# Community safety programs for bushfire: What do they achieve, and how?

*Through a synthesis of evaluative studies, Gerald Elsworth, John Gilbert, Alan Rhodes, Helen Goodman argue that community safety programs 'work'.*


## Abstract

This paper provides a summary of the findings from a review of available evaluative studies of community education, awareness and engagement (EAE) activities and programs for bushfire in Australia. It provides a brief account of the background to this work and the innovative approach used, known as realist synthesis. The synthesis highlighted the diversity and complexity of the contexts that EAE programs are implemented in and identified four broad causal processes that appear to be critical for the generation of the desired community safety outcomes (risk awareness and knowledge of fire behaviour and safety measures, household and community level planning, physical and psychological preparation for a bushfire, and a safe response if and when a fire occurs). These causal processes are: Engagement, Trust and Self-confidence, Confirmation and Re-assessment, and Community Involvement and Collaboration.


## Introduction

Bushfire is a major source of loss of life and property in Australia (McAneney, Chen, Crompton, & Pitman, 2007); (Australian Bureau of Statistics, 2004, 2008). Recent government initiated inquires have addressed a range of common themes relating to improved bushfire safety, many embracing the broad premise of community responsibility and self-reliance (Stevens, 2007). Bushfire agencies also increasingly state publicly that they do not have the resources to defend every property that may be in danger when a major event occurs.

Thus in the past decade or so there has been an explicit shift in thinking to acknowledge that reducing bushfire risk is critically dependent on the willingness and ability of individuals, households and community groups to actively support agency activities.

This transformation in thinking from bushfire response to preparedness has parallels with emerging international approaches to emergency management, crime prevention and public health that have become known as the 'community safety paradigm' (or 'community safety approach'). Defining characteristics include the general themes of shared responsibility, identifying and protecting those at risk, securing sustainable reductions in the source of the danger and the unreasonable fear of it, and the development of community-based programs and multi-agency partnerships (Hughes, 2002; Squires, 1997; Steelman & Burke, 2007). For example, writing from the perspective of crime prevention in Great Britain, Hughes (2002, p. 3) described 'partnership' as the "primary symbolic and organizational means of delivering community safety politics". Community-level engagement, responsibility and empowerment are also emphasised, and residents are seen as being responsible for coordinated action within their own localities in collaboration with statutory agencies and the voluntary sector (Chess, Salomone, Hance, & Saville, 1995; Labonte, 1994).

Another central component of the community safety approach is active engagement with and empowerment of the community to investigate its own risks and develop its own solutions. In this sense, the change in thinking in emergency management is similar to the approach in public health that aims to realise, in practice, the ideals of community empowerment and 'ownership' of problems and possible solutions within the context of national, state and local government planning and provision of professional services (Labonte, 1994; Laverack & Labonte, 2000).

Reflecting this new approach to the management of the risk of bushfire in Australia, a safe community has been defined as "locally organised and resourced, well informed about local risks, proactive in prevention, risk averse, motivated and able to manage the majority of local issues through effective planning and action" (Hodges, 1999). Increasingly, bushfire agencies are seeking ways to work more effectively with communities by promoting increased involvement through a wide

variety of education, awareness and engagement (EAE) programs and activities that emphasise risk appreciation, planning and preparedness.

## Community Safety Programs and Activities

In a similar manner to recent work in the United States (Reams, Haines, Renner, Wascom, & Kingre, 2005; Service) an inventory of community safety activities and programs for bushfire in Australia has been developed (Gilbert, 2007). Currently, approximately 90 distinct programs are represented. Program development has been rapid and, in many instances, little systematic information beyond website descriptions and examples of media materials is available.

