AFTER THE fires

THE IMPACTS OF THE 2019-20 BLACK SUMMER BUSHFIRES ON THE WELLBEING OF EMERGENCY SERVICES PERSONNEL WHO RESPONDED TO THE FIRES

FINAL REPORT

Lawrence D, Rikkers W, Lawn S, Madzoska M, Hunt A, Bartlett J, Houghton S, Van Hooff M (2023) *After the Fires: The impacts of the 2019-20 Black Summer bushfires on the wellbeing of emergency services personnel who responded to the fires. Final Report*. Perth: School of Population Health, Curtin University.

Curtin University

Flinders UNIVERSITY

Military and Emergency Services Health Australia

a charity of The Hospital Research Foundation Group

THE UNIVERSITY OF WESTERN AUSTRALIA


uvex
FIRE & RESCUE
NEW SOUTH WALES

CONTENTS

Cover image: DFES Incident Photographer Evan Collis
This page: NSW Fire and Rescue

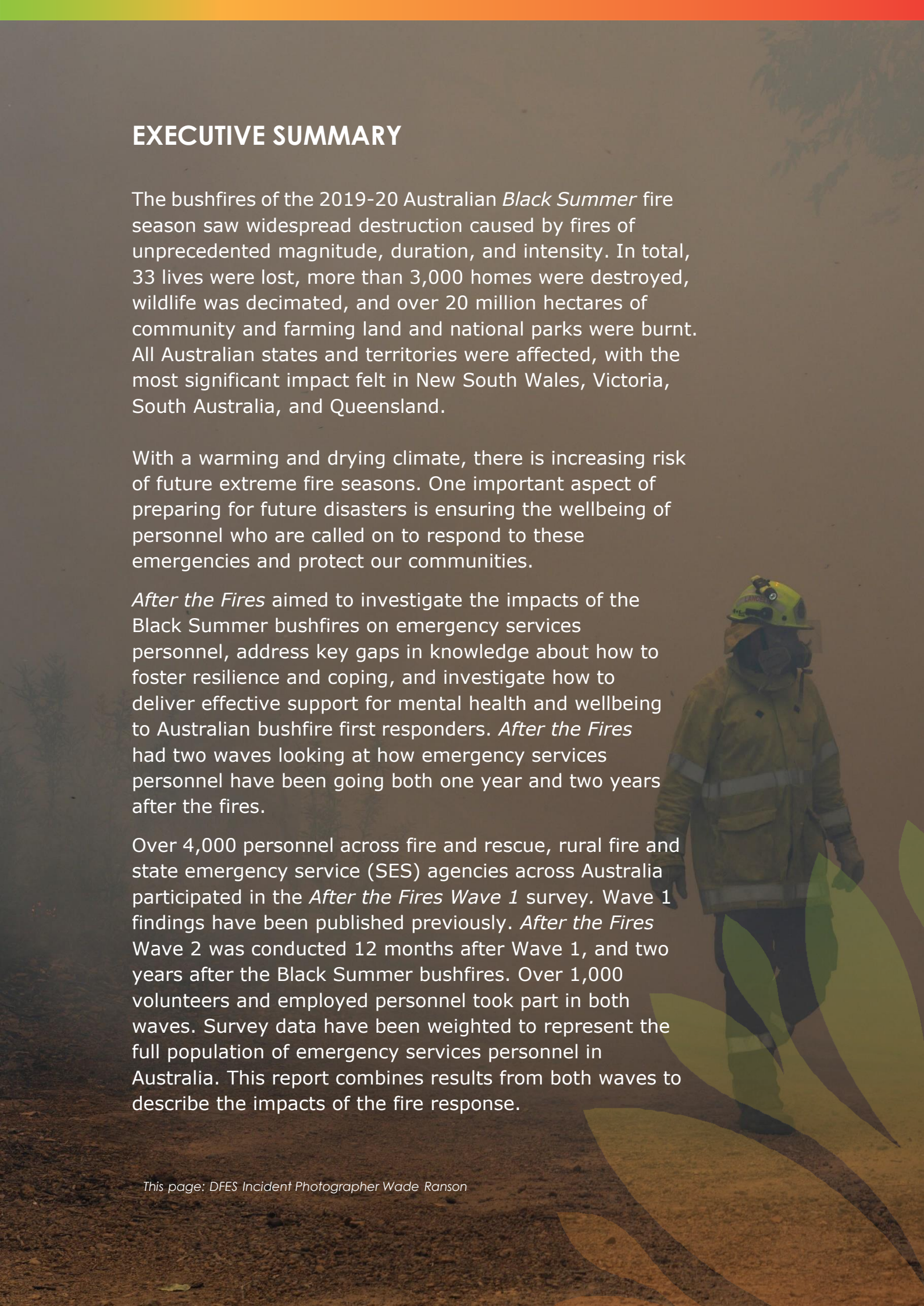
EXECUTIVE SUMMARY

The bushfires of the 2019-20 Australian *Black Summer* fire season saw widespread destruction caused by fires of unprecedented magnitude, duration, and intensity. In total, 33 lives were lost, more than 3,000 homes were destroyed, wildlife was decimated, and over 20 million hectares of community and farming land and national parks were burnt. All Australian states and territories were affected, with the most significant impact felt in New South Wales, Victoria, South Australia, and Queensland.

With a warming and drying climate, there is increasing risk of future extreme fire seasons. One important aspect of preparing for future disasters is ensuring the wellbeing of personnel who are called on to respond to these emergencies and protect our communities.

After the Fires aimed to investigate the impacts of the Black Summer bushfires on emergency services personnel, address key gaps in knowledge about how to foster resilience and coping, and investigate how to deliver effective support for mental health and wellbeing to Australian bushfire first responders. *After the Fires* had two waves looking at how emergency services personnel have been going both one year and two years after the fires.

Over 4,000 personnel across fire and rescue, rural fire and state emergency service (SES) agencies across Australia participated in the *After the Fires Wave 1* survey. Wave 1 findings have been published previously. *After the Fires* Wave 2 was conducted 12 months after Wave 1, and two years after the Black Summer bushfires. Over 1,000 volunteers and employed personnel took part in both waves. Survey data have been weighted to represent the full population of emergency services personnel in Australia. This report combines results from both waves to describe the impacts of the fire response.



