

Bushfire risk, messaging and older people: setting a research agenda

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Abstract

Intense bushfires are going to become more prevalent in Australia because of changes in the climate. Also, the population of older people in bushfire areas is increasing. Under the new Australian Fire Danger Rating System, 'catastrophic' bushfire danger days are those when houses may not be able to be defended and, as such, the advice from authorities is that people should leave early, prior to the advent of fire. Leaving early is particularly important for vulnerable groups in communities, including older people. Experience from Australia's summer bushfires in 2019–20 suggests that leave-early messages were not communicated effectively and were not enacted. This paper presents an overview of bushfires and bushfire messaging in the Australian context and the associated risk to older people. It identifies gaps in the current understanding of the intersection of these issues and lays out a plan for future research in this area.

Introduction

The 2019–20 summer bushfires presented a real-time example of the growing influence of climate change on weather conditions that contribute to catastrophic bushfires. On a national scale, Australia was dangerously underprepared for the 2019–20 fire season (Commonwealth of Australia 2020). For south-eastern Australia, this was the 'worst bushfire season ever encountered' (Government of South Australia 2020; Gergis and Cary 2020; Morton 2019). The fires caused 33 deaths (25 in New South Wales) and significant property destruction and damage (Government of South Australia 2020; Owens and O'Kane 2020).

In Australia's bushfire history, catastrophic bushfire events were few enough to be regarded as anomalies (Commonwealth of Australia 2020). However, catastrophic bushfire days, and the conditions that cause them, are likely to increase over the next 50 years (van Oldenborgh *et al.* 2021; Commonwealth of Australia 2020; CSIRO 2020).

Australia has an ageing population. The percentage of people aged 65 and over has increased from 4.6% in 1922 to 16% in 2021 (Australian Institute of Health and Welfare 2021). The Australian Institute of Health and Welfare indicates that this trend will continue. By 2066, older people in Australia will represent approximately 21% of the population. Most older people live in private dwellings (ABS 2017) and 'ageing in place' is the intention of this cohort. This has implications for disaster planning and management because older people represent a vulnerable group (Fountain *et al.* 2019; Howard *et al.* 2017; Orimo *et al.* 2006). For this group, risks associated with bushfires are heightened and older people are overrepresented in bushfire fatalities (Commonwealth of Australia 2020), especially in rural areas (Handmer *et al.* 2019; Handmer and O'Neill 2016; Haynes *et al.* 2010). Many older people face complexity when planning for bushfires. They may require help to prepare for bushfires (Commonwealth of Australia 2020; Owens and O'Kane 2020) and research has shown that older individuals may be hesitant to evacuate before a fire breaks out, which highlights the need for targeted efforts that promote a 'leave early' action (O'Neill and Handmer 2012).

There is a paucity of research about how older people interpret messaging for bushfire planning (Fountain *et al.* 2019). This paper provides an overview of the growing threat of bushfires in Australia and the associated risks that older people face. It emphasises the importance of messaging that instructs safe evacuation. We identify gaps in knowledge regarding evacuation planning and preparedness practices of older individuals living in areas threatened by bushfires. We also consider the interpretation of 'leave early' messaging and the challenges encountered in enacting leave early plans. The paper concludes with a proposed

research agenda to better understand how older people may interpret bushfire messaging to improve how they create plans and enact them and the intended actions of older people living in bushfire-prone locations.