These programs and activities can usefully be organised along a continuum ranging from 'top-down' information dissemination approaches to 'bottom-up' community engagement and development strategies.
Thus general alert and warning systems together with the communication strategies designed to inform the public about their meaning and encourage appropriate response might be located at the 'top-down' end of the continuum (Warning Systems). A wide range of information dissemination strategies was also identified including media campaigns, printed materials and an increasing use of interactive media such as DVDs and public information 'phone lines (Public Information Provision). These generic information provision strategies were also found to exist in a variety of locally developed and adapted forms, suggesting another category (Localised Information Provision). Next was a diversity of Localised Community Engagement/ Education Activities and Programs. Face-to-face presentation and/or interaction was the common element in this group of activities, which could also be segmented into 'one-off' (street and community hall meetings, and, occasionally, one-on-one consultations with households) and 'continuing' activities.
Continuing activities consisted of on-going community fire-safety groups and recently developed 'community briefings' that are held regularly in the same locations for the duration of a fire. Finally, towards the 'bottom-up' pole of the continuum various Community Consultation, Collaboration and Development Approaches were identified. Along with the community briefings, this group of activities represent the more recent and emerging strategies. They include integrated planning systems that contain (sometimes mandate) community consultation as a critical element and much more localised community development activities, including those that seek to capitalise on existing community strengths and organisations.

## A Theory-based ('Realist') Synthesis of Australian Community Safety Evaluation Studies

An innovative approach to research synthesis and review has recently been developed in Great Britain by Pawson and colleagues (e.g. Pawson, Greenhalgh, Harvey, & Walshe, 2004). Called 'realist synthesis', it is focused on uncovering and 'testing' the provisional theories (frequently un-stated) that underpin social programs and other change activities. With some modifications, realist synthesis was used to develop a review of publicly available evaluation studies of Australian bushfire community safety programs.

As outlined by Pawson et al. (2004 p. v) realist synthesis follows a number of principles that differentiate the process quite sharply from either the statistical approach of meta-analysis and the (perhaps more closely related) traditional procedures of narrative literature review.
The principles are derived from the viewpoint that programs and other initiatives designed to bring about social change are, themselves, theories that actively engage with individuals (and families, households etc.) and involve long and complex causal chains.
The principles are that:

- Realist reviews should be expected to pick up, track and evaluate the program theories that implicitly or explicitly underlie families of interventions;
- That, in tracking the successes and failures of interventions, the review will find at least part of the explanation in the reasoning and personal choices of different participants; and
- Realist reviews should inspect the integrity of the implementation chain, examining which intermediate outputs need to be in place for successful outcomes to occur, and noting and examining the flows and blockages and points of contention (Pawson et al. 2004, pp. 4-6, paraphrased a little from original).

Studies of seven distinct Australian activities and programs (based on approximately 15 separate reports) were intensively reviewed. The reports were searched for information on:

- The context of the initiative;
- Outcomes and impacts at the level of the individual and household;
- Outcomes and impacts at the level of the community, local (implementing) organisation and policy institution;
- Causal processes at the individual/household level – both enabling and constraining;

- Causal processes at the community and/or agency levels - enabling and constraining; and
- Any evidence that these causal processes may have operated successfully in some contexts rather than others, or constrained successful implementation in some contexts rather than others.

Summaries of this assembled information on each intervention were written up in the form of a brief case study. The major causal chains that appeared to be operating in each program or activity were represented in a program-theory diagram that also included any evidence for context-process interaction. Finally a synthesis of the important context - causal process - outcome/impact relationships discovered was developed, including an overall program-theory model.[1]

The programs included in the synthesis are sorted into the five broad categories outlined below in Table 1, with references to the evaluation studies reviewed. As the Ferny Creek Fire Alert Siren originated from a community engagement and consultation process it is located in this category but also included in the table under 'Warnings'.

## Results of the Synthesis

Reviewing the available evaluative studies of community EAE activities and programs for bushfire in Australia was a challenging task. The studies were quite diverse, varying considerably in research approach and reporting detail. While some explicitly utilised mixed-method approaches (e.g. surveys, individual interviews, focus groups, expert appraisal etc.) others were more-or-less anecdotal studies for which the data gathering and analysis methods used were not always clearly apparent. All, however, contained a rich discussion of the actual or potential causal processes that were activated by the initiative and that, potentially, resulted in the desired outcomes. Additionally, for many, a useful description of the context(s) in which the initiative was implemented could be derived, either from the study itself or from other sources (e.g. municipal or state government websites). It is also interesting to note that a number of the studies, in one way or another, were either based on an explicit theory of causal processes and desired outcomes or had the development of a theory model of the initiative as an objective of the investigation.