This page: DFES Incident Photographer Wade Ranson

KEY RESULTS

Involvement in responding to the fires

- *After the Fires* estimated that 82,480 personnel were involved in responding to the Black Summer bushfires, including 64,500 volunteers and 17,980 employees, with volunteers representing 78% of responders.
- In total the bushfire response represented an estimated value of $637.2 million of volunteer labour.
- Volunteers contributed an estimated 1,840,000 days to the bushfire response, comprising $143.5 million of paid leave and an estimated $116.5 million of unpaid leave. The estimated value of volunteer time among volunteers who were self-employed, retired or no longer working was $316.9 million.
- In addition to their paid roles, career firefighters contributed additional volunteer time worth an estimated $60.3 million.
- Volunteers spent on average three weeks and employees on average four weeks responding to the fires. In addition, 30% of employees volunteered additional time, contributing on average an additional three weeks.
- Only 33% of volunteers with paid employment received paid leave for their volunteer contribution, and an additional 19% accessed a combination of paid and unpaid leave.
- 72% of volunteers and 73% of employees spent at least one night away from home, with volunteers spending on average nine nights away from home and employees on average 14 nights away from home.
- 13,800 volunteers and 3,100 employees travelled interstate to help fight fires.

Mental health and wellbeing of personnel involved in the Black Summer bushfires

- Rates of mental health problems reported one year after the fires persisted two years after the fires.
- Based on participants in both waves, among those responding to the 2019-20 bushfires, 4.2% of volunteers and 5.1% of employees had probable PTSD 12 months after the fires, and 4.2% of volunteers and 7.3% of employees had probable PTSD two years after the fires, representing an estimated 2,700 volunteers and 1,320 employees with probable PTSD two years after the fires.
- 4.2% of volunteers and 7.0% of employees had very high psychological distress indicative of serious mental illness after one year, and 4.5% volunteers and 7.0% of employees had very high psychological distress after two years, compared with 4.0% of the Australian population.

