

Reconceptualising Disaster Warnings: Warning Fatigue and Long Lead time Disasters

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WHAT'S THE PROBLEM AND WHY DOES IT MATTER?

'Cry-wolf' syndrome and 'warning fatigue effect' are generally recognised terms for cynicism or apathy that can result from being 'over-warned'. When "high alarm" messages do not eventuate in an event of corresponding magnitude (despite the very real nature of the threat) conventional wisdom says that repeated events can lead to reduced vigilance and preparation. Emergency managers have been known to downplay the severity of a potential disaster, or hesitate to warn appropriately because they are worried that the public will be affected by warning fatigue. Examples of this effect have been anecdotally observed in disciplines of health, meteorology, defence, emergency and disaster management

- ❖ In 2010, the US National Weather Service actively sought to reduce the false alarm rate (FAR) related to weather warnings, because of anticipated community complacency (Barnes et al., 2007).
- ❖ 'Emergency managers may be more reluctant to issue warnings for the fear of issuing a false alarm' (Gruntfest and Carsell 2000)
- ❖ 'It is hard for emergency officials to know just how aggressive to be when 'sounding the alarm' as they have a two-fold problem; avoiding the accusation of panicking the public whilst running the risk of under-preparing them at the same time (Sandman 2006)
- ❖ 'In order to reduce residual risk from bushfires in the Australian context the 'cry wolf' effect needs to be managed' (Cook, Bradstock and Williams, 2010).
- ❖ In worst case scenarios, warning fatigue acts as a decision-making barrier for bushfire-fighters in Australia. (Johnson, 2011)

LONG LEAD TIME DISASTERS – THE LITERATURE TO DATE

There is a dearth of empirical research examining warning fatigue, and the few examples have all done so using short lead time (SLT) disasters: hurricanes, cyclones, tornados and other extreme weather events. Long lead time (LLT) disasters such as pandemics, earthquakes, volcanic eruptions and bushfires require the public to incorporate long-term risk into their daily lives whilst maintaining a level of vigilance.



Disaster literature has shown that there is a relationship between warning time, preparedness and response. The following comments suggest that this relationship is more important than previously thought.

- ❖ 'the very fact that it was possible to issue warnings long before the danger was imminent made possible a gradual, easy adaptation to the approaching danger, but at the same time, rendered the warnings less effective' (Janis, 1962:79).
- ❖ "A false-alarm or a 'cry wolf' effect could result in people concluding that 'the entire alarm was unjustified in the first place' and that the forecasters or scientists 'did not know what they were doing' (Turner, 1983:308).
- ❖ Warning lead time was one of two factors cited by Drabek (1999) which constrained the responses of tourists and residents alike prior to hurricanes Bob (1991), Andrew (1992) and Iniki (1992).
- ❖ If a LLT threat has been 'anticipated by numerous antecedent warnings' then by the time a final and more urgent warning is given, the potential hazard is perceived to be less of a threat. (Janis 1962:81)



METHODOLOGY

Residents of bushfire-vulnerable Victoria and Tasmania identified warning fatigue as a major contributor to personal decision-making prior to disaster events providing the imperative for this research. Bushfires are long lead time disasters and the methodology is designed within the context of the Australian bushfires.

The methodology used a mixed method approach; there were two qualitative semi-structured interview rounds and one primarily quantitative survey (conducted over 6 months). The epistemology was social constructionist and used a combination of IPA, content, thematic and discourse analyses to interpret the data.