**Table 1: Programs included in the Review.**

| Warnings | Public Information Provision | Localised Information Provision | Localised Community Engagement/ Education Activities and Programs | Community Consultation, Collaboration & Development Approaches |
|---|---|---|---|---|
| (Ferny Creek Fire Alert Siren) | Media materials, including the internet (Rohrmann, 2000, 2002, 2007) | Moondarra Fire Information Unit (Drumond, 2007; Smith, 2006) | Operation Bushfire Blitz (Hill, 1998; Rhodes, 2001, 2003)<br>Street FireWise (Gilbert, 2005)<br>Community Fireguard (Boura, 1998a, 1998b; Rohrmann, 1999)<br>Community Fire Units (Lowe, Haynes, & Byrne, 2008) | Ferny Creek Fire Alert Siren (Betts, 2001, 2003) |

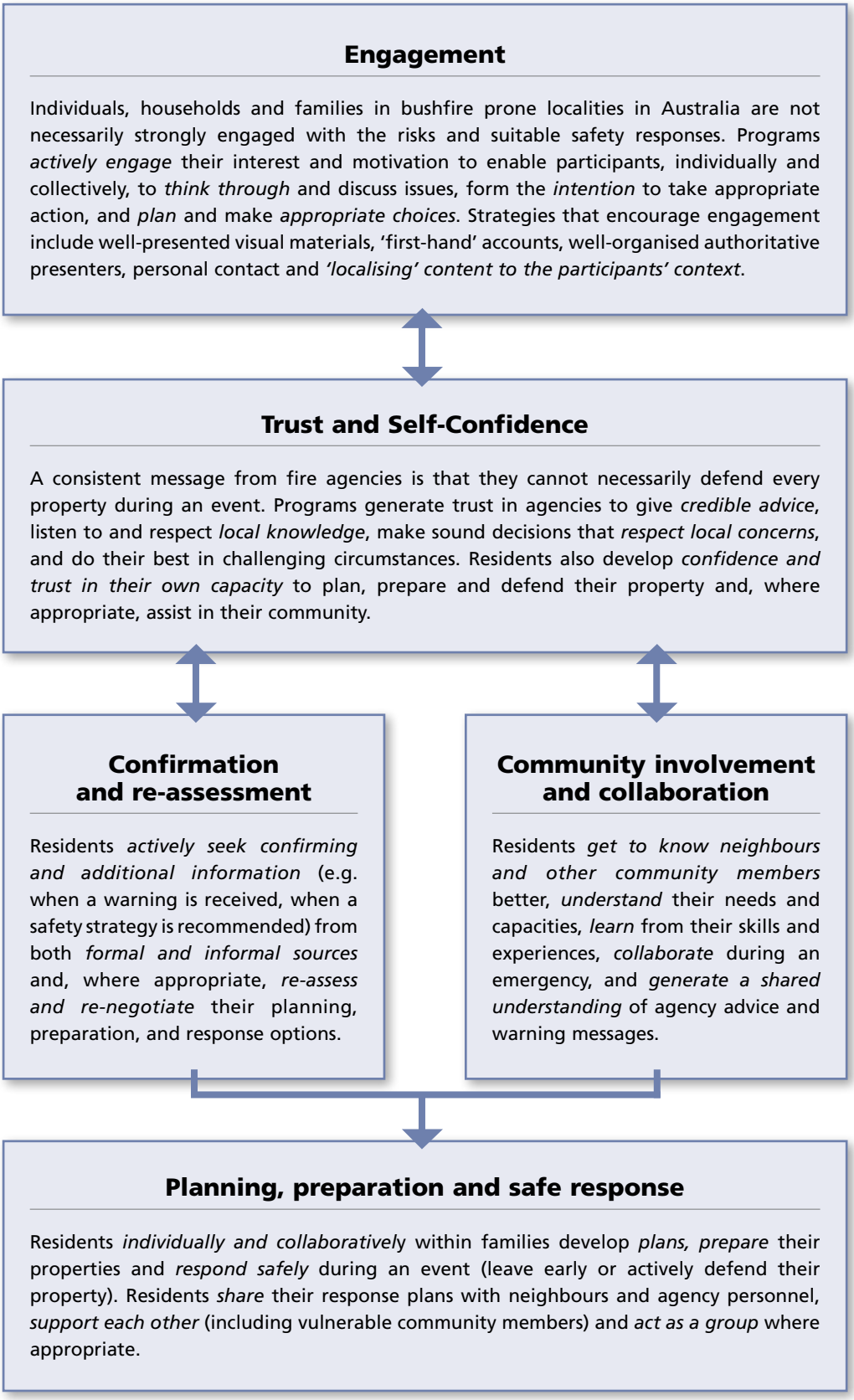
**Context**

Diverse contexts are important in determining the appropriateness and success of specific community EAE initiatives for bushfire. These include:

- locality (urban fringe, rural township, rural)
- livelihood/lifestyle (commuter, small land-holder, farmer)
- community (existing ties, local organisations, local advocates, diversity – CALD, disabled, older residents)
- the nature of past and present events (recency, duration, phase (mitigation, preparedness, response, recovery)
- Prior level of engagement/interest in issue (resistant, motivated, active)
- inter-organisational relationships during planning/implementation (e.g. partnerships between response agency, land management agency, local government)
- intra-organisational relationships (e.g. response/community engagement officers)
- agency/community relationships (e.g. with local brigade or community fire unit)

1. The full report of the synthesis and the theoretical perspectives that informed it is available from the first author (gerald.elsworth@rmit.edu.au).

**Figure 1. A preliminary theory model of community engagement/education initiatives.**



An explicit aim of realist research synthesis and review is the generation of preliminary configurations of contexts, causal processes (mechanisms) and outcomes for the general kind of initiative being studied. Thus:

Realist evaluation asks of a programme, 'What works for whom in what circumstances, in what respects and how'? Realist review carries exactly the same objective, namely program theory refinement. What the policy maker should expect is knowledge of some of the many choices to be made in delivering a particular service and some insights into why they have succeeded and/or failed in previous incarnations (Pawson et al., 2004, p. 3, emphasis in original).