- Additionally, rates of high psychological distress indicative of less severe mental illness which would benefit from treatment increased from 8.8% of volunteers after one year to 12.3% after two years and from 12.9% of employees after one year to 13.5% of employees after two years, compared with 8.0% of the Australian population.
- 5.5% of volunteers and 5.7% of employees had seriously considered ending their own life in the year following the fires, 2.8% of volunteers and 2.4% of employees had a suicide plan, and 0.2% of volunteers and 0.3% of employees had attempted suicide. In the second year after the fires, 5.6% of volunteers and 4.0% of employees had seriously considered ending their own life, 2.3% of volunteers and 1.9% of employees had a suicide plan, and 0.5% of volunteers and 0.3% of employees attempted suicide. These rates of suicidal ideation and suicide plans were about twice as high as in the general population.
- Among personnel responding to the 2019-20 bushfires, 7.5% had worsened mental health conditions in between Waves 1 and 2, while 5.7% had improved mental health conditions. The most significant protective factor seen in those whose mental health improved was ongoing high levels of social support.
- Among those who received formal mental health care, 40% of volunteers and employees in Wave 2 had reported no improvement in their mental health and wellbeing.

Experience of traumatic or life-threatening events

- 31% of volunteers and 25% of employees had felt there was a time when their life was threatened when responding to the 2019-20 bushfires.
- 22% of volunteers and 19% of employees had experienced one or more traumatic events that affected them deeply in the course of the 2019-20 bushfires.
- Overall, 4,150 volunteers and 1,040 employees who were exposed to traumatic or life-threatening events during the bushfires had indicators of high need for mental health support – either probable PTSD, very high psychological distress, or suicidal ideation.
- Cumulative trauma is common. Of personnel who experienced a traumatic event during the 2019-20 bushfires, 28% of volunteers and 45% of employees had experienced one or more additional traumatic events since.

Support for mental health and wellbeing

- 52% of volunteers and 40% of employees with high need for mental health support – either probable PTSD, very high psychological distress, or suicidal ideation – had not received any help in the 12 months following the fires.
- Only 16% of volunteers and 22% of employees with high need for mental health support felt they received as much help as they needed.
- There were over 5,000 people who faced traumatic or life-threatening events while responding to the bushfires who had a high need for mental health support, more than double the rate that would be expected. Around 1,000 of these had received a sufficient level of support for their needs by Wave 1.
- There was little change in levels of help received between Wave 1 and Wave 2, with still less than one in five volunteers or employees with high need for mental health support having received sufficient help for their needs two years post-fires.
- The main protective factor for volunteer and employee wellbeing was high levels of social support.
- Being asked to perform a role they were not sufficiently trained for was identified as a risk factor for subsequent poor mental health.
- Preferring to deal with problems informally, concerned at being seen as weak, that their career prospects would be damaged or that it may stop them from doing operational work remained major barriers to timely help seeking.
- Only 45% of volunteers and 41% of employees had noticed changes in their agencies to better support mental health and wellbeing two years after the fires.
- Despite the challenges involved, the experience of the bushfires did little to dampen commitment to volunteering, with only 6% of volunteers reporting they were less committed, and 22% more committed post fires. This was particularly so among younger volunteers, with over 40% of volunteers aged under 35 years reporting being more committed to volunteering since the fires.

IMPLICATIONS

Australia is highly dependent on volunteers to respond to major bushfires. While almost all available paid personnel were involved in the response to the 2019-20 bushfires, 78% of responding personnel were volunteers. It is likely that volunteers will continue to play a major role in responding to major bushfires in the foreseeable future. A challenge for our future bushfire preparedness is sustaining a volunteer workforce of sufficient size and capacity to be able to respond to large-scale events without overtaxing volunteers to the point where they are at risk of burnout or mental ill-health. This is even more important in the context of changing demographics of rural and regional areas. This is reflected in the age distribution of volunteers, with three-quarters over the age of 45 and one quarter over the age of 65 years. Supporting existing volunteers is even more critical in areas where population size is declining, and populations are ageing.