Bushfire in the Australian context

According to climate projections, Australia will experience dangerous fire conditions in the future. Fires are predicted to be more intense, more frequent and be of longer duration (Commonwealth of Australia 2020; Bruyere *et al.* 2020; IPCC 2021; Pausas and Keeley 2021). Destructive and self-running fires will become more prevalent, the return interval of catastrophic events will shorten and bushfire seasons will extend, accompanied by more days with consistently high bushfire danger ratings (Bruyere *et al.* 2020; Commonwealth of Australia 2020; Piper 2020). In 2022, Australia's fire rating index added a new category of catastrophic to account for this expected enhanced level of danger (Chuvieco *et al.* 2021; NEMC n.d.). Historically, catastrophic bushfires in Australia have been regarded as anomalies (Commonwealth of Australia 2020), but over the next 50 years, the conditions that cause them will be enhanced (van Oldenborgh *et al.* 2021; Commonwealth of Australia 2020; CSIRO 2020). Catastrophic bushfires have an intensity so great they generate weather conditions to produce fire-generated or 'pyro cumulonimbus' storms (Piper 2020; Commonwealth of Australia 2020). These fires are 'the most dangerous conditions for a fire' and most homes have not been constructed to withstand the intensity of them (AFAC National Council for Fire and Emergency Services 2023). Therefore, the risk to residents living in bushfire-prone areas will increase, as will the need for them to be well-prepared for such events.

Australia's major cities and suburbs adjacent to and within dense native vegetation have experienced regular episodes of severe fires (Blanchi *et al.* 2010; Gibbons *et al.* 2012). Dwellings and populations in peri-urban settlements (the places in-between urban and rural areas) face an increased bushfire risk (Rauws and de Roo 2011; Bardsley *et al.* 2018). Due to housing affordability and lifestyle choices, these peri-urban locations are attracting an influx of population including tree changers (Bond and Mercer 2014; Paton 2006), a proportion of whom are older people (ABS 2010; Westbury 2021). Researchers have found that people living in peri-urban communities may not fully realise bushfire risk (Bond and Mercer 2014; Bardsley *et al.* 2018; Browne and Minnery 2015) and assume that emergency services agencies will protect them and their homes. This combination of risk, lack of awareness and a growing older population poses significant challenges for communities, service providers and first responders.

Self-preparedness and locally led initiatives are important (Akama *et al.* 2012). Post-bushfire studies have found that self-efficacy (taking the initiative to follow through with a plan of action) is an important variable affecting community resilience (Randrianarisoa *et al.* 2021) and, alongside well-informed disaster preparedness, is a key predictor of good recovery. However, research conducted by the Australian Red Cross found that while people were aware of climate-related hazards, only 2 in 5 people interviewed were taking active steps to prepare for the next

fire season and less than 50% of participants in bushfire-prone areas thought their community was ready for a future bushfire event. The research also found that only 20% of participants had identified an evacuation refuge (Randrianarisoa *et al.* 2021). Other studies have found that bushfire plans created did not correlate with actions taken in a fire event. For example, despite an intention to leave to avoid a bushfire, respondents reported that they delayed leaving until it was too late or stayed to defend their property (Strahan and Gilbert 2021a; Strahan and Gilbert 2021b). This is a complex and confounding set of challenges.

Communicating warnings and preparedness

Whittaker *et al.* (2020:2) state that:

...a good warning message is distinguished from a poor one by its content – including information about the nature, location, guidance, time, and source of the hazard or risk – and style – including its specificity, consistency, accuracy, certainty, and clarity.

After the bushfires in 2019–20, numerous submissions to the Royal Commission into National Natural Disaster Arrangements by several state governments (Western Australia, Queensland, Victoria and New South Wales) and the Bureau of Meteorology identified inadequacies in both the national bushfire warning system and community messaging (Commonwealth of Australia 2020). Specifically, concerns were raised about the inconsistency of hazard rating levels between states and the lack of clarity in advice issued to the public about when to leave (Commonwealth of Australia 2020).

