EMG506- Literature Review

Assessment Item 4

Literature Review

Contents

Introduction

Emergency management can be referred to in terms of 'Prevention, Preparedness, Response and Recovery' (PPRR) or the 'Comprehensive Approach' to managing disasters and emergencies. The literature review (review) is aimed at public information in the response phase. For the purposes of the review, response is defined as "activities which activate preparedness arrangements and plans to put in place effective measures to deal with emergencies and disasters if and when they do occur" (Emergency Management Australia, 2004, p. 4).

The scope of the literature examined is based on four themes; systematic influence, challenges, an evolving field and future directions/solutions. The review informs the report for the Tasmania Fire Service (TFS) and State Emergency Service (SES) (final product) for the unit EMG505 – Work Based Project for the qualification of Master of Emergency Management at Charles Sturt University. Across the four themes the following points are considered.

- Identification and discussion of current best practice.

- Identification of gaps in practice in the TFS and SES.

- Identification and discussion of standout issues, including meaningful insights.

- Contribution to public information knowledge through thought and insight.

The topic for the review is *enhancing public information practice during the response phase, in Tasmania's emergency services (Tasmania Fire Service and State Emergency Service).*

The structure of the review is through thematic organisation, the division of the research into sections representing the conceptual subject for research (University of New South Wales, 2017). The purpose of the review is to investigate the current state of practice in public information during the response phase, including 'best practice'. The review pays particular attention to the literature following the Victorian Black Saturday Bushfires in 2009.

Background

Typically, fire and emergency services utilise the Australasian Inter-Service Incident Management System (AIIMS) for incident management during the response phase. AIIMS is defined as a system that "…has enabled Australian agencies to come together to resolve incidents through an integrated and effective response" system (Australasian Fire and Emergency Services Authorities Council [AFAC], 2017). Through the application of AIIMS in training, policy and incident response, fire and emergency services have been able to build trust and confidence with the community and between services (AFAC, 2017).

Considered one of Australia's worst natural disasters, almost ten years on from the 2009 Victorian Black Saturday Bushfires. 173 people died, 2,133 houses were lost (Parliament of Victoria, 2010, p. vii and p.13) and 78 communities (CFA, 2018) were directly affected. It can be argued that the profile of public information during the response phase was raised. Over the last decade Australia has experienced a number of other significant natural disasters including the Queensland Floods 2010-11, Cyclone Yasi 2011 and bushfires across the nation which have continued to influence the public information in response field.

Specific to the research, Tasmania has a long history of natural disasters with the 1967 bushfires etched in history. 62 people died and over 900 people were injured (ABC, 2017). In recent times the 2013 and 2016 bushfires, 2016 floods and 2018 Hobart floods are of note. With these natural disasters in mind, the importance of sound public information during the response phase of emergencies is more important than ever.

The context of the topic

Public information in emergency response, is part of an integrated emergency management system and is relatively new in the incident management sphere within the TFS, SES, nationally and internationally – (Anderson-Berry, Achilles, Panchuk, Mackie and Canterford et al., 2018, BNHCRC, 2017, Emergency Management Victoria, 2014, Dufty, 2014, Parliament of Victoria, 2009, TFS, 2014). The themes discussed in this review are connected and intend to contribute to the future enhancement of public information during the response phase within TFS and SES (gap).

Themes

Systematic influence: behaviour change, politics and power relationships

The Victorian Bushfires Royal Commission (Parliament of Victoria, 2010, p. 26) recommended (Recommendation 14) that fire agencies alter AIIMS to acknowledge and give greater authority to public information, placing it on the same level as the operations, planning and logistic functions of incident management. It was from this point that public information during the response phase formally commenced becoming a greater priority for emergency services (AFAC, 2011). The Royal Commission recommended that a public information unit (similar to the other functional AIIMS units) be established as its own section during major response incidents. The recommendation also identified that if at any point a full incident management team was required during the response phase of a major incident, a public information unit was required (Parliament of Victoria, 2010, p. 26).

