Community Safety Edition

Reducing firefighter fatalities | Understanding social resilience | Websites as emergency information source?

historical snapshot

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Bradford Football Stadium Fire

Just prior to 3.40pm on 11 May 1985, a small fire was noticed three rows from the back of the Bradford City Football Stadium in Bradford, England and fire-fighting equipment was requested. Within minutes flames could be seen and police commenced evacuating fans from the stand. The antiquated wooden structure enabled the fire to spread very rapidly, engulfing the whole of the roof and stand area of 'G Block' in minutes.

Police and spectators struggled to rescue people who were too weak or terrified to move. The barrier built to block fans' access to the field during matches created a major obstacle for rescuers, hampering efforts to move people to safety.

Some fans rushed to an exit gate, only to find it padlocked. The weight and willpower of a couple of burly men soon smashed it open.

Fifty six supporters, mostly children and the elderly, were fatally crushed in the stampede. With 265 others injured, emergency services were stretched to meet the response.

The fire was believed to be accidentally started either via the dropping of a match or the stubbing of a cigarette in a polystyrene cup. The fire was further fuelled by an accumulation of rubbish underneath the wooden stand.

The resulting enquiry recommendations resulted in new legislation governing safety at sports grounds across the UK.

*Cover shot: Highly Commended entry in 2005 **Volunteers In Action** photographic competition by Ashley Hocking, Basket Range Country Fire Service, South Australia. Entry title: School Visit. This photo shows a volunteer fire officer demonstrating equipment to primary school children as part of the brigade's community relation program.*

interesting websites

Volcanic Ash

Twenty-five years ago, in June 1982, a British Airways Boeing 747 aircraft suffered severe damage after encountering ash from an Indonesian volcano. All four engines 'flamed out' and the aircraft descended 12000 feet before the pilots managed to restart some of the engines and make an emergency landing in Jakarta.

Three weeks later a Singapore Airlines 747 suffered a similar encounter and, after losing two engines, also made an emergency landing. Volcanic ash is made up of pulverised rock and gases, which include sulphuric acid. The ash melts in the hot section of the engine and fuses into a glass like substance, causing loss of thrust and possible engine failure.

These incidents are not isolated and with the volcanic ash causing excessive damage to aircraft, not to mention the safety considerations for passengers and crew, a major international effort has been underway to track and warn aircraft of volcanic ash cloud. The cited cost to aviation since 1982 is over $250 million, and continues to be an ongoing problem. International airlines are prepared to re-route aircraft in order to avoid volcanic ash.

Nine Volcanic Ash Advisory Centres have been set up around the world to advise the international aviation industry of the location and movement of volcanic ash clouds. They operate 24 hours a day and use satellite information, ground reports from vulcanological agencies, pilot reports, meteorological knowledge and numerical models to track and forecast ash movements. The centre in Darwin covers some of the more active volcano areas including Indonesia, Papua New Guinea, and part of the Philippines.

**For further information see
http://www.bom.gov.au/info/vaac/ or
http://www.icao.int/anb/iavwopsg/VAAC06.ppt**

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Vol 22 | No 2 | **May** 2007

Please note that contributions to the *Australian Journal of Emergency Management* are reviewed. Academic papers (denoted by ⓡ) are peer reviewed to appropriate academic standards by independent, qualified experts.

FOREWORD

by
Naomi Brown, CEO, Australasian Fire Authorities Council

Strong communities are the backbone of Australian society. They are the source of vital volunteers to work alongside paid emergency workers and increasingly an integral part in the management of the range of emergencies that affect this country.

As the majority of fire and emergency management agencies and authorities have discovered, involving and educating communities to identify the risks and prepare for appropriate action in an emergency is imperative. So much so that the majority of Australian fire and emergency management agencies have entire departments dedicated to Prevention and Community Safety.

The Australian Fire Authorities Council (AFAC) is working side-by-side with EMA on projects aimed at improving community safety and assisting community resilience. Sadly, over the past few years there have been a number of large bushfires that have devastated many Australian states and territories. These fires led to coronial inquiries and the establishment by the Prime Minister, after the 2002-2003 bushfire season, of the COAG Inquiry on Bushfire Mitigation and Management. Together with EMA, AFAC's member agencies have played a leading role in the implementation of the findings of the inquiry.

A lot of people lost their homes and a few their lives during these fires and AFAC, through its Community Safety Group — made up of AFAC member agencies, including EMA — is continually looking at methods of improving community safety and resilience whether it is through the development of a national position on Stay & Defend Or Go Early or recommending which type of smoke alarm is the safest for the Australian public to purchase for their homes.

Although involving communities often received limited consideration during emergency management planning and emergency operations in the past, recent events here in Australia and worldwide have necessitated a change in thinking by the country's fire and emergency services organisations.

At the recent International Emergency Management Conference (IEMC) *Reaching Beyond Catastrophe – The Return Journey* in Adelaide earlier this year, delegates explored the issue of building community resilience.

Its organisers stressed that disasters are events that impact on people and communities, and managing and supporting affected people is a major part of dealing effectively with a disaster. Recovery is enhanced when there is a sense of 'community', where people, both the victims and the responders, feel supported before, during and after a disaster.

Resilience involves engaging communities by helping them help themselves, harnessing the power of volunteers and developing self-reliance via local issues and solutions.

AFAC currently has a strong association with EMA. Fostered over many years this relationship is evident in the many collaborative arrangements that exist between the two organisations.

The organisations are currently developing (with others) national arrangements for Universal Search & Rescue (USAR) and the establishment of a common incident management system for Australia.

Also, of particular interest to AFAC at the moment is the project being undertaken by AEMC's National Community Safety Working Group that is researching the effectiveness of community education programs being used by a wide range of emergency agencies across Australia. This work will help us understand what works for which parts of the community and in what circumstances.

AFAC looks forward to continuing its excellent working relationship with EMA with a common goal of fostering safer and stronger communities in all Australian states and territories.

Naomi Brown
CEO AFAC
May 2006

The Australasian Fire Authorities Council (AFAC) is the peak body that represents the fire, land management and emergency services agencies in the Australasian region. AFAC is an independent, not-for-profit organisation whose operations are principally funded through the contributions of its member agencies.

Increasing community resilience to bushfire — implications from a north Queensland community case study

Sally Bushnell and Alison Cottrell report on research that defines bushfire issues within a community, with the aim of contributing to efforts to increase community resilience to bushfire

Abstract

Increasing community resilience to the bushfire hazard through raising awareness and increasing preparedness for bushfire is a crucial step towards reducing the impact of a bushfire event. The case study presented in this paper investigates the attitudes, expectations and needs of a community in north Queensland in regard to the bushfire risk in their area. Understanding these social aspects, and the community itself, can lead to better delivery of bushfire services, and thereby increase community resiliency. The findings from the case study present a number of implications for bushfire service delivery in the area.

Introduction

The bushfire hazard is fast becoming recognised as a social issue. Bushfires are a natural part of ecosystem processes in Australia. However, as human settlements expand into or adjacent to bushland areas, the risk to lives and property increases. Therefore, there is a greater number of cases in which bushfire and people meet, and consequently bushfire management must focus on the social dimensions of the hazard, in addition to the more familiar technical and scientific dimensions. Targeting community resilience to the bushfire hazard has the potential to significantly reduce the impact of a bushfire event.

Currently there are few resources available for bushfire service providers to efficiently and effectively increase community resilience. The case study presented in this paper is part of a larger project that is developing a tool for service providers nation-wide to define their community and clarify bushfire issues within it, which will provide the means to target community resilience. At the local level however, the case study provides information that can help direct hazard reduction strategies in the surveyed community. This paper reports the results of this case study and discusses the implications for bushfire service delivery in the area.

Methodology*

Study area

The City of Thuringowa is the twin city to Townsville in northeast Queensland (Figure 1). The study area is peri-urban and thus incorporates residential, rural and farming properties. The predominant level of bushfire risk is moderate, and in recent times there have been no significant bushfire events. Ten Rural Fire Brigades (RFB) operate within the area.

Focus groups

Figure 1. Survey area, located in the City of Thuringowa, north Queensland, Australia
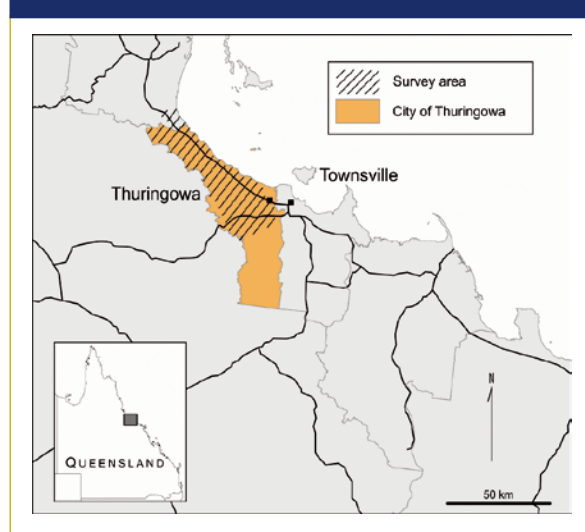
Initially, a number of focus group discussions were undertaken with members of the local RFBs and with members of local community groups. This was to identify local bushfire issues in the area as perceived by these groups, and to guide questionnaire development.

Mail survey

An eight-page self-completion questionnaire was designed to collect data on a wide range of social factors including: demographics and property/lifestyle factors; hazard experience; knowledge of local fire services, bushfire and controlled burning; perception of local hazard risks; participation in bushfire

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preparation activities; preferences for the receipt of bushfire information; views on responsibility for bushfire-related activities; views on service providers and services provided; views on local community and risk; and involvement in community organisations. The questionnaire was trialled in a pilot survey and appropriate changes made before the final version.

Data collection

In total, 957 questionnaires were delivered in October 2005. Questionnaires were hand-delivered to mailboxes to ensure that each RFB area was sampled randomly and equally. Respondents were asked to return surveys by mail using the provided postage-paid return envelopes. One hundred questionnaires were delivered to each RFB area except one, which was delivered 57 due to its small population size. An overall response rate of 28% was achieved with a total of 263 completed surveys returned.

Data analysis

Data for all survey questions were analysed descriptively. For quantitative data, chi-square tests were used to test for statistically significant relationships between variables of interest, and for qualitative data, themes and topics were identified from comments provided by respondents.

Results*

Three major themes derived from the survey data are presented in this paper; each theme has implications for bushfire management in Thuringowa.

Roles and responsibility for bushfire hazard management

Almost all respondents agreed that they would rely on the local fire brigade if there was a bushfire in their locality (93%). Respondents more likely to state such a reliance were those with an urban background (i.e. formerly from an urban area), newcomers to the area, those who were more concerned about the bushfire hazard and those who agreed that the local fire brigade does a good job. For bushfire maintenance activities, respondents mostly indicated that property owners and the local council are responsible (Table 1).

Some respondents tended to view the RFB's role as more extensive especially those that appear to not be familiar with the RFB. For example, those who did not know if RFB members are volunteers (i.e. paid or not) tended to state that the RFB should maintain firebreaks around properties. Respondents living on suburban-size blocks, those with an urban background, not working full time and renters also viewed the RFB as responsible for more activities. These respondents similarly tended to view the council's role as more extensive.

Preparation for bushfires

Respondent preparation for bushfire was linked to perception of the hazard, perceptions of responsibility and previous experience with bushfire; respondents were more likely to prepare when they perceived the bushfire risk, perceived themselves as responsible for reducing the risk (see section above) and had experienced a bushfire before. Eighty-four percent of respondents rated the bushfire hazard in their locality as moderate to very high, although ratings of bushfire risk to their house was lower with 87% giving a rating of moderate to very low. Thirty-seven percent of respondents had experienced a bushfire in the past, and comments regarding what they learned from this experience were commonly about how the fire behaved and the importance of preparing homes for bushfire. Experiences of bushfire through observing controlled or uncontrolled fires in their locality and reports in the media of fires burning elsewhere were commonly selected prompts for respondents to begin preparing their homes for bushfire (Figure 2).

Almost all respondents stated that they undertook activities on their property to prepare for bushfire (94%). Common activities were cutting long grass, clearing rubbish out of the yard and clearing leaves from gutters (Figure 3). Some respondents were more likely to undertake certain types of activities than others. For example, the preparation of a firebreak tended to be undertaken by men, the self employed and tradespeople, while an evacuation plan tended to be prepared by females, office workers, household managers and households with children.

Table 1. Respondent views on who is responsible for bushfire maintenance activities				
	RFB (%)	Property owner (%)	Local council (%)	Parks and Wildlife Service (%)
Firebreaks around properties	9.7	83.1	7.2	0.0
Keep overgrown bushland and creek beds clear	11.0	12.4	54.1	22.5
Clear overgrown properties	0.4	81.0	18.2	0.4
Remove rubbish from public areas	0.4	2.0	95.6	2.0
Maintain property access for the fire brigade	6.3	72.1	19.8	1.8

Figure 2: Prompts for thinking about preparing for bushfire in Thuringowa indicating order of importance to respondents who could nominate their three most important prompts.

Other 18%
Media News 65%
Controlled Burning 69%
Pamphlets 18%
Displays 18%
Uncontrolled Bushfire 69%
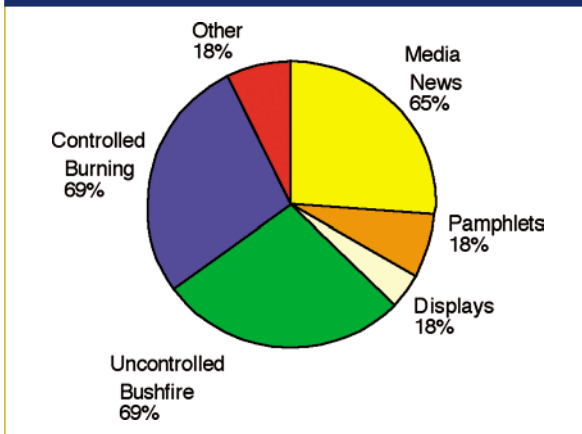
Figure 4: Useful sources of information about bushfire in Thuringowa indicating the highest preferences where respondents could nominate three choices.

Neighbours or friends 33%
Pamphlets 39%
Info from Council 20%
Meeting RFB members 12%
Internet 2%
Info from Schools 4%
Newspaper 42%
TV or radio 64%
Newsletter 32%
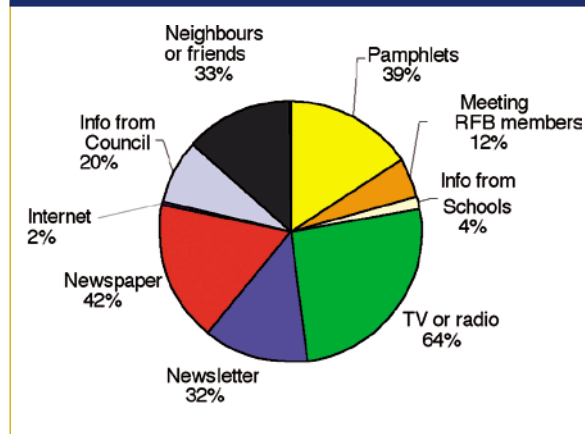
Figure 3: Bushfire preparation activities undertaken by respondents in Thuringowa indicating the highest ranking activities of the three activities nominated by respondents.

Prepare Evacuation plan 13%
Check water Supply 34%
Clear yard 55%
Remove Branches and undergrowth 35%
Prepare Firebreak 40%
Clear gutters 44%
Cut long grass 50%

Respondents demonstrated an overall understanding of the bushfire season: almost all respondents selected at least one month within the normal bushfire season (97%). However, respondents did not demonstrate an understanding of the ideal time for controlled burning (months leading up to the bushfire season, determined by the RFB): almost half selected months outside of this time (46%), and many tended to select months after the ideal time (i.e. during the bushfire season). Seventy-eight percent of respondents were aware of a controlled burn in their area in the last two years, and of these 62% had received notification of the burn, mainly via leaflets in the mail. Overall, respondents were supportive of controlled burning, although they indicated that notification prior is important.

Bushfire education

Most respondents indicated that they receive information about bushfire (91%). Information sources commonly selected as useful were TV or radio, newspapers and pamphlets in the mail (Figure 4).

Some respondents however, had clear preferences for certain sources of information. Respondents living on rural properties showed a preference for information from TV or radio, and those on farming properties from meeting with local brigade members. Long-term residents (> 15 years) also appeared to prefer meeting with brigade members and meeting with neighbours and friends. Furthermore, those working locally and renting their house also tended to prefer meeting with brigade members. Respondents with children and those aged between 26 and 40 years showed a preference for information brought home by children from school. Respondents who worked fulltime tended to prefer information from the internet, whilst those not working fulltime or not working at all preferred information from local community newsletters and the council.

Bushfire awareness through word of mouth was evident from the data. Although a minority stated that they talked to their neighbours about bushfire preparation (23%), those that did so tended to perceive a higher risk to their house, and talking to neighbours was commonly mentioned as the means by which respondents became aware of controlled burns in their area. These respondents were also more likely prompted to prepare for bushfire season by controlled burning rather than uncontrolled fires in their area. However, there were some misconceptions about controlled burning. For example these respondents were more likely to agree that people bring their rubbish to a controlled burn.

Discussion

The roles and responsibilities of various bushfire service providers is a topical issue. It is clear from the Thuringowa case study, and other similar studies (e.g. Beringer, 2000; Gilbert, 2004), that people primarily expect fire brigades to protect people and property from bushfires. Indeed, that is the overarching goal of fire services; however it is the level of reliance on

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these services during a bushfire event that is cause for concern. This study highlights the heavy reliance on brigades, and with such alarming figures (93% stating their reliance), Thuringowa bushfire service providers need to consider an awareness raising strategy that defines the different roles and responsibilities for all players, including residents. In particular, residents need to be aware of the fact that limited resources can restrain brigade efforts to protect all properties during a large bushfire event, and therefore residents need to be adequately prepared to take on the role themselves, or ensure that their property is adequately prepared before evacuating. The survey revealed a number of groups within the community who may rely more heavily on the local brigades than others, and who may not fully understand their own role and that of service providers in bushfire management. These groups include residents with an urban background, newcomers, and perhaps those who cannot justify or afford to take on a greater role in bushfire management (e.g. renters and the unemployed). Other studies have identified newcomers as a group that has little understanding of their local bushfire hazard and associated issues (e.g. Beringer, 2000; Halvorsan, 2002). Residents living on smaller allotments may also expect their local council to undertake more bushfire-related activities.

Such information can help direct awareness-raising strategies. Targeting newcomers to the area for example, could have a considerable positive impact on overall resident understanding of their own responsibilities, and therefore increase their independence. Cooperative efforts between local brigades, council and real estate agents should provide the means to identify new residents moving to the area (as well as other groups) and disseminate appropriate bushfire information.

Perceptions of responsibility for bushfire management were found to be linked to respondent participation in management activities. That is, in order to take action and undertake bushfire preparation activities, a person must first understand that they are responsible to do so, which further emphasises the need for clearly defining a resident's responsibilities. Bushfire risk perception, bushfire experience and preparation were also found to be linked. Previous experience with bushfire appears to have led to more accurate perceptions of the bushfire risk, which leads to participation in bushfire preparation activities. It is therefore important that residents maintain their level of bushfire risk perception, perhaps through retaining what they learned from their experience(s), as well as being aware that what they experienced may happen again in Thuringowa. This may also be achieved through information dissemination. Such findings and implications have been discussed in other studies (e.g. Gardner et al., 1987; Beringer, 2000; Odgers and Rhodes, 2002; Anderson-Berry, 2003; Gilbert, 2004; McCaffrey, 2004).

The direct and indirect experiences of bushfire acting as prompts for residents to begin bushfire preparations for the season, as reported by respondents in this case study, have noteworthy implications. It suggests that various types of experiences with bushfire can be important for residents to perceive the risk and prepare for it. However, it is dangerous if residents begin preparations after the bushfire season has started. Using prompts such as uncontrolled bushfires burning in the locality and viewing media reports of bushfires elsewhere to begin preparations indicates that it is being undertaken too late. Preparations coinciding with controlled burning undertaken by the local brigades in the area are ideal. These burns are undertaken before the bushfire season and are adjusted accordingly with conditions affecting the timing of the bushfire season from year to year. Despite a general understanding of when the bushfire seasons falls in Thuringowa, many respondents did not understand the ideal time for controlled burning, and many selected months falling within the bushfire season. Therefore, while there may be some residents who understand controlled burning and are prompted to prepare by controlled burning, there are many who are confused and prone to preparing too late. A contributing cause may be that many residents are unaware of when controlled burns are undertaken in their locality, thereby missing the 'prompt' to prepare, or missing the opportunity to link controlled burning with the time of year, and with preparations for the bushfire season. Reasons why residents do not always receive notification for controlled burning are not known, although the RFB states that it notifies all residents. Thus further investigation, or perhaps a different approach, will be needed if notifications continue to fail to reach residents.