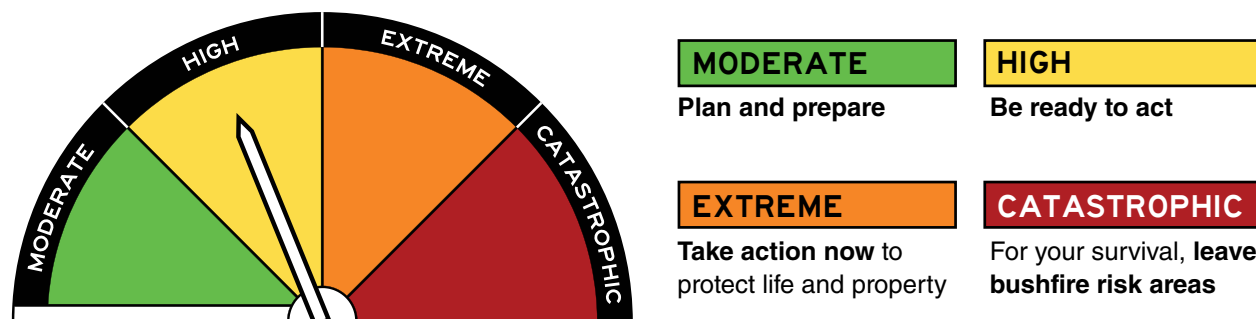
Recommendations of the royal commission specifically addressed the need for a nationally consistent fire danger rating system. Recommendation 13.2 (Education on the Australian Fire Danger Rating System) called on state and territory governments to provide education on the rating system, including the potential danger and associated actions for each rating (Commonwealth of Australia 2020).

Bushfire messaging and communication

On 1 September 2022, an updated Australian Fire Danger Rating System came into effect. The system is a 'simplified, action-oriented fire danger rating system' to 'improve public safety and reduce the impacts of bushfires' (AFAC National Council for Fire and Emergency Services 2023). Its stated benefits include improved information and communication, better decision-making tools and a 'truly national system'. It has 4 ratings, each with an associated action (Figure 1).

It should be noted that until the 2009 Black Saturday bushfires in Victoria, the danger rating approach emphasised preparation and having 'pre-defined triggers' indicating when to leave (Handmer *et al.* 2019). The current approach to bushfire planning has shifted and greater emphasis is on people leaving.

The Australian Fire Danger Ratings (AFDRS) levels are:



Moderate	Plan and prepare Most fires can be controlled. Stay up to date and be ready to act if there is a fire.
High	Be ready to act Fires can be dangerous. There's a heightened risk. Be alert for fires in your area. Decide what you will do if a fire starts. If a fire starts, your life and property may be at risk. The safest option is to avoid bushfire risk areas.
Extreme	Take action now to protect your life and property Fires will spread quickly and be extremely dangerous. These are dangerous fire conditions. Check your bushfire plan and ensure that your property is fire ready. If a fire starts, take immediate action. If you and your property are not prepared to the highest level, go to a safer location well before the fire impacts. Reconsider travel through bushfire risk areas.
Catastrophic	For your survival, leave bushfire risk areas If a fire starts and takes hold, lives are likely to be lost. These are the most dangerous conditions for a fire. Your life may depend on the decisions you make, even before there is a fire. Stay safe by going to a safer location early in the morning or the night before. Homes cannot withstand fires in these conditions. You may not be able to leave, and help may not be available.

Figure 1: Australian Fire Danger Ratings and advice for each rating (AFAC National Council for Fire and Emergency Services 2023)

Leave early messaging

Each Australian state and territory is responsible for producing its bushfire messaging in line with the Australian Fire Danger Rating System. Emergency information and warnings are communicated in numerous ways, including roadside signs, websites, social media, traditional media outlets, mobile apps and text and voice messages (Commonwealth of Australia 2020). Using a variety of communication methods is intended to increase message reach to a wide audience (Commonwealth of Australia 2020; Mehta *et al.* 2022).

Ahead of catastrophic bushfire days, the message issued by all governments is that the safest course of action is to evacuate from places that are at risk to safer places. This is 'leave early' messaging. The intent of leave early messaging is that residents leave their place of residence before the risks of the fire grows too great.