Recommendation 14 set national priorities, with fire and emergency services across Australia prioritising the issuing of alerts and warnings and protecting vulnerable people as their top operational priorities during the response phase of major incidents. The Royal Commission findings stated that public information during the response phase in its form up until 2009 failed to "…reflect the quantity, demands and priority surrounding information management in the 21st Century" (Parliament of Victoria, 2010, p. 88). In current practice, the TFS 'Chief Officers Command Doctrine - Operational Priorities (in out of control bushfires)', priority one states: "Gather, analyse and disseminate information on current and predicted fire location, direction, rate of spread and issue relevant and tailored warnings to those communities threatened by fire to assist community members to make informed decisions to ensure their safety" (TFS, 2014).

At an international level, one of the driving factors informing public information response, includes the United Nations' 'Sendai Framework for Disasters and Risk Reduction 2015-2030' (United Nations, 2015). One of the objectives of the framework is to "substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments by 2030" (United Nations, 2015). Internationally, awareness and interest in disasters and warnings is high (Basher, 2006). Basher (2006), Martin and Rice (2012) discuss the importance of a systems approach to warnings that considers the inputs from both the natural and social sciences. Early warning systems are defined by Turban and Volonino (2011) in Martin and Rice's (2012) research as

"…systems that collect, process, store, analyse, and distribute information in support of emergency and disaster situations" (Martin & Rice, 2012, p.529).

Basher (2006) further describes what makes public information effective:

> early warning systems for natural hazards need to have not only a sound scientific and technical basis, but also a strong focus on the people exposed to that risk, whether arising from the natural hazards or social vulnerabilities, and from short term or long-term processes (p.2167).

Strong political commitment and durable institutional capacities are critical to success of strong early warning systems. Identifying the importance of being hazard specific. Basher (2006) discusses that the Boxing Day Tsunami in 2004 and Hurricane Katrina in 2005 provided an instrumental mechanism in creating significant change in the warnings space internationally by raising the profile.

In 2014 the Bushfire Cooperative Research Centre (BCRC) underwent a synthesis of all community bushfire safety research for the period 2003-2013, including post-bushfire community surveying. Specific to public information in response, was that a lack of local knowledge in information and warnings updates has proven to cause the erosion in trust of emergency services. The synthesis identified that there were conflicts between the emergency services need to disseminate information and media agencies need for audience attention. A key finding from the synthesis in relation to how warnings are issued was that "telephone alerts are seen as the most effective way of providing information to residents in bushfire risk areas when faced with escalating risk" (Bushfire CRC, 2014, p. 13). It is worth noting the importance of social media as a critical medium for communicating alerts and warnings. Flew and Burns (2015) discuss the example of "social media platforms such as Facebook and Twitter playing a major role in public information during "…disasters, including the Christchurch earthquakes, the 2011 Queensland floods, Hurricane Sandy in the US, the Japanese earthquake and tsunami, and the 2015 Nepalese earthquake" (Flew and Burns, 2015) .

Seeger (2006) discusses that the BCRC findings display that "to be effective sources of information and influence need to be trusted by individuals and the community". An example of

where trust can easily be eroded is the mispronunciation of place names, localities of fires or stating a fire is on a road that is 50km's long. The BCRC synthesis highlights some of the mismatch between emergency services and community/individual perceptions in emergency management.

'The National Review of Warnings and Information' conducted in 2014 by Emergency Management Victoria, a critical review in the public information response field nationally, discusses that the "….discipline of public information should always be considered in this broader community resilience and public safety context" (Emergency Management Victoria, 2014, p.2). This is supported by Anderson-Berry et al. (2018) and Leadbeater (2010) who discuss the importance of prevention and preparedness education programs and the need to build community preparedness and resilience prior to emergencies. Indicating that this may increase the likelihood of information and warnings being acted upon by the public.

Specific to prevention and preparedness in emergency management, Hall (2007) discusses the importance of prevention and preparedness being linked with response for achieving greater public information outcomes for and with the community. Through cultural change and greater collaboration across prevention, preparedness and response, this can ultimately enhance public information during the response phase. Mayhorn (2005) discusses the benefits of emergency management agencies investing in elder friendly risk communications, as this can impact the safety of increasingly large segments of the population. This is of particular importance with Tasmania's rapidly ageing population. "Tasmania has the oldest population in Australia with 19.4% of the population aged 65 years or more and a median age of 42 years" (COTA, 2017). Shevellar and Riggs (2015) findings discuss that many individuals decision making in emergency response is sometimes based on official advice and sometimes it is not. Highlighting that there is an opportunity for greater linkages between prevention, preparedness and response so that individuals have trust in emergency management agencies in relation to public information that is communicated. Trust is discussed by researchers as a critical factor in public information communication effectiveness, including that there should not always be a 'one size fits all' approach (Burns, Robinson, Smith, 2010, Steelman & Mccaffrey, 2013).