Notification of controlled burning is important for a number of reasons and at the forefront is that residents want to be notified. It also offers a valuable opportunity to include extra information to define the bushfire season and the ideal time for preparing for it, and to encourage all residents to view controlled burning in their locality as a prompt to prepare their homes, rather than uncontrolled fires or media reports of uncontrolled fires. This strategy could also address a number of misconceptions residents have in relation to controlled burning. Furthermore, there is an opportunity to address levels of preparedness; there are indications that residents are under-prepared. The activities undertaken were commonly for 'housekeeping', not specifically for bushfire hazard reduction such as ensuring a water supply and preparing an evacuation plan. A property is not prepared for bushfire unless a suite of activities are undertaken. This is a common problem (Odgers and Rhodes, 2002; Balcombe, in prep), with serious consequences, particularly if the residents believe that they are prepared, creating a false sense of security, which can significantly increase vulnerability (Montz, 1993; Holden et al., 2000; Anderson-Berry, 2003; Blanchard and Ryan, 2004; Nelson et al., 2004).

KEY IMPLICATIONS

- The need for community education and awareness-raising programs to address a number of issues highlighted by this case study.
  - Define the roles and responsibilities of property owners and bushfire service providers in Thuringowa: newcomers to the area particularly need such information;
  - Define the ideal time for household preparations for bushfire through linking with controlled burning undertaken in the area: additional information provided with controlled burning notifications could clearly state the ideal time for bushfire preparations and the suite of preparation activities needed to be undertaken, as well as address misconceptions about controlled burning.
- The need for more strategically-based information strategies:
  - Use a number of different information sources to reach most corners of the community;
  - Promote informal information networks throughout the community.
- The need to address cost and feasibility issues for some residents to enable and encourage greater levels of household preparation.
- The need for bushfire service providers to share resources to attain the goal of safe and resilient communities.

It is possible that residents in Thuringowa underestimate their personal risk: respondents to the survey clearly rated the risk to their property to be less than that of their locality, perhaps due to inaccurate perceptions of preparedness. However, people can simply view themselves as less at risk than others (Johnston et al., 1999; Kumagai et al., 2004; McCaffrey, 2004). For whatever reason, it is important to ensure that residents have the correct information so that self-assessments of vulnerability can be more objective.

Throughout the above discussion, the importance of information dissemination to residents has been highlighted. Community members in the focus groups conducted for this study also indicated a desire for more information and education. However, disseminating information is not a straightforward activity, and although there is evidence of increased awareness of hazards through community information programs (Rohrmann, 2000ab; Anderson-Berry, 2003), the overall effectiveness, especially when put into context with resources expended, is often questionable. This case study has brought attention to the possible ineffectiveness of disseminating information about controlled burning via leaflets/pamphlets in the mail

in Thuringowa. This is somewhat surprising due to respondents rating this information strategy as highly useful. Anecdotal evidence suggests that residents may disregard the pamphlets, perhaps due to other priorities at the time, confusing them with 'junk' mail, or there may simply be a lack of interest in reading such material. This method however, should not be disregarded; it is clearly an important line of communication for some residents. Rather, it indicates that there is a need for more strategically based information programs.

This case study provides a number of implications for information strategies in Thuringowa. In particular, a number of different information sources need to be utilised in order to reach most corners of the community, which could be undertaken simultaneously or separately to target appropriate groups depending on the goal of the program. Overall, respondents stated that TV or radio was the most or at least one of the most useful sources of information about bushfires, followed by newspapers and pamphlets. These are perhaps the most accessible information sources in our society, and thus are appropriate means of disseminating information. However, results suggest that different people prefer information from different sources, highlighting the need to use different sources. In addition, the information received from the source most preferred should have a greater impact on that individual. It should be noted that verification of these results is required; there may be a large distance between respondent stated behaviour and observed behaviour. Furthermore, any information strategies undertaken need to be evaluated for effectiveness in delivering the desired message.

Information sharing via 'word of mouth' appears to be an effective method of raising awareness about bushfire risk and associated issues in Thuringowa. Contact with neighbours was associated with higher perceptions of the bushfire risk and awareness of controlled burning in their area, as well as household bushfire preparations beginning at the ideal time. Community cohesiveness has indeed been linked with greater community resilience to hazards (Buckle, 2000; Jakes et al., 2002; Anderson-Berry, 2003; McGee and Russell, 2003). However, community cohesiveness is a very complex phenomenon and affecting the state of cohesion through any means is basically unfathomable.

Creating and encouraging community networks to transfer information about the bushfire hazard and its management is probably undervalued, and although difficult to evaluate, it is potentially one of the most efficient and effective strategies available: that is, the stimulation of informal networks is important. RFB volunteers in particular are in a unique position to influence communication through interacting with community members and transferring information on a

The impact of a bushfire event can be reduced through awareness raising and preparedness training.

day-to-day basis, because the community they serve is also the community in which they live.

There is evidence from the survey data that cost and feasibility of bushfire preparation may be a problem for some households. There was a bias towards activities that require the resources and know-how that the respondent already possesses, for example tradespersons are more likely to prepare a firebreak. Preparation activities can require significant resources and those who do not have the resources or cannot justify undertaking these activities, for example the unemployed and renters, are less likely to do so. Evaluations of cost-versus-benefit and implementation feasibility of home protection measures can be complex, and often extend beyond the number of dollars involved (Bushnell and Cottrell, in press). Residents who perceive themselves as unable to undertake some level of home protection can consequently rely more heavily on service providers and, as discussed above, this is cause for concern. There are a number of potential strategies to help address cost and feasibility issues. Examples include subsidising the cost of equipment for home protection such as water tanks and pumps, and arranging a number of bushfire preparation working days where community resources, including equipment and know-how, can be shared between households.

Conclusion

This case study has identified a number of strategies that could lead to increased community resilience to the bushfire hazard in the Thuringowa area. In particular there is a need is to refine the content of educational strategies and reassess the use of current communication channels. Community education and awareness raising programs need to address a number of issues highlighted by this case study:

- Define the roles and responsibilities of property owners and bushfire service providers in Thuringowa; newcomers to the area particularly need such information; and

- Define the ideal time for household preparations for bushfire through linking with controlled burning undertaken in the area; additional information provided with controlled burning notifications could clearly state the ideal time for bushfire preparations, and the suite of preparation activities needed to be undertaken, as well as address misconceptions about controlled burning.

There is also a need for more strategically-based information strategies which:

- Use a number of different information sources in order to reach most corners of the community;

- Promote informal information networks throughout the community; and

- Address cost and feasibility issues for some residents to enable and encourage greater levels of household preparation.

However, for reasons of cost and feasibility, one agency cannot achieve the task single-handedly; success also depends on sharing of effort and resources. It is therefore imperative that fire services, councils and other relevant service providers work together to provide the support needed to realise the common goal of creating bushfire safe and resilient communities.

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*Full details of the methodology and results are available in Bushnell et al (2006).

Exploring information for residents on websites of fire authorities — practical experiences

Bernd Rohrmann outlines a research project investigating the usefulness of websites as bushfire information sources

Abstract

The project *Potential of the internet for enhancing residents' bushfire preparedness* 2004–2006 (PIB) was carried out to analyse the capability and the utility of information sources provided by authorities for the public via the Internet/ WWW. Crucial research questions were: How well are these risk communication means used by residents, and why or why not? How likely are they to significantly advance problem awareness, preparedness and coping with actual fires? How can the usability and effectiveness of these tools for individual emergency management be improved? Last year, sub-study PIB-E *Surveying bushfire events on websites – experience of people from different cultural backgrounds* was conducted. Participants were experienced students; they assessed internet information of fire authorities in South Australia, Victoria and N.S.W., focussing on then present bushfire events. Predominantly, these websites were found to be informative, comprehensive and helpful. However, the respondents also identified shortcomings, in both content and presentation of fire preparedness information for residents, and stated limitations of addressing cultural variety. Obviously there is considerable potential for the improvement of websites. Pertinent suggestions and resultant research needs are outlined.

Problem area: Significance of bushfire websites

Websites as information source for residents

In Australia, the bushfire hazard affects large areas, and residents are regularly exposed. Consequently, emergency management is a permanent task. Risk information/communication/education about bushfires near residential settings are crucial components. Residents need to be properly informed about relevant hazard characteristics, preventative measures and appropriate behaviours during the onset of an emergency situation and after the event. Information campaigns for enhancing disaster preparedness make use of media activities (television, radio, internet) meetings with residents, and a variety of visual communication means, such as information leaflets, brochures and video-tapes. Internet-based information provision, especially websites run by authorities, have been commonly established within the last decade. They are widely available and accepted as an essential and increasingly indispensable information source for both experts and residents; however, they are not yet 'mainstream' procedures.

Research on the value of fire websites

Given the increasing relevance of fire authority websites, the capability and utility of information sources provided via the Internet became a significant issue. To get empirical data, the project *Potential of the internet for enhancing residents' bushfire preparedness* [PIB] was conducted from 2004 to 2006. Conceptually, this research is based on the author's socio-psychological Risk Communication Model. The investigation comprises six studies, which combine several approaches, including focus groups, experiments, surveys and expert panels. Last year, sub-study PIB-E *Surveying bushfire events on websites — experience of people from different cultural backgrounds* was conducted. The research questions to be clarified are summarised below in table 1.

Table 1: RESEARCH ISSUES

Focus:

How are events, i.e., current bushfires in an area, represented and explicated on websites of pertinent fire authorities.

Crucial research questions:

- How well are new risk communication means using the Internet utilised by residents, and why or why not?

- How is information provided in websites perceived in comparison to reports in local newspapers?

- To what degree does website information advance problem awareness, preparedness and coping with actual fires?

- How can the usability and effectiveness of these tools for individual risk management be improved?

Critical perspective:

Explorations and expectations of residents (rather than fire experts), and differences between people from diverse cultural backgrounds.

Table 2: PROJECT DESIGN – STUDY PIB-E

Information sources:
Monitoring and assessing of three websites:

- CFS = South Australia's Country Fire Service (Adelaide; responsible for the area which had disastrous fires in Jan 2005)   =>> http//www.cfs.org.au/

- CFA = Country Fire Authority of Victoria (Headquarter in Melbourne; a large institution; in parts progressive)   =>> http//www.cfa.vic.gov.au/

- RFS = New South Wales (NSW) Rural Fire Service (located in Sydney; is the world's largest fire service)   =>> http//www.bushfire.nsw.gov.au/

Newspapers:

- The Age;

- Herald-Sun
  (both from Melbourne).

Participant Sampling:
Sampling of six people who are knowledgeable about bushfire issues from a residents point of view, familiar with Internet and website features, and are from different national and cultural backgrounds: South Australia & Victoria (i.e. Australia), Hong Kong & China (i.e. Asia), Germany & Netherlands (i.e. Europe).

Timing:
Regular website observation for 1 month, mid-Jan to mid-Feb 2005; during the same time, checking for newspaper articles about bushfires.

The focus of this study is experiences of residents, both local ones and those from a different linguistic and cultural background.

Project design

Designing the study

The research plan was to focus on a current bushfire during the 'fire season', to choose the three most relevant websites of the pertinent governmental fire authorities, to ask experienced people for a continuous appraisal of these internet information sources, to examine newspaper reports during the same time period, and to incorporate people from different cultural backgrounds into the study. Details are listed in table 2. In figures 1 to 4, sample pages from these four information sources are presented.

In January 2006, the largest bushfire happened in South Australia, claiming nine lives and destroying 83,000 hectares of farmland.

Website assessment

The websites listed above were regularly inspected by the participants and finally assessed using the author's 'Questionnaires for the Appraisal of Website Utility for Residents'.

Furthermore, an agenda for describing and comparing reports in Melbourne newspapers was developed.

Empirical results

Only selected results can be presented here, regarding the appearance of the websites of fire authorities, their usefulness for residents' hazard preparedness, and the eminence of internet-based information in relation to newspapers.

Appraisal of the 'face' of the websites

As the results in table 3 demonstrate, the governmental websites of interest were generally rated positively, including their navigation features. However, basic requirements, such as an organisation's name and contact provisions, are not always transparent.

Assessment of information regarding 'fire preparedness'

In table 4, the main results regarding the convenience and utility of information for residents are presented, focussing on preparedness for fire hazards. The observed websites were found to be generally helpful and informative. Positive evaluations include: 'Understandibility', 'Clarity of fire safety actions' and 'Motivating for fire preparation'; they are seen as "Meeting own information need" and "Better than brochures".

Table 3: Mean responses compared for the websites of CFS (S.A.), CFA (Victoria), RFS (N.S.W.) A: ASSESSMENT OF THE INTRODUCTORY PAGE					
Facet	Variable content	Response scale	CFS	CFA	RFS
A1	Name of authorisation stated	% "yes"	100%	50%	83%
A2	Contact details provided	% "yes"	100%	67%	83%
A3	Organisation of home page	1= very poor to 5= excellent	4.5	3.7	3.7
A4	Ease of navigation	1= not at all to 5= very	4.5	3.7	4.0
A5	Ease of locating relevant information	1= not at all to 5= very	4.2	4.5	4.0
A*	Ratings as favourite site	1= most, 3= least favourite	1.7	1.7	2.7

Table 4: Mean responses compared for websites of CFS (S.A.), CFA (Victoria), RFS (N.S.W.) B: EVALUATION OF INFORMATION REGARDING "FIRE PREPAREDNESS"					
Facet	Variable content	Response scale	CFS	CFA	RFS
B1	Interesting to look at	1= not at all to 5= very much so	3.8	3.7	2.7
B2	Understandibility	1= not at all to 5= very much so	4.3	4.4	3.7
B4	Visual appeal	1= not at all to 5= very much so	4.0	4.0	2.2
B5	Helpfulness of pictures/illustrations	1= not at all to 5= very much so	3.2	3.7	2.4
B7	Comprehensiveness	1= not at all to 5= very much so	4.5	4.3	3.7
B9	Length section safety/preparedness	1= far too short to 5= far too long	3.3	3.0	2.7
B10	Keypoints & summaries provided	% "yes"	100	83	100
B11	Good examples given	1= not at all to 5= very much so	4.2	4.2	3.5
B12	Clarity of fire safety actions	1= not at all to 5= very much so	4.2	4.6	3.3
B13	Own info need is met	1= not at all to 5= very much so	4.0	4.0	3.8
B15	Extent of motivating fire preparation	1= not at all to 5= very much so	3.8	3.7	3.0
B16	Difficulty remembering information	1= not at all to 5= very much so	1.8	2.5	2.7
B17	Seen as reliable source of information	1= not at all to 5= very much so	4.2	4.3	3.7
B18	Clarity of where to get assistance	% "yes"	100	100	83
B19	Better than brochures	1= much poorer to 5= much better	3.6	4.0	2.8
B22	To be recommended to lay people	1= not at all to 5= very much so	4.0	4.0	2.8

Relevance of linguistic and cultural background

The ratings of the participants from a European or Asian background tended to be slightly less positive — they are less familiar with the English language (which dominates in websites) and the significance of bushfires for Australians.

Evaluation of newspapers in relation to websites

Regarding alternative media, the websites were appraised as far more comprehensive in scope, yet the respondents emphasised that newspapers are easier to obtain, usually less demanding and likely to be more explicit and emotive. This judgment is stricter for websites which deal with principal bushfire matters rather than current events.

Conclusions and considerations for research

Evaluation of websites' strengths and weaknesses

All study participants identified shortcomings, either regarding the content or the presentation of bushfire impacts and proposed procedures to enhance preparedness for hazardous events; see the list in table 5. Information complexity and comprehensibility for non-Australian citizens are core issues, i.e., limitations of addressing cultural variety were stated.

Clearly there is considerable potential for improving websites (cf. part 2 of table 5). When working on website enrichments, some audiences deserve particular attendance, e.g. children, elderly people, and residents with a non-Australian background.

Table 5: APPRAISAL OF WEBSITES – CRITICISMS AND SUGGESTIONS

Perceived shortcomings:
- Some information and instructions too 'texty',
- information about present bushfires not as current as newspaper or TV reports,
- some parts difficult to understand for people with a 'non-English' linguistic and cultural background,
- some summaries of key points too complex,
- explanation of technical terms occasionally hard to find and/or to understand,
- inconvenient if information comes in 'pdf' format and needs a printer.

Suggested improvements:
- Reflecting the (restricted) awareness and knowledge of residents,
- using more maps, pictures, diagrams, charts to convey information,
- providing downloadable videos for demonstrating fire risks and enhancing preparedness,
- including facilities for those with not-so-good eyesight,
- adding information aimed at children,
- placing up-to-date information about current bushfires on prominent frontpage position,
- making core information usable for all website users, including those who have restricted download capabilities, no flash player and can't print website texts,
- enhancing accessibility for the wider Australian audience, by providing information in languages other than English.

Table 6: RESEARCH SUGGESTIONS

- Comparing the communication efficiency of pictures versus diagrams versus charts versus videos as visual enrichments of text information,
- critically analyzing the options for providing multi-language bushfire information and preparedness advice,
- exploring differences in website utilization across people of high or low familiarity with internet & web-browser procedures,
- website utilisation regarding specific information needs 'before' versus 'during' versus 'after' bushfire events/disasters,
- empirically investigating the links between website features and the real behaviour when preparing for or coping with actual fires,
- testing the linkage and potential mutual enrichment of information provided by various media, such as websites, newspapers, television and meetings of community groups such as 'fireguard',
- investigating necessary features in case children and/or the elderly are to be addressed in websites.

Considerations for further research

Improving the potential utility and actual use of a website has better chances if based on empirical research about residents' responses to the content and appearance of forestfire information.

In table 6, a set of pertinent research topics are suggested. These issues refer to the presentation mode (e.g. the role of pictures), the links to other media (e.g. radio), the fire situation (before versus during versus after an event), linguistic and cross-cultural problems (e.g. non-Australian residents), and website requirements regarding specific groups (e.g. children).

Research projects about the soundness and efficiency of internet-based fire information should be conducted both before and after re-designing a website.

Significance of bushfire websites

It appears almost certain that 'electronic' information channels will become as commonplace in disaster preparedness as in many other fields of public information, communication and education. In fact, WWW-based risk communication has considerable advantages: The Information to be provided can be updated regularly and quickly; users can bookmark and store relevant hazard info; access is fast; and blockage is unlikely (unlike telephone contacts).

Concluding Remark

To conclude, the results from the current study, *Surveying bushfire events on websites – experience of people from different cultural backgrounds*, will help to better identify (1) why and how residents seek and utilise information regarding forestfire preparedness, (2) whether current websites of fire authorities meet the reading style and information needs of residents, and (3) which features of websites are essential and deserve substantial improvement in order to maximise their potential for enhancing residents' preparedness.

Far-reaching website quality and information presented in several languages are crucial features in a country like Australia which has a multi-cultural society and numerous residents who live outside of towns and cannot easily reach a fire authority centre — internet facilities are of significant value to them.

Figure 1: CFA Website sample page

Figure 2: RSF/NSW Website: Sample Page

Figure 3: CSF Website: Sample Page

Figure 4: The Age – Article regarding bushfires

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Acknowledgement

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Disasters and communities: understanding social resilience

Brigit Maguire and Patrick Hagan argue emergency management plans must recognise and build on a community's capacity for social resilience

Abstract

Social resilience is the capacity of social groups and communities to recover from, or respond positively to, crises. In this paper, we review the multifaceted nature of social resilience, and how this capacity is thought to have various properties, notably resistance, recovery and creativity. We also discuss the idea that social groups within a community differ insofar as their levels of resilience and the threats to which they are resilient. While research in the social sciences suggests that social resilience is a 'naturally emergent' response to disaster, we argue that emergency management plans must recognise and build on this capacity, and that improved indicators of social resilience are a priority area for future research.

Introduction

In today's world, the general public experiences disasters in ways unlike any other period in history (Omand, 2005). With each edition of the nightly news, we are able to view images of the latest disaster regardless of where it has occurred. Cheap travel options mean it is easy for us to visit the sites of disaster (see Jagannathan, 2006 on visitors to 'Ground Zero') and, as fuel prices testify, international trade brings tangible consequences of disasters to those far from affected areas.

With this heightened salience comes a growing understanding that authorities cannot prevent all disasters from occurring, or alternatively, shield people from all their consequences (Osterholm, 2005). It is generally acknowledged, for example, that Australia is *inherently* vulnerable to natural disasters (e.g., floods, drought and cyclones) (e.g., Reser & Morrissey, 2005). Furthermore, our democratic culture and participation in various military deployments are often associated with an increased risk of terrorism and while preventative efforts have proved successful in recent years, officials remind us of complexities and inevitabilities (Nolan, 2005; Sydney Morning Herald, 2004).

If it is not possible to totally prevent disasters, or shield people from their consequences, what can be done to minimise disruption and damage? Many government and non-governmental organisations now consider it a priority to strengthen the *resilience* of groups and communities in Australia, and are addressing this through research, policy and program development, as well as in crisis management and education initiatives (e.g., Coghlan & Norman, 2004). For example, Emergency Management Australia (EMA) has taken *Building Individual and Community Resilience* to be its current research priority.

Yet, in order to be able to effectively promote resilience, we should first understand what it is. To that end, this paper outlines an understanding of *social* resilience. It provides a basis upon which to develop practical actions to strengthen social resilience in Australia and to guide future research.

The three properties of social resilience

In broad terms, social resilience is the capacity of a social entity (e.g., a group or community) to 'bounce back' or respond positively to adversity

Australia is inherently vulnerable to natural disasters

(e.g., Almedom, 2005; Landau & Saul, 2004; Omand, 2005). More specifically, social resilience is understood as having three properties comprising aspects of how people respond to disasters: *resistance, recovery,* and *creativity* (Kimhi & Shamai, 2004). A community that is highly resilient has the capacity to demonstrate each of these properties.