Over 5,000 personnel who responded to the fires had high needs for mental health support in the 12 months after the fires. This is more than double the number that would be expected in the absence of events of this nature. While all emergency services agencies have policies and procedures in place to support the wellbeing of their personnel and provide support to those with mental health issues, an important issue to consider is how to build a capacity to scale up the level of support available following major disasters. In many areas available mental health supports are at or above capacity in ordinary times and have limited or no spare capacity to provide additional support when needed in the wake of major disasters. With a drying and warming climate increasing the likelihood of future significant fire events which could lead to increased workload and potential for exposure to trauma for volunteers, it is important to ensure that organisational capability to support wellbeing is increased proportionately.

As mental health concerns can persist long after traumatic events, *After the Fires* was continued over 2021-22 with a second survey wave and additional focus groups and interviews. Wave 2 reports identified a cohort of personnel with persistent mental health distress. The majority of those who had not received help at Wave 1, still had received no help by Wave 2.

As Australia is heavily dependent on volunteers to respond to disasters, it is crucial that planning and provision of mental health resources proceeds more quickly and with the commitment that accompanies the delivery of more visible assets such as fire trucks and personal protective equipment. Mental health disorders are often concealed and may develop slowly. Their hidden nature belies the degree and significance of their impact, which has profound ramifications and costs at a personal, community and national level. Maintaining a sustainable workforce into the future requires enough people and resources to share the burden of responding to the increasing frequency and intensity of disaster events.

Acknowledgements

After the Fires was funded by the Australian Government Medical Research Future Fund. The study was conducted by Curtin University in collaboration with Flinders University, Military and Emergency Services Health Australia (MESHA), The University of Western Australia, Roy Morgan Research, and the Bushfire and Natural Hazards Cooperative Research Centre.

We would like to thank the following organisations and individuals whose support, cooperation and expertise were integral to the success of the study:

- The volunteers and community members who came forward to participate in interviews and focus groups, and the 4,000 volunteers and employees across the sector who shared their experiences through the surveys.
- The 19 participating fire and emergency services agencies: NSW Fire and Rescue, NSW Rural Fire Service, NSW State Emergency Service, Victoria Country Fire Authority, Victoria State Emergency Service, Queensland Fire and Emergency Services, South Australian Metropolitan Fire Service, South Australian State Emergency Service, South Australian Department of Environment and Water, Tasmania Fire Service, Tasmania State Emergency Service, WA Department of Fire and Emergency Services, Northern Territory Fire and Rescue Service, Northern Territory State Emergency Service, ACT Ambulance, ACT Fire and Rescue, ACT Rural Fire Service, ACT State Emergency Service, ACT Emergency Services Agency.
- Members of the Study's advisory group - Andrew Colvin APM OAM (Chair to 30 June 2021), Michael Baldi (Chair from 1 July 2021), Dr John Bates, Commissioner Ken Block, Susan Caracoussis OAM, Julie Edwards, Greg Jennings, Chris Killick-Moran, Ken Lay AO APM, Karen McColl, Scott Nowak, Associate Professor Tim Slade, Torben Soelvsteen.

INTRODUCTION

The 2019-20 *Black Summer* fire season was one of the most intense and sustained fire seasons ever experienced in Australia. Between August 2019 and March 2020, over 20 million hectares of community and farming land and national parks were burnt.

In total, 33 people lost their lives and more than 3,000 homes were destroyed. An estimated three billion animals were killed or displaced by the fires. The economic cost of the fires has been estimated at over $10 billion.

Through the Medical Research Future Fund, the Australian Government provided funding to investigate the health impacts of the 2019-20 Black Summer Bushfires, with funding provided in two streams - to investigate the physiological impacts of exposure to bushfire smoke and to examine the mental health impacts. The *After the Fires* study was funded as part of this second stream. *After the Fires* set out to investigate the impacts of the bushfires on the mental health and wellbeing of Australia's emergency services personnel involved in the fire response. The study focused on volunteers and employees working within fire and rescue, rural fire, and state emergency service (SES) agencies. The study aimed to address key gaps in knowledge about how to foster resilience and coping, and how to deliver effective support for mental health and wellbeing to Australian bushfire first responders.