A summary program theory model for bushfire EAE asctivities and programs is presented in Figure 1. The model is based on those aspects of the individual theory models reconstructed for each initiative that were judged to be the more consistent across the studies reviewed in (potentially) generating the desired outcomes of the community safety approach. Overall, there appeared to be a very high level of agreement and coherence between the results and discussion of the available studies, and with the values and principles that underpin the community safety approach in Australia (Stevens, 2007). This was particularly the case in relation to the processes and outcomes for individuals, households and communities. Two initiatives, however, involved explicit agency-agency and agency-community partnerships (the Ferny Creek Fire Alert Siren and the Moondarrah Fire Information Unit - FIU) and both were reported to have resulted in increased community trust and effective collaboration (between the fire agency and the municipality in the case of the Ferny Creek Siren and between the fire and land management agencies in the case of the Fire Information Unit).

### *Context*

A notable feature of the summary theory model is the richness and diversity of the contexts that are discussed or implied in the evaluations. These differences in context range across:

- The geographic locality, including its fire history, the characteristics of individuals, households and families in the locality, and the extent to which they are linked by informal ties and more formal social networks and organisations [that, when present, might constitute the locality as a community (Walmsley, 2006)];
- The agencies involved in program implementation and their relationships (informal and formal partnerships); and
- The prior nature of any relationships between these agencies, partnerships and the community.

Additionally, there is some evidence from the studies reviewed that elements of this context interact with the nature of the initiative such that it might only generate its anticipated outcomes if those elements are present. This evidence is sketchy at present, however, and considerably more analysis is required to make it more systematic.