Resistance relates to a community's efforts to withstand a disaster and its consequences. It can be understood in terms of the degree of disruption that can be accommodated without the community undergoing long-term change (e.g., to its social structure; (Adger, 2000). One way to represent this idea is shown in Figure 1a. Here, resistance is the distance between the community's pre-disaster level of functioning (r') and a threshold (t) beyond which the community would be unable to return to its usual state (with t represented by a dotted line). For highly resistant communities, r' and t are far apart – considerable disruption is needed to move the community to the threshold. For less resistant communities, r' and t are close together.

Recovery relates to a community's ability to 'pull through' the disaster (Adger, 2000; Buckle, Marsh, & Smale, 2000a; Kimhi & Shamai, 2004). It is this property that refers directly to the idea of a community 'bouncing back' to its pre-disaster level of functioning (Breton, 2001). Recovery can be understood in terms of the time taken for a community to recover from a disruption, as shown in Figure 1b. A more resilient community returns to its pre-disaster state quickly and efficiently whereas a less resilient community recovers more slowly, or will fail to recover at all (Aguirre, 2006).

An optimal recovery involves not just returning to an initial equilibrium point. Rather, by adapting to new circumstances and learning from the disaster experience, higher levels of functioning (and thereby resilience) can be attained (Kimhi & Shamai, 2004; Pooley, Cohen, & O'Connor, 2006; Sonn & Fisher, 1998). This is the property of creativity (Kimhi & Shamai, 2004) and is represented by a gain in resilience achieved as part of the recovery process (Figure 1).

To illustrate, consider the example of a school community that is affected by a disaster. With respect to resistance, one can imagine a threshold beyond which the school community changes permanently. For example, a particularly severe disaster may cause many deaths in the community, leaving survivors too afraid or disorganised to attend school, causing the school's eventual closure. A more resilient community may provide support for teachers and students so that normal functioning (e.g., re-established classes) can resume quickly. Indeed, a creative community may learn from the experience and teach its members how to better prepare for future disasters (e.g., teaching people how to recognise tsunami warning signs), so that higher levels of post-disaster resilience are attained.

Aguirre (2006) sees resilience as encompassing all three of these components. In an ongoing process, a resilient community predicts and anticipates disasters; absorbs, responds and recovers from the shock; and improvises and innovates in response to disasters.

Social resilience as multi-faceted

A society's resilience to disasters should not be thought of as a discrete capability. Even relatively straightforward communities contain multiple social groups, and these groups differ in significant ways (Pooley, Cohen, & O'Connor, 2006). Groups may differ in terms of their socio-economic status, their degree of geographic isolation, or vulnerability to psychological trauma. These group differences may mean that different groups within the one society can be more or less resilient to a disaster (Buckle, Marsh, & Smale, 2000b). Vulnerable social groups, such as the elderly, children, or the economically disadvantaged, may have fewer resources available to cope with disaster. According to Oxfam (2005):

> …*disasters, however 'natural', are profoundly discriminatory. Wherever they hit, pre-existing structures and social conditions determine that some members of the community will be less affected while others will pay a higher price.* (Oxfam, 2005, p. 1)

Figure 1: Properties of resilience (adapted from Adger, 2000)

1a. Resistance
1b. Recovery
1c. Creativity
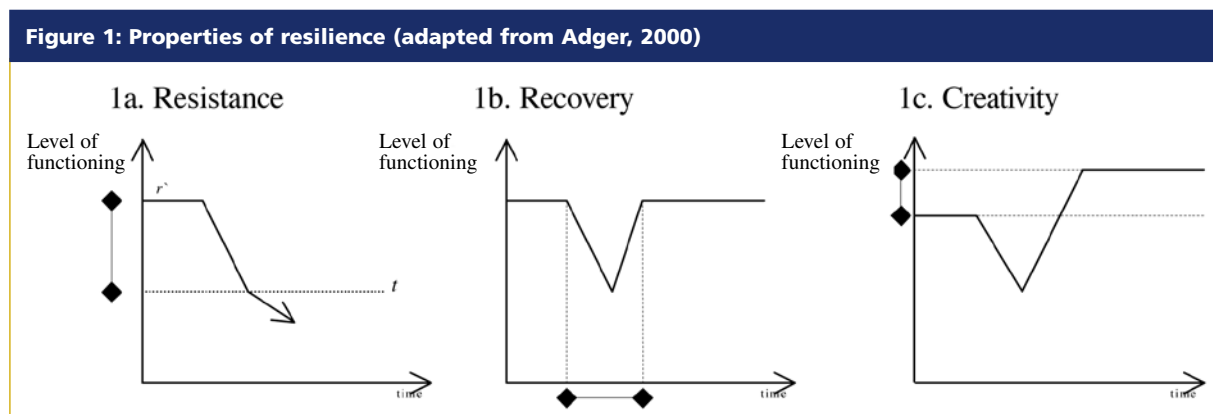
This was clearly demonstrated during the South-East Asia tsunami in December 2004. In various countries affected by the tsunami, women were disproportionately impacted. Specifically, in Indonesia, India and Sri Lanka, more women were killed than men. The resulting demographic changes (the gender imbalance) may have a number of long-term negative social consequences, including poor treatment of women and unequal economic freedoms (Oxfam, 2005). Non-government organisations such as Oxfam are attempting to counter such problems by involving women in medical, fire and police roles; registering houses in the names of women as well as men; supporting women's livelihoods; and ensuring wage parity across genders. As well as supporting the recovery of the community, these sorts of activities are a form of creativity. That is, they act to increase the social resilience of the community so that it can minimise similar consequences in the event of another disaster.

Thus, in order to truly understand the social impacts of disasters, and to manage and prevent adverse consequences, we must understand the impacts of disasters on particular groups (Oxfam, 2005). Moreover, it is important to identify the potential 'fracture points' or social cleavages within a community. From this, it may be possible to predict future breakdowns in social resilience in disasters, and to design preventative initiatives.

It is also true that the resilience of a community can vary with different types of disasters (Roisman, 2005). Disasters cover a broad spectrum of events, and can be differentiated in terms of their agent (natural or human-caused), proximity, impact (visible or invisible), size, scope, duration, magnitude, and the number of deaths. Furthermore, Danieli, Brom and Sills (2005) suggest that individuals can be resilient and vulnerable at the same time, depending on the type of disaster (see also Buckle, Marsh, & Smale, 2001). A community in a bushfire-prone area might have the social resources to deal with a bushfire, as an experience they are used to. However, at the same time, the community might be more vulnerable to pandemic influenza as an experience they are not used to, and lack the social resources to deal with.

Disaster management and resilience

Disaster management professionals describe the process of human reaction to disasters as cyclical, having four phases: mitigation, preparedness, response and recovery (e.g., Comfort, Ko, & Zagorecki, 2004; Mileti, 1999). Mitigation is the general process of strengthening a community's capabilities so that it has the resilience to better cope with any future disaster. Preparedness involves anticipation of an imminent disaster, and the creation of a response capability. This includes analysing probable threats, setting up warning and communication

Response is one phase in a cycle of human reaction to disasters

systems, response management structures, organising training, and stocking supplies (Mileti, 1999). Response refers to the actions taken during, and immediately after a disaster occurs. The focus here is on saving lives, minimising damage to property and minimising disruption to the community. Recovery is the short- to long-term phase of rebuilding and restoring a community to its pre-disaster state. During this phase damage assessment is completed, and used to inform the reconstruction of housing and infrastructure, and the re-establishment of community institutions.

Mitigation is a vital link in the cyclical process of disaster management, and predominantly takes place after a disaster has already occurred. Similar to the creativity component of social resilience, mitigation involves more than just preparing for, responding to, and recovering from a disaster, but involves implementation of the lessons learnt in the creation of new policies and activities that will increase the community's resilience (Mileti, 1999). Without mitigation, a community is unlikely to become more resilient in the future, as it continues through cycles of short-term preparation, response and recovery, without any fundamental changes (Moore et al., 2004).

The greatest improvements in social resilience will be achieved when all four stages of the disaster process are considered in emergency management planning. It is vital, however, that such plans recognise the innate nature of social resilience (see also Yates & Anderson-Berry, 2004). It was once thought that panic, social disorder and adverse psychological consequences were expected and normal responses of a community to a disaster. In this 'Hollywood' conception of disasters,

resilience and positive coping are seen as rare and unusual (Auf der Heide, 2004). However, research into human reactions to disaster has overwhelmingly recognised that resilience in response to disaster is much more common than suggested by the media, and "mass trauma may not necessarily be a given" (Almedom, 2005, p. 254). In the immediate aftermath of a disaster, communities tend to come together, with more prosocial behaviour being demonstrated by most individuals (Auf der Heide, 2004; Barsky, Trainor, & Torres, 2006). To be effective, emergency management plans need to build on the capacities arising from naturally emergent social resilience.

Indicators of social resilience

An important step for future research is to determine valid indicators of social resilience. While we have an intuitive knowledge of what makes a resilient community, there is as yet little research that systematically sets out such indicators. Methodologically, this may involve the identification of factors that predict higher levels of resilience by comparing communities that have responded differently to similar disasters. To date, the literature would suggest that an array of factors are potentially relevant here, including:

- Trust (e.g., Enemark, 2006)
- Leadership (e.g., Ink, 2006)
- Collective efficacy (e.g., Moore et al., 2004)
- Social capital (e.g., Breton, 2001)
- Social cohesion and sense of community (e.g., Poynting, 2006)
- Community involvement (e.g., Clauss-Ehlers & Lopez-Levi, 2002)
- Existing norms/attitudes/values (e.g., Oxfam, 2005)
- Communication and information (e.g., Ink, 2006; Rohrmann, 2000)
- Resource dependency (e.g., Adger, 2000)

Research must determine which of these (if any) are predictive of resilience-related outcomes, the degree of overlap amongst them, and indeed whether such factors are themselves driven by more fundamental processes.

Summary and future directions

In this paper, we have outlined a definition of social resilience that will guide our future research. Social resilience is understood as having three properties: resistance, recovery and creativity. It is a multi-faceted, rather than a discrete capability, and there can be vulnerable groups even within a generally resilient community. Communities can also be resilient to some disasters and vulnerable to others. Past research strongly suggests that social resilience is a naturally emergent response to disasters, and it is important that

emergency management plans recognise and build on this capability.

While Australian society is resilient to most disasters, little is known about the limitations of this resilience. Events such as the 2005 Cronulla riots would suggest, for instance, that there remains the potential for disasters to disrupt the multicultural fabric of Australian society and undermine resilience-building initiatives. Future research must also set out to identify indicators of social resilience and begin to leverage predictive insights through the development of theory and empirical analyses.

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Emergency health care workers' willingness to work during major emergencies and disasters

Through a comprehensive literature search, Erin Smith explores the factors that affect health care workers' willingness to work during major emergencies and disasters

Abstract

Current national and international emergency preparedness plans require emergency health care workers to play an integral role in responding to, and managing major emergencies and disasters. To understand whether emergency health care workers would be willing to work during these events, this study reviewed the international literature to identify studies that had addressed this topic. Research conducted in the United States, Canada, Asia, and Israel, all came to the same conclusion: the assumption that all emergency health care workers will be willing to work during a major emergency or disaster is not realistic. The impact of this should be considered in emergency preparedness and planning.

Introduction

The potential for a major emergency or disaster to occur exists in all communities. The 2002 and 2005 Bali Bombings brought terrorism to Australia's doorstep, the 2004 Indian Ocean Tsunami and Cyclone Larry in 2006 reminded us that Australia's coastlines are vulnerable to natural disasters, and the annual threat of debilitating bushfires, drought, and extreme weather are constant concerns for Australian emergency planners and managers. Combine this with the ever- present threat of emerging infectious diseases such as Severe Acute Respiratory Syndrome (SARS) and "Bird Flu", and we are reminded that Australia's border is not immune to devastating conventional and non-conventional disasters.

When these major emergencies and disasters occur, employers, emergency planners, and even the public may assume that emergency health care workers will be willing to work. In reality, emergency health care workers may be reluctant to work when the situation poses a possible threat to their own safety and health, or that of their co-workers and families. Such reluctance could be detrimental to the ability of the health care system to cope with the surge of demand on resources that is synonymous with major emergencies and disasters (Chua 2004, Verma 2004, Koh 2005).

This issue is of particular concern in highly populated urban areas (Qureshi 2005) where the majority of major trauma centres and hospitals equipped with isolation and negative-pressure facilities are located. In addition, the density of the population will encourage the rapid spread of infection or contamination in the event of health disasters and chemical, biological, radiological, and nuclear (CBRN) events.

Recent international experience with Hurricane Katrina in the United States illustrated how essential emergency health care workers are in both the initial response to an event, and the longer term management of the injured, ill, and displaced population. Indeed, it has been suggested that local emergency health services will bear the immediate brunt of any major emergency or disaster (Green 2003), and will be called upon to play a significant role in the ongoing response to such an event.

Given that a willing and able emergency health care workforce will be a vital component of any successful response to a disaster situation, an understanding of their willingness to work and barriers to willingness to work during major emergencies and disasters is needed. This paper reviews the international literature to identify studies that have addressed this issue, and reports on the results of relevant studies.

Methodology

A comprehensive electronic literature search was conducted using MEDLINE (1950 – February 2007) and CINAHL (1982 – February 2007) using the terms "disaster", "emergency", "mass-casualty", "multi-casualty", "catastrophe", "emergency health care worker", "paramedic", "EMS", and "emergency medical service". Authors known to specialise in the field of disaster preparedness and disaster response were contacted, and relevant conference proceedings were reviewed.

Results

International Research

Reports from the USA, Canada, Asia and Israel highlight that during conventional and non-conventional disasters (such as hurricanes, outbreaks of infectious disease, warfare and terrorism) emergency health care workers will not always report to work. A study of Israeli health care workers reported that 58% of respondents were not willing to report to work during a non-conventional missile attack (Shapira 1991). A Hawaiian study which examined the willingness of doctors and nurses to work in field hospitals during mass casualty events identified that respondents were more likely to be willing to work during natural disasters, with willingness influenced by perception of risk, perceived knowledge, and self-perceived ability to provide the type of care required (Lanzilotti 2002).

A number of studies have been conducted in New York following the terrorist attacks of 9/11 and the subsequent anthrax outbreak. These studies investigated the willingness and ability of emergency health care workers to respond to work during catastrophic disasters and terrorist related events. Barriers to being willing and able to work during these events included childcare, transportation, personal and family health concerns, compensation, and pet issues (Qureshi 2002, Qureshi 2005). DiMaggio et al reported that emergency medical technicians were less willing than able to respond to terrorist related events, with reported fears for personal and family safety (DiMaggio 2005).

During the SARS outbreak of 2003, the infectiousness of SARS was substantially higher among health care workers than the general population, especially those working in hospitals and prehospital care (Maunder 2004). Following the SARS outbreak staff involved in the medical care of SARS patients reported being fatigued, concerned about their own health and the health of their family, and developed a fear of social contact (Chua 2003, Koh 2005). Health care workers believed that they were at high risk of becoming infected, with some refusing to care for the ill and imposing self-quarantine on themselves to protect family members from potential exposure (Stein 2004). These behaviours are reminiscent of the psychosocial reactions witnessed during the beginning of the AIDS epidemic, where healthcare workers refused to treat patients, avoided physical contact with potential AIDS patients, and self-imposed isolation and quarantine measures to prevent "spreading" the disease to loved ones (Stein 2004).

More recently, a survey of emergency personnel (physicians, nurses and paramedics) in Rochester, New York investigated whether staff would respond to mass casualty incidents involving the release of transmissible and non-transmissible biological agents. The study reported that as an event develops, fewer health care providers will report to work, and at no time will 100% of all personnel rostered to work actually report for duty (Syrett 2007).

With risk of injury, infection, illness, and contamination being inherent in the provision of emergency health care, emergency health care workers need to find the balance between concerns for their own safety and the safety of their colleagues and family, and their duty to respond to work during a disaster situation (Singer 2003). Finding this "balance" will depend in part on the way that emergency health care workers perceive the risks involved with responding during disasters, and how these perceptions shape the subsequent risk assessments they make when deciding if they are willing to work or not.

National Research

A recent Australian study investigated the issue of paramedic's risk perception and assessment and the subsequent impact on willingness to work during conventional and non-conventional disasters (Smith 2006). A non-conventional disaster was defined as one which involved or potentially involved the use of CBRN, or naturally occurring infectious agents, resulting in the threat of exposure, infection, illness, or contamination to emergency health care workers.

Perception of risk and willingness to work differed for conventional and non-conventional disasters, however, the common "risks" associated with any disaster response were injury, illness, and infection. Paramedics were more willing to work during conventional disasters ("It's my job", "It's my responsibility"), and their perception of risk focused predominantly on injury ("I could get hurt", "My co-worker could get hurt") and safety ("Is this scene safe?"). Paramedics were less willing to work during non-conventional disasters ("I could get sick", "My family could get sick", "I could take something home with me") with threats to health and wellbeing of self and family (exposure, infection, and illness) the most frequently reported perceived risks of responding to non-conventional disasters.

Common themes for both conventional and non-conventional disasters were the need for current and reliable information, improved communication from employers and between responding agencies, and improved disaster focused education and training. Finally, perception of risk increased the longer that a disaster situation lasted for, resulting in fewer paramedics reporting willingness to work as non-conventional disasters develop. This issue is of particular concern when considering the required response to on-going health-related disasters.

This 2006 study reported on the generation of a "decision making hierarchy" used by paramedics in assessing the risk of injury, illness, and infection in disaster response. Paramedics assessed the issues of safety, professional responsibility, personal ability, and accurate scene knowledge respectively when conducting a risk assessment prior to responding to a disaster. Of note, this decision making hierarchy was largely influenced by the level of trust paramedics had in their employers, and the credibility given to the information provided from them.

A further Australian study is currently being funded by the National Health and Medical Research Council (NHMRC), with a team of researchers from the University of Queensland and Monash University, Melbourne investigating paramedic's attitudes and beliefs towards working during an avian influenza pandemic. Information on this project can be obtained from the Chief Investigator, Ms Vivienne Tippett (VTIPPETT@emergency.qld.gov.au).

Discussion

The studies identified by this literature review all report a common result: the assumption that emergency health care workers will be willing to work during major emergencies and disasters is not a realistic one. No study reported 100% willingness to work among surveyed health care workers, with one study reporting a willingness to work rate as low as 18% (Syrett 2006). It appears that reported willingness to work is higher for "conventional" disasters — where infection and contamination are less likely to be issues, than for "non-conventional" disasters, where responders are at risk of becoming infected, ill, and may possibly in turn expose family members to infectious or contaminated agents.

Reports of actual willingness to work are harder to come by, however, one study that attempted to prospectively study this issue reported that only 42% of 2,650 Israeli hospital personnel surveyed on the eve of the first Gulf War were willing to respond to an unconventional missile attack (Shapira 1991). Of importance to emergency planners, 86% of the Israeli hospital personnel surveyed reported that their willingness to work during these situations would increase if they were provided with adequate "safety measures" and "protective equipment" (Shapira 1991). Koh et al (2005) noted a similar result in Singapore following the SARS outbreak, with a greater number of emergency health care workers being willing to work during a similar event if further safety measures were available to staff, such as protective equipment and education.

Emergency planners should take note of another recurring theme in the results from these studies — the impact of partner, childcare, and eldercare obligations. The need for emergency health care workers to provide care and reassurance to family members needs to be recognised and addressed in emergency preparedness plans. The inability to fulfil these obligations may have a profound influence on willingness to report to work. Qureshi et al (2005) identifed that emergency health care services can pre-plan the formation of emergency childcare and eldercare facilities that can be either on or off-site, or by facilitating the pre-planned formation of emergency childcare/eldercare "pools", where health care workers can leave their family members in the custody of people that they already know and trust (Qureshi 2005).

Fears for personal safety and personal health issues were commonly reported by these studies, and need to be addressed by emergency planners. Whether this occurs in the form of further training, transparent protocols for the provision of vaccinations and/or anti-virals (in the case of non-conventional disasters), or by way of providing adequate protective equipment to all staff, this barrier is amenable to intervention by targeted preparedness initiatives. The findings of Shapira et al (1991) support this idea, where the provision of appropriate personal protective equipment to front line responders facilitated health care workers willingness to work during an unconventional missile attack. This is also consistent with the findings of DiMaggio et al (2005) that recent training and the provision of appropriate protective equipment was consistently associated with willingness to respond to potentially dangerous mass casualty incidents.

Conclusions

This paper demonstrates that emergency health care services should not rely on all personnel reporting to work during disasters. Of particular relevance to non-conventional and health related disasters, willingness to work appears to decrease with the involvement of CBRN agents and the threat of infection and illness. Specifically, if the threat of infection or illness extends to emergency health care workers family member, willingness to work decreases substantially. Finally, reported willingness to work decreased the longer that an event lasts. The impact of this on staffing and managing associated surges of demand on resources during a major emergency or disaster is obvious. Issues such as the provision of appropriate vaccinations and antivirals to emergency health care workers and their immediate family, financial support for childcare and eldercare, provision of communication channels dedicated to informing family members of the latest developments during an event, and the opportunity for voluntary isolation and quarantine should be considered by emergency managers and incorporated into emergency preparedness plans. A lack of planning now will inevitably result in a lack of emergency health care workers responding in the event of a major emergency or disaster in the future.