The research was conducted by the same team that undertook the *Answering the Call* study on behalf of Beyond Blue in 2017-18. *Answering the Call* was the first National Mental Health and Wellbeing Study of Police and Emergency Services. The study provided the first national baseline measure of the mental health and wellbeing of first responders. It identified the high risk of exposure to traumatic events in emergency services, the impacts that cumulative exposure to traumatic events can have over the course of a career, and the personal, cultural and organisational barriers that stand in the way of seeking help in a timely way if mental health issues emerge.

After the Fires was conducted by Curtin University in collaboration with Flinders University, Military and Emergency Services Health Australia (MESHA), The University of Western Australia, Roy Morgan Research, and the Bushfire and Natural Hazards Cooperative Research Centre.

DFES Incident Photographer Evan Collis

AIMS

The *After the Fires* study aimed to:

(i) Quantify the short and long-term impacts of direct and indirect exposure to the 2019-20 bushfire events on the wellbeing and resilience of first responders.

(ii) Assess their need for support and use of support services.

(iii) Determine the best strategies to build resilience and protect mental wellbeing.

After the Fires comprised two parts:

(a) Two surveys, which were conducted in 2020-21 (Wave 1) and in 2021-22 (Wave 2), including both volunteer and paid personnel in fire and rescue, rural fire, and state emergency services agencies. The surveys measured first responders' engagement with the 2019-20 bushfires, their mental health and wellbeing, resilience, their need for and use of support services; and the cultural and organisational factors that may have affected their wellbeing.

(b) Qualitative research, which included a series of focus groups and individual interviews in communities most affected by the fires to gain a deeper understanding of these impacts.

This report presents findings from both waves of the *After the Fires* survey and the *After the Fires* qualitative study.

Surveys

Over 4,000 personnel across the fire and rescue, rural fire and SES sectors participated in Wave 1 of the survey, including over 2,000 volunteers and almost 2,000 paid staff. Wave 1 sought information on involvement in the bushfire response, mental health, wellbeing, social support, help seeking and workplace culture.

Just over 1,000 personnel, including over 600 volunteers and almost 300 employees, also participated in Wave 2 of the study which explored how a sample of volunteers and employees were going two years after the fires.

Survey data have been weighted to represent the full population of volunteers and employees across the fire and rescue, rural fire, and SES sectors. All numbers and percentages presented in this report have been weighted to represent the population of volunteers and employees in the sector.

Confidence intervals can be used to assess the level of accuracy of survey estimates. A 95% confidence interval has been calculated for each estimate included in this report and only significant differences in the results have been noted in the text. When numbers were relatively small and apparent differences are more likely to be due to chance alone, this is also noted.

One critically important factor is recognising changes in wellbeing early and taking appropriate action to talk through issues and to seek help when it is needed.

After the Fires found that all fire and rescue, rural fire, and state emergency services agencies across Australia have mental health and wellbeing programs and offer a range of supports to their personnel, but agencies with a high proportion of volunteers generally have fewer resources to support wellbeing. The location, scale, and intensity of the 2019-20 bushfires meant that volunteers played a major role in responding to the fires. This study explores the roles that both volunteers and employees played, and the critical role of volunteers in responding to major bushfire events in Australia.

While cumulative exposure to traumatic events can have negative consequences, it is not just the nature of extreme events that has an impact, but how we respond to them. One critically important factor is recognising changes in wellbeing early and taking appropriate action to talk through issues and to seek help when it is needed. Often mental health issues develop slowly over a period of months or years. Early

action can prevent the development of serious problems, and one of the issues that *After the Fires* sought to investigate was whether personnel involved have had the opportunity to process the events and whether those who may need support were receiving it.

Interviews

To complement the quantitative survey data, a qualitative phase focused on those volunteer responders who lived and worked in the communities most closely affected by the Black Summer bushfires. A series of interviews and focus groups were conducted with a range of volunteer firefighters who responded during the 2019-20 Black Summer bushfires, as well as community leader volunteers who contributed to the recovery efforts. The Wave 1 interviews took place during November 2020 - April 2021 with 29 volunteer fire-fighters and 15 community volunteers. Wave 2 interviews were repeated some 16-18 months later (March – June 2022) with 15 volunteer fire-fighters and 3 community volunteers. Participants were drawn from South Australia, New South Wales, Victoria, and Queensland. Through talking directly with people involved in fighting the fires, one year and two years after the fires, this phase of the study sought to gain a more in-depth understanding of the ongoing personal impacts, mental health tolls, and post-fire challenges which continue to confront communities across the bushfire affected areas. These personal accounts provide compelling and complementary context to the survey data, by providing insight into the levels of trauma experienced and the factors important for resilience.