Bullock and Hallow (2004) discuss the importance of specific public information plans being implemented to support robust systems. Strong senior leadership is identified as a key factor to systematic success. Bullock and Hallow (2004) state that within emergency service organisations

every "…effort should be made to ensure that whatever information is released to the public is accurate and up to date". In respect to how this relates to the role of the Public Information Officer (PIO), one PIO described the role as being the first and best source of information, whether good or bad.

Over the decade proceeding the Victorian Black Saturday Bushfires, significant improvements and systems have been established in the public information space. An example of one such improvement is the Attorney General's Department Best Practice Guide for Warning Originators (2013). This guide, based on research, inquires and practice provides best practice in the creation and dissemination of alerts and warnings to assist PIOs and those who make decisions about what to warn, who to warn, and how to issue a warning.

Through the analysis of 'best practice' in crisis communications, Seeger (2006) identified ten 'best practices' that can act as a framework. Acknowledging every emergency is unique and will evolve in its own way. The ten practices include:

- Process approaches and policy development.
- Pre-event planning.
- Partnerships with the public.
- Listening to public concerns and understand the audience.
- Honesty and openness.
- Collaboration and coordination with credible sources.
- Meet the needs of the media and remain accessible.
- Communicate with compassion, concern and empathy.
- Accept uncertainty and ambiguity.
- Messages of self-efficiency.

Challenges

There are a series of challenges and barriers to the enhancement of public information response (Cao and Bryan et al., 2017). Some of the challenges identified include:

- Technology being vulnerable – (Burns, Alex et al., 2010, Cao, Boruff & McNeill, 2017, Emergency Management Victoria, 2014).

- Shifting towards 'joint public information systems' – (Anderson-Berry et al., Basher, 2006, 2018, Hall, 2007).

- Relationships between stakeholders and the community – (Steelman & Mccaffrey, 2013).

- Gaps in understanding behavioural change – (Burns, Alex et al., 2010, Leadbeater, 2010, Shevellar and Riggs et al., 2015, Steelman and Mccaffrey, 2013).

- Vulnerable populations, E.g. the elderly and tourists – (Mayhorn, 2005).

- Organisational culture (Pearson & Clair, 1998, Bunker & Smith, 2009).

Leadbeater (2010) discusses that in today's world there is increasing expectations from the public for information during disasters. Leadbeater demonstrates through the use of international examples, including 9/11 and the London bombings that the best defence in any disaster is a public that is informed.

Leadbeater refers to Falkenrath's (2005) three rules of public information during response:
- First reports of disaster are normally inaccurate
- Once accurate reports are determined, these normally have a high level of uncertainty
- Technology has increased the demand for faster public information and that agencies need to be prepared to provide quick information (Falkenrath, 2005, p.133).

Culturally, Hall (2007) discusses that we cannot achieve effective public information until the focus is placed on the leadership role of emergency management in providing effective early warning capability. A suggested solution to this is through increased integration with science and technology and commitment and involvement of all at risk to disasters, a 'shared responsibility' approach. Hall (2007) discusses the value of providing impact based warnings and the importance of and rights of the community being kept informed. Of note, is the identification of the shift in the emergency management paradigm from emergency response to prevention and preparedness being more integrated with response (Hall, 2007, p. 36).

Communications expert Peter Sandman (2006) debates if 'best practices' in crisis communication are part of the issue. In respect to response to disasters, Sandman suggests that we are implying emergency services know what the public should do. Stating that the reality of different crisis is "…some people are maybe insufficiently concerned while others are appropriately concerned" (Sandman, 2006, p.258). Sandman argues that communication is a two way process in that emergency management agencies need to trust that the public will do the right thing, including

that most people will listen to dire warnings. Sandman debates that coordinated messaging is overrated. He argues that a single message approach can also be disputed. Some of Sandman's work can be argued as being more a commentary, debate and discussion on his opinion on crisis communications rather than evidence based research.