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The psychological impact of responding to agricultural emergencies

Meredith Jenner overviews the literature on the unique psychological impacts of responding to agricultural emergencies

Abstract

It has increasingly been recognised that emergency responders may suffer stress and adverse psychological reactions to their exposure to traumatic events and the nature of the work they are expected to perform. However, little previous research has focused on the psychological impact of responding to agricultural emergencies. While these types of emergencies have some stressors in common with 'traditional' emergencies, there are a number of factors that are more specific to agricultural emergencies. These are explored in the context of the existing literature and interventions or preventative measures suggested to mitigate the possible negative impact of responding to agricultural emergencies.

Most people are familiar with the stereotype of the 'superhuman' emergency responder, able to work tirelessly in extreme conditions whilst remaining invulnerable to stress and emotion[1]. However, in recent years there has been increasing recognition that emergency responders can be affected by their exposure to traumatic events. While emergency responders "display an implicit willingness to expose [themselves] to potentially distressing situations and the associated risks to [their] well being"[2] through choosing to work in the field, the effects of this exposure can range from feeling overworked and overwhelmed during the event to the development of long-term psychological difficulties such as anxiety, depression, anger or aggression[3], and even post-traumatic symptoms similar to those seen in the 'victims' of the event[4].

An emergency scene is, by its very nature, a dynamic and ever-changing work environment, which "bring[s] together some of the most distressing aspects of human experience"[5]. Emergency responders work "under stressful and chaotic conditions, face unprecedented personal demands"[6] and may even be faced with situations that threaten their own lives and safety. There may also be the threat of further events impacting on and worsening the situation. Time pressures are high, with rapid and effective action essential, work hours may be long and resources may be limited or stretched to capacity.

Emergency responses involve the breakdown of routine and familiar frameworks and may require emergency responders to perform unfamiliar tasks. Communication problems may also be a source of stress[7], particularly at the start of a response when the situation is unclear. Despite all this, emergency responders must operate under the rules and expectations of their organisation[8] to ensure that the response is coordinated and achieves its objectives. Due to the high profile of many emergency events, this may be compounded by "politically motivated demands for immediate and effective action, accompanied by intense administrative pressures"[9]. All of these factors combine to present an intense experience for emergency responders and may cause them to experience stress reactions of various degrees.

Stress is distress caused by a physical or mental strain[10] and results in a state of extreme emotional and physical arousal. Once stress becomes overwhelming and reaches a level where performance deteriorates and personal well-being is seriously impaired, this can have serious implications for emergency management organisations. Most seriously, exposure to a life-threatening situation can lead to the development of Post-Traumatic Stress Disorder (PTSD). The prevalence of PTSD in the general population is 1–2% but has been reported as being as high as 30% or more in emergency responders after serious incidents[11]. PTSD is characterised by several potentially debilitating symptoms which, if left untreated, can continue for months or even years and severely impact on the quality of life of sufferers.

The majority of the literature on stress reactions in emergency responders focuses on the traditional first responders such as fire fighters, police, ambulance attendants and other rescue personnel. These are the emergency responders most likely to encounter life-threatening situations as part of fulfilling their duties.

Working in physically dangerous conditions leads to high levels of arousal and fear and problems may arise when these feelings are not released after the event. Facing death in the line of duty can also lead emergency responders to feel a greater awareness of their own mortality and that of loved ones[12].

However, it is important to recognise that stress reactions in emergency responders can occur whether or not the incident put their lives directly at risk. For instance, emergency responders have reported feeling stressed and frustrated at not being able to 'save' everyone who needs help[13]. This frustration can be coupled with anger if it is felt that the failure to save people was the result of the inadequacy of resources, equipment or personne[14]. Alternatively, the frustration and sense of helplessness can be internalised when emergency responders feel they are unprepared, inadequately trained[15], or possess insufficient knowledge. These feelings are likely to persist and impact on the emergency responder's performance in subsequent incidents if they are not addressed.

Emergency workers also have to deal with the emotions and reactions of victims, including shock, anger, anxiety and criticism or even the refusal of help[16]. While these are natural reactions, the emergency responder is likely to be the first person on the scene and so may bear the brunt of the victim's emotions. This can increase the stress reaction of the emergency responder if they are not expecting it, able to cope with it or are in an emotionally heightened state themselves. Listening to the recollections of victims can in itself be traumatic and emergency responders may then experience secondary stress reactions[17] or suffer from "compassion fatigue"[18]. This idea is supported by research which indicates that trauma reactions are "more likely among those whose job duties require an empathetic interaction with trauma survivors"[19]. Stress reactions caused by working with victims can be further heightened when emergency responders identify with victims because they remind them of someone they know or worse, because they are someone they know[20].

Emergency responders are trained to carry out specific tasks and they may feel a sense of heightened involvement or even elation while performing these tasks. However, this 'high' may lead to emergency responders working "to the limits of endurance… strength, power and courage"[21] and staying on duty well beyond the limits of their normal or optimal functioning. This leaves them susceptible to burnout and increases the risks to their safety, the safety of those around them and their chances of making mistakes. Stressed workers lose perspective and can react in non-characteristic ways, displaying behaviours such as non-performance, insubordination, personality change and an "exaggerated sense of the importance of

their work"[22] and a belief that no-one else can do it as well as they can.

Studies have indicated that serious psychological distress is not just experienced by front-line emergency responders but can also be experienced by second-line emergency responders such as administrators, control centre staff, call centre staff and switchboard operators[23]. Further, emergency responders experiencing stress reactions can cause stress within their families and strain these potentially supportive family relationships[24]. Stress may be transmitted directly to family members through changes in the emergency responders behaviour, the family dynamics may change due to the emergency responders role or absence and problems may be caused by the interaction of the emergency responders work with other psychological factors within the family[25]. Stress within the family may then effect the ability of the emergency responder to reduce the stress induced by an emergency incident and may therefore increase the duration of stress reactions.

Stress effects can be further compounded, and cumulative stress reactions developed, when emergency responders are required to attend subsequent emergencies and do not have time to wind down and work through their experiences after an event[26]. Similarly, attempts to assign blame for the failure of a response and post-emergency events such as "funerals, memorial services and the legal processes involved in assigning blame and addressing compensation issues"[27] can all contribute to the maintenance of stress reactions.

The increased recognition of these stress reactions has led some researchers to claim that the stereotype of the 'superhuman' emergency responder is in danger of being replaced by the stereotype of the vulnerable 'victim' emergency responder[28] who is traumatised by their work and suffering from a range of harmful psychological effects. While this may be true for some people, the reality is that there are significant differences between people in their reactions to stress. Emergency responders bring with them individual characteristics such as personal demographics, personality, previous experience, coping skills and perceptions and stress reactions are related to the interaction of these factors with the circumstances of their involvement in the emergency[29].

Further, not all the outcomes of exposure to emergency incidents are negative. Positive outcomes identified include "the opportunity to exercise professional skills, perception of a job well done, and a relaxation of bureaucratic constraints"[30]. The majority of emergency responders display courage and perseverance in the face of traumatic circumstances and they "deserve to feel positive about helping"[31]. Low levels of stress can actually be performance enhancing, with effects including alertness, faster reactions, increased energy

Burial pits for disposal of chicken carcasses during the Mangrove Mountain outbreak of Newcastle Disease
Photo courtesy of the NSW Department of Primary Industries

and accelerated thinking skills[32]. In addition, some emergency responders who have had their lives threatened in the course of carrying out their duties have reported positive outcomes such as a greater appreciation of life and better relationships with others.

Despite the growing body of literature investigating the impact of exposure to emergency incidents on traditional emergency responders, little has focused on the impact of responding to agricultural emergencies. While the issues facing agricultural emergency responders are in many ways similar to those described above, there are a number of factors that are more specific to agricultural emergencies. One of these is the potential duration of an incident. Emergency animal, aquatic or plant disease outbreaks can take months or years to eradicate. For example, the 2001 Foot and Mouth Disease (FMD) outbreak in the United Kingdom lasted for 32 weeks and involved over 10 000 personnel[33]. Similarly, a total of 5 000 personnel were involved in the 1999 Newcastle Disease outbreak at Mangrove Mountain in Australia, which lasted for four months[34]. Many agricultural emergency responders are required to work long hours, seven days a week and may be separated from their families for weeks at a time. Combined with stressful working conditions, this makes emotional strain, overwork, exhaustion and burnout serious issues.

While the physical dangers faced by agricultural emergency responders tend to be different to those faced by traditional emergency responders, their health, safety and even lives can still be threatened. Obviously, accidents are always possible, especially among workers suffering from burnout, but the most serious threat to agricultural emergency responders comes from zoonotic diseases, or animal diseases that can be transmitted to

humans. Agricultural emergency responders must have contact with diseased and dead animals to fulfil their duties and the thought of catching a disease can be very stressful. Even when a disease outbreak is not zoonotic, agricultural emergency responders must still handle diseased and dead animals and "must consider all bodily fluids as biohazards"[35]. Added to this, various chemicals are used to disinfect infected premises and equipment and these can cause injuries and illness if proper handling protocols are not followed.

Thankfully, large-scale agricultural emergency disease outbreaks are rare. However, this means that many agricultural emergency responders will not have had any previous experience in responding to such an incident. This can make them particularly susceptible to stress reactions arising from the implementation of policies such as the culling of animals during disease outbreaks. Carrying out stock destruction, or even witnessing it, can be very traumatic for agricultural emergency responders[36] as many are vets or have veterinary training. They may therefore experience "a profound sense of sorrow and anger at having to slaughter the lives they had dedicated themselves to protect and heal"[37]. Mass slaughter of animals on the scale of that seen in the UK FMD outbreak "inevitably had deep impacts on human sensibilities"[38] and affected even experienced slaughter men.

The destruction of animals may also cause a stress reaction in agricultural emergency responders when they have to deal directly with the owners of the animals, some of whom they may know personally. The "enormity of the responsibility for delivering bad news and terminating farm enterprises"[39] can be very distressing. Research has also indicated that animal-human bonds can be very strong and that many farmers

do not think of their animals simply as agricultural commodities[40]. They may react very emotionally, and even violently[41], to the slaughter of their animals and this can be difficult to handle for agricultural emergency responders who have not previously had any experience in dealing with distressed or suicidal individuals. The need to cull healthy animals to contain an epidemic can be particularly traumatic for farmers and their "feelings of hopelessness, anger, frustration and injustice"[42] can be directed at the agricultural emergency responders enforcing the control strategy.

Public perceptions can be an added stress for agricultural emergency responders. While most people "condone animal slaughter in certain circumstances"[43], such as putting down a terminally ill animal, mass slaughter is less easily accepted. Saturation media coverage of burning animal pyres became potent representations of the UK FMD outbreak and contributed to negative public perceptions of the way the government handled the crisis. A poll conducted in 2001 indicated that only 27% of the public were satisfied with the way the outbreak was being handled[44] and questions were raised about the animal welfare implications of the methods used. This public disapproval was experienced by many agricultural emergency responders as open hostility, anger and suspicion[45].

In the current climate of heightened global awareness and fear of terrorism, bioterrorism has become a very real threat. Just the suggestion of bioterrorism can have a significant impact as was seen in New Zealand in May 2005, when the Prime Minister received a letter claiming that FMD had been released on Waiheke Island[46]. Although this was proven to be a hoax, an emergency response had to be initiated and maintained for over two weeks. Responding to bioterrorism incidents, real or threatened, can in fact have "an even greater negative psychological impact than a natural epidemic"[47]. These impacts include anger that people could deliberately cause so much destruction and suffering, fear of further attacks spreading the disease and the need to work closely with investigative agencies such as the police, in unfamiliar working relationships.

As can be seen, there is the potential for agricultural emergency responders to experience stress reactions similar to those seen in traditional emergency responders. Therefore, the interventions that have been identified in the literature on these emergency responders may also have implications for the agricultural emergency management function. These include pre-incident training, post-incident psychological debriefing, providing organisational support, recognition and follow up support, providing access to trained mental health workers and establishing appropriate work practices[48].

Preventative measures can be put in place to reduce the impacts of stress reactions well before an incident occurs through conducting trauma and risk assessments to determine an organisation's vulnerability. Trauma prevention components can then be included in all emergency management plans and documents[49] to ensure that organisations are able to respond promptly and adequately to employee needs. Formally recognising the potential stress reactions that emergency responders may experience in this way helps to validate and normalise them[50] and this can reduce the emotional fallout of participating in an emergency response as these reactions are no longer hidden, minimised or ridiculed[51].

Training is also an important pre-incident preventative measure. Research has indicated that emergency responders who are aware of the traumas they may encounter, and their potential reactions to these traumas, are better able to integrate the emergency experience and so fulfil their roles and responsibilities without suffering detrimental effects[52]. Training which prepares responders for many different scenarios and which identifies "the atypical and emotionally threatening nature of disasters and reduce[s] the perception of disaster demands as stressors"[53] is

Catching chickens for destruction using CO2 during the Mangrove Mountain outbreak of Newcastle Disease
Photo courtesy of the NSW Department of Primary Industries

Scenes confronting agricultural emergency responders during the UK Foot and Mouth Disease outbreak.
Photo courtesy of the NSW Department of Primary Industries.

therefore vital. The involvement of trained mental health providers in training exercises can also be used to help agricultural emergency responders recognise signs of stress reactions in themselves and in others and so facilitate early identification and intervention[54].

During incidents, agricultural emergency responders should be reminded of what signs to look for and must be encouraged to attend to their personal needs, including their physical health, balance, social support and acceptance, in order to ensure they have the resources needed to perform their emergency roles[55]. Organisations can assist in this by ensuring that systems of relief and back-up are enforced and that social activities are organised to allow workers to remove themselves from the response for a time[56]. Support networks set up for the families of agricultural emergency responders, particularly those required to be away from home for considerable periods of time, can also relieve stress as responders can be more confident that their families understand the situation and that their needs are being met[57].

Debriefing after an incident has become very common in recent years and is designed to "help victims of psychological trauma process their experience cognitively and emotionally"[58]. Optimally, debriefs should include all the agricultural emergency responders involved and be held within 48 hours of the conclusion of the incident[59]. Participants should be encouraged, but not pressured, to discuss their feelings about the incident, both negative and positive[60]. However, "debriefing is a short intervention provided at the start of a longer period of recovery"[61] and stress reactions can continue for some time. Individual debriefing should therefore also be made available on an informal, spontaneous basis, without any sense of stigma[62], and referrals to specialist counsellors made for people suffering from serious psychological disturbance and post-traumatic symptoms,

Post-event, some agricultural emergency responders may find the return to normal duties stressful and therefore need additional support at this time[63]. Stress reactions can make it difficult to settle back into routine work and social sanctions can make some people reluctant to express their emotions for fear that they will be thought of as weak or vulnerable[64]. There can also be a perception that co-workers who have not gone through the experience cannot really understand what it was like and this can lead to feelings of alienation[65]. The return to normal duties may also be difficult for agricultural emergency responders who have experienced positive outcomes, such as high job satisfaction, with the potential that they may experience a 'letdown' phase[66]. Formal recognition by the organisation of a worker's participation in a disaster operation can help reduce the feeling of letdown by reinforcing the value of the individual's contribution.

Ultimately, a combination of several of these interventions is likely to have the greatest impact on reducing stress reactions in agricultural emergency responders as 'one size' does not fit all and treatment and support must be suited to individual needs[67]. A "distressed worker is not a fit worker"[68] and stress reactions and burnout can result in significant financial and social costs to the individual and the organisation. Therefore, recognition of potential stress reactions in agricultural emergency responders and the implementation of appropriate interventions can only enhance the ability of agricultural agencies to respond to agricultural emergency incidents in the future and to protect the well-being of their staff.

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Early Warning Systems: reframing the discussion

Philip Hall proposes a shift in the way emergency managers conceptualise Early Warning Systems

Abstract

In recent years, the focus of the international community in relation to risk, disaster or emergency management has shifted from the development of disaster response capabilities to the need to strengthen risk reduction and control mechanisms and policies, with a particular interest in the design and implementation of better early warning systems as a major mitigator of disasters. The emphasis on early warning systems has turned attention and funding to the current capabilities and developments in science and technology, and unfortunately, distracted us from the central issue of addressing the real needs of the communities and people at risk. This paper argues from a background in mission critical systems, project management and business performance, that we cannot achieve the risk reduction and mitigation we seek until the emphasis is placed on the leadership role of emergency management in providing an effective early warning capability through the integration of the improvements in science and technology with traditional methods and an expanded commitment and involvement by all those at risk.

Introduction

For decades, the international community has discussed and debated how coordinated, collaborative international action can reduce the loss of life, property damage, and social and economic disruption caused by natural disasters. The early emphasis on the development of disaster response capabilities has shifted to the need to strengthen risk reduction and control mechanisms and policies, and most recently, to the design and implementation of better early warning systems. As a result of the International Decade for Natural Disaster Reduction (IDNDR), a rich body of literature now exists on the topic of Early Warning and a variety of successful local initiatives are in place. What has not resulted is coordinated, collaborative international action.

The lack of action is keenly felt within the international community, as is evidenced by the papers presented and workshops held at recent conferences organised around themes such as "Research to Action" (Programme, World Conference on Disaster Reduction, Kobe 2005) and "Concept to Action" (Programme EWCIII, Bonn 2006). While the "Hyogo Framework for Action", agreed by 168 nations at Kobe, Japan in January 2005, documents international agreement of the need to move from discussion and debate to tangible results, it lacks clear cut and precise goals which would constitute commitments and provide baseline points of reference for participating governments and any subsequent evaluation of achievements. The Framework, however, does specifically emphasise the importance of implementing early warning systems "that are people centered [sic] … and that support effective operations by disaster managers and other decision makers." (Hyogo Framework, 17 (ii) (d), p. 9)

Many of us agree on the vision and the importance of translating that vision into a global reality. Why is it, then, that we have not been able to generate a sustainable effort to make Early Warning an international achievement? I believe the answer is that the international community has lost sight of the fact that early warning is the integration and extension of existing emergency management capabilities, and therefore, efforts to establish any local, national, regional and international early warning capability must be led by emergency managers, not by scientists and technologists.

Emergency management is a range of measures that bring together the everyday endeavours of private, voluntary, and government agencies in a comprehensive and coordinated way to deal with the whole spectrum of emergency needs. Through this coordinated effort, emergency managers make use of existing tools and processes, such as weather forecasting, law enforcement, transport infrastructure, health services, scientific modelling, telephony, television and radio broadcasts, and legislation, all of which are used to provide specialised services to the community on a day-to-day basis. In the broadest sense, emergency managers are those who carry out any tasks before, during or after a disaster or emergency, which contribute to enhancing or maintaining the safety of communities from disasters by using whatever tools and processes that are available.

The plans, structures and arrangements coordinated by emergency managers are people-centric, recognising that the community owns the risk and must be given all possible assistance in identifying and dealing with it. (EMA Web Site)

Putting early warning systems into perspective

In 1997, the UN's Guiding Principles for Effective Early Warning stated that the objective of early warning "is to empower individuals and communities, threatened by natural or similar hazards, to act in sufficient time and in an appropriate manner so as to reduce the possibility of personal injury, loss of life, and damage to property or nearby and fragile environments." (Guiding Principles, p. ii) Later that year, the IDNDR Working Group on Early Warning Capabilities summarised years of international debate and expert advice in a report on global experience and current practice on the subject, as well as making recommendations for improvements with particular emphasis on how to ensure that hazard warnings contribute to risk reduction. The result was a thoughtful and detailed discussion of early warning, framed unfortunately in terms of specific systems and sub-systems rather than capabilities (Maskrey et al, 1997).

'Unfortunately' because, despite the fact that few have disputed the validity and importance of the concepts presented in the IDNDR Working Group's report, the international community continues to debate whether early warning systems should involve the creation of effective preparedness and response mechanisms. (EWS Workshop Viewbook, p. 11). I believe that the terminology we are using is causing much of this confusion. A 'system' is generally described as organised or structured, with specific functionality. This description encourages us to think about systems as particular ways of doing specific things, implies scientific and technical leadership, and leads to the kind of questions discussed at the EWS Workshop in Shanghai in 2003. I believe that we would be better able to envision and discuss early warning strategically if it were considered as a capability rather than as a system.

From a strategic viewpoint, an early warning capability is the management integration of expert local knowledge with existing specialised systems and processes, each of which are separately owned and operated by a variety of service providers. Emergency management and its stakeholders assess the functionality and integration of these systems and processes for fitness of purpose relative to a specific hazard, and work with the service providers to extend the functionality or improve the integration of their systems and processes as required toward achieving a more effective and sustainable capability. Without question, an early warning capability provides for preparedness, response, and mitigation mechanisms needed to deal with emergency needs.
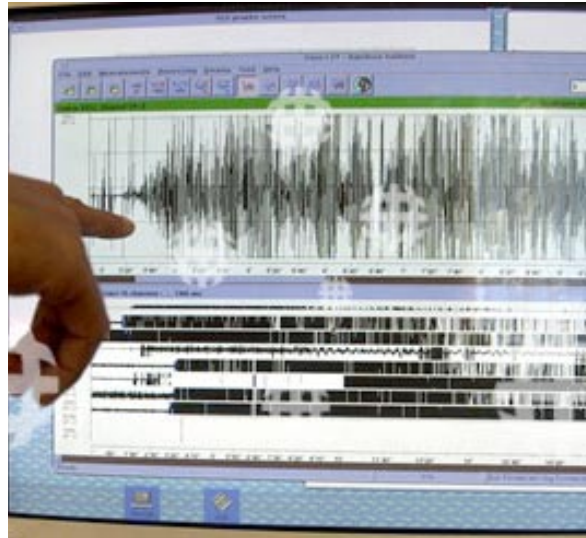
Science must provide emergency managers with early notification of a suspected event so that the appropriate levels of response can be initiated

'Early warning system' is an accurate descriptor for the functionality provided by specialised science and technology based systems and processes, such as those focused on the detection and interpretation of hazard events, or issuing alerts and warnings for those events. The science and technology based early warning system, however, is not the primary driver for emergency management processes, although many current discussions of early warning requirements and functionality incorrectly position it in that way.