Interviews	Warning Fatigue Measure	Survey												
<p>Two rounds of semi-structured interviews were held between November 2010 and October 2011. The interviews were a purposive discussion about risk perception and warnings as they related to the participants' lived experience of the Australian bushfires. The participants ranged in age from 26 to 77 years of age.</p> <p>❖ Participants in the first interview (n=20) were from two bushfire vulnerable communities in two Australian States (Tasmania and Victoria); these participants were all actively involved in personal and community bushfire mitigation activities through their local fire brigade group CFA (Community Fireguard Association)</p> <p>❖ The second interview group (n=17) lived in the Mt Dandenong ranges of Victoria, an area that recently experienced devastating bushfires ('Black Saturday', February 2009). They all identified as not belonging or engaging with any formal community bushfire mitigation activities.</p>	<p>Based on an extensive literature review and the analyses of the interview transcripts, a measure of warning fatigue was devised which directed the design of the survey.</p> <p>❖ The survey explored, in a more structured way, the idea that warning fatigue is a multi-faceted phenomenon, consisting of 12 variables:</p> <table border="1"> <tr> <td>Over-warning</td> <td>False Alarms</td> <td>Helplessness</td> </tr> <tr> <td>Localisation</td> <td>Risk Perception</td> <td>Desensitisation</td> </tr> <tr> <td>Trust & Credibility</td> <td>Worry/Anxiety</td> <td>Optimism</td> </tr> <tr> <td>Experience</td> <td>Apathy</td> <td>Scepticism</td> </tr> </table> <p>❖ The survey consisted of 36 statements, (3 per variable) to which the participants responded on a 7 point Likert scale – Strongly Disagree to Strongly Agree.</p>	Over-warning	False Alarms	Helplessness	Localisation	Risk Perception	Desensitisation	Trust & Credibility	Worry/Anxiety	Optimism	Experience	Apathy	Scepticism	<p>Official warnings and preparation information is continually communicated to the bushfire vulnerable communities throughout the fire season. The survey was designed to capture any changes in risk perception attitudes.</p> <p>❖ The online survey was administered once a month for 6 months, over the Australian bushfire season (November 2011-April 2012) and was primarily quantitative in design.</p> <p>❖ The participants (n=33) were self-selecting within a desired criteria – they had lived in a rural or semi-rural area of Australia for 3 years or more, were not involved in any community or CFA bushfire mitigation, and were not retirees.</p> <p>❖ The first survey (November) contained an option for a qualitative comment, one for each of the variables measured (see Warning Fatigue measure). Subsequent surveys took between 5 and 10 minutes to complete and were submitted online.</p>
Over-warning	False Alarms	Helplessness												
Localisation	Risk Perception	Desensitisation												
Trust & Credibility	Worry/Anxiety	Optimism												
Experience	Apathy	Scepticism												

DISASTER WARNINGS RECONCEPTUALISED: AN EMERGING FRAMEWORK

In long lead time disaster scenarios, pandemics, volcanic eruptions, earthquake and bushfires, the public is exposed to repeated warning messages in the absence of the actual event. This is fundamentally different to extreme weather-related short lead time scenarios whose warnings are issued based on actual data (radar and atmospheric modelling).

Whilst acknowledging that there are well-known factors that increase the efficacy of responses to disaster warnings, such as trust and credibility, salience and experience, all disasters are not the same. Government and emergency management authorities err on the side of caution when warning the public of a potential disaster, for legal as much as for safety imperatives. The resultant risk communication can blur the line between warnings and risk information, and in long-lead time disaster scenarios, often what the emergency authorities intend as a warning, the public perceive as seasonal 'business-as-usual' information. Terminologies are often used interchangeably and have different meanings depending on the context: 'prediction' and 'warning', 'alert' and 'forecast', and 'prevention' and 'preparation' are such examples.

Participants in the second round of interviews were asked about their ideal warning system, and were very clear that, when a bushfire was threatening their particular area, they wanted someone local to provide a warning which was conspicuously different than what they usually heard – for example a siren with a unique sound and specific information such as fuel loads and wind direction. Personal knowledge of their environment, coupled with the use of multiple forms of media formed most people's way of evaluating their risk. The influence of people's local community, neighbours, friends and family cannot be overstated. Many of their ideas are represented by the following comments:

- ❖ "I've got a brain, I don't need to be told what to do, I just need knowledge about conditions" (Roger)
- ❖ "...a warning system has to be embedded into a larger understanding of how fire works" (Nyrie)
- ❖ "...shorter, more intense messages when it really counts" (Martha)

This research has highlighted that warning fatigue and community complacency are intrinsically linked to how risk messages are framed and how they are interpreted. Additionally, review of the literature suggests that if emergency and disaster agencies acknowledge the difference between short lead time and long lead time disaster scenarios (and design their warnings in these contexts), risk communication will become more effective, increasing public engagement and disaster response.