For example, the evaluation of the Street FireWise program in New South Wales highlighted the role played by a combination of geographic and socio-demographic characteristics of a neighbourhood (small townships with a pattern of side streets, parks etc.) in facilitating the specific format of the program (a Saturday street meeting) and providing a clientele that is potentially receptive to the content of the meeting. Similarly, the study of the Moondarrah FIU suggested that 'during event' community engagement initiatives that are built around a number of separate activities including community meetings, street walks, information points, school visits etc. are better suited to longer-running fires.

### *Causal Processes*

The causal processes highlighted in the model are Engagement, Trust and Self-confidence, Confirmation and Reassessment, and Community Involvement and Collaboration. Engagement (of individuals, households, families and community groups) with the program messages and ideas is the first challenge in the development of a successful community safety initiative for bushfire. Engagement is a broad idea that includes individual curiosity and interest, and the motivation to learn more, think carefully and, importantly, form the intention to commence appropriate planning and preparation activities. Various strategies for gaining and maintaining attention are discussed in the studies reviewed. Perhaps the most clear-cut recommendations from these studies is that, to activate engagement, fire safety presentations, materials and activities should be: (a) localised, that is to say, carefully and explicitly adapted or tailored for the locality and community; and (b) attractively presented, for e.g. using simple explanatory images not overburdened by text. Engagement is also likely to be easier to generate if the locality has had a recent history of fire.

The generation of Trust and Self-confidence is proposed to result from successful Engagement. Residents need to be assisted to overcome possible initial hostility to agencies and their staff - "why bother talking to you, no one ever gets back to us" (Drumond, 2007) - so that agencies can be seen to be offering credible advice, that negotiated solutions continue to be accepted, and that agencies with finite resources can be seen to be making sound decisions, taking co-ordinated action and thus doing their best for communities that are threatened by fire. Trust also suggests the idea that residents believe

they can rely on themselves, their families and their neighbours in the event of bushfire; that they come to believe in the efficacy of what they know and have learnt, and understand their own and others' capacities and limitations so that they have the confidence to make decisions that are appropriate for themselves and their families and to put those decisions in to action.

The studies of media-based approaches (Rohrmann, 2000, 2002, 2007) and Bushfire Blitz (Rhodes, 2001) both suggest that the process of seeking Confirmation and Elaboration of information that is received from media or in face-to-face events and the use of this information to confirm or re-assess and re-negotiate prior decisions is a critical causal process at the individual and household level. Confirmation, elaboration, re-assessment and re-negotiation can be supported by both formal and informal sources of information and it is very likely in some communities that informal sources of information may be critical for this process, particularly during an event (Goodman, Healey, & Boulet, 2007). While the theory that these processes are critical for effective planning, preparation and an effective and timely response is plausibly argued there is only scattered evidence in the studies reviewed that they are actively and consciously supported and encouraged in community EAE materials and activities (exceptions include the insertion of 'workbook' sections in fire awareness and preparedness booklets, the encouragement of 'two-way' interaction and discussion in street corner and other community meetings rather than didactic presentations, and the acknowledgement of the importance of one-one-one meetings with residents following community briefings (Drumond, 2007).

A number of programs and activities, in quite different ways, actively seek to encourage community-level engagement, decision-making and collaborative action as a primary causal process. These programs include, for example, on-going community group programs such as Community Fireguard where groups, having completed the 'formal program' over the first four or five meetings are encouraged then to consider specific community characteristics and needs and to explore the development of local solutions such as setting up a telephone tree. Similarly, while the possibility of the Street FireWise program in the NSW Blue mountains leading on to the formation of formal on-going groups was abandoned as an objective there was evidence that informal groups had been formed and were, indeed, being assisted by agency volunteers.

