-user group and other key stakeholders in the sector.

- In July 2016, Associate Professor Amisha Mehta was a member of an academic team that received a Vice-Chancellor's Award for Excellence for their work in the *ERB201 Destructive Earth*, a subject on natural hazards and disasters. The team collaborates with the Office of the Inspector General for Emergency Management, Queensland Fire and Emergency Services, the Bureau of Meteorology among other industry partners.

- In August 2016, Associate Professor Amisha Mehta was awarded PR Educator of the Year by the Public Relations Institute of Australia, Queensland. In December, Amisha received a Highly Commended from the national group. The BNHCRC wrote a blog post on it as the work from the BNHCRC informed her teaching programs: http://www.bnhcrc.com.au/news/2016/national-gong-researcher.

- In November 2016, Dr Paula Dootson was awarded a Vice-Chancellor's Performance Award for her research engagement with industry on this project.

- In May 2017, Associate Professor Amisha Mehta was interviewed following TC Debbie and her comments were found in multiple online news sites including: WA Today, Brisbane Times, and Beaudesert Times.

FOLLOW-UP PROJECTS

SEQWATER

In August 2016, the research team led by Associate Professor Amisha Mehta completed and shared research work commissioned by Seqwater with full endorsement from the BNHCRC. This project drew on findings from the BNHCRC, and involved collecting additional data specific to Seqwater's needs. The research report is publicly available and is cobranded with the BNHCRC and QUT. The researchers ran a workshop to disseminate the findings to Seqwater staff and other interested stakeholders. Seqwater sought out this work in response to a review by the Queensland Office of the Inspector General of Emergency Management. Seqwater and QUT collaborated to develop an extended abstract and presentation for the 2017 AFAC conference.

MORETON BAY REGIONAL COUNCIL

In October 2016, the Moreton Bay Regional Council approached the team to review their emergency warning messages. With support from the BNHCRC, a small consulting project was led by Dr Paula Dootson, drawing on knowledge built within the CRC and with the team's other 'follow-up project' with Seqwater. Following the review, the suggested changes were presented to Moreton Bay Regional Council (24 November 2016) along with suggestions on how marketing and communications principles could be used to improve comprehension, attendance, and behaviour in the emergency context.

QUEENSLAND FIRE AND EMERGENCY SERVICES

In March 2017, QFES contracted a QUT research team led by Associate Professor Dominique Greer (supported and approved by the BNHCRC) to (a) review and revise the current suite of 13 bushfire warning messages to align with good practice messages for fire hazards, and (b) produce a report detailing evidence for proposed revisions to support the renewed message suite. The project team facilitated three workshops with the stakeholder group, collated research on good practice message design, reviewed the current message suite, drafted modified messages for discussion, and submitted a confidential final report.

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PUBLICATIONS LIST

JOURNAL – PEER REVIEWED

Tippett, Vivienne, Mehta, Amisha M., Greer, Dominique, Dootson, Paula, Duncan, William D., Christensen, Sharon A., et al. (2015) [Conference abstract] Effective communication during disasters: What effects community decision making & action? *Prehospital and Disaster Medicine*, *30*(1), s83.

Dootson, Paula, Mehta, Amisha M., Greer, Dominique, Tippett, Vivienne, Duncan, William D., Christensen, Sharon A., et al. (2015) [Conference abstract] Effective emergency messaging during natural disasters: An application of message compliance theories. *Prehospital and Disaster Medicine*, *30*(1), s12-s13.

[Under review]

Balancing flexibility and certainty in emergency management regulation and policy, *International Journal of Disaster Risk Reduction* [H Index= 16; Q1 SCImago]

[In preparation]

Improving emergency message comprehension to encourage protective actions *Prehospital & Disaster Medicine* [H index=33; Q1 SCImago rating]

Message comprehension and message framing, *Journal of Business Research* [H index = 100, Q1 SCImago rating]

CONFERENCE PAPER – PEER REVIEWED

Mehta, Amisha, Greer, Dominique, Dootson, Paula, Christensen, Sharon Anne, Duncan, Bill, Stickley, Amanda, et al. (2014) Making smart decisions: key steps towards a typology for emergency communication during natural hazards. In International Communication Association 2014: Digital Transformations, Social Media Engagement and the Asian Century, 1-3 October 2014, Brisbane, QLD.

