

Research development in the field of emergency management

Introduction

Basic research is defined as research that helps us to understand the basic laws of nature and develop theories about how things work. Applied research differs from basic research in that it concentrates on the application of theory (derived from basic research) to practical situations. In the emergency management sphere, applied research often involves the application of knowledge drawn from other contexts and fields of practice to the management of emergency situations. There are many instances where basic research has been applied to emergency management. For example, medical knowledge derived from in-hospital patient care is routinely applied to patient management in the pre-hospital setting; knowledge about road traffic flows has been applied to response modelling for emergency services; and theoretical understandings about fire behaviour are applied to fire fighting. While the application of basic research to emergency management problems is laudable, this paper argues for a fundamental change in our approach to applied research in emergency management.

Research development in the field of emergency management

In the autumn 1998 edition of the *Australian Journal of Emergency Management*, the Editor, Rob Fleming, argues that emergency management agencies should re-consider the place of applied research in emergency management. The point is made that research in the emergency management sector has been 'narrowly focused on specific hazards or disciplines' (Fleming 1998) and is generally basic, rather than applied, in character.

Emergency management research in Australia focuses predominantly on the development of our understanding of specific hazards (such as earthquake or tsunami). In part, this is because active researchers are usually located in universities and other research organisations where basic (theoretical) research is undertaken; in part, it is because research problems seem to be identified relatively more often by these theory and discipline based groups than by emergency manage-

by Paul Arbon, Chief Superintendent, St John Ambulance Australia and Senior Lecturer, Health Sciences Division, University of South Australia; and Colleen Smith, Senior Lecturer, Health Sciences Division, University of South Australia

ment practitioners. In addition it has been difficult to establish applied research projects in the emergency management sector. Anecdotal evidence suggests that there is poor communication and understanding between researchers/research agencies and emergency management operatives/agencies; only limited collaboration between these groups is evident in Australia. Emergency management agencies do not appear to place a high priority on research. This is probably because they are generally small organisations; they have limited resources to support research endeavour; and they do not possess a 'research culture'. A further reason is that personnel employed by these agencies generally lack the knowledge and skill to undertake research.

With the current Evidence-based Practice (EBP) movement and the need for organisations to be accountable to the public for their actions, emergency management agencies are increasingly obliged to consider seriously the role of applied research in establishing best practice.

Two features of modern research seem to work against the successful application of research in emergency management agencies. First, research is a strategic activity and does not provide immediate answers. Research projects are established, implemented and interpreted over long time frames, often addressing issues that will affect organisations in the long term. Modern management often struggles to take longer-term organisational perspectives, being arguably more familiar with the world of time pressure, ministerial briefs and economic rationalism.

Second, by its nature, research challenges taken-for-granted knowledge and understandings, thereby undermining the very sense of certainty that is an important feature of emergency management prac-

tice. Expert practitioners usually move through complex work situations in a pre-reflective fashion, making decisions in a way that some would describe as intuitive (Benner 1984, Goldberg 1983, Taylor 1990). That is, while less experienced practitioners need to think before acting, experts often think as they act; they are capable of making complex decisions on the basis of previous experience, and with a level of certainty about their own knowledge and their capacity to deal with the situations they encounter. Research has the capacity to challenge some of the knowledge and understandings that have underpinned emergency management work in the past, and this is dis-comforting for practitioners who rely on a high level of certainty about their knowledge and practice in work situations that are often dangerous. Sometimes, however, our best people draw conclusions based on current understandings that appear ridiculous in the light of new knowledge. Take for example Galileo and his colleague Huygens:

When Galileo discovered in the 17th Century that Jupiter possessed four moons, the great mathematician and physicist Christian Huygens applied his reasoning power to the question of 'Why four instead of one?' He asked himself, 'What is the purpose of a moon?' Well the purpose of Earth's moon was to help sailors navigate. If a planet has four moons it must therefore have a lot of sailors. Sailors mean boats and sails mean ropes. Therefore, it is obvious that Jupiter must have many hemp producing plants (Choice 1986).

Despite the apparent misfit between research/researchers and emergency management practitioners/agencies, research is an essential tool in the future armoury of emergency management. Research can be used by emergency management agencies for several purposes, for instance, to inform resource allocation; identify international best practice; show what works and what does not; identify emerging trends in emergency management; identify new ways of looking at issues and problems; analyse cases of organisational failure; and assist in categorising and organising insti-

tutional knowledge (Fleming 1998). Research evidence provides a foundation for many of the accepted features of modern service provision including accountability, best practice, quality control, risk management, acceptance of liability and ethical practice.