With responding to disasters comes significant and sometimes uncertain communications issues. Manoj and Baker (2007) summarise the challenges as being technological, sociological and/or organisational. Providing a case for a comprehensive approach to these issues.

Trust is a common theme in the literature. Steelman, McCaffrey et al. (2014) in the paper 'What information do people use, trust, and find useful during a disaster?' discuss the attempts to understand the kinds of information sources public information recipients trust and find most useful to inform their decision making in a bushfire emergency. Steelman et al. reaffirm the importance of proactive public information during major incidents. Investing in TFS and SES capability, including; the most useful areas where people source information and the importance of public information being delivered through "…crafting, honest, trustworthy messages, and levering of credible sources" (Steelman et al., 2015, p. 617). In their research the most useful sources of information and high trust sources identified included: local fire departments, maps, discussions with local forest service, family/friends/neighbours and conversations with incident management team members.

Bullock, Haddow et al. (2004) suggest that putting public information personnel and infrastructure in place to execute robust, flexible and effective public information is critical. Arguing that a strong commitment of senior leadership to put systems in place is critical. Bullock et al. (2004) discuss the importance of a single voice model with public information for communicating with the public. The importance of media training and having clear lines of communication across government. Using the example of one public information officer describing it as "every effort should be made to ensure that whatever information is released to the public is accurate and up to date" (Bullock et al. 2004, p.6), whether it is good or bad news. There are dangers in withholding information, even if things have not changed it is important to communicate this.

Burns and Eltham (2010) discuss six theories from the field of 'catastrophic failure', with a focus on reviewing why Victoria's emergency management response systems failed during the 2009 Black Saturday Bushfires. Exploring how the media can learn lessons from the field of 'catastrophic failure' arguing that there is a mismatch in some areas of fire and emergency services

communications in terms of government authority and the behaviour of the community and that technology is vulnerable during disasters.

Disaster myths are a common challenge in the public information response field. Arnold (2006) in the paper 'Disaster Myths and Hurricane Katrina' discusses some of the common issues. From the Hurricane Katrina case study, a myth included; "I want to make sure these dead bodies get taken out of the water before mosquitos spread disease all over the south" (Arnold, 206, p. 1).

Kox, Kempf, Luder, Hagedorn and Gerhold (2017) discuss the challenge of operations practices regarding the processing of information. Linking with Le Clerc (2015), results show that in order to improve weather warning communication, spatial technical requirements need to be addressed. Technological challenges of including impact information provided by emergency services and social media. A solution to this challenge may include the enhancement of mutual exchange between weather forecasters and emergency services. Bunker and Smith (2009) discuss that no single form of technology should be relied upon to communicate alerts and warnings with the public.

Hancock, Fisk and Rogers (2001) argue that successful comprehension of warning text necessitates an ability to understand both explicitly and implicitly information. Stressing that comprehension levels vary across ages and demographics. Findings suggest that older and younger people are capable of understanding information that is explicitly stated in a consumer product warning. Hancock et al. (2001) found that older adults tended to be more willing than younger adults to correctly reject a statement as false within the context of a given warning. Encouraging warning designers to be cautious when using warnings that necessitate a lot of inferencing to interpret.

An evolving field that is rapidly changing

The public information response area has advanced in the last decade since the devastating Victorian Black Saturday Bushfires in 2009, the Queensland Floods of 2010/11 and other disasters within Australia and internationally (Anderson-Berry et al., 2018, Emergency Management Victoria, 2014).

The 2009 Victorian Bushfires Royal Commission was an important part of ensuring that the lessons are clearly defined and learned. The Royal Commission report looked at the lessons that

could be learnt at the time including; how we can reduce the risk and impacts of fire and minimise fire-related loss of life in the future. Recommendation 14 (Parliament of Victoria, 201o, p. 26) suggested that prior to the 2010/11 bushfire season that where ever an IMT is stood up a PIO is put in place, with recognition of local knowledge in public information.