CONFERENCE ITEM – PEER REVIEWED

Dootson, Paula, Greer, Dominique. A., Mehta, Amisha, and Tippett, Vivienne. Understanding and improving community comprehension of emergency messages to facilitate protective action. In Australian & New Zealand Disaster and Emergency Management Conference, 30-31 May 2016, Gold Coast, Qld.

Tippett, Vivienne, Mehta, Amisha M., Greer, Dominique, Dootson, Paula, Duncan, William D., Christensen, Sharon A., et al. (2015) Effective communication during disasters. In Australian & New Zealand Disaster and Emergency Management Conference, 3-5 May 2015, Gold Coast, Qld.

Tippett, Vivienne, Mehta, Amisha M., Greer, Dominique, Dootson, Paula, Duncan, William D., Christensen, Sharon A., et al. (2015) Effective communication during disasters: What effects community decision making & action? In 19th World Congress on Disaster and Emergency Medicine (WCDEM), 21-24 April 2015, Cape Town, South Africa.

Dootson, Paula, Mehta, Amisha M., Greer, Dominique, Tippett, Vivienne, Duncan, William D., Christensen, Sharon A., et al. (2015) Effective emergency messaging during natural disasters: An application of message compliance theories. In 19th World Congress on Disaster and Emergency Medicine (WCDEM), 21-24 April 2015, Cape Town, South Africa.

Baker-Jones, Melanie, Duncan, William D., Christensen, Sharon A., Stickley, Amanda P., Tippett, Vivienne, Mehta, Amisha M., et al. (2015) Legal mechanisms for maximising community engagement with formal evacuation messaging: How well are these understood? In 19th World Congress on Disaster and Emergency Medicine (WCDEM), 21-24 April 2015, Cape Town, South Africa.

Tippett, Vivienne, Greer, Dominique A., Mehta, Amisha M., Christensen, Sharon A., Duncan, William D., Stickley, Amanda P., et al. (2015) Building resilient communities: Creating effective multi-channel communication during disaster response and recovery. In AFAC 2015, 1-3 September 2015, Adelaide, SA.

Tippett, Vivienne, Greer, Dominique, Mehta, Amisha, Dootson, Paula, Christensen, Sharon, Duncan, Bill, et al. (2014) Building resilient communities: creating effective multi-channel communication during disaster response and recovery. In AFAC: After Disaster Strikes, Learning from Adversity, 2-5 September 2014, Wellington, New Zealand.

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CURRENT TEAM MEMBERS

RESEARCHERS

Professor Vivienne Tippett (QUT Faculty of Health), Associate Professor Dominique Greer (QUT Business School), Associate Professor Amisha Mehta (QUT Business School), Professor Sharon Christensen (QUT Faculty of Law), Professor Bill Duncan (QUT Faculty of Law), Associate Professor Amanda Stickley (QUT Faculty of Law), and Dr Paula Dootson (QUT Business School).

STUDENTS AND RESEARCH ASSISTANTS

Melanie Baker-Jones (PhD student – Faculty of Law) attained "Associate Student" status of the BNHCRC and top-up scholarship from BNHCRC (February 2015). Dr Baker-Jones graduated with a PhD, June 2017.

END USERS

Lead

Andrew Richards, Community Engagement Manager, State Emergency Services, NSW

On-going

Anthony Clark, New South Wales Rural Fire Service; Fiona Dunstan, Country Fire Service, South Australia; Gwynne Brennan, Country Fire Authority, Victoria; Laura Keating and Suellen Flint, Department of Fire and Emergency Services, Western Australia; Reegan Key, Emergency Management Victoria; Iain McKenzie, Office of the Inspector-General Emergency Management, Queensland; Wendy Kelly, Attorney-General's Department, ACT; Trent Curtin, Metropolitan Fire and Emergency Services Board, Victoria; Sandra Barber, Tasmania Fire Service; Karen Enbom, Country Fire Authority, Victoria; Nicole Ely, Metropolitan Fire Service, South Australia; Simon Goodwin and Michelle Coombe, South Australia Fire and Emergency Services Commission; and Heather Larkin, Office of the Inspector General for Emergency Management, Victoria. Amanda Leck, Australasian Fire and Emergency Service Authorities Council, Rowena Richardson and Nicola Moore, Office of the Inspector General Emergency Management, QLD, Samantha Chard, Attorney-General's Department, ACT, Shannon Panchuk, Bureau of Meteorology, ACT, Mark Unsworth, Emergency Management Victoria, VIC.

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