We can only succeed in meeting the UN's objective for effective early warning if we recognise that emergency management agencies must lead the development and govern the operation of early warning capabilities as an integration of the extensive hierarchy of emergency management services and processes. An effective early warning capability uses the best available science and technology within the all-hazards emergency management approach. To achieve effective risk reduction functionality, emergency management agencies must fully integrate science and technology into, but not allow them to drive, emergency management.

What is early warning?

The word "early" in Early Warning emphasises the need to improve and optimise not only the science and technology, but also the human capability throughout the entire range of interactions that support emergency management. Science and technology must continually improve their ability to accurately detect, interpret, and report a hazard event at the earliest possible moment. The community must, through its vigilance and participation, augment and confirm the information from the scientific or technical systems with local knowledge and observations. Emergency managers also need communications technology infrastructure that

An early warning capability is the management integration of expert local knowledge with existing specialised systems and processes

integrates with traditional methods of communication, so that they can send emergency information out to every community and person at risk.

By reframing the discussion on early warning in terms of the physical issue (i.e. the hazard event), the place of early warning within the context of effective emergency management can be more easily understood. The hazard event is real; everyone, from the international community of experts and specialists to the individuals living in areas that experience the hazard event, can talk about it in tangible terms. Most simply, these tangible terms relate to two operational or functional modes with respect to the hazard event; either:

- Preparing for the hazard event should it occur (i.e. the Prepare State), or

- Dealing with the hazard event when it does occur (including where appropriate as it approaches) (i.e. the Action State).

The hazard event itself triggers our transition from one state to the other; when it occurs, we deal with it and when we have dealt with it, we prepare in case it should occur again.

This proposition, simple and tangible, can be communicated clearly and understood across all possible demographic, gender, cultural, education and livelihood characteristics of the target audiences. It provides a realistic structure within which we can manage the myriad of community awareness, education, scientific, technical, political and logistical details required to prepare for and deal with hazard events. It provides a basic point of reference for emergency managers, planners, politicians, scientists, technologists, and the media; if their actions are not helping prepare for the hazard event should it occur, or helping deal with the hazard event when it does occur, then they are not helping.

Governance of the early warning capability

Reframing the discussion on early warning relative to the hazard event also provides a practical framework for the governance of the early warning capability by emergency managers. Emergency managers govern the early warning capability in accordance with the overall emergency management communications strategy, through which emergency managers agree the terms of and manage relationships with their stakeholders. This strategy identifies appropriate interfaces with the community and with the strategic service providers whose support is crucial if the early warning capability is to be effective – strategic service providers such as scientists, engineers, infrastructure providers, public officials, community emergency services, and the media. Emergency managers must actively lead, engaging their stakeholders in the development of the early warning capability, and strengthen and sustain that capability through a continuous cycle of review, assessment and improvement activities with the community and the strategic service providers.

Effective governance always depends on the unambiguous articulation of roles and responsibilities, and provides for clear prioritisation and delegation. With respect to the early warning capability, I believe it is essential that we clarify and understand the roles and responsibilities of five primary participants: emergency managers, scientists, the media, public officials, and the community.

In the Prepare State, emergency managers function as Project Managers. They are responsible for coordinating the design, development, implementation, and testing of the plans, systems and processes that facilitate the community's capability to deal with specific hazard events.

Science must provide risk information on hazards that may impact the community, and with assistance from the media, communicate that information to the community in meaningful ways. The community has both the right and the responsibility to be informed about risks on which it is expected to have an opinion or to take action. Therefore, the community must actively participate with emergency managers in the development and presentation of hazard preparedness and community education and awareness programs, ensuring that local knowledge and history are included to augment and contextualise the scientific information available.

Emergency managers must collaborate with the community and strategic service providers on the development of hazard preparedness and response plans that take into account such things as what can be done to reduce the potential risks the community faces with respect to a particular hazard; whether and how an early warning can be realistically provided to the community for a given hazard; how notifications relative to a given hazard should be provided to the community for optimal effectiveness; and how both the strengths and weaknesses of traditional knowledge and local resources can be managed to ensure the most effective response.

Science and the community are responsible for maintaining diligent observations and monitoring with respect to hazards. Scientific monitoring systems operate continuously, and science is responsible for maintaining and managing these systems as well as reporting to emergency managers when pre-agreed thresholds have been reached or exceeded. Local observations reported by the community not only assist emergency managers to ground truth the data and interpretations derived from the technology-based systems but in situations such as lahars and local tsunami, local observations by the community may be the primary or only source of detecting the hazard and raising the alarm.

Responding to alerts and warnings is the responsibility of all stakeholders, led by emergency management. In the Action State, emergency managers act as Operations Managers; they have the immediate relationship with those at risk and the responsibility for activating and managing the response systems established to deal with the hazard event. They are assisted in their decision making by the continual feed of information from science and the community (monitoring and interpretation), and from all stakeholders on the effectiveness of, and their on-going capability to carry out, planned actions.

Under many hazard response plans, science is responsible in the Action State for issuing alerts and warnings to the community through its normal communications channels. In these situations,

the governance model must require that science maintain a close collaborative relationship with emergency managers on the issue of alerts and warnings to facilitate the appropriate community response. Science must also maintain a continuous dialogue with emergency managers about the on-going status of the hazard event and, supported by the media, adhere to the agreed communications strategy for the specific hazard by providing the expected information to target audiences to re-enforce the established hazard response measures. The media, in accordance with the agreed communications strategy, must support emergency managers in the on-going communication with the community, reminding the community of the actions set out in the hazard preparedness plans and informing them of the changing events that guide emergency management decisions on whether to expand or decrease the community's response level. Public officials must activate designated resources and engage with infrastructure providers in accordance with the hazard response plan to support the emergency management measures being initiated.

In governing the early warning capability, emergency managers must take the lead in dealing with two recurring areas of conflict. Scientists often fear that false or inaccurate warnings might result in lack of faith in subsequent warnings and loss of credibility for the scientists. However, even when unable to confirm detection or interpretation, science must provide emergency managers with early notification of a suspected event that may impact the community so that the appropriate levels of response can be initiated. Emergency managers must collaborate with science and the media to inform the community and to establish realistic expectations of the extent and limits of scientific knowledge with respect to the hazards that threaten the community. An informed community, with realistic expectations, can accept false alarms without becoming apathetic or devaluing the professional capabilities of the scientists.

A second area involves public officials who often resist initiating or escalating within the hazard response plan because they are concerned that information and warnings about hazard events will create panic within the community. Rational fear — fear of situations that are liable to occur — generally motivates people to engage in constructive actions to deal with the situation they fear. Emergency managers must collaborate with public officials and the media to provide factual information about the risks the community faces and the options the community has to mitigate and manage those risks. An informed community is unlikely to panic, and adverse economic reactions will be directly related to the hazard event itself.

Conclusion

The international emphasis on early warning systems has shifted the focus, and the funding, from emergency management to science and technology. As a result, scientists and technologists are more and more considered to be leading the development of a global early warning capability. While there are important benefits to be gained from improving our detection and interpretation systems for natural hazards, these benefits will not be realised unless these systems are fully integrated into the all-hazards emergency management capability. Adopting an all-hazards approach, in which local needs are clearly identified and provided for in national and regional policies, generates synergies and efficiencies that can — and must — be leveraged in international strategic planning for early warning capabilities.

To do this, emergency managers need to establish additional, and strengthen existing, international collaboration and exchange of information mechanisms on early warning capabilities just as science has done with early warning system technology. Emergency management must assume the role of 'Champion' and actively lead the dialogue at all levels, working with the community and strategic service providers — in particular science, public officials and the media — to develop effective local, national, regional and international early warning capabilities.

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How the United States is reducing its firefighter fatalities

Gareth Burton outlines some of the initiatives the US is taking to reduce its firefighter deaths

Abstract

On average one hundred firefighters lose their lives in the line of duty each year in the United States. Review of the data indicates that the number of firefighter deaths in recent years is less than the number of firefighter fatalities in the late 1980s. However when the data is considered with regard to the number of emergency calls, it is found that the number of firefighter deaths per call has increased. In 2004, a goal was established at the Life Safety Summit to reduce firefighter deaths within the United States by twenty-five percent within five years and by fifty percent within ten years. This article discusses initiatives that have been implemented in an attempt to bring about the desired reduction.

Introduction

Within the United States, there are an estimated 1.1 million firefighters involved in the response to fire and associated emergencies. Of these firefighters, approximately 313,300 are classified as career personnel with the remaining 823,650 firefighters performing their duties on a volunteer basis (Karter, 2006). Out of the total number of firefighters, approximately one hundred individuals are killed and tens of thousands are injured while on duty each year. After reviewing the causes of incidents that resulted in firefighter fatalities in recent years, and examining the demographics of the data, this article outlines some of the initiatives being implemented in the United States to reduce firefighter fatalities.

Firefighter Fatality Statistics

As illustrated in Figure 1, the number of annual firefighter fatalities in recent years has been reduced slightly from that which was occurring in the late 1980s (Firefighter Fatalities, USFA, 2006).

Figure 1: Firefighter Fatalities in the United States 1985–2005 (Firefighter Fatalities, USFA, 2006).
Note: Data does not include 344 fatalities as a result of the events of 11 September 2001.

No. of Fatalities	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
No. of Fatalities	126	121	131	136	119	107	108	77	81	106	102	99	100	93	113	105	105	101	112	117	115
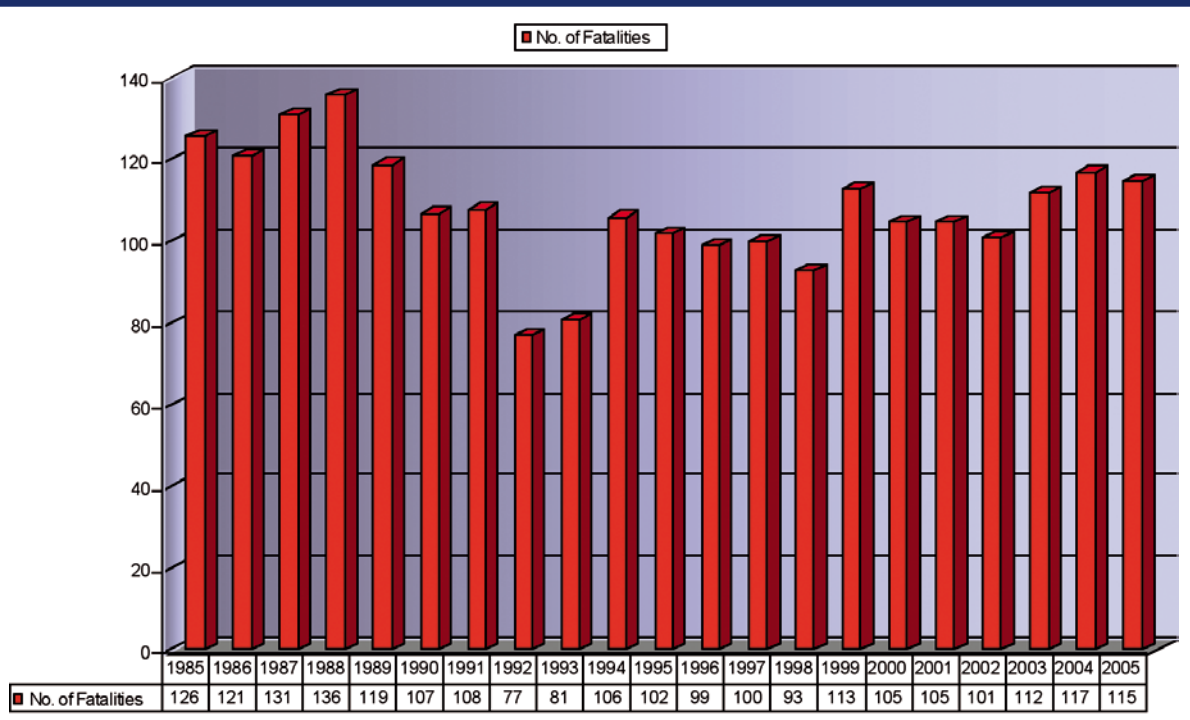
US Firefighters using an open fog hose pattern to offer personnel protection

As shown in Figure 2 (Firefighter Fatalities, USFA, 2006), when the data is analysed with respect to the call volume being completed by fire departments, the results indicate that the number of firefighter fatalities per 100,000 incidents has risen over recent years.

The factors contributing to fatal incidents involving firefighters and the associated demographics of those that died in the 1990s are discussed below (USFA, 2002).

Nature of Fatal Injury

Heart attacks, which were the leading cause of fatal injuries to firefighters, were responsible for forty-four percent of the incidents. Trauma resulted in twenty-seven percent of firefighter fatalities with asphyxia and burns resulting in a further twenty percent of the incidents.

As could be expected, the age of a firefighter directly affects the likelihood of a fatality as a result of a heart attack. The data indicates that firefighters under the age of thirty-five years are more likely to be killed by traumatic injuries than they are to die of medical causes such as a heart attack.

Age

The firefighter's age at the time of death is represented in Figure 3. As noted, approximately sixty percent of firefighter fatalities were over the age of forty years when they were killed, with one-third of fatalities over the age of fifty years. Nationally, firefighters over the age of forty comprise forty-six percent of the fire service, with those over fifty years accounting for only sixteen percent of firefighters. Although older firefighters possess a wealth of invaluable knowledge and experience, they are killed while on duty at a rate disproportionate to their representation in the fire service.

Figure 2: Firefighter Fatalities per 100,000 Incidents in the United States 1990–2004 (Firefighter Fatalities, USFA, 2006).
Note: Data does not include 344 fatalities as a result of the events of 11 September 2001.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Fatalities per 100,000 Incidents	2.48	2.79	2.55	2.41	3.80	3.05	2.73	3.34	2.96	4.50	3.34	3.29	3.73	3.79	3.42
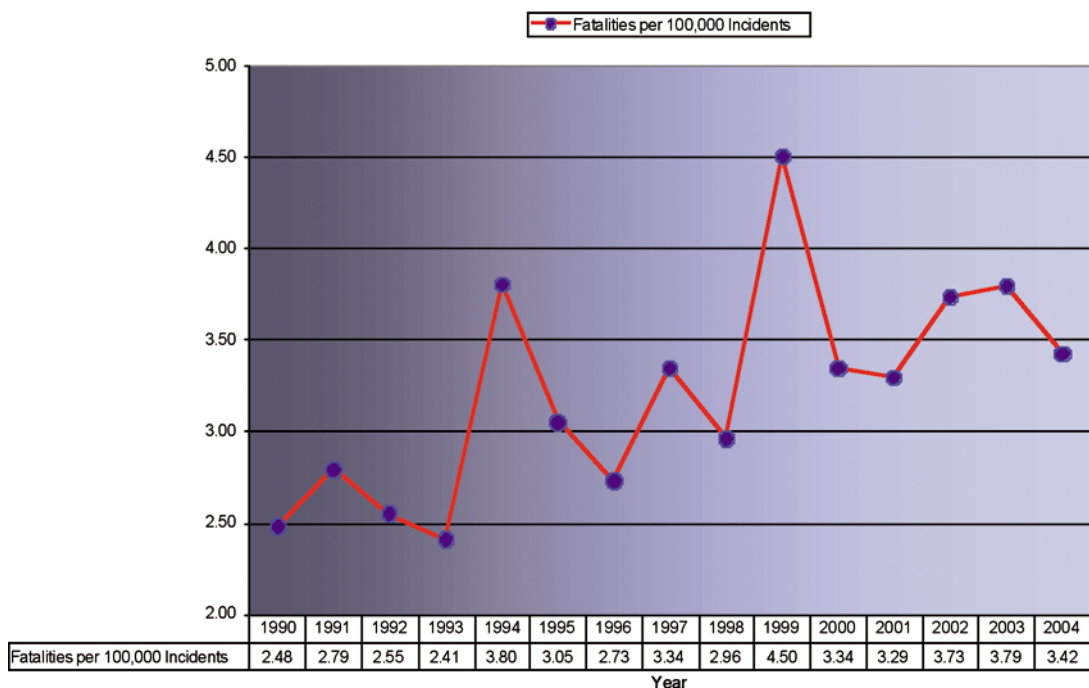
Affiliation

Full-time career personnel accounted for thirty-three percent of firefighter fatalities, volunteers accounted for fifty-seven percent with the remaining being composed of contract workers, military and prison personnel. The fatal incidents involving career personnel are at a disproportionately higher rate than their twenty-eight percent representation within the fire service.

Type of Duty

Figure 4 illustrates the type of duty being completed at the time of the fatal incident. Direct fire extinguishing activities, responding to an incident and supporting suppression activities accounted for sixty percent of all fatalities.

Motor Vehicle Collisions

Since 1984, motor vehicle collisions have accounted for over twenty percent of firefighter fatalities each year. Approximately one quarter of these incidents have occurred as volunteer firefighters responded to emergency calls in their personally owned vehicles.

Training

In the last decade, approximately six percent of firefighter fatalities occurred during training activities. Over time, the leading type of training activity resulting in fatalities has remained physical fitness, followed by equipment/apparatus drills and live fire exercises.

Figure 3: Firefighter Age at time of Fatal Incident 1990–2000 (USFA, 2002).
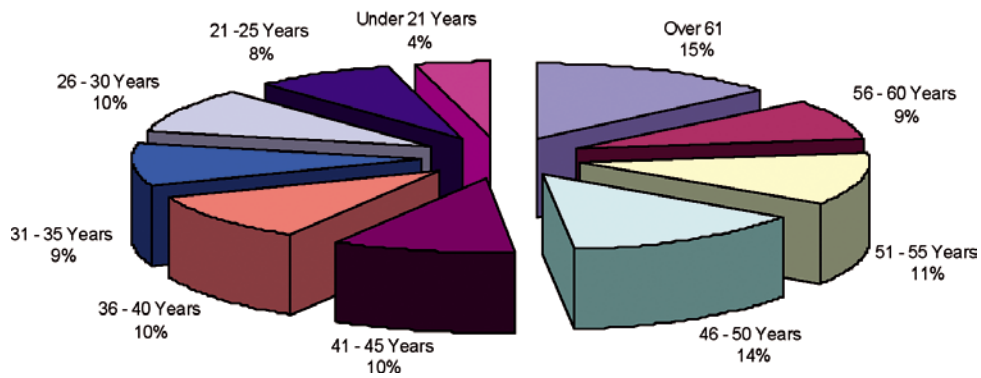
Figure 4: Duty being performed at time of fatal incident 1990–2000 (USFA, 2002).
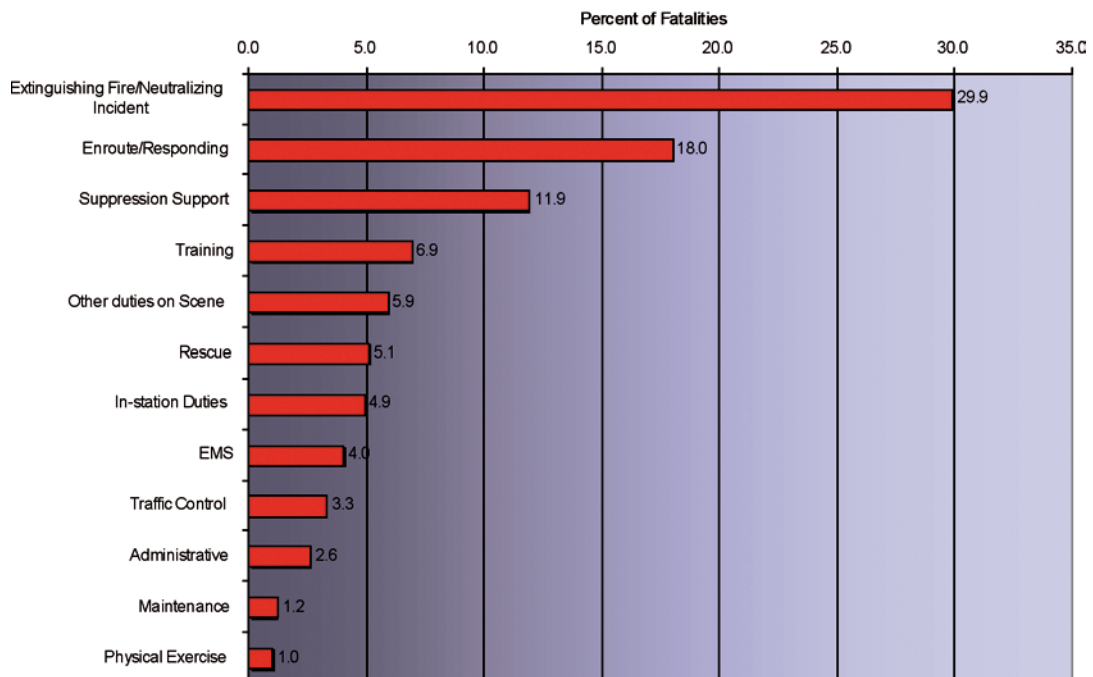
US Firefighters aggressively attacking a natural gas fuelled fire

Firefighter Fatality Reduction Initiatives

Recent initiatives that have been developed within the United States to reduce the number of fatal firefighter incidents include:

1. The Sixteen Life Safety Initiatives

The National Fallen Firefighters Foundation (NFFF) organised the Firefighter Life Safety Summit held in 2004 (Everyone Goes Home, 2006). The Summit was convened to bring together representatives from fire service organisations to determine how to reduce firefighter deaths in the United States.