> *We're all here, we all owned it, we all lost it, and now we're rebuilding it. (CFS Volunteer)*

INVOLVEMENT IN RESPONDING TO THE 2019-20 BUSHFIRES

There are an estimated 221,800 volunteers across the fire and rescue, rural fire, and SES sectors across Australia, with the majority being rural fire service volunteers. In addition, there are about 22,240 employees in the sector, including an estimated 18,200 operational firefighters.

Some 64,500 volunteers were involved in responding to the fires (Table 1). While this represents less than 30% of all volunteers on the books across the country, evidence from previous studies suggests that the number of active volunteers is likely to be substantially lower than the total number of registered volunteers. As such, it is quite likely that the proportion of volunteers living in areas close to or affected by the fires who were involved in responding to the fires would be much higher.

The vast majority of employees in the sector were involved in the bushfire response. An estimated 17,980 paid staff were involved in responding to the fires, 81% of the paid workforce in the sector. The percentage of paid staff involved in responding to the bushfires was higher in the worst affected states and was higher among fire agencies than SES agencies. Table 1 shows the number of volunteers and employees who played an active role in the 2019-20 bushfire response.

Table 1: Personnel who played an active role in the 2019-20 bushfire response

Sector	Played an active role				Total
	Yes		No		
Volunteers					
Fire & Rescue (including Rural Fire)	57,800	29%	139,200	71%	197,000
SES	6,700	27%	18,200	73%	24,800
Total	64,500	29%	157,400	71%	221,800
Paid employees					
Fire & Rescue (including Rural Fire)	17,300	81%	4,000	19%	21,300
SES	680	73%	260	27%	940
Total	17,980	81%	4,260	19%	22,240

Of the 82,480 personnel across the sector involved in fire response activity, including direct firefighting and support roles, 78% were volunteers. This highlights Australia's dependence on volunteers for responding to major bushfire events. It is unlikely that a higher proportion of paid staff could have been deployed to the fire response, as some paid staff were not located close to the fires, and fire agencies also had to retain some staff outside of the bushfire response in order to maintain the capacity to respond to other emergencies.

Engagement with the fires

Table 2 shows a breakdown of the types of roles played by personnel involved in responding to the bushfires. Of those, an estimated 53,200 or 83% of volunteers and 13,100 or 73% of employees were directly involved in fighting the fires. A slightly higher proportion of employees compared to volunteers played coordinating and logistical management roles.

Table 2: Roles played by personnel who played an active role in responding to the 2019-20 bushfires

Role[a]	Volunteers (%)	Employees (%)
Fighting fires	83	73
Operations support	41	46
Community support	28	17
Administrative support	16	19
Staging/basecamp	13	11
Rapid damage assessment	3	10
Other	6	9

a) Personnel could play multiple roles

Amongst volunteers, the average time spent responding to the bushfires was three weeks, while among employees the average time spent responding to the bushfires was one month (Figure 1). In addition to their paid roles, 30% of employees in the sector also volunteered their time to respond to the bushfires, on average committing three weeks of volunteer time (Table 3).

Figure 1: Time spent responding to bushfires among personnel who played an active role in responding to the 2019-20 bushfires