In this article we describe a strategy, the implementation of a series of research development seminars, that facilitates the development of research activity within emergency management agencies. The Emergency Services Research Development Seminar Series was an early attempt to develop an understanding and interest in research among a small group of emergency management personnel. The project arose from an evolving understanding of the place of research in emergency management and several key concerns about research development in this field. First, emergency management research was under-represented in the Australian research effort. Second, little collaboration was apparent between research agencies and emergency management agencies. And third, emergency management practitioners were poorly prepared, relatively, for involvement in research within their area(s) of practice.

Emergency Services Research Development seminar series

In early 1998, St John Ambulance Australia (South Australia) and the University of South Australia collaborated in the development, implementation and evaluation of a seminar series on Emergency Services Research Development, funded by Emergency Management Australia (EMA) and attended by emergency service personnel in South Australia. This project was an attempt to address some of the issues described above and was modelled on a program that had been implemented previously within the South Australian health sector by the University of South Australia.

The seminar series provided an opportunity to trial the development of research skills by emergency service officers with an interest in, or responsibility for, research. Its aim was to support the growth of a research culture within South Australian emergency service organisations by introducing staff to the processes involved in undertaking research. The pilot program described included the development of materials and a syllabus that could provide the foundation for future research seminars and workshops. Other intended outcomes were:

- development (and implementation) of research proposals

- development of research interest networks among participants and senior managers of the organisations involved
- collection of evaluative comments from emergency service participants
- development of recommendations

Implementation of the seminar series

The series comprised four half-day workshops conducted over a period of four months, that set out to introduce the research process through the development of a research proposal.

Participants were drawn from Emergency Management Australia, SA State Emergency Service, SA Country Fire Service, SA Metropolitan Fire Service, St John Ambulance Australia, SA Ambulance Service and the South Australia Police.

The seminar series considered the role of research, approaches to research, the analysis of data, presentation of results, and the application of research findings to practice. In each seminar, the generic principles of research were presented and applied to the context(s) and problems of specific emergency services. Participants were asked to develop a research idea from the conceptual stage to the production of a formal research proposal. Figure 1 provides examples of research ideas that evolved during the workshops. In the period between each workshop, participants were asked to read selected material and to further develop aspects of their research proposal. Throughout the seminar series, researchers from the University of South Australia provided individual advice and assistance. Each of the four seminars focused on particular aspects of the research process, namely *thinking* research, *planning* research, *doing* research and *applying* research.

The first seminar on *thinking* research introduced participants to the nature of research; ways of thinking about research; and research proposal development. This was facilitated by discussions on the research problems and questions that each participant brought to the workshop. From this, each research problem was refined and a clear statement of the research question was developed. Possible research approaches were discussed in relation to each identified research question.

The second seminar on *planning* research focused on identifying information resources and conducting literature reviews. Participants were introduced to the processes of critical evaluation, and their application to information from

many sources, including the academic literature. They discussed how best to develop and present this section of the research proposal. On completion of this seminar and before the third seminar, each participant was required to undertake a literature search related to their research question, and to critically evaluate the literature.

The third seminar on *doing* research focused on the selection of an appropriate research design. Participants were asked to consider where they would conduct the research, how they would access, inform and select participants, and how they would collect and analyse the data. A further focus was on ethical aspects that should be considered in implementing the project and the process(es) of seeking ethics approval.

The fourth and final seminar on applying research, focused on assisting participants to complete their research proposal, and discussed how to apply for research funding and work in collaboration with other research agencies. Each participant was asked to present a brief summary of their near completed proposal, and clarify any final concerns.

Outcomes of the research development seminar series

Project evaluation suggests that the approach taken was effective and provided participants with many of the skills necessary to develop research proposals and to evaluate research submissions within their respective agencies. Research ideas developed by seminar participants addressed an interesting and diverse range of issues as shown in *Figure 1*.

While the majority of these research ideas and proposals will not be implemented several have been developed further, having received financial support, and are under way. Not all participants produced a research proposal, for reasons discussed later. However, the range of research ideas exposed by the seminars is interesting and demonstrates the breadth and relevance of potential research in the emergency management area. In fact, there appears to be considerable scope for the development of research in this area, though relatively little has so far been undertaken within emergency management agencies or in collaboration with research organisations.