The public information response field is rapidly evolving – (Anderson-Berry et al., 2018, Emergency Management Victoria, 2014). Anderson-Berry et al. (2018) discuss the history of the information and warnings landscape. Including major disasters that have influenced the landscape and the recommended future direction based on evidence based research. They recommend a 'total warnings system'. Highlighting the importance of working within an integrated emergency management model across all hazards. This review acknowledges that in 2018 state, territory and commonwealth agencies are scoping projects that develop capability to integrate hazard and risk based information into the role out of warnings with a people centred approach. Anderson-Berry et al. (2018) discuss prevention and preparedness education programs and the need to build community preparedness and resilience prior to emergencies. Stating that it is likely to increase the likelihood of the success of information and warnings going out to the public. This includes understanding the social capital within communities and building relationships with communities in preparedness. Since 2009, the TFS has invested in the preparedness space through community development and education programs, including the Bushfire-Ready Neighbourhoods program (AFAC, 2015).

A shifting paradigm is recognised, shifting the focus in emergency management from disaster response to early warnings, disaster resilience and a 'shared responsibility' approach to emergency management – (Dufty, 2014). Dufty discusses progress made with early warning systems in Australia in the ten year period from 2005 to 2014. Discussing what may be considered as an early warning system. Summarised from the United Nations these include; risk knowledge, monitoring and warning service, dissemination and communication and response capability. Dufty highlights some areas that have evolved, including; forecasting and prediction, intelligence, interoperability, public information officers, warning mechanisms, protocols and principles.

Laughery (2006) identified and reviewed the factors that research has shown to be most significant in determining the effectiveness of warnings, and to offer suggestions regarding some of the challenges and opportunities in the public information area. Like others (Dufty, 2014, Anderson-Berry et al., 2018) Laughery argues significant progress has been made in the warnings space over

the last decade. Discussing that technology is an opportunity to continue to develop in the field. A practical example of this is the current development of a new National Fire Danger Rating System and multi-hazard warning system in Australia. Cao, Boruff et al. (2017) discuss creative approaches including the utilisation of bushfire maps and pictures/imagery in public information. Cao et al. debate that there is a reluctance of agencies in using accurate and timely bushfire maps for warnings. Arguing that it is possibly a sentiment fuelled by beliefs that the public are not fluent map readers and maybe overwhelmed. Results from Cao et al. research indicated that appropriately designed maps prevailed over text messages for the communication of bushfire warnings.

Expectations are greater than they have ever been, in terms of the information people expect and the timeliness of when that information is made available is speeding up – (Sandman, 2006). Reynolds and Seeger (2005) describe a model of communications from the health sector known as crisis and emergency risk communications (CERC). The model suggests specific kinds of communication activities that should be considered at various stages. Identifying the changes in the nature of disasters has changed the communication mediums required. The importance of timely public information, recognition that disasters will happen, the importance of planning for them and recognising that they are not a surprise. Medford and Davis's (2014) work links to Reynold and Seeger's (2005) research, in terms of recommending systems being in place well before disasters.

Exploring the topic of the 'cry wolf effect' with warnings, LeClerc and Joslyn (2015) discuss the rate of false alarms in weather related decision making. As well as reviewing people's experience with false alarms. LeClerc and Joslyn's (2015) findings suggest that very high and very low alarm rates did not significantly affect compliance or decision quality. Suggesting that a future improvement could include adding an uncertainty estimate, which may increase the likelihood of people paying attention. There could be benefit in exploring this in future research.

In terms of an evolving field, the Importance of an all hazards approach to public information response has been identified – (Anderson-Berry et al., 2018, Tarrant, 2006). On a practical level, TFS and SES is working in this direction with the recent (July 2018) establishment of a joint Public Information Coordination Group.

Future direction and solutions

The current and future direction of alerts and warnings is an area of focus in the literature (Cao, Boruff et al., 2016). AFAC discusses the importance of alerts and warnings being in place to protect and guide people in terms of public safety – (AFAC, 2016). In 2016 AFAC developed the 'Community Safety Messaging for Catastrophic Bushfires: Lessons Learnt from Black Saturday Bushfires'. Discussing the importance of key messaging advice to be shared as part of key messaging with the community during the prevention, preparedness and response phases of emergency management. A critical message that comes out of the guideline for the public is "don't rely on warnings" (AFAC, 2016, p.5) and that it is a 'shared responsibility' for the public to stay informed. The guideline recognises the limitations of warnings including, the ability to connect to the internet.