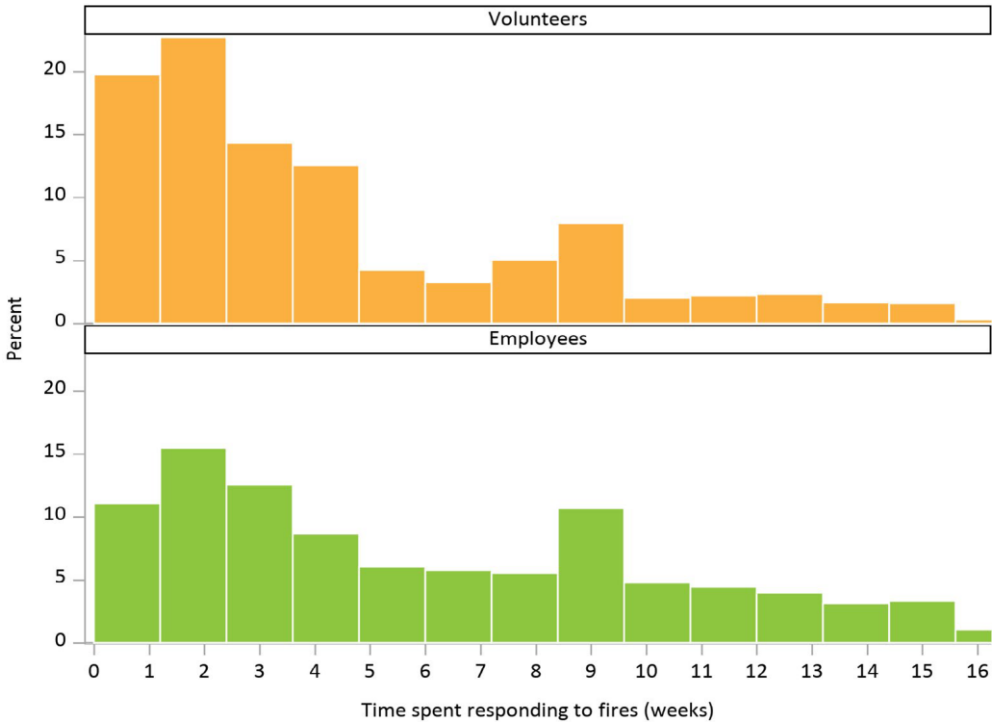


Table 3: Time spent responding to bushfires among personnel who played an active role in responding to the 2019-20 bushfires

Time spent	Volunteers (%)	Employees	
		In paid role (%)	In volunteer role (%)
None			70
Less than one week	14	10	6
1-2 weeks	24	20	8
3-4 weeks	23	19	6
1-2 months	16	17	4
Over 2 months	23	34	6

Time away from home

An estimated 72% of volunteers with active involvement in the bushfires spent one or more nights away from home while responding to the fires, with those going away spending an average of nine nights away from home, while an estimated 6,200 or 17% of volunteers were away from home for more than 14 nights over the fire season.

Similarly, an estimated 73% of employees with active involvement in the bushfires spent one or more nights away from home while responding to the fires, spending an average 14 nights away from home, and 10% were away from home for more than 30 nights over the 2019-20 fire season.

Travel interstate

Excluding volunteers from the ACT who fought fires in NSW, an estimated 13,800 or 21% of volunteers involved in responding to the 2019-20 bushfires travelled interstate to assist with the bushfire response. Excluding employees from the ACT who fought fires in NSW, an estimated 3,100 or 17% of employees responding to the 2019-20 bushfires travelled interstate to assist with the bushfire response. The majority of those travelling interstate travelled to NSW from other states to assist with the NSW fires.

DEMOGRAPHIC CHARACTERISTICS

Table 4 shows demographic characteristics of volunteers and employees who played an active role in responding to the 2019-20 bushfires. Only 18% of volunteers and employees in the sector are female. In contrast to the Australian population, volunteers have an older age distribution. While 16% of the Australian population is aged 65 years or older, 25% of volunteers in the sector are aged 65 years or over. Both within the volunteer and paid sectors, many people commit to extended careers in the service, with 34% of volunteers and 39% of employees having over 20 years' service, and 26% of volunteers and 29% of employees having between 11 and 20 years of service.

Table 4: Demographic characteristics of personnel who played an active role in responding to the 2019-20 bushfires

	Volunteers (%)	Employees (%)
Sex—		
Male	82	82
Female	18	18
Age group—		
Under 25 years	4	1
25-34 years	7	9
35-44 years	12	22
45-54 years	22	35
55-64 years	30	28
65 years and over	25	4
Length of service—		
Less than 2 years	6	6
2-5 years	15	11
6-10 years	19	15
11-20 years	26	29
21-30 years	18	23
More than 30 years	16	16
Location of usual workplace[a]—		
Major cities	20	53
Inner regional	49	28
Outer regional	29	16
Remote or very remote	2	3

a) workplace or place of volunteer work

Multiple members of a family may work or volunteer in fire or emergency services. Almost 45% of volunteers and almost 40% of employees have at least one other extended family member involved in emergency services. One in four volunteers and one in five employees have at least one other family member living with them involved in emergency services (Table 5).