### *Outcomes*

An expert consultation conducted by Rhodes and Reinholtd prior to a series of evaluation studies of Bushfire Blitz identified a comprehensive list of the specific short/medium term outcomes at the individual/household level that might be achieved through community safety initiatives. They were:

- *Awareness* and *recognition* of the wildfire risk;
- *Knowledge* of fire behaviour and fire safety measures;
- *Planning* for the event of fire;
- *Physical preparations* of property and household; and
- *Psychological readiness* involving confidence and self-reliance (reported by Rhodes, 2003, p. 1, emphasis added).

Positive reports of outcomes across the full spectrum identified by Rhodes and Reinholtd were found in the review. For example:

- In Rhormann's studies of media materials, respondents reported positive views of printed materials (in particular a longer workbook-style booklet), television advertisements relating to bushfire safety and some agency websites.
- The Moondarra FIU was positively regarded for the value of advice provided at the community meetings and the face-to-face contact and opportunity to talk and ask questions on an individual basis following community briefings. Residents also valued the up-to-date knowledge about the fire and being listened to, taken seriously, cared about, and supported by the FIU team.
- In Rhodes' studies of Bushfire Blitz, residents who had attended meetings previously and during the current fire season had higher levels of knowledge about bushfire compared (in order) with those who attended during the current season but had not attended previously, those who had attended previously but not during the current season and, finally, those who had never attended a meeting. A similar pattern was observed for self-reported levels of bushfire preparation (both outcomes were measured by multi-item indices). These differences were found to be statistically significant.
- Gilbert's study of the Street FireWise program reported residents who attended increased their awareness and understanding of bushfire risk. These increases were mediated by processes such as building on existing resident knowledge, changing misconceptions, introducing new ideas, contextualising issues to the local situation, generating resident understanding of how they can contribute to mitigation, and generating a clearer understanding of the role of the local fire brigade.

- Rohrmann's evaluation of Community Fireguard reported that, compared with non-participants, Fireguard members (a) were more likely to accept responsibility for bushfire preparedness and safety rather than seeing this as predominantly a fire agency task, (b) rated their overall bushfire preparedness higher, and (c) undertook more preparedness actions . A comparison of two newly formed Fireguard groups against two groups of non-participating residents from the same areas showed that the view that the fire agency was responsible for fire safety decreased in the Fireguard group over an initial six-month period of membership more than it did in the comparison group. Additionally, the number of preparedness actions taken by the new Fireguard members increased significantly. More specifically, the greatest change was observed for "joint planning with neighbours" and "writing down planning for bushfire events".
- Among other outcomes, Lowe et al reported that individuals involved in Community Fire Units (CFUs) (a) gained confidence in their ability to organise themselves, plan and to stay and defend their homes, (b) had enhanced local knowledge (knowing each others resources, the best configuration of equipment for particular circumstances, status and whereabouts of other residents), (c) felt more independent and self-reliant, (d) felt a greater connection with their immediate neighbours, had learnt to trust their neighbours, felt that 'looking after each other' would become increasingly important as they become older and (e) felt that they had obtained great personal benefit from CFU membership with little sacrifice.
- From the evaluation reports on the process that resulted in the installation of the Ferny Creek Fire Alert system it was concluded that (among other outcomes) the consultation process and siren installation had resulted in a trend towards safer behaviour during a bushfire. On a follow-up survey 79% of respondents indicated that they would put their bushfire survival plan in place after hearing the alert siren (an increase from 28%) while there was a reduction of 50% in those indicating that they would leave their home on hearing the siren. Taken together these findings suggest a quite substantial increase in the number of householders reporting that they would follow the core recommendation of the 'stay-go' policy.
- Positive program outcomes at the community level were less frequently reported, the following, however, are indicative of the potential impact of community-based activities:
- Early in the establishment of the Moondarra FIU a decision was made to take a community engagement approach to encourage the development of lasting positive relationships with the community.
  The case study suggests that the community meetings were a critical link with the community and that the portrayal of the fire as a 'community fire' (and not an 'agency fire') was "a very powerful message" (Department of Sustainability and Environment, n.d., p. 3). Early in the fire period it became apparent that the community at one township (where the FIU was based) was "using the meetings to check on community wellbeing after difficult nights and pass on local messages". At the meetings, residents were encouraged to look out for others, to visit neighbours to see if they needed help, and to share information gained at the meetings as a way to contribute. A shopkeeper from one of the townships commented that "The community updates helped me to help others" (Department of Sustainability and Environment, n.d., p. 4).
- Lowe et al (2008, pp. 29-30) suggest that the evidence from their study confirms that the formation of a CFU in a locality led to increased community resilience and cohesion (connections expanding from an initial core group to a wider range of residents). CFUs that had been actively involved in an incident "worked well together" and benefited from "understanding fire brigade operations and procedures".
  Further, successful defense of homes and property resulted from "a more detailed knowledge of pre-fire preparations, fire behaviour, likely ignition points and each other's strengths and assets".