Issues associated with the pilot program

The Emergency Services Research Seminar Series highlighted several issues that warrant discussion. Participants

Research ideas from the workshops

- **Fire-fighter survivability**—an investigation of the factors associated with the survival of firefighters in typical structure fire conditions.
- **Assessment of the efficacy of an intravenous morphine** administration protocol in the pre-hospital phase of cardiac care.
- **An ethnographic study of an ambulance service provider** focusing on organisational and professional culture(s).
- **Evaluation of sites** for the strategic placement of automated weather stations in the Adelaide Hills Region.
- **Evaluation of joint emergency service operations** to assess the effectiveness of inter-organisational operating arrangements.
- **Investigation of inappropriate fire setting behaviours** in children and development of educational strategies to reduce the incidence of juvenile arson.
- **Review of the role of local government** in effective local disaster planning—a study of current practices and perceptions about the role(s) of local government.
- **Behavioural profiling** of persons involved in setting rural fires—a project aimed at better understanding the behaviour and typical activity of this group of persons as a means to more effectively combating the problem of deliberately lit rural fires.
- **Assessment of strategies** for successful transition from registered nurse to ambulance officer
- **Best policing practice at special events**—a study to develop an understanding of the factors effecting public perception of policing practices at large public events.
- **Models of evacuation**—an evaluation of decision making related to the evacuation of persons at risk.
- **Public safety**—an investigation of the perception of personal safety as a basis for the development of community education programs to reduce the incidence of injury associated with normal home/business practices.
- **Community perspectives** on best policing practice in youth drug and alcohol related offences—an investigation of community and police perspectives on current practice in handling youth drug offenders and the development of police training and procedural guides.
- **Mass gathering first aid**—patient presentations and levels of patient care provided at major public events—an investigation of typical patient presentation rates at large public events and the factors effecting the incidence and type of injury.

granted (assume it works), or the result of intelligent guesses. How safe, effective and cost efficient is this approach to practice? Given the need for professional accountability and the potential for legal ramifications from inefficient practices, emergency service personnel can no longer rely on these traditional approaches in their practice. Increasingly, they recognise the need for new (and existing) practices to be evidence-based, but no formal strategies have yet been adopted to implement an evidence-based approach.

Evidence-Based Practice (EBP) originated with the work of Archie Cochrane who recognised that there was a lack of research evidence to support medical practice. Cochrane's main argument was that, because of limited health care resources, there was a need to ensure that whatever *is* available is used effectively to reach the desired outcomes. Cochrane has focused his interest on evidence-based practice for health care, but his arguments are also applicable to the emergency service field (Farrell 1997).

Evidence-based practice thus aims to bring research and practice together through the acquisition of the best available evidence to inform best practice. It is the conscientious use of current best evidence to inform decision making, whether those decisions be about health-care, emergency management or any other field. As well as identifying areas where evidence is lacking and where research is clearly needed, EBP also sets standards for what constitutes good research evidence and how this is evaluated.

The development of evidence-based approaches in, for instance, emergency service work requires the ability to access and interpret relevant literature, specifications and other materials to determine the extent to which claims about new technologies and techniques are well founded. In addition, when new ideas are applied within emergency services, applied research is sometimes necessary to ensure that the new ideas are transferred to the emergency service context in an appropriate manner. Increasingly, systematic literature reviews are being conducted to gather the best available evidence from current research and expert opinion as the basis for establishing best practice. A systematic review can also highlight those areas of practice that are not evidence-based and do require further research. Systematic reviews are a form of research and must be carefully constructed and implemented in order that all available and relevant evidence is

Figure 1: Research ideas from the workshops

identified the need within emergency service organisations for an increase in research activity, and the promotion of research as a worthwhile activity. Three key areas have been identified in which research skills were seen to be required.

Assessment of research

Participants said they were increasingly asked to be involved in the endorsement or approval of research conducted by external agencies. Emergency service managers are at times required to approve access to pre-existing data, personnel or clients, when external researchers require information or subjects for their research. A rudimentary understanding of research would help them to effectively evaluate these proposals and to identify any risks or issues that should be addressed by the

organisation. In addition, emergency services were beginning to receive research submissions from within their own ranks, particularly where emergency service officers were enrolled in higher degree (research) studies. Again, senior officers were often asked to provide the Chief Executive Officer with advice on these matters. It was apparent that research project and ethics approval procedures were often haphazard in these organisations; the importance to research of effective organisational structures was not well understood.

Evidence-Based Practice

Participants noted that much of current emergency service practice seems, at times, to be based on tradition (it has always been done that way), taken for

collected and analysed in an unbiased fashion. Sackett, Rosenberg, Muir Gray & Richardson (1996) and O'Rourke (1998) provide a more extensive discussion of EBP.