The Summit produced an agenda of sixteen initiatives as a means to reach the established milestones of reducing firefighter fatalities by twenty-five percent in five years and by fifty percent in ten years. The initiatives established as a result of the Summit, which have been widely promoted and distributed within the United States fire service are:

1. Define and advocate the need for a cultural change within the fire service relating to safety, incorporating leadership, management, supervision, accountability and personal responsibility.

2. Enhance the personal and organisational accountability for health and safety throughout the fire service.

3. Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical and planning responsibilities.

4. Empower all firefighters to stop unsafe practices.

5. Develop and implement national standards for training, qualifications, and certification (including regular recertification).

6. Develop and implement national medical and physical fitness standards.

7. Create a national research agenda and data collection system that relates to the initiatives.

8. Utilise available technology wherever it can produce higher levels of health and safety.

9. Thoroughly investigate all firefighter fatalities, injuries, and near misses.

10. Ensure grant programs support the implementation of safe practices and/or mandate safe practices as an eligibility requirement.

11. Develop and champion national standards for emergency response policies and procedures.

12. Develop and champion national protocols for response to violent incidents.

13. Provide firefighters and their family's access to counseling and psychological support.

14. Provide public education more resources and champion it as a critical fire and life safety program.

15. Strengthen advocacy for the enforcement of codes and the installation of home fire sprinklers.

16. Make safety a primary consideration in the design of apparatus and equipment.

2. Health Initiatives

As noted above, heart attacks were the leading cause of fatal injuries to firefighters in the period 1990 to 2000, responsible for forty-four percent of the incidents. In response to this trend, the following health related programs have been implemented:

- *Healthy Heart Program.* This program, funded by the Federal Emergency Management Agency (FEMA) was developed by the National Volunteer Fire Council (NVFC) to lower the incidence of cardiac-related problems in the fire service by educating firefighters and their families about fitness, nutrition and heart disease. Details are available online at: http://www. healthy-firefighter.org.

- *Fired Up for Fitness.* This online system, which is a component of the Healthy Heart Program, permits firefighters to log their daily fitness activities and chart their progress over time. Rewards are offered to firefighters that achieve milestones in the program.

- *Health and Wellness Guide for the Volunteer Fire Service* (USFA, 2004). The guide provides information on how volunteer fire departments can enhance compliance with appropriate National Fire Protection Association (NFPA) firefighter health and safety standards such as NFPA Standard 1583 – *Health Related Fitness Programs for Fire Fighters.*

- *Emergency Incident Rehabilitation.* The United States Fire Academy and the International Association of Fire Fighters (IAFF) are currently engaged in a study related to emergency incident rehabilitation. It is anticipated that a document providing up-to-date firefighter health and safety standards from the Occupational Safety and Health Administration (OSHA), the National Fire Protection Association (NFPA), and others will be published.

3. Emergency Vehicle Safety Initiatives

Vehicle crashes are the second leading cause of on-duty firefighter deaths. As is often noted, these crashes undermine the mission of all firefighters to arrive first, and then assist individuals needing emergency help. Initiatives to address crashes of emergency vehicles include:

- The Emergency Vehicle Safety Initiative, a jointly sponsored project of the United States Fire Administration (USFA) and Department of Transportation (DOT) (Emergency Vehicle Safety Initiative, USFA). The project addresses issues including seatbelt use, intersection safety, emergency vehicle safety design, driver selection and training. Components of this initiative include:

  – *Guide to Model Policies and Procedures for Emergency Vehicle Safety* (Guide to Model Policies, IAFC). This web-based educational program developed by the United States Fire Administration (USFA) and the International Association of Fire Chiefs (IAFC) is aimed at reducing the impact of vehicle related incidents on the fire service and the communities they protect. The guide provides in-depth information for developing policies and procedures required to support the safe and effective operation of emergency vehicles, as well as privately-owned vehicles.

  – *Improving Apparatus Response and Roadway Operations Safety in the Career Fire Service* (Emergency Vehicle Safety Program, IAFF). This comprehensive program developed by the International Association of Fire Fighters (IAFF) discusses critical emergency vehicle safety issues such as intersection safety, roadway operations on crowded interstates and local roads and driver training.

  – *Emergency Vehicle Safe Operations for Volunteer and Small Combination Emergency Service Organizations* (Emergency Vehicle Safe Operations, NVFC). This in-depth web-based program developed by the National Volunteer Fire Council (NVFC) includes an emergency vehicle safety best practices self-assessment, example standard operating guidelines, and behavioral motivation techniques to enhance emergency vehicle safety.

  – *Research on Non-Blinding Emergency Vehicle Warning Lighting Systems.* The United States Fire Administration (USFA) is working with the Society of Automotive Engineers (SAE) on an effort to study the effect and effective mitigation of the disorientation of motorists caused by emergency warning lights, including the effects on normal, impaired and drowsy drivers (Study of Emergency Vehicle Warning Lighting, USFA). Various lighting systems are being studied including incandescent, halogen, strobe and light-emitting diode (LED) systems.

  – *Safe Operation of Fire Tankers Report* (Safe Operation of Fire Tankers, FEMA). This report published as a result of the examination of crashes involving fire tankers provides strategies, techniques, and technologies to mitigate fire tanker crashes.

4. Accident Reporting/Lessons Learned

It is estimated by the National Fire Protection Association (NFPA) that for every 100 incidents of injury, one million "close call" incidents go unreported. In an attempt to learn from the "close calls" and to prevent injuries and fatalities, a near-miss accident report system, similar to that utilised within the aviation industry, has been implemented in the United States fire service.

Accident reporting and distribution of information is available at:

- *Firefighternearmiss.com.* This website is promoted as a voluntary, confidential, non-punitive and secure reporting system. The program has a goal of improving firefighter safety through sharing lessons learned and combining data than can be used for the further analysis of fire firefighter injury-producing behaviors.

- *Firefighterclosecalls.com.* Information on the program is available on the internet at: http://www.firefighterclosecalls.com.

- *Lessons Learned Information Sharing.* This website contains a network of lessons learned and best practices for emergency response providers and homeland security officials. The information is designed to facilitate efforts to prevent, prepare for and respond to acts of terrorism and other incidents across all disciplines and communities throughout the United States. Information on the program is available on the internet at: www.llis.gov.

Fire suppression activities at a multi-million dollar residence

5. Code Development

Codes and standards which influence firefighter safety continue to be developed and refined. Examples of standards produced by the National Fire Protection Association (NFPA) which have a direct influence on firefighter safety are:

- NFPA 1002, *Standard on Fire Apparatus Driver/ Operator Professional Qualifications* which identifies the minimum job performance requirements for firefighters who drive and operate fire apparatus.

- NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments* which outlines procedures for fire departments to follow in screening candidate firefighters and handling health problems that arise during a firefighter's service career.

- NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* which outlines the safety procedures for firefighters involved in rescue, fire suppression, and related activities.

- NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters* which includes information relating to firefighter fitness assessments.

6. Fire Department Training

Due to the increased national attention, the safety culture has become more ingrained in fire department training operations in recent years. Training classes to assist firefighters in recognising hazardous, potentially life threatening situations and the appropriate actions to take have become common in both recruit and on-going training classes. Examples are training events providing firefighters with knowledge and skills to initiate a "mayday" situation and use Rapid Intervention Team concepts.

7. Technological Developments

Advancements in the equipment and technology that firefighters are utilising continue to be made. Examples in this area include:

- Self contained Breathing Apparatus including integrated Personal Alert Safety Systems (PASS) system

- Firefighter clothing.

- Developments in fire apparatus including:
  - Independent suspension systems
  - Occupant protection including airbags and seatbelt pre-tensioners

Summary

Despite the technological advancements in the past decades, over one hundred firefighters are still losing their lives in the line of duty each year in the United States. Recent initiatives within the United States focus on the root causes of these incidents including firefighter health, the safe operation of emergency vehicles and an increased awareness to perform operations in a safe manner.

It is anticipated that the increased awareness on firefighter fatality incidents, brought about by the promotion of the sixteen life safety initiatives and the new methods of tracking near-miss events will have a significant effect on reducing firefighter fatalities. The goals established at the 2004 Life Safety Summit, to reduce firefighter fatalities by twenty five percent within five years and by fifty percent within ten years remain targets for the United States fire service to achieve.

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Photographs by Todd Holder

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Is a contained fire less risky than a going fire? Career and volunteer firefighters' perception of risk

Sadler, Holgate & Clancy investigate how career and volunteer firefighters perceive risk in different scenarios

Abstract

Since fighting fires can pose a great risk to the lives of firefighters, it is important to understand how they perceive risks in dynamic wildfire situations. The aim of the current study was to determine whether career and volunteer firefighters differ in their perception of the risk of a going vs. contained fire and whether descriptions of a fire as either going or contained affected perceptions of risk. It was expected that career firefighters would rate a contained fire as significantly riskier than would volunteer firefighters. The sample consisted of 55 career and 84 volunteer CFA Victorian firefighters (134 males and 5 females). An ambiguous wildfire scenario was presented and described as either going or contained and risk ratings were recorded. Two-way ANOVA results showed that career firefighters rated a going fire as equally risky as a contained fire. On the other hand, volunteer firefighters perceived a fire described as contained to be significantly less risky than a fire described as going, despite the fact that the same fireground conditions were described in both cases. It was concluded that a framing effect had occurred and that career firefighters demonstrated a higher level of situation awareness than volunteer firefighters due to their heightened levels of risk perception when exposed to contained wildfire scenarios. A practical implication of the current research is that those conducting firefighting briefings need to be aware of possible framing effects in the way information is presented to firefighters and need to ensure that all briefings make risks cognitively salient to firefighters.

Despite the number of well-trained career firefighters worldwide, many fire brigades rely heavily on their volunteer base. The Country Fire Authority (Australia) is one of the world's largest volunteer-based emergency services with approximately 58,000 volunteer members supported by over 400 career firefighters.

Firefighting is a risky activity. This is especially evident in wildfire situations where the environment is dynamic and potentially life threatening. For instance, in 1998 the Linton (Victoria) bushfire burnt more than 660 hectares of open eucalypt forest and took the lives of five firefighters as a result of a sudden wind change (Dunlop, 2002). Since fighting fires can pose a great risk to the lives of career and volunteer firefighters, it is important to understand how they perceive risks in dynamic wildfire situations.

Although risk perception would appear to be an obvious aspect to firefighter safety and effective wildfire operations, there has been no previously published psychological research into risk perception on the fire ground.

The concept of risk perception has generally referred to people's judgements and evaluations of potential hazards (Slovic, Finucane, Peters, & MacGregor, 2004). The individual is seen as an information-processing unit that gathers information about a risk through the use of schemas (mental models) and heuristics (cognitive shortcuts) to determine a rational conclusion (Trumbo, 1999). These cognitive mechanisms are used as guidelines and shortcuts to enable perceivers to quickly make sense of risky situations (Reyna, 2004).

Although the rational approach has been thoroughly investigated and widely applied, this literature has primarily focused on theoretical explanations of risk perception and has yet to address how people perceive risks in dynamic naturalistic settings. The current research project aims to expand the domain of risk perception by investigating whether firefighters' perception of risk varies depending upon how a firefighting scenario is framed.

There has been a growing interest by applied psychologists into the study of naturalistic decision making (NDM). NDM is an attempt to understand how people make decisions in complex real-world settings (Klein, 1998; Lipshitz, Klein, Orasanu, & Salas, 2001; Zsambok & Klein, 1997). Klein (1997) found that fireground Commanders' accounts of their decision making did not fit in to any conventional decision-tree framework (e.g. rational approach). Fireground Commanders argued that they were not making choices, considering alternatives, or assessing probabilities. The Commanders saw themselves as acting and reacting on the basis of prior experience by generating, monitoring, and modifying plans to meet the needs of the situations. On the basis of these groundbreaking findings, Klein (1997) developed a template called the Recognition-Primed Decision (RPD) model.

The RPD model illustrates how experienced decision makers rapidly decide on the appropriate course of action in a high-pressured situation. Rather than going through laborious logical and rational processes to make decisions, experienced firefighters could simply pattern-match cues in the environment to stored schemas with the use of heuristics to make a decision (Klein, 1997). As a result, NDM type strategies (e.g. RPD model) felt like intuitive responses to experienced fire Commanders rather than like analytic comparisons or rational choices of alternative options (Klein, 1997).

If firefighters are to perceive risks accurately in order to operate safely and effectively in NDM settings, then they must not only have experience in these environments, but they must also have a sound understanding of what to expect and how to operate effectively in wildfire conditions. This understanding is referred to as situation awareness.

Situation awareness involves an internal conceptualisation of the situation at hand and becomes an important factor in the decision making process (Endsley & Garland, 2000; Ericsson & Lehmann, 1996). Research has indicated that individuals will differ in their capacity to perceive, comprehend and predict the situation depending upon their level of training and expertise (Barnett & Breakwell, 2001; Lewandowsky & Kirsner, 2000). For example, those with greater training and expertise (e.g. career firefighters) are likely to have developed richer cognitive schemas to draw upon in comprehending a situation.

Furthermore, research has shown that professionals in a domain are better able than novices in a domain at distinguishing relevant cues from irrelevant cues (Barnett & Breakwell, 2001; Ericsson & Lehmann, 1996; Lewandowsky & Kirsner, 2000). Although many volunteer firefighters have advanced levels of expertise it may be expected that, in general, career firefighters may

Firefighters must maintain situation awareness in dynamic circumstances

consider that there is more risk of being overrun by a contained bushfire than will volunteer firefighters due to their generally greater levels of specialised training and experience which should lead to higher levels of situation awareness (e.g. picking up relevant cues in the environment). Consequently, it is likely that career firefighters will demonstrate a greater overall awareness of risk than will volunteer firefighters.

The way in which a scenario is presented or "framed" also has a powerful impact on an individual's risk perception (Perrin, Barnett, & Walrath, 2001; Tversky & Kahneman, 1981). Research has demonstrated that framing derives from the individual's knowledge about events that had led up to the situation in question (Endsley & Garland, 2000; Perrin et al., 2001). This information serves to tie events to the decision maker's ongoing experience, thereby endowing those events with meaning. Therefore, prior information can tell an individual what to expect and how to behave.

Knowing the frame that a decision maker is processing is likely to aid in predicting and understanding the decisions that an individual might make. One of the ways in which fire is officially framed in firefighting briefings as defined by the CFA (2007) is as "going" ("any fire expanding in a certain direction or directions, spreading at the perimeter of the fire") or "contained" ("the fires spread has been halted but may be still burning freely within the perimeter, and further work is required to bring the fire under control"). If firefighters' are briefed that they are being deployed to fight a dangerous spreading fire, then firefighters' may perceive this situation as of high risk. On the other hand, if firefighters' are briefed that they are being deployed to mop up a contained fire, then the firefighters' may perceive this situation as involving lower risk.

Investigating the effect of framing is an important area of research because it was believed that a framing effect was a contributing factor in the deaths of five firefighters at Linton (Victoria, 1998). According to testimony to the 2002 Coronial inquiry into the Linton bushfire, the firefighters at Linton perceived the fire to be a 'marshmallow fire' (e.g. a fire of such low intensity that it is suitable for toasting marshmallows), which possibly led to complacency about the risks involved in the fire-fight (Johnstone, 2002).

Based on the previous research, the aim of the current study is to determine whether career and volunteer firefighters differ in their perception of the risk of a going vs. contained fire. It is expected that career firefighters, presumably with more specialised schemata upon which to draw, will rate a contained fire as significantly more risky than will volunteer firefighters.

Method

Participants

The sample consisted of 139 CFA Victorian firefighters aged from 18 to 66 (M = 37, SD = 12), which included 134 males (96 %) and 5 females (4 %), with 55 (40 %) being career firefighters and 84 (60 %) being voluntary firefighters. Firefighters that participated in the current study were sampled from rural Country Fire Authority (CFA) Victoria, Australia, fire brigades. Of career firefighters 45% had previously performed in the role of incident controller at a fire (the highest level of command on the fireground) compared to 23% of volunteer firefighters who had performed this role.

Materials

Since no research has investigated the effects of framing on firefighters' risk perceptions, materials were specifically designed for the purpose of the current study. Participants were randomly assigned to complete one of two self-report questionnaires. All participants

Firefighters need to be aware of framing effects in briefing

were presented with the information that they were part of a firefighting crew consisting of 2 tankers and had been called to attend a fire at 16.00 hours. They were given the following information regarding the fire: the size of the fire was approximately 50 hectares; the current air temperature is 28 °C and the relative atmospheric humidity is 15%; the current wind prevailing is a Northerly at a speed of 10 km/h; fuel loads in the area vary from light to medium with grass but also patches of scrubby bush with some eucalyptus trees; flame heights are approximately 1 metre climbing to 2-3 metres in places; and the terrain is variable.

The bushfire scenarios that were described to participants were designed to represent ambiguous and variable conditions. The wordings of the bushfire scenarios were developed in consultation with experienced CFA personnel to ensure that they were unlikely to prompt consistent risk ratings.

Respondents were then presented with one of two descriptions of the fire status: 1. The fire is contained and you are being deployed to mop up (n = 67) or 2. The fire is going and you are being deployed to fight the fire (n = 72). Respondents were asked: how risky do you think this situation is for conducting safe firefighting operations? Respondents rated the level of risk on a 10 point scale from 1 (no risk at all) to 10 (extreme risk – avoid).

Demographic information of gender, age, educational level, occupation, and various types of firefighting experience was also gathered.

Procedure

Ethics approval was granted by the Deakin University Human Research Ethics Committee. Participants were approached to participate in the current study from various rural Victorian CFA fire brigades during their attendance at routine training nights.

Data gathering was achieved by asking participants to complete the questionnaire that was randomly assigned to them. Questionnaires took approximately 15 minutes to complete. All participants were debriefed following completion of questionnaires.

Results

A two-way ANOVA was performed to compare mean risk ratings of a going vs. contained fire of volunteer vs. career firefighters. The model was significant overall ($F_{(1,138)} = 3.51$, $p = .017$). The interaction between firefighter employment status and mean risk rating of fire status approached significance ($F_{(1,138)} = 3.36$, $p = .06$). There was no significant difference between career and volunteer firefighters in their risk ratings of a going fire, however volunteer firefighters rated a contained fire as significantly less risky than a going fire ($F_{(1,138)} = $

Figure 1: Differences in mean risk ratings between career and volunteer firefighters according to fire status.
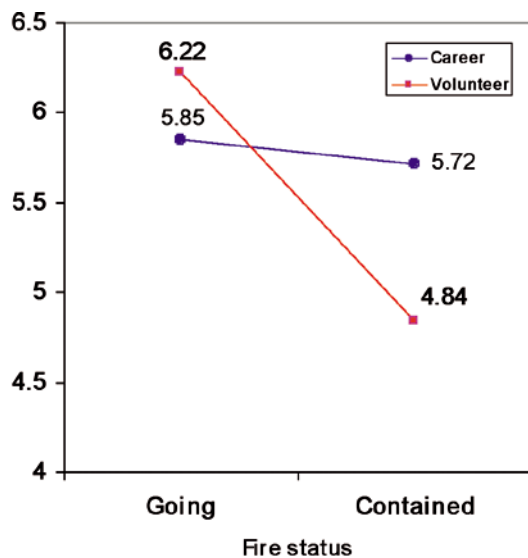
Note: Standard deviations for career firefighters were 2.07 (going) and 2.38 (contained) and for volunteer firefighters were 1.95 (going) and 1.49 (contained).

4.79, $p = .03$) whereas career firefighters did not. Figure 1 illustrates the mean risk ratings for all groups.

Overall, whether a fire was described as going or contained influenced firefighters' risk perceptions. Career firefighters did not show evidence of a framing effect, rating a going fire as equally risky as a contained fire. Volunteer firefighters perceived a fire described as contained to be significantly less risky than a fire described as going, despite the fact that the same fireground conditions were described in both cases.

Discussion

As hypothesised, career firefighters perceived a contained fire to be significantly more risky than did volunteer firefighters.

Research has indicated that experience and familiarity are important components to accurate situation awareness and risk perception (Barnett & Breakwell, 2001; Ericsson & Lehmann, 1996; Lewandowsky et al., 1997). The difference between career and voluntary firefighters' risk perceptions may have occurred because career firefighters have greater exposure to risky situations than do volunteer firefighters, thereby enhancing their cognitive skills of precarious situations. Based on this difference in firefighters' risk perceptions, how can fire brigades ensure that both career and voluntary firefighters exhibit high levels of situation awareness and risk perception in wildfire situations?