Table 5. Family members involved in emergency services

	Volunteers (%)	Employees (%)
Extended family members involved in emergency services—		
None	56.7	61.5
One	25.0	21.0
Two or more	18.3	17.5
Family members living with you involved in emergency services—		
One or more	26.7	21.5
Either of your parents involved in emergency services	26.9	25.9
Any of your children involved in emergency services	31.1	19.1

LEAVE FOR VOLUNTEERING

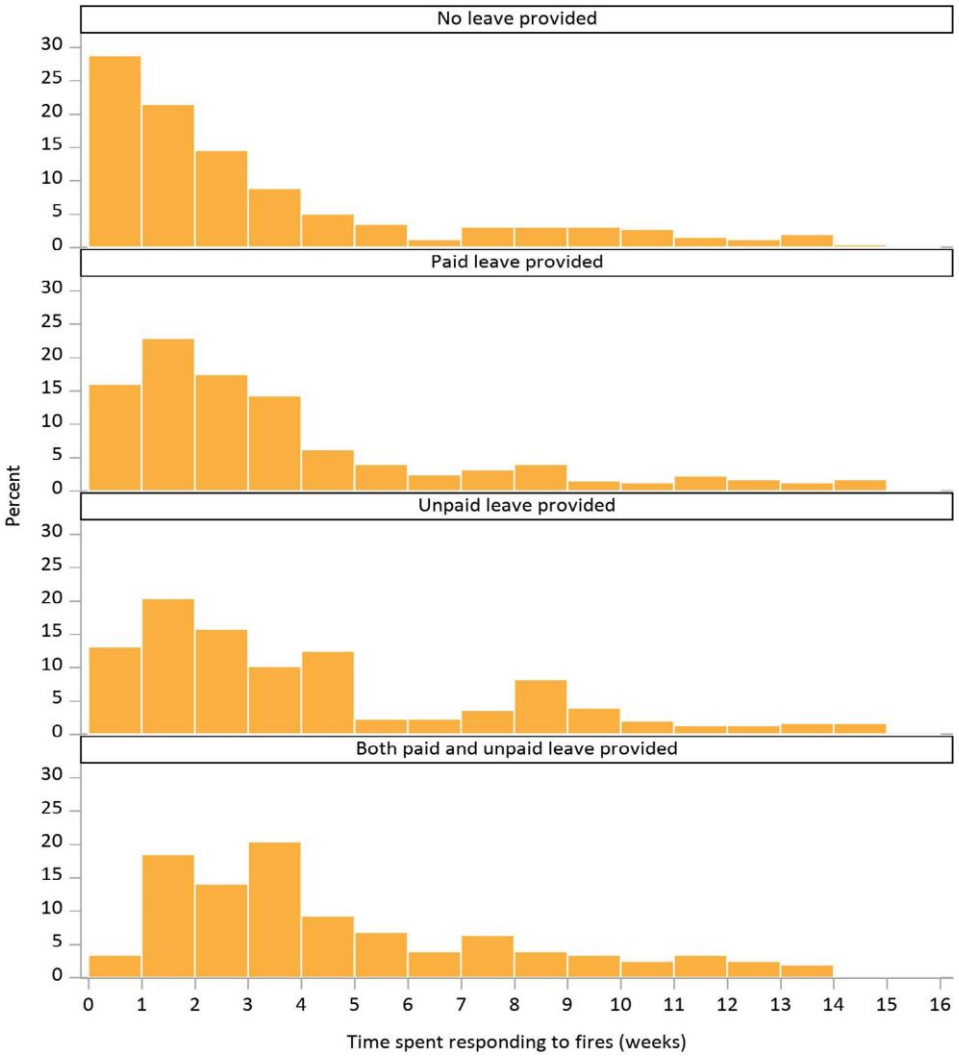
Of the 64,500 volunteers involved in responding to the 2019-20 bushfires, 66% were in