





Towards protective action: Effective risk and warning communication during natural hazards

Research Advisory Forum / **2019**

**Associate Professor Dominique Greer/ Professor Vivienne Tippett/ Associate Professor Amisha Mehta/ Dr Paula Dootson/ Professor Lisa Bradley/ Dr Sophie Miller
Queensland University of Technology**

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Research Package 1:

Encouraging Protective Action and Enhancing Trust with Multi-Agency Risk and Warning Communication Strategies

Lead Researcher: A/Professor Amisha Mehta

RQ1: How do community members respond to risk and warning communication from multiple agencies during natural hazards?

RQ2: What is the optimal communication strategy (timing, content, agency) to enhance community trust in agencies and encourage protective action?

RP1.1: PROVE

Describe how communities evaluate messages, trust agencies, and take protective action in response to risk and warning communication from multiple agencies.

RP1.2: ASSESS

Develop and test how risk and warning communication from multiple agencies and sources can enhance community trust in agencies and encourage protective action.

RP1.3: UTILISE

Engage with end-users to translate the findings via briefing notes, workshops, and personalised consultation to optimise ways to (i) build trust in risk and warning communication and (ii) support the adjustment of messages during hazards. Possible outputs could include multimedia content and message templates (including content, prompts, and starting phrases).

RP1.4: EVALUATE

Assist end-users to develop evaluation strategies for their changes (if any) to emergency warning communications.

Research Package 2:

Overcoming Ambiguity: Conflict between Emergency Warning Messages and Socio-environmental Cues

Lead Researcher: Dr Paula Dootson

RQ1: How do community members interpret socio-environmental cues that conflict with emergency warning messages?

RQ2: How can emergency warning messages overcome this conflict to encourage protective action?

RP2.1: PROVE

Identify how conflict between emergency warning messages and socio-environmental cues negatively impact risk perceptions, information seeking, self-efficacy, and non-compliant behaviour.

RP2.2: ASSESS

Develop and test an intervention to mitigate the negative effects of conflict between emergency warning messages and socio-environmental cues to encourage protective action.

RP2.3: UTILISE

Engage with end-users to translate the findings via briefing notes, workshops, and personalised consultation to optimise emergency warnings to encourage community compliance when there is conflict between emergency warning messages and socio-environmental cues. Possible outputs could include multimedia content and message templates.

RP2.4: EVALUATE

Assist end-users to develop evaluation strategies for their changes (if any) to emergency warning communications.

Research Package 3:

Optimising Emergency Warning Messages to Encourage Readiness to Act

Lead Researcher: Dr Dominique Greer

RQ1: To what extent do current emergency warning messages encourage community members' readiness to act on emergency instructions?

RQ2: In cases of low readiness to act, can emergency warning messages be optimized to encourage higher levels of readiness to act on emergency instructions?

RP3.1: PROVE

Measure the extent to which current emergency warning messages encourage readiness to act on emergency instructions (using measures of self-efficacy, motivation, opportunity and ability).

RP3.2: ASSESS

Develop and test optimised emergency warning messages that encourage higher levels of readiness to act on emergency instructions.

RP3.3: UTILISE

Engage with end-users to translate the findings via briefing notes, workshops, personalised consultation, and media to enhance hazard knowledge to optimize emergency warning messages in order to improve readiness to act in accordance with emergency instructions. Possible outputs could include multimedia content and message templates.

RP3.4: EVALUATE

Assist end-users to develop evaluation strategies for their changes (if any) to emergency warning communications.



What the research tells us

Optimised warning messages are:

- Highly comprehensible and effective for community members
- Provoke moderate and appropriate threat appraisal by community members
- Contain instructions that community members perceived (i) they could execute well (perceived self efficacy), (ii) would be highly protective (protective response efficacy) and (iii) were low cost (response cost)
- Fatalism, wishful thinking, and denial seems to be driven most strongly by response costs



What the research tells us

When a warning is consistent with social and environmental cues, participants were more likely to:

- intend to evacuate
- share information, and
- perceive the event to be risky

When the warning conflicted with social or environmental cues, participants were more likely to seek further information → social milling → delayed protective action



What the research tells us

Agencies were highly trusted and the message information was highly trusted.

Over the course of an event, trust increased when participants saw two consistent messages (written/video in either order).

Trust was positively related to appropriate intended protective action, but the video provided additive utility.

There was reasonable bushfire and riverine flooding knowledge within the community, but there were many gaps.



How and where the research is being used

1. Multiple agencies have iteratively reviewed their official warning messages to align with the latest evidence to drive protective action (e.g., QFES, NSW SES, SA CFS, VIC SES)
2. Research findings have been embedded in the *AIDR Public Information and Warning Handbook* and *AIDR Guideline 1 Warning Message Construction: Choosing Your Words*.
3. Research has been cited in 2018 IGEM QLD Bushfires review
4. We continue to work with new partner agencies to provide them a strong evidence base from which to make considered changes to their emergency warning messages