In an ideal world, both career and volunteer firefighters would undergo advanced risk perception training on a regular basis to improve their decision making skills on the fireground. Advanced training activities may include formal risk perception courses, role-play scenarios, group meetings, and simulated exposure to wildfire settings. For example, evidence has demonstrated the importance of experienced firefighters sharing their knowledge with others to assist in improving firefighters' understanding and awareness on the fireground (Fender, 2003; Klein, 1997). The key to these interventions would be regular training to provide firefighters with the cognitive skills to be aware and prepared for risky wildfire situations. This training routine would aim to make certain that firefighters' risk perception would not decrease when informed that fireground conditions are expected to remain stable.

Despite the proposed ideal training plans, time is a factor for voluntary firefighters because these individuals have other priorities such as family and work commitments. Therefore, risk perception programs for voluntary firefighters would need to be realistic and focused on enhancing their awareness and risk perception on the fireground. The current study has identified that a key message that fire agencies must instil into its volunteers is that no wildfire situation is ever safe, and that each fire involves a certain level of risk, which requires firefighters to remain alert at all times and constantly be aware of potential hazards (e.g. windchange).

Although the current study has provided central findings into how firefighters perceive risks when exposed to wildfire scenarios, the present research has room for improvement. Although a survey methodology is efficient for data collection, they in no way simulate real dynamic firefighting conditions.

Since the study of firefighters' risk perceptions is in its infancy, a pen and paper design is an important starting point because the findings from the current study should generate further research. It may be expected that differences in risk perception are likely to become more apparent in a wildfire situation when participants are under stress. Differences in risk perception between career and volunteer firefighters may be even more acute in research conducted under more realistic conditions.

It is recommended that future research concentrate on improving the methods of data collection to obtain firefighters' risk perceptions. Several studies that have investigated dynamic situations have demonstrated that the use of visual cues is more meaningful and realistic (Cannon-Bowers & Salas, 1998). For example, naval, military, and aviation fields have implemented a computer-simulated technique to assess and train marines, soldiers, and pilots in their respective dynamic fields. Greater use of computer simulated

wildfire scenarios could be made to assess firefighters' risk perceptions.

The current study has provided a platform for understanding how career and volunteer firefighters may perceive risks when exposed to wildfire scenarios. It was found career firefighters demonstrated a higher level of situation awareness than volunteer firefighters due to their heightened levels of risk perception when exposed to contained wildfire scenarios. As a result, firefighters' familiarity and expertise may have influenced how alert they were to potential risk of contained wildfire scenarios. Since voluntary firefighters demonstrated a lower level of situation awareness to contained scenarios, the current study highlighted the importance of further research and advanced training programs to help voluntary firefighters become more aware of risky situations on the fireground. A practical implication of the research is that those conducting firefighting briefings need to be aware of possible framing effects in the way information is presented to firefighters and need to ensure that all briefings make risks cognitively salient to firefighters. The evidence that has been discussed throughout the current study will allow for more advanced analyses in the future and make for improved firefighting on the fireground.

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REPORTS

Emergency Management Information Development Plan (EMIDP)

Nicolopoulos, Damcevski, Tomlinson & Lye report on the new Emergency Management Information Development Plan

For some years the emergency management sector has seen the need to establish consistent and comparable national emergency management information to provide greater cohesion across emergency management data sources. The release of the 2002 Council of Australian Government (COAG) Report *Natural Disasters in Australia: Reforming mitigation, relief and recovery arrangements*, coupled with the increasing emphasis on the development of emergency management plans and policy in relation to counter terrorism, has added to this impetus for greater cohesion across and within jurisdictions.

Beginning in 2004 a series of consultative workshops involving key emergency management stakeholders provided the opportunity to develop a framework to assist with the capture of information needs of the emergency management sector, to identify gaps and key priority areas for action. The end result, the Emergency Management Information Development Plan (EMIDP), a national information framework for improving the information available to support policy, planning and accountability within the Australian emergency management sector.

This paper provides an overview of some key drivers that led to the development of the EMIDP and outlines the priority areas for improving the relevance, coverage, comparability and quality of emergency management information.

Introduction

Changes to social, economic, environmental landscapes, the current global security environment, and the paradigm shift from response-only emergency management to one that includes mitigation, are placing increasing demands on emergency management stakeholders to improve the availability of relevant and quality emergency management information to facilitate informed discussion and decision making within government and the community.

Quality statistical information is important to effective government. Confidence in official statistics allows debate to focus on what the data have to say, rather than on how they were produced. *One of the things you find in government is that no amount of goodwill is enough, no amount of good policy direction is enough, unless you have accurate information at your disposal. And the use of taxpayer resources to achieve particular goals can be very frustrating if in fact the database on which these policies are based and the objectives pursued are inadequate, or worse inaccurate* (Prime Minister, Hon. John Howard at the launch of the Australia Research Alliance for Children and Youth, July 2002).

The EMIDP, endorsed by the Australian Emergency Management Committee (AEMC) in September 2006, outlines an information framework of agreed priorities and plans for improving relevance, coverage, comparability and quality of information for the emergency management sector over the next three to five years.

The remainder of this paper has been reproduced from the EMIDP released by the Australian Bureau (ABS) of Statistics in October 2006 (ABS cat. no. 1385.0).

The purpose of the EMIDP

Information Development Plans (IDP) are being developed by the Australian Bureau of Statistics (ABS) in consultation with key users and providers of data across a number of fields of statistics including health, justice, education and training, rural and regional statistics, and children and youth. An IDP represents agreed actions to

improve the availability and quality of data within the broader policy and research context of the demand in a particular field of statistics.

Specific to emergency management, the IDP is designed to reflect the suite of information required to support policy, planning and accountability within the sector. Recognising the diversity of arrangements for the collection and dissemination of emergency management information, the EMIDP:

- identifies key information management issues and data gaps for consideration,

- presents agreed priorities and plans for improving relevance, coverage, comparability and quality of information, and

- identifies responsibilities for individual strands of work, and for monitoring overall progress.

The Emergency Management Working Group

The EMIDP has been developed by a Working Group (EMIDPWG) of agencies and organisations working within emergency services/management. The EMIDP working Group consists of members from jurisdictional emergencies services agencies, representatives from federal agencies (Emergency Management Australia, Bureau of Meteorology, Australian Bureau of Statistics,

Department of Transport and Regional Services) and peak emergency management bodies such as the Australasian Fire Authorities Council (AFAC).

While many of the EMIDPWG members are from traditional emergency service agencies, ownership of the EMIDP resides with the emergency management community. The EMIDP, particularly the accompanying data needs matrix, has been designed with the flexibility to encompass the needs and to benefit the wider sphere of the emergency management community which has a broader range of information needs than that of responding emergency service agencies.

It is envisaged that the membership of the EMIDPWG will change to reflect the priorities of the working group over time including participation of subject matter experts. Since the release of the EMIDP the focus of the working group has moved from one of strategy to implementation and monitoring.

Scope of Emergency Management

The range of event types addressed by emergency management includes fires, medical transport and emergencies, rescues, other natural events (such as floods, earthquakes, tsunamis, landslides, heatwaves, cyclones and other storms), consequences of acts of terrorism, technological and hazardous material

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Diagram 1: EMIDP stakeholders to date

Australian Emergency Management Committee (AEMC)

National agencies

Emergency Management Australia *(EMA)*

Geoscience Australia *(GA)*

Department of Transport and Regional Services *(DOTARS)*

Australian Bureau of Statistics (ABS)

Jurisdictional representatives

NSW Fire Brigades

Vic Office of the Emergency Services Commissioner

Qld Department of Emergency Services

Fire and Emergency Services Authority of WA (FESA)

SA Fire and Emergency Services Commission (SAFECOM)

ACT Emergency Services Authority

NT Department of Police, Fire and Emergency Services

Industry bodies or other groups

Australasian Fire Authorities Council (AFAC)

Australian Council of State Emergency Services (ACSES)

Emergency Management Working Group (EMWG) for the Steering Committee for the Review of Commonwealth/ State Service Provision (SCRCSSP)

Non-attending members

Australian Local Government Association *(ALGA)*

Council of Ambulance Authorities *(CAA)*

Wider emergency management community

* The CAA representative is also the Tasmanian jurisdictional representative.

incidents (such as chemical spills, harmful gas leaks, radiological contamination, explosions and spills of petroleum and petroleum products), and the quarantine and control of diseases and biological contaminants (Report on Government Services, 2006, pp 8.1-8.2).

Emergency Management Australia (EMA) defines emergency management as 'a range of measures to manage risks to communities and the environment' (EMA 2003). Emergency management has been considered to be a broad concept encompassing the four elements of Prevention (mitigation), Preparedness, Response and Recovery (PPRR) in relation to such emergencies.

State and Territory governments and local governments provide emergency management services to the community through a range of emergency service organisations. The objectives of emergency service organisations are to provide highly effective, efficient and accessible services that:

- reduce the adverse effects of emergencies and disasters on the Australian community;
- contribute to the management of risks to the Australian community; and
- enhance public safety (Report on Government Services, 2006, p 8.10)

The events that are attended by emergency services tend to be frequently occurring, smaller scale incidents. However, emergency services also attend the larger scale emergencies.

It should be noted that the same objectives of emergency service agencies are also held by many other agencies within the broader emergency management community and that therefore their information needs may be similar.

The term 'emergency management' has been employed in this paper as a general term intended to include emergency services. The term 'emergency' is intended to include emergencies, events and incidents; and discussion of emergency management information includes reference to both emergency management and emergency services information.

The key drivers of the EMIDP

A number of drivers led to the development of the EMIDP. These included:

(a) Better information for better decision making

The global security environment, climate change and global warming, the rising complexity of hazards, changes in regional and coastal population, land use and hazard levels and a greater emphasis on community safety, is placing increasing demands on emergency management stakeholders for relevant, accessible and quality information to support evidence based planning and decision-making, in turn delivering more responsive and cost effective services to businesses and the community.

Emergency management stakeholders need information to provide them with an understanding of the emergency management problem and policy options including:

- risk of damage arising from particular types of emergencies,
- possible costs to the community and to the Government, and
- options for investment in reducing risk/damage.

The availability of comprehensive data on the full costs of emergencies and emergency risk management services will enable governments and communities to identify the most cost effective mix of risk based emergency management investment in Prevention, Preparedness, Response and Recovery (PPRR) interventions across all hazards. At present, collating all the available data necessary to identify the total costs of emergency risk management within a community is extremely difficult and beyond the capacity of most researchers. Some of the key data required is currently not collected or not accessed by emergency services at all. Case studies tend to focus on one disaster or type of emergency rather than allow an 'all hazards' view of the cost benefit of emergency risk management investment.

Changes to social, economic and environmental landscapes also mean that emergency managers must provide frontline operations with relevant, timely and quality information to ensure occupational health and safety (OH&S) and to enable them to manage operations efficiently and effectively. Duty of care and OH&S obligations are also in part driving the need the interoperability of systems, especially during emergencies.

(b) Significant reports

There have been a number of significant reports and findings recommending a more unified and comprehensive approach to emergency management and reducing risks. Central to the new approach is a systematic and widespread national process of disaster risk assessments and, most importantly, a fundamental shift in focus towards cost-effective, evidence-based disaster mitigation.

Some of these reports include:

- The COAG Report *Natural Disasters in Australia*, in particular, Reform Commitments 1 and 2 from this report which respectively state: "develop and implement a five-year national programme of systematic and rigorous disaster risk assessments" and "establish a nationally consistent system of data

collection, research and analysis to ensure a sound knowledge base on natural disasters and disaster mitigation" (COAG, 2002, p 14). While the report's focus was on natural disasters, with an emphasis on mitigation, the EMIDP is, in part, a response to that commitment, applying however, the wider all-agencies, all-hazards approach;

- The *Report of the ANZLIC Counter Terrorism Project* (or Conybeare Report) (2003),
- The COAG Report *National Inquiry on Bushfire Mitigation and Management* (2002),
- The Parliamentary report *A Nation Charred* (2003),
- OECD's Report *Emerging Risks in the 21st Century: An Agenda for Action* (2003),
- Management Advisory Committee Report *Connecting Government: Whole of government responses to Australia's challenges* (2004), and
- Catastrophic Disasters Working Group Recommendations.

(c) Improved governance and coordination of information management

The increased level of activity within emergency management has generated an increased level of planning and investment to improve the availability and quality of information needed for cost-effective emergency management. This has led to multiple fragmented and parallel projects with overlapping priorities and an increased potential for duplication.

There are currently a number of other cross-jurisdictional departmental data management processes underway within the emergency management sector. Some of these processes include:

- Disaster Mitigation Program (DMAP),
- Steering Committee for the Review of Government Service Provision,
- National Information Management Advisory Group (NIMAG),
- The Australian and New Zealand Land Information Council Emergency Management/Counter Terrorism (ANZLIC EM/CT) Working Group,
- Critical Infrastructure Protection (CIP), and
- National Spatial Information for National Security (NSINS).

The aim of the EMIDP has been to complement these processes. The overlaps that occur between the EMIDP and other processes are in the nature of identifying data needs and assigning a priority to these needs, whether it be a format for data (e.g. spatial) or in the identification of consistent and comparable performance indicators across jurisdictions. The EMIDP assists in providing details on the need and its priority to an existing group, agency or organisation which is already responsible for this area of work within the emergency management sector.

(d) Changing models and approaches to managing emergencies

The move from response-only emergency management to one that includes mitigation represents a paradigm shift in Australia. The increasing interaction between 'natural' and 'human-caused' events, as well as the regular occurrence of disasters in recent times, and the focus on their cost, both socially and economically, have brought about changes in the way in which emergency events need to be considered. It has been recognised that emergency management is a 'whole-of-government' issue, encompassing Federal, State and Local Government agencies, and including industry and the community. This approach to emergency management is driving the need for integration of many data bases and their interfacing in multiple contexts to support 'whole–of–government' approaches to service delivery and inter-agency interoperability.

Emergency management agencies recognise that they need to spend more effort on prevention and mitigation, that is, emergency risk management, coupled with the need to adopt a community centred approach. Research into the effects of disasters on communities has highlighted significant gaps in knowledge on what is really meant by 'community safety'. Further research could contribute to enhanced knowledge and mutual understanding of constructs such as community centred and community safety.

Governance

The EMIDP was endorsed by the Australian Emergency Management Committee (AEMC) in September 2006. At that meeting, AEMC tasked the National Information Management Advisory Group (NIMAG) with monitoring implementation and regular reporting on progress.

Since the release of the EMIDP in October 2006, a number of emergency service organisations have submitted applications seeking funding from DOTARS' Natural Disaster Mitigation Program to progress individual strands of work within the IDP. The proposals that have been prepared to progress the EMIDP have the intent and potential to result in nationally (and regionally) consistent standards for data capture and information requirements.

The development of the EMIDP has identified the need for the emergency management sector to formalize a regular funding stream for information projects of national significance. Formalising funding will also improve the governance and monitoring of progress of the information initiatives.

Key priority areas

A data needs matrix was developed to assist in identifying the priority information areas of work for the emergency management sector. The Matrix is a complex data needs analysis of the emergency management sector which underpins the EMIDP. For each of the five domains of emergency management (Risk Assessment, Risk Reduction, Readiness, Response, and Recovery), the matrix provides information on the characteristics of the data needs and development requirements. It contains information on existing data and data gaps and their data characteristics, cross-classified by the environmental characteristics, the hazard or risk types and the business processes that constitute the different organisational and operational procedures within the service agencies.

While not in official use, the '5R' framework has been used in the EMIDP and the matrix as it specifically examines risk through the analysis and synthesis of baseline data on communities, the built and natural environments and the economy, as well as the service operational business processes, to measure exposure and vulnerability.

Six broad categories were identified as priority areas of information gaps within emergency management. The listed priority areas are:

- Overarching costs: social, economic and environmental,
- Theoretical issues: methodologies, tools, standards, definitions, systems,

- Agency/industry issues: return on investment, risk based resource allocation and performance management, prevention/mitigation versus response and recovery,
- Community issues; volunteers, community networks,
- Specific hazards, and
- Emerging issues: water and climate change.

These priorities reflect cross-jurisdictional needs, gaps, deficiencies with existing data and the need for improved coverage, comparability, access to, and quality of, emergency management statistics.

While these priorities may initially reflect the needs of the more traditional emergency services agencies involved on the Working Group, many of these priorities have a broad scope (e.g. the theoretical issues) and have the potential to be of interest and use to many of the wider emergency management community. However, the data needs matrix has been designed to include the information needs and potential development work of the wider emergency management community and will be circulated widely and updated regularly to reflect these changing needs. It is hoped that the next iteration of the EMIDP will contain additional priorities raised by the wider emergency management community.

Table 1 provides a summary from the EMIDP of the identified outcomes sought and user context for each of the six priority areas.

Table 1: Key information priority areas, outcomes sought and user context			
Priority Headline – Overarching costs: social, economic and environmental			
Priority area	**Outcomes sought**	**User context**	**Three year target**
Understanding the full impact of costs (economic, social and environmental) of emergencies	The provision of detailed cost/benefit data to support informed decision-making and enable the most efficient distribution of emergency management resources between mitigation and response activities. These data will provide a fuller understanding of the impact of all costs associated with emergency management and allow more effective targeting of service delivery leading to safer communities. New data standards would be created for the emergency management sector.	Recent COAG reviews (including Natural Disasters Reform Commitment 2) have highlighted the need for more comprehensive data on the full costs of emergencies and emergency risk management services to enable governments and communities to identify the most cost effective mix of risk based emergency management investment in PPRR interventions across all hazards. At present, collating all the available data necessary to identify the total costs of emergency risk management within a community is extremely difficult and beyond the capacity of most researchers. Some of the key data required is currently not collected or not accessed by emergency services at all. Case studies tend to focus on one disaster or type of emergency rather than allow an 'all hazards' view of the cost benefit of emergency risk management investment.	To understand more about the full costs of emergencies to enable the most efficient distribution of emergency management resources between mitigation and response activities as well as providing models for effective recovery management.

Priority Headline – Theoretical issues: methodologies, tools, standards, definitions, systems			
Priority area	**Outcomes sought**	**User context**	**Three year target**
Assessing the impact of emergencies on the community	A common framework for assessing the impact of emergencies on communities, including standards and definitions, to ensure consistent and comparable data. Ensuring consistency and comparability across jurisdictions, agencies and other organisations involved in emergency management will provide a better rationale or basis for requests for support before, during and after emergencies. A consistent set of national data and indicators to assess community recovery from emergencies to provide better recovery outcomes.	Strong needs were identified by COAG in both policy and data areas, particularly in the recommendations from the 2002 Natural Disasters in Australia Report regarding the need for nationally consistent data collection research and analysis (Reform Commitment 2). There is a need to develop a consistent set of national data and indicators to improve understanding of the contribution of social and community networks before, during and after emergencies. At present, variable approaches are used across and within national agencies, state/territory jurisdictions, local councils, insurance agencies and other organisations regarding the comprehensive quantification of the impact of emergencies. A framework is needed to improve data consistency before and during emergencies and for the short, medium and long term after emergencies. There are currently inconsistencies in information available on post-emergency recovery support programs and community outcomes. There is a need to quantify the demand for services by consistent definitions of type, duration cost and provider; a need to choose between models of service delivery; a need to report on coordinated case management approaches and to assess the success of support services, including counselling.	To have a common framework for emergency impact assessment on communities. This would include standards and definitions to ensure consistent and comparable national data and to provide better recovery outcomes.
Priority Headline – Agency/industry issues: return on investment, risk based resource allocation and performance management, prevention/mitigation versus response and recovery			
Priority area	**Outcomes sought**	**User context**	**Three year target**
Better models and tools to allocate investment across PPRR	There is a need for a methodology for assessing resource needs and priorities within emergency management, tools to facilitate emergency management policy exploration and decision support, options for performance management and productivity and a framework for evaluating the effectiveness of emergency service investment to optimise community risk treatment. These improved models and tools would lower the economic, financial and social costs of emergencies through more cost-effective emergency management service delivery.	The current level of research in developing models and tools to optimise resource allocation across the emergency management spectrum (PPRR) to improve community safety is inadequate and uncoordinated. COAG's Natural Disasters' Reform Commitment 2 requires the 'establishment of a nationally consistent system of data collection, research and analysis to ensure a sound knowledge base on natural disasters and disaster mitigation'. This priority project will contribute to this reform commitment and will provide information to agencies on the most effective way of allocating investment across the PPRR spectrum to increase community safety and reduce the costs and social effects of emergencies and disasters.	To have a methodology for assessing resource needs and priorities within emergency management, tools to facilitate emergency management policy exploration and decision support, and a framework for evaluating the effectiveness of emergency service investment to optimise community risk treatment.

Priority Headline – Community issues: volunteers, community networks			
Priority area	**Outcomes sought**	**User context**	**Three year target**
Volunteers in the community	Quantification of the contribution of volunteers to national emergency services to enable a better basis for management of volunteers within the sector. This would provide a rationale for community building by providing appropriate support for volunteers within the community.	No consolidated national data exists to assess the profile and contribution of emergency services volunteers or the impact of structural change and other socio-economic factors. There is therefore a need for information on emergency services volunteers to understand the contribution of volunteers within emergency management for effective performance measurement and data interpretation. Better data is also needed to improve the management of volunteers and their work within the community.	Quantification of the contribution of volunteers to national emergency services.