Identification, analysis and evaluation of risk

Emergency management research can contribute to effective risk management. Emergency service officers are required to manage risk; the ability to identify, analyse and evaluate risk is included in the national public safety competencies (Public Safety Training Package 1998). Since researchers are in a position to uncover areas of risk, establish systems to manage risk, and evaluate possible consequences, the development of research skills in the emergency service area can provide the cornerstone for effective risk management.

Recommendations for future research development

Following the seminars, a number of recommendations were developed to facilitate the growth of research within emergency service organisations, as discussed below. These recommendations aim to build part of the foundation necessary to further the development of strategic and relevant research endeavour in emergency management among emergency service agencies in Australia.

National emergency management research development initiative

A national development initiative for emergency management research could be established to facilitate the growth of research capacity within emergency management organisations. This initiative is important, because, in line with current thinking, emergency management strategies should be based on good current evidence (EBP), successfully applying theoretical knowledge and knowledge drawn from other contexts to emergency management situations and problems. Collaboration between research organisations and emergency management agencies provides one strategy to facilitate the development of applied research. Research agencies have research expertise and infrastructures that are not available within emergency management agencies; from their side, the emergency management agencies can ensure that any proposed research is relevant and timely, and provide a detailed understanding of the context of the research problem. Several strategies, outlined below, could assist in the development of strategic collaborative links.

Strategy 1. Development of the research capacity of organisations

Extension activities: research development workshops could be conducted in each State/Territory or within agencies to provide individuals with opportunities to develop research ideas and generate associated research proposals. These workshops would facilitate the development of strong research proposals by encouraging individual participants to focus on identifying meaningful research problems.

Strategy 2. Facilitation of strategic cross agency research

National Workshop: a regular annual workshop could be developed to allow research issues and problems identified within States/ Territories by senior emergency management personnel to be addressed. This workshop would focus on issues identified as of strategic importance by State/Territory disaster committees/planners, and could provide the opportunity to address cross agency and corporate level research.

The formation of strategic research partnerships between emergency management agencies would be another important strategy. This approach to developing research endeavour recognises the relatively limited resources and infrastructure available within individual agencies for the conduct of research and, particularly at the State level, allows for the development of a strategic research plan that takes account of the research needs and priorities of each agency and directs attention to priority research issues.

Strategy 3. Research and education support

Mentoring: individuals and/or organisations could be given the opportunity to develop links with selected mentors within the research sector. Mentors would provide guidance and supervision for research projects during the developmental phase, and assist in the identification of suitable collaborative partners for individuals or organisations wishing to undertake research. Mentor relationships could also facilitate entry into higher degree (research) studies and provide academic counselling for prospective higher education students.

Emergency management research interest home page

The University of South Australia has established an Emergency Management Research Interest page on the World Wide Web as one outcome of the South Australian project. This page provides a summary

of some emergency management research projects in progress and gives contact details for researchers. The intent is to provide a forum for the exchange of research ideas and support among researchers within the university and emergency management sectors. The Emergency Management Research Interest page is located at: www.unisa.edu.au/nur/ESRIG.html.

Other existing World Wide Web pages, while providing an important resource for emergency management practitioners, have focused on research about specific hazards rather than the management of emergencies. The Australasian Disaster and Hazard Research Directory provides a useful database of hazard related research and is located at www.es.mq.edu.au/NHRC/ema.html.

Conclusions

The Emergency Services Research Development Seminar Series arose from several concerns about the low level of emergency management research apparent in Australia and the tendency for emergency management research to be driven by the more theoretical and discipline based perspectives of researchers rather than emergency management practitioners. The seminars provided useful information about the potential range and scope of emergency management research and led the authors to consider other strategies that might facilitate the implementation of strategically important research projects within the emergency management sector.

It is apparent that many of the issues canvassed above have not yet been adequately addressed and the challenge remains for emergency management agencies and practitioners to develop their research capacity. In doing so it is important that emergency management practitioners develop an understanding of the role of research in their practice and adopt a pro-active stance that will promote research projects that are applied in nature, relevant to emergency management practice and result in practical outcomes.

Perhaps with a new perception of the value of research within our own field, we should take full advantage of it and turn it into the vital knowledge that enhances Australia's emergency management capability (Fleming 1998).

References

- Benner P. 1984, *From Novice to Expert*, Addison Wesley, Menlo Park, California.
Choice 1986, 'Evidence vs. nonsense:

understanding the scientific method', *Choice*, March, pp. 18–20.