## Conclusion

Contrary to the skeptical view that very little in community education, awareness and engagement initiatives for natural hazards 'works', this preliminary synthesis of evaluation studies clearly suggests that programs across the broad spectrum of 'top-down' to 'bottom-up' activities have the clear potential to achieve positive outcomes at both the 'individual' (resident, household, family) and community levels.

Three particular challenges in implementing the community safety approach are, however, apparent. Firstly, as mentioned above, the critical importance of context in successful program implementation is clearly evident. A specific aspect of context that has only recently been consciously addressed is community diversity. There has been, perhaps, a tendency for community EAE activities for bushfire to be 'one size fits all' activities. Some recent initiatives have explicitly considered aspects of community diversity, for example a post-fire interview study and follow-up community forums focussed on the needs of disabled residents in regional Victoria and the translation of printed brochures into a range of community languages. But the increasing trend towards technology-based communication solutions suggests that the diversity of the Australian community is still an important challenge for Australian emergency management agencies.

Secondly, from an agency perspective, it is clearly important that a consistent and coherent message of planning and preparation for bushfire is disseminated to householders and communities, and, where community members are engaged in response activities, that a shared understanding of necessary 'command and control' structures is generated and accepted - as stressed, for example, in the CFU program (Lowe et al., 2008). The community safety approach, however, entails acknowledging that communities will adapt and perhaps re-invent this message both to fit it to their own setting and to achieve a measure of control of it. The central importance that both agency and community groups accorded the concept Greater Community Ownership and Responsibility for Bushfire Safety in a related concept mapping study (Elsworth, Anthony-Harvey-Beavis, & Rhodes, 2008) suggests a critical task for policy institutions, agencies and communities: to seek to achieve greater community engagement with and responsibility for bushfire safety while encouraging appropriate agencies to continue to provide expert professional support through relevant policy principles and objectives and the institutional arrangements, broad strategies and programs necessary to implement them.

Thirdly, if the length and complexity of the causal chains between a community safety activity and the desired medium-term outcomes of planning and physical and psychological preparedness is carefully considered it becomes evident that a single stand-alone initiative is unlikely to achieve all the desired changes embedded in the community safety approach. This suggests that the careful selection and integration of a suite of activities and programs that are, for example, focussed sequentially on generating Engagement, Trust and Self-confidence, Confirmation and Re-assessment, and Community Involvement and Collaboration may be more successful than any individual stand-alone initiative.

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## About the authors

**Gerald Elsworth, PhD** recently retired as Associate Professor in the School of Global Studies, Social Science and Planning (GSSSP) at RMIT University. He was project leader of the National Review of Community Education, Awareness and Engagement for Natural Hazards and Project C7 of the Bushfire CRC.

**John Gilbert** is a researcher in GSSSP at RMIT University. He is part of the Project C7 research team (Bushfire CRC) and the National Review of Community Education, Awareness and Engagement for Natural Hazards.

**Alan Rhodes** is the CFA Manager, Community Safety Research and Evaluation. He is also completing a PhD at RMIT University as part of the Bushfire CRC.

**Helen Goodman**, PhD is a Research Fellow in GSSSP at RMIT University working on Project C7 of the Bushfire CRC.

**John Gilbert** is the contact on this paper. His email address is john.gilbert@rmit.edu.au.