Priority Headline – Specific hazards			
Priority area	**Outcomes sought**	**User context**	**Three year target**
Information on specific hazards	Better understanding of the risks and vulnerabilities of Australian communities to specific hazards such as cyclones, storm tides/storm surges, severe winds and floods. This better understanding would inform and enhance the emergency management response and recovery systems in Australia to these disasters and lead to a better basis for preparation, mitigation and recovery. It will also help inform the process of addressing COAG Reform Commitment 1.	Understanding of, and information on, the risk reduction, readiness and response to specific hazards could serve to reduce the impact of these hazards and reduce recovery time and costs. There is also a need for more information on multi-agency events and how these are coordinated by emergency service agencies.	To have data to fill information gaps to better understand specific hazards such as cyclones, storm tides/storm surges, severe winds and floods.

Priority Headline – Emerging issues: water and climate change			
Priority area	**Outcomes sought**	**User context**	**Three year target**
A greater understanding of the influence of our environment on the management of emergencies	Broader, evidence-based knowledge on the influence of environmental factors on the probability, frequency and consequence of natural hazard events are needed. In particular, a better understanding of: Water Resources: The availability of water for emergency management planning is essential to reducing hazards and responding to emergencies; and Climate Change: The impact of environmental changes on emergency management is essential to planning for preparedness, in Australia and throughout the Asia-Pacific region. The emergency management sector needs to contribute to an informed debate on options for Australia associated with climate change.	Water is a scarce resource, but also a key component of Australia's emergency management capacity. No national data exists for the impact of emergency services on water supply and quality (e.g. volume of water used, including overuse, extent the water table is contaminated by run-off, re-use, grey water, etc). Global and local forces are changing the environment with effects including global warming, increase/decrease in rain and more extreme weather events. Investigation of our 'Greenhouse vulnerability' has produced computer models and data, but there needs to be better application of research data to the emergency management sector (planning, mitigation, etc.).	The emergency management sector to: (a) influence the debate in Australia on environmental change; and (b) understand more about water supply, use, reuse and quality and to influence debate in this area as well.

Conclusion

The EMIDP process has been successful in raising awareness of the importance of information for the emergency management sector, and in identifying agreed priorities and plans for improving relevance, coverage, comparability and quality of information to support policy, planning and accountability within the emergency management sector.

With a number of parallel information projects and cross-jurisdictional departmental data management processes underway within the emergency management sector, the EMIDP provides a framework for improved governance, transparency and coordination supporting both the development and use of information for the emergency management sector in Australia.

The EMIDP will facilitate informed decision making within government and the community to better meet the needs of the community by improving the availability of relevant, high quality emergency information for the sector.

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About the Authors

Nick Nicolopoulos is Manager Strategic Information Services, NSW Fire Brigades (NSWFB). He is responsible for ensuring the NSWFB has strategic and performance information to facilitate strategy, planning and policy development, and to support informed decision making for improved service delivery and organisational performance.
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Peter Damcevski is the Director of the Statistical Coordination Branch, NSW Office, of Australian Bureau of Statistics.

Jill Tomlinson is the Manager NSW Statistical Coordination Branch, NSW Office, Australian Bureau of Statistics.

The Statistical Coordination Branch, NSW Office of the Australian Bureau of Statistics is responsible for providing a range of statistical services to meet mostly NSW Government's statistical needs as well as promoting better statistical information management practices in the emergency management sector.

Jill and Peter performed the roles of Secretariat and Chair respectively in the development and endorsement of the Emergency Management Information Development Plan.

Roger Lye is the Assistant Director Knowledge Management Partnerships, Emergency Management Australia (EMA). He is responsible for the promotion, development, and enhancement of knowledge management policy and initiatives in the emergency management sector. Also the development of strategic directions for EMA's involvement in the co-ordination and integration of spatial data usage across the emergency management sector. Roger also represents EMA on the Emergency Management Information Development Plan Working Group.

NOTES FROM THE FIELD

Patient retrieval services benefit with new technology

After a successful trial on Palm Island, Queensland's Clinical Coordination centre (QCC) is set to begin 12 new telemedicine services around the state.

The Palm Island pilot linked the community's health clinic to the coordination centre in Townsville via video-link for three months from last September.

QCC Manager Beverly Rey said it exceeded their expectations. "The new technology was used extensively during the trial. One particular example of its success was a case where an adult male had had a fall and sustained ankle injuries.

"He was brought into the Palm Island health clinic and the doctors there were able to teleconference with doctors in Townsville – using video and audio technology.

"The Clinical Coordinator in Townsville could see his injuries and speak to the doctor on site in Palm Island and as a result, it was determined the patient didn't require air transfer and an appropriate patient management plan was put in place to observe him at Palm Island.

"It's better for the patient and takes the strain off us as well. It means more support can be provided to promote medical facilities and doctors in these areas.

"Distance isn't an issue anymore. Our ability to coordinate and plan has been greatly enhanced as a result," she said.

The Director of Statewide Clinical Coordination and Retrieval Services for the Townsville Health District Mark Elcock said the telemedicine trial allowed his team to get immediate advice to doctors on

The new screens. The screen on the left is the videolink between the two regions and the right screen is an electronic planning board containing the daily aeromedical tasks.

(L-R) Mark Elcock, Director, Statewide Clinical Coordination and Retrieval Services and Stephen Rashford, QAS Medical Director, using the new screens.

Palm Island in terms of resuscitation and also to make clinical decisions in terms of aircraft.

"We could then decide whether we needed to move them now or if we could prevent a retrieval or put it off till daylight hours.

"The benefits are not only clinical but also logistic – it allows us to be a lot more efficient with our resources.

"Building a telemedicine facility in the QCC in Brisbane is also on the way. We're going to roll-out telemedicine to a further six sites

in the north between now and July. Then after that, a further six sites will be linked up in southern and central Queensland.

"Which areas get the service will be determined by the number of transfers completed out of those places and the level of medical cover they have. "Ultimately I'd like to have a camera in the helicopters to help with patient treatment during the retrieval.

"We're also close to getting GPS satellite tracking on all aircraft. This means we could have their exact location up on screens.

We'd know exactly where the aircraft are, be able to plan road links, and ensure the safety of the aircraft, of the crews and efficiency of resource use," he said.

And that's not the only exciting development for the QCC at the moment. Teleconferencing screens and an electronic planning board are now in place. The teleconferencing screens connect the Brisbane and Townsville centres, allowing them to see and speak to each other in real time. Since all operational coordination is done in Brisbane, this allows them to consult directly with local doctors in the north.

Beverly Rey said this makes the process much easier. "All we have to do is look at the screen and we can see and speak to them through the audio system. It's as simple as speaking to someone in the same room; it's running all the time.

"It's just like we're looking through a window pane whereas before we had to use the phone. It was much more time consuming," she said.

The electronic planning board is projected from a lap-top computer onto a large plasma screen – showing data including where patients are and where the aircraft are.

"We've been able to build in a function of sending data from the monitor in Brisbane to one in the Townsville QCC through a high speed internet line. That way both areas can see what is on the board. It enables us to plan more effectively.

"On the planning screen we have the ability to manipulate data using our hands. We can annotate on the screen over data and maps to enable us to plan more effectively as well" said Beverley.

The Satellite Phone Subsidy Scheme –
helping Volunteer Emergency Services stay in touch in regional areas

Volunteer Emergency Services have the opportunity to receive a significant subsidy on the purchase of a satellite mobile phone thanks to the Australian Government's Satellite Phone Subsidy Scheme.

The subsidy is part of the Australian Government's response to rural, regional and remote mobile telephony needs, and operates until June 2009. The Satellite Phone Subsidy Scheme offers support to those living or working in areas that are beyond mobile coverage by allowing them to receive a subsidy of up to $1200 towards the purchase of a satellite mobile phone.

Volunteer Emergency Services are one of the eligible categories under this scheme. If your Volunteer Emergency Services is located in an area without terrestrial mobile phone coverage, or regularly has volunteers spending time in such areas, you may be eligible for up to two satellite phone subsidies. Only Volunteer Emergency Service organisations that are not principally Government funded and which operate with predominantly unpaid, volunteer operational staff are eligible to apply for a subsidy.

Applicants must first apply and, if approved, can then purchase their phone through a dealer registered under the scheme. The price paid for the phone will be reduced by the amount of the subsidy, and the dealer is then reimbursed for the subsidy amount by the Australian Government.

The subsidy reduces the purchase price of a satellite phone only, and does not cover any ongoing charges or accessories. More information on the scheme is available at: www.dcita.gov.au/satphone, via phone on 1800 674 058 (free call from a fixed phone) or email satphone@dcita.gov.au

AJEM BOOK REVIEW

Communities living with hazards

Reviewed by:
Ken Granger
Principal Disaster Risk Scientist
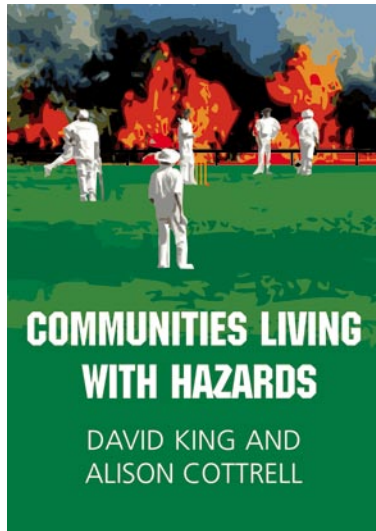**Institute for International**
Development

Authors:
David King and Alison Cottrell

Published by:
The Centre for Disaster Studies,
James Cook University

ISBN No: 0 86443 752 8

The terms 'community' and 'vulnerability' are widely used in the contemporary emergency management literature. Indeed, it seems likely that every issue of this Journal over the past twenty years has contained some consideration of either or both concepts.

This lengthy monograph, produced to mark the 25th anniversary of the Centre for Disaster Studies at James Cook University, is a valuable contribution to the ongoing consideration of these central themes, especially given its focus on the more remote regions of Australia's north.

Whilst each of the eleven papers contributed by staff or researchers at the Centre address various aspects of community and vulnerability, there is a refreshing diversity of perspective and approach across the volume. The case studies reported on consider the range of hazards typically encountered across northern Australia including tropical cyclones, bushfires, floods and droughts. One paper considers the vulnerability of tourist-dependent communities to those relatively easy-to-forecast natural hazards, as well as the unpredictable hazard including tsunami and terrorism. The subject communities range from Aboriginal outstations and 'dinner camps', to major regional cities such as Cairns, and on to the international tourist centres of Bali and Thailand.

Each of the papers demonstrates the enormous value of undertaking careful, scientifically-based, post-event studies. The insights gained in such studies are invaluable to those emergency managers who accept that their role goes well beyond the traditional PPRR model.

If there is a weakness in the papers, it is their very limited recognition of the more comprehensive emergency risk management process as distinct from the PPRR model.

EMA Update

EMERGENCY WARNINGS – DOES EVERYONE GET THE MESSAGE?

The third millennium has to date been subject to a range of catastrophic disasters from both natural and human caused events. Furthermore, there is nothing to suggest that with the ever present threat of a terrorist attack and the potential effects of global warming, this trend will not continue. The consequences for vulnerable communities continues to be of concern to governments at all levels and it is imperative to find measures to reduce community vulnerability as a matter of priority.

A common question in the aftermath of the more significant disasters that have occurred in recent years has been the effectiveness of emergency warnings to the public. The provision of authoritative, timely, accurate and believable warnings in crises enables communities to take protective action and can serve to reduce casualties and the loss of life and property.

In recognition of the importance of clear and timely communications during a crisis, the Department of Prime Minister and Cabinet (PM&C) commissioned a *Review into Government Communications During a Crisis*. One aspect of this multi-faceted review involved a survey of State and Territory emergency warning arrangements for "all hazards". One of the recommendations of this survey was the establishment of a national forum to enable the sharing of information on best practice and a nationally consistent approach to emergency warnings. Such a forum would also provide a means of engaging with all sectors of the community including people with disabilities and those from remote and culturally and linguistically diverse communities to ensure that their emergency warnings needs are met.

The Attorney-General's Department was given responsibility for implementing some of the outcomes of the PM&C review and, in particular, Emergency Management Australia (EMA) was tasked to facilitate the establishment of the *National Forum on Emergency Warnings to the Community*.

The inaugural meeting of the National Forum was conducted in Adelaide on 29 and 30 March 2007. The meeting was opened by Tony Pearce, Director General of EMA, and brought together representatives from the three tiers of Government, national peak and research bodies, and advocacy groups representing people with a disability and those from culturally and linguistically diverse backgrounds. These included:

- Australian Government agencies, including Indigenous Coordination Centre representatives;
- State and Territory Government agencies and emergency service organisations;
- Local Government and Municipal Associations;
- Australian Red Cross;
- Australasian Fire Authorities' Council;
- Australian Federation of Disability Organisations;
- Blind Citizens Australia;
- Deafness Forum of Australia Ltd;
- Federation of Ethnic Communities' Councils of Australia;
- Australian Communications Exchange;
- Telecommunications and Disability Consumer Representation;

EMERGENCY WARNINGS – DOES EVERYONE GET THE MESSAGE?

- National Information Communication Technology Australia,

- Surf Life Savers Australia, and

- Relevant Working Groups, including the Remote Indigenous Communities Advisory Committee and the National Community Safety Working Group.

The National Forum will act as a conduit — a connector and value adding mechanism for and between the existing bodies of work nationally that address the dissemination of emergency warnings to the public. The Forum brings together key players and stakeholders and serves as a vehicle to identify and address impediments and obstacles; build partnerships; consider new technologies and share information on best practice approaches leading to the achievement of a nationally consistent approach to the dissemination of emergency warnings to the community.

It will identify, link and share strategies for public engagement and education as they relate to community warning systems; focus on issues impeding the delivery of emergency warnings to target audiences, and promote and influence the adoption of improved emergency warning systems which are accessible to the entire community, including people with a disability and those with cultural, linguistic or geographic diversity.

The National Forum will also facilitate improved information flows between jurisdictions, agencies, organisations and other relevant working groups to ensure consistency of emergency warnings and their initiation.

The inaugural meeting heard presentations from a range of stakeholders to inform the development of a nationally consistent approach. The meeting also identified a conceptual framework upon which the work of the National Forum is to be based. The framework provides for prediction, interpretation, message construction, communication and protective behaviour. As a priority, the Forum agreed to progress work on message construction, communication and protective behaviour including:

- developing a national approach for consistent emergency warning messages and to ensure that they are accessible and easily understood by all;

- developing a nationally consistent communication strategy and principles ;

- identifying gaps in the current public awareness and education programs, and

- developing a national community awareness and education approach.

It was agreed that the Forum Secretariat, through EMA, would explore the adoption of the Common Alerting Protocol (CAP) as the national standard in Australia for the electronic distribution of emergency warnings to the community.

Participants supported this inaugural meeting as an excellent first step in identifying the issues for nationally consistent emergency warning systems involving all sectors of the community.

The next meeting will be held in the second half of this year at a location to be advised.

Contacts: Taru Farrelley and Jessica Nagajek
nfewc@ema.gov.au

EDUCATION AND TRAINING

School Education Update

Interactive Learning Object (Resource)

EMA are working with multi-media consultants to develop an interactive learning object (resource) aimed at middle years (upper primary/lower secondary) students which will engage them in:

a) identifying risks from natural disaster to their immediate community; and

b) emergency preparedness and preparations in the Australian environment.

The interactive resource will raise awareness of local risks of natural disaster, emergency management processes and enhance community resilience to the effects of natural disaster. The resource will be linked to state and territory curriculum frameworks and will be available on the EMA Schools website by the end of September 2007.

For further information contact melanie.ashby@ema.gov.au

EMA's Inclusive Emergency Management with Culturally and Linguistically Diverse Communities (CALD) Program

The EMA four-year program, a component of the National Action Plan (NAP) to Build on Social Cohesion, Harmony and Security has commenced.

The program is aimed at:

• raising CALD communities' awareness of emergency management;

• enhancing community resilience to the effects of disasters;

• increasing CALD community engagement in emergency management volunteer activities; and

• enhancing the relationship between the CALD communities and the emergency management sectors

To date the following activities have been undertaken:

• The national reference group has met. This group comprises of representatives from the emergency management and CALD communities sectors. This group has been established to provide high level expertise and guidance on the program.

• Data has been collected to inform the culturally specific national school education emergency management resources for youth. This has been done through research and by jurisdictional workshops.

• Work with the Australian Emergency Management Volunteers Forum to plan workshops looking at recruitment and retention of CALD volunteers in emergency management.

• A national workshop was held to highlight the issues for CALD communities in the emergency management context.

• Jurisdictional working parties have been established to plan community based projects.

• Consultants have been engaged to assist EMA with these activities.

The revised "Guidelines for Working with Culturally and Linguistically Diverse Communities in Emergency Management" has been completed and is about to be published. It will be available on the EMA website as well as in hardcopy.

If you would like more information on the EMA's Inclusive Emergency Management with Culturally Diverse Communities (CALD) Program please contact Judy Parker on (03) 54215229 or by e-mail on judy.parker@ema.gov.au

EDUCATION AND TRAINING

ONE DAY WORKSHOPS
How to increase the cultural diversity of your volunteers.
Workshops on recruiting volunteers from
culturally diverse backgrounds.

A series of one day workshops, designed to enhance the cultural diversity of volunteers involved in emergency management, will be held across Australia later this year. The aim of these workshops will be for emergency management agencies to connect with multicultural communities and to develop sustainable and long-term strategies to involve culturally diverse communities in volunteer groups related to emergency management.

Workshops will provide participants with a range of practical approaches to recruit, manage and support volunteers from culturally diverse backgrounds. In addition to their very practical focus, the workshops will specifically address volunteer management in an emergency management context. Using a problem-solving and hands-on approach, case studies will explore situations and challenges facing emergency management agencies. The three general areas covered will be:

- **Recruitment:** how to recruit, undertake effective promotion, analyse and understand your local demographics, who are the community gatekeepers, what are the information channels and how to form strategic partnerships.

- **Volunteer management:** how to overcome obstacles, identify different approaches to communication, how to deal with the challenges and benefits of diverse views and values, how to work with people who have varying English language skills, how to make sure people understand their roles and responsibilities.

- **Support and mentoring:** how to foster connections with people whose first language is not English, how to engage role models and enlist buddies.

The workshops will be open to people in emergency management agencies who manage volunteers and are part of a number of projects outlined on pg. 62.

For further information and to register your agency participation, contact Julien Nicolas on 03 54215295 or by e-mail on julien.nicolas@ema.gov.au

KNOWLEDGE MANAGEMENT

Community Development Branch

Australian Emergency Manual Series

The third edition of *Storm and Water Damage Operations* has recently been published by EMA. This manual is part of the *Skills for emergency services personnel* stream and is designed to provide emergency service personnel with a basic reference for storm and water damage operations. The techniques and principles in the manual are designed for immediate and temporary storm and water damage repairs. *Storm and Water Damage Operations* is intended for use in the planning, training and operations of emergency service personnel and organisations.

Storm and Water Damage Operations – Third edition is available in PDF format on the EMA website, www.ema.gov.au, or through the print-on-demand facility accessed via EMA's website. Limited print copies are also available to emergency service personnel via the State Training Manager for the State Emergency Service in each jurisdiction.

For further information contact Kate Keane
Phone 02 6256 4671
email kate.keane@ema.gov.au

EMA Library

The annual Australasian Libraries In the Emergency Sector (ALIES) workshop was held from 1–5 April 2007 in Mount Macedon with a theme of *'Mapping knowledge: where in the world are we?'* The workshop was attended by 40 representatives from 30 ALIES libraries. Members identified key issues for ALIES to focus on over the next 12 months, and new working groups have been established to provide a coordinated approach to a number of major issues including consortia, marketing, technology, thesaurus development, and cooperative journal indexing. ALIES will progress these issues by collaborating with key emergency management organisations, groups and committees.

USEFUL INFORMATION

Australian Journal of Emergency Management

The Journal is published quarterly and is disseminated throughout the emergency management community and related disciplines, in Australia and overseas. Articles identifying and discussing issues, policies, planning or procedural concerns, research reports and any other information relevant to the emergency/disaster management community are welcome.

Refer to the EMA website (www.ema.gov.au/ajem) for current and past issues and information on how to subscribe and contribute.

Letters to the Editor

The Journal welcomes Letters to the Editor. Please note that letters should be no more than 300 words. Letters exceeding this limit may be edited or refused. Letters must be in good taste and focus on issues of emergency management or past AJEM content.

Letters must contain a name, address and daytime phone number of the author. Unsigned letters or those submitted without a phone number will not be considered.

Regular contributors should submit letters on varied subjects. Letters by the same author that reiterate opinions previously expressed may not be published. The editor reserves the right to reject or edit any Letter to the Editor.

Advertising in AJEM

Display and classified advertising may be accepted for publication with the agreement of the Editor-in-Chief. The editor reserves the right to insert the word "Advertisement" above or below any copy.

Conference Diary

Full details of local and international conferences relating to emergency management are available from the EMA website. For information, please visit www.ema.gov.au.