The 'National Review of Warnings and Information' (Emergency Management Victoria, 2014) can be seen as an important review of public information practice during response. Discussing that society is seeing more and more disasters that are having impacts on communities, with that being the impetus for the national review in 2014. Looking at public information effectiveness, likely impacts of disasters on infrastructure and how emerging technologies may support emergency communications and warning systems. Of note are the themes discussed, including; advancing a national approach, improving warning frameworks, the role of community education and preparedness, trust, credibility and information validation, publishing systems and a multi-channel approach, tailoring messages language and consistent technology, importance of targeted warnings and avoiding warnings fatigue, reaching drivers and at risk groups, emerging technology and the next frontier, social media, two way conversations and information sharing, Emergency Alert, multi-hazard websites, working with partners and third parties, workforce management and capability, centralised and decentralised models in use, evaluating effectiveness of warnings and information.

Recommendation 8 from the National Review aligns with the theme of future directions for the public information response field. Emergency Management Victoria (2014) stated;

> Practitioners and researchers agree that the success of warnings largely relies on efforts to build community resilience, awareness and preparedness prior to an emergency. There is merit in the 'total warning system' concept, already adopted by flood response agencies, being more formally considered across other hazards in the development of future warning frameworks (p. 10).

In acknowledging this recommendation it is recognised that complex human responses to warning messages can include their dynamic nature and people's non-compliance (Cao et al. 2017). Identifying that warnings need to continue towards being more people focused, impact based and specific in terms of recommended actions for the public for a particular hazard.

Medford-Davis and Kapur (2014) highlight the importance of future directions and solutions undertaking communications prior to disasters to improve preparedness and link preparedness with response. Referring to Huricane Katrina as a case study, Medford-Davis and Kapur discuss how to prepare communications ahead of disasters including the skills and training required for Public Information Officers and recommendations before disasters to improve systems. The importance of communicating early, communications with government and other decision makers in terms of their needs to know what is going on. They suggest future enhancement to the communications with vulnerable people and extending the reach with diverse and at risk groups. This is also supported by the 'National Review of Warnings and Information' (Emergency Management Victoria, 2014).

Taylor, Kox and Johnson et al. (2018) discuss significant weather events and that they are increasing worldwide. Arguing, that with the increase, these weather events are increasingly putting people's lives at risk. A solution that Taylor et al. discuss is that forecast and warning systems information can be made available that may reduce the impact of these weather events on people's lives. Taylor et al. discusses the importance that forecast information does not exist in a vacuum. Arguing that the future enhancement of alerts and warnings need to consider the broader organisation, political, social and cultural issues. Suggesting that warnings need to be impact based, trusted and clearly name up the uncertainties. Specifically "warnings and forecasts are only one input into decisions about responses to and preparedness for high impact weather" (Taylor et al., 2018, p.3).

With the weather industry being central to effective public information, in 2015 the World Meteorological Organisation published 'Guidelines on Multi-Hazard Impact-Based Forecast and Warning Services'. The Guidelines establish a road map that identifies the various milestones from weather forecasts and warnings to multi-hazard based forecast and warning services. Highlighting future directions continuing to shift towards impact based forecasting. A potential area for further research and investigation.

Emergency Management Victoria (2014) identified increases in the use of social media, recognising the broad nature of communities, human behaviour and the political setting, recognising that there is not always a 'one size fits all' approach. For example, tailoring messaging to cultural and linguistically diverse communities.

With contemporary research recommending the use of impact based warnings Potter et al. (2018) tested the influence of impact based severe weather warnings on risk perceptions and intended protective actions. Potter et al. found that impact based warnings maybe more effective, but do not necessarily translate to higher levels of action. Stating that gender and location influence risk perception and actions. Furthermore, their research supports the inclusion of information about hazard impacts and what to do information in a warning message.

