

CREATING EFFECTIVE EMERGENCY ALERTS

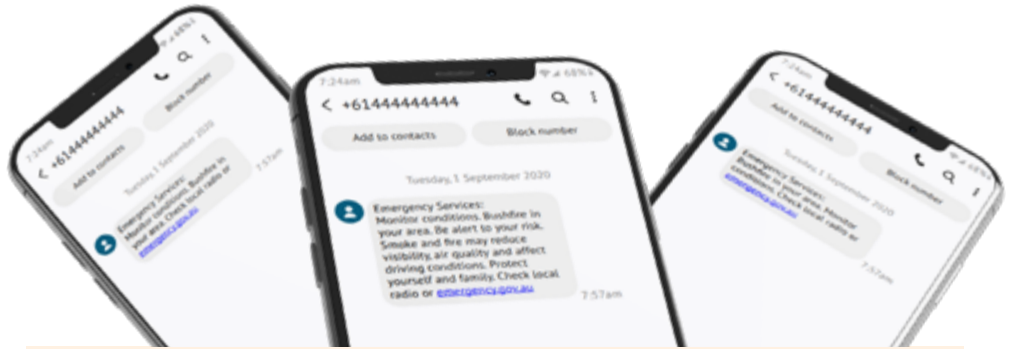
CONTEXT

Emergency Alerts are used by emergency service organisations to warn communities of potential or imminent threat and to trigger protective action. They complement long-form official warnings and media broadcasts during natural hazard emergencies like bushfires and floods. As a type of warning, they are noted for being short and tersely phrased. Critical to the design of Emergency Alerts are word choice, content order and length.

Emergency Alerts are pushed to mobile phones and fixed landlines in geographically defined areas, enabling targeted, direct and timely communication. During the 2019-20 bushfire season, more than 4 million SMS messages and almost 500,000 fixed-line messages were issued nationally. However, despite the high use of Emergency Alerts, scant research in Australia has been undertaken to guide the structure and length of this type of warning in the context of a national and consistent warning approach. This study provides an empirical evidence base to examine differential impacts and guide the future design of Emergency Alerts.

BUSHFIRE AND NATURAL HAZARDS CRC RESEARCH

Bushfire Emergency Alerts comprised three levels of escalation that reflected their likely use by emergency service agencies during emergencies: *Monitor Conditions*, *Evacuate Now* and *Shelter in Place*. Similarly reflecting likely use in practice, flood Emergency Alerts comprised two levels of escalation: *Prepare to Evacuate* and *Evacuate*. Within each type, Emergency Alerts were tailored based on content order and message length. For the purposes of this *Hazard Note*, reporting is limited to Emergency Alerts that differed by action-led (i.e. *Monitor Conditions*) versus hazard-led (i.e. *Bushfire in Your Area*) content order, and short-form versus longer-form (see Figure 1, page one, for examples).



▲ **Figure 1:** EXAMPLES OF SHORT-FORM AND ACTION-LED (LEFT), LONGER-FORM (MIDDLE) AND SHORT-FORM AND HAZARD-LED (RIGHT) EMERGENCY ALERT STIMULUS, USED BY RESEARCHERS IN SIMULATED GRAPHICAL SMARTPHONE DISPLAY FORMAT.

ABOUT THIS PROJECT

This research was conducted as part of the Bushfire and Natural Hazards CRC project, *Effective risk and warning communication during natural hazards*. Researchers used risk communication and behavioural theories to determine whether risk and warning communications can be reinforced or adapted to better support community understanding, decision-making and protective behaviour during bushfire and flood emergencies.

AUTHORS

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SUMMARY

Emergency Alerts are an integral part of warning systems in Australia. They are

issued during natural hazard emergencies, most commonly by SMS or text messages but also via an automated voice message to fixed landlines. Emergency Alerts can be issued across all phases of the warning cycle to support awareness of imminent hazards and encourage urgent decision-making and action.

This *Hazard Note* examines the effectiveness of different Emergency Alert structures for bushfire and flood, which were co-designed with the Victoria State Emergency Service and Emergency Management Victoria. The results support the recent transition to longer-form Emergency Alerts but **also found some differential effects for bushfire versus flood Emergency Alerts**.

The companion *Hazard Note 110* explores how words and phrases can be used to signal risk, warning and the need for protective behaviour.

Via a national online survey of 3,138 people in July 2020, participants were presented with an Emergency Alert similar to that illustrated in Figure 1 (see page one) and asked to assess it against a range of measures: cognitive evaluations (e.g. level of risk, comprehension, perceived effectiveness, trust in information and decision clarity) and protective behaviour intentions (e.g. the intention to evacuate).