Communicating bushfire risk on catastrophic-rated bushfire days has some identified problems and there is difficulty of achieving leave early responses from at-risk communities (Bardsley *et al.* 2015; Government of South Australia 2020). For example,

there may be a misinterpretation of the leave early message by receivers as the message is deemed to be relevant only once a bushfire has started. During the bushfire, the 'leave early' message is not heeded sufficiently by communities. Research on previous catastrophic bushfires found that residents failed to leave early due to a lack of the observable bushfire threat; residents were relying on signs of smoke or flames to prompt their evacuation (Johnson *et al.* 2012; Thornton and Wright 2012; Trigg *et al.* 2015). The realisation by residents that they should have left sooner often came too late (Whittaker *et al.* 2020; Government of South Australia 2020a).

The Royal Commission into National Natural Disaster Arrangements and other state enquiries and reviews report challenges caused by poor communication and imprecise messaging. Late evacuation created traffic congestion on roads, threatened the safety of evacuees and posed challenges for responding ground crews (Commonwealth of Australia 2020).

Older people and acting on leave early messages

Older people can be vulnerable during emergency events for reasons related to reduced or impaired mobility, lack of social support, decreased physical capabilities and loss of independence (Halcomb *et al.* 2022). In addition, older people may have limited access to communication technology that can limit their exposure to disaster-related apps and warning systems (Howard *et al.* 2017). Many information providers are increasingly transmitting bushfire messaging through websites, social media and mobile apps. Notably, there is an observed digital technology gap, with many older people less willing to embrace technologies (Hill *et al.* 2015; Knowles and Hanson 2018; Wilson *et al.* 2023; Suhaimi *et al.* 2022). Many are unable to access internet-based and mobile phone messaging (Fountain *et al.* 2019). According to Akama *et al.* (2012) and Trigg *et al.* (2015), older people may find print-based bushfire information to be 'excessive' and difficult to interpret and apply to their own situations. Information packages delivered to households of older residents have been found 'unopened and unused' (Akama *et al.* 2012). So, for older people, planning for bushfires is likely to be more complex than for others in the community (Cooper *et al.* 2020; O'Neill and Handmer 2012). In the event of an emergency situation, households comprised of older residents tend to rely on television or radio and have a preference for telephone calls to a landline (Fountain *et al.* 2019; Howard *et al.* 2017).

Given these observations and personal preferences, the existing approaches to communicating bushfire warnings to older people and encouraging a leave early response requires approaches that cater for their abilities and preferences. Analysis by Akama *et al.* (2012) of communication models indicated that it is crucial to adapt messaging to suit community needs and to emphasise community agency. The future research agenda needs to examine the contribution that older people can make to communication as co-constructors of community resilience, rather than passive consumers of messaging (Beilin and Paschen 2021).

Conclusion

Given the circumstances and expectations of older people regarding bushfire preparation and planning, a research agenda into specific needs of older people should consider effective communication and education approaches.

Research should be conducted with, rather than simply for or about, older people. This is an important aspect to address research gaps and incorporate the strengths, knowledge and abilities of older people in the community into solutions that can better inform local government and bushfire emergency response efforts.

Identifying ways that will encourage and facilitate older people to leave early on a catastrophic bushfire day may improve the resilience of older people living in hazardous areas. Improved leave early messaging and action will also support ground crews that have fewer residents requiring their assistance when fighting fires. For vulnerable citizens, early evacuation poses considerable challenges. Older people are an under-researched group regarding disaster preparedness and response. There are specific considerations relevant to this cohort that need to be addressed within bushfire messaging and communication.

Existing bushfire planning guidance materials issued by firefighting authorities reveals ambiguity and lack of precision around leave early messaging. This is particularly problematic for older people who have mobility issues, lack transportation or are reliant on home support services. For these people, leaving early is complicated. Existing guidance materials do not include specific advice on how this complexity might be navigated (see CFA 2021; DFES n.d.).

There is a place for a deeper analysis of the communication materials distributed by emergency services organisations specific for older people and an investigation into the barriers to leaving early could be investigated.

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