The '2013 Tasmanian Bushfires Inquiry' reflects the importance of prioritising public information and states that public information is important for many reasons. An example described is that "it provides context for alerts and warnings that are issued, options available and action that should be taken" (Parliament of Tasmania, 2013, p.166). McLennan, Ryan, Bearmans and Toh (2018) support the importance of warnings providing sufficient information. Arguing that the detail and currency of public information influence the public's compliance with alerts and warnings (McLennan & Bearmans et al., 2018). Recommendation 68 from the inquiry recommended that "warning communities and people generally should not only be a priority when fires are burning out of control" (Parliament of Tasmania, 2013, p.165). This places the argument that detailed, accurate and current public information is important for all incidents.

In terms of future directions in public information, Choo and Nadarajah (2014) looked at the information needs of the public during the 2009 Black Saturday Bushfires. Choo and Nadarajah (2014) through case study analysis found that the public wanted a trigger for action, timely information and a clear indication into the seriousness of a bushfire. Through a laboratory experiment looking at the format and information distributed as part of a high impact weather events, Mu, Kaplan and Dankers (2018) discuss that increasing the information provided to the public (warnings) with content can be beneficial and add to the trust of warnings. Mu et al. (2018) debate that better decision making is not always made with more information. Findings from there research recommend that it is important that this is done with caution.

Through a comparative study in Germany and Australia, Rohrmann (1994) discusses the different ways that risk can be perceived. Highlighting the need to communicate with more diverse audiences. Societal groups affiliated with particular professional and political orientations differ in their judgement and evaluation of risks. Recognising the influence of political movements or media coverage can also influence people's perceptions of risk. People's values also shape their interpretations of risk. Spence and Lachlan et al. (2007) examine the differences in evacuation, crisis preparation, and information seeking patterns, and media use among communities of disabled and non-disabled evacuees in the aftermath of Hurricane Katrina. Emphasising that interpersonal networks are critical for people with disabilities. Spence et al. argues that disabled people are more likely to be prepared, but less likely to have an emergency plan. Recognising that there is still "…much to learn about the effective means of communicating critical information to vulnerable populations during a crisis. The current study suggests specific message areas in need of such attention, such as crisis preparation, evacuation, and information distribution" (Spence et al., 2007, p.402).

In terms of current and future direction, the Sendai Framework for Disaster Risk Reduction (2015 to 2030) states a priority internationally for emergency management is the "…substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries" (United Nations, 2015, p. 12). Specific to public information in response; substantially increasing "…the availability of and access to multi –hazard early warning systems and disaster risk information and assessments to people by 2030" (United Nations, 2015, p.12). For practice this means investing in understanding disaster risk reduction, strengthening disaster risk governance to manage disaster risk, investing in disaster risk reduction and enhancing disaster preparedness for effective response (United Nations, 2015, p.14).

Conclusion

In concluding, the literature review has investigated the current state of practice in public information during the response phase, including 'best practice'. Particular attention has been paid to the literature following the Victorian Black Saturday Bushfires in 2009. The Victorian Bushfires Royal Commission findings recognised that public information during the response phase in its form up until 2009 failed to meet the demands and priority surrounding information management in current day (Parliament of Victoria, 2010).

The literature between 2009 and 2018 has demonstrated that significant progress and enhancement has been made in the public information response field since 2009 in Australia. It is important that the 'foot is not let off the pedal'. The review informs the enhancement of public information practice during the response phase, in Tasmania's emergency services (TFS and SES).

Synthesized into four themes; systematic influence, challenges, an evolving field that is rapidly changing, future directions and solutions. The review has highlight that the enhancement of public information at TFS and SES needs to continue and that the 'foot is not let off the pedal'. Areas identified in the review for future enhancement include:

- The importance of working within an integrated emergency management model across all hazards is recognised.
- The importance of prevention, preparedness and response being linked and a community resilience approach.
- Tackling the challenges including; technology being vulnerable, relationships between stakeholders and the community, increasing public expectations, gaps in understanding behavioural change, organisational culture, leadership and vulnerable populations.
- The importance of public information being planned and organised through the use of strong systems.
- Strong leadership and capable personal is identified as a key factors to systematic success.
- Continuing to shift towards a greater focus on impact based warnings.

The review provides an evidence base for the recommendations report for the unit EMG505 – Work Based Project.

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