At the time of study, Australian Emergency Alerts were limited to 160

characters. As a result, Emergency Alerts reflected the 160-character limit but also slightly longer alerts of approximately 260 characters in length.

RESEARCH FINDINGS

This *Hazard Note* reports the findings for message length and message order, but you can read about more findings in the project final report (see Tippett et al. 2021 in Further Reading, page 2).

END-USER STATEMENT

Emergency Alerts are an important part of warning systems in Australia and part of the national agenda. This research, which involves co-design with agency peers, provides evidence to support the design and structure of Emergency Alerts for bushfire and flood emergencies. Its focus on signal words and calls-to-action will also be of value as the sector continuously reviews message design across multiple channels to deliver timely, urgent warning information to residents who may not be monitoring traditional media. The Country Fire Service highly values this important research. Improvements to Emergency Alert messages together with enhancements to the national warning system will continue to support the community to make informed decisions under stress that can save lives and property.

Fiona Dunston, former Manager Information Operations, South Australia Country Fire Service. Now Bureau of Meteorology.

MESSAGE LENGTH

Researchers assessed short- versus longer-form bushfire and flood Emergency Alerts for cognitive evaluations and protective behaviour intentions.

Bushfire

For cognitive evaluations of all bushfire Emergency Alerts, longer-form messages resulted in higher levels of effectiveness, trust in information and decision clarity. This indicates merit in extending character length to longer-form messages. Interestingly, longer-form messages have a more significant and positive effect for the bushfire *Monitor Conditions* Emergency Alert than the shorter-form messages, with participants indicating significantly higher comprehension, effectiveness, trust in information and decision clarity for the longer-form version.

With respect to protective behaviour intentions, across all bushfire Emergency Alerts, longer-form messages resulted in significantly greater intentions to follow instructions immediately and share the information with others. This finding reinforces the value of longer-form Emergency Alerts. The bushfire *Monitor Conditions* Emergency Alert shows the most significant improvements in several protective behaviour intentions between short- and longer-form versions.

Flood

Overall, for flood Emergency Alerts, there were no significant differences between short- or longer-form messages for comprehension, effectiveness, trust in information, decision clarity or protective behaviour intentions. However, moving to a longer message format did not cause any negative outcomes.

MESSAGE ORDER

Researchers assessed action- versus hazard-led bushfire and flood Emergency Alerts for cognitive evaluations and protective behaviour intentions.

Bushfire

For cognitive evaluations of action-led bushfire Emergency Alerts overall, there were no significant differences in comprehension, effectiveness, trust in information or decision clarity. The exception was the action-led *Evacuate Now* bushfire alert, which showed higher levels of comprehension compared to the hazard-led version of that same alert (*Bushfire in Your Area*).

For protective behaviour intentions, participants responded similarly to both action- and hazard-led bushfire Emergency Alerts, although the hazard-led bushfire *Evacuate Now* alert resulted in significantly lower intentions to do nothing (that is, this

alert motivated people to at least perform one action rather than no action). In addition, intention to share information with others was significantly higher for the hazard-led bushfire *Monitor Conditions* alert.

Flood

For flood Emergency Alerts overall, there were no significant differences in cognitive evaluations, but there was a significantly greater intention to follow instructions immediately for those who saw the action-led flood messages compared to those who saw the hazard-led flood messages.

HOW IS THE RESEARCH BEING USED?

The results support the recent transition to longer-form Emergency Alerts, with consideration of the differential effects for bushfire versus flood Emergency Alerts. The findings of this study were presented at the telephony-based warnings review workshop in 2020. End-users have indicated opportunities to strengthen current Emergency Alerts. Improvements to Emergency Alert messages, together with enhancements to the national warning system, will continue to support the community to make informed decisions under stress.

FURTHER READING

Mehta A, Murray S, Weeks CS, Bradley L, Riley J & Liuzzo C (2022) Choosing powerful words that signal risk and encourage action, *Hazard Note 110*, Bushfire and Natural Hazards CRC, available at www.bnhcrc.com.au/hazardnotes/110.

Tippett V, Greer D, Mehta A, Dootson P, Bradley L, Miller S & Murray S (2021) Towards protective action: effective risk and warning communication during natural hazards, final project report, Bushfire and Natural Hazards CRC, available at www.bnhcrc.com.au/publications/biblio/bnh-8131.

The Bushfire and Natural Hazards CRC has been incorporated into Natural Hazards Research Australia, the new national centre for natural hazard resilience and disaster risk reduction. The new Centre is funded by the Australian Government.

Hazard Notes are prepared from available research at the time of publication to encourage discussion and debate. The contents of *Hazard Notes* do not necessarily represent the views, policies, practises or positions of any of the individual agencies or organisations who are stakeholders of the Bushfire and Natural Hazards CRC.

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