Farrell G. 1997, *Getting Up To Speed With Evidence Based Practice*, Australian and New Zealand College of Mental Health Nurses Inc, Greenacres, South Australia.

Fleming R. 1998, 'The use and value of research in the field of emergency management', *Australian Journal of Emergency Management*, Vol. 13, No. 3, p. 1.

Goldberg P. 1983, *The Intuitive Edge*—

Understanding and Developing Intuition, Jeremy P. Tarcher Inc., Los Angeles.

O'Rourke A. 1998, 'An Introduction to Evidence-Based Practice' Online accessed 22 April, 1999, www.shef.ac.uk/uni/project/wrp/sem3.html.

Public Safety ITAB 1998, *Public Safety Training Package: Validation Workshop Kit*, Public Safety ITAB, Alexandria, NSW.

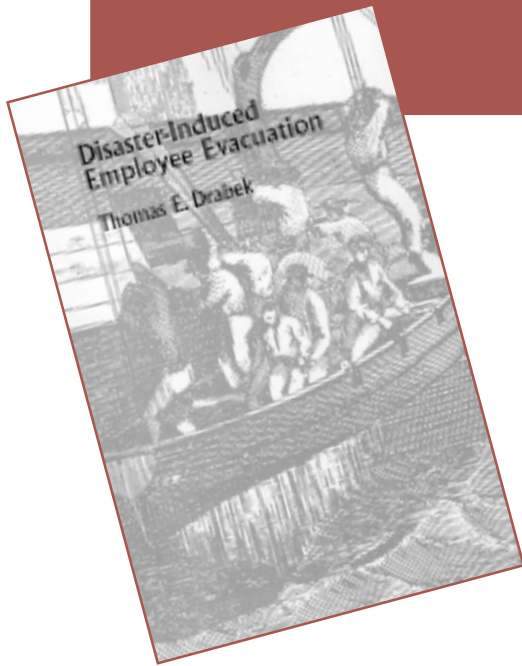
Sacket D., Rosenburg W., Muir Gray J., Haynes R. and Richardson W. et al. 1996,

'Evidence based practice: what it is and what it isn't', *British Medical Journal*, Vol. 312, pp. 71–72.

Taylor R. 1990, *The Mystery of Intuition*, Richard Taylor, pp. 254–258.



New Books



Disaster-Induced Employee Evacuation

by Thomas E. Drabek

Published by the Natural Hazards Research and Applications Information Centre, Institute of Behavioural Science, University of Colorado.

Thomas Drabek has produced for us another advance in researching disasters. Building upon his previous work titled *Human Systems Response to Disaster*, Drabek continues to focus upon understanding human behaviour within organisations when confronted with a potential or real disaster event.

The results of his research follow on from interviews conducted with 23 Federal, State and local emergency management managers, interviews with business executives and employees, and an extensive questionnaire.

As outlined in this study, Drabek uses seven disaster events, which have occurred across 12 communities. He focuses

on the effect these events had on the employees of some 118 businesses.

Drabek establishes excellent comparative criteria for these events. This provides him with a good data on which he bases his conclusions.

Using terms like 'Uncertainty of Forewarning', the 'Magnitude of Impact' and the 'Accessibility of Escape Routes' Drabek is able to provide good comparisons related to 'similarities' and 'differences' that arise from the seven disasters studied.

Students and practitioners of Emergency Management in Australia, who need to understand more the employees behaviour when faced with the need to evacuate, will find this publication an excellent source of data.

For example, I found it of interest that of the 406 employees involved in this current study, 92% had some prior disaster experience which had triggered a workplace evacuation. 40% of the interviewees had also evacuated from their home because of a prior disaster.

However, according to Drabek's research, only 27% of the 406 employees claimed that they had received some form of disaster training at their place of work. Drabek provides an analysis of workplace training and its effectiveness.

What can we learn from this publication? That will depend on your understanding of both the 'theoretical' and 'behavioural' concepts used by the author.

Thomas Drabek provides us with good discussion on the results of his research. He uses responses from his interviews and the questionnaire to predict employee behaviour and document their concerns.

While based upon disaster events that have occurred within America, his work none-the-less proves a rich source of data for those involved in emergency management. His work will be of particular interest to those who are seeking organisational change that will provide for educative programs and support for the employee whenever a disaster event occurs.

To my knowledge, no comparative research has been published that deals with our employees' behaviour during evacuations that have been initiated in response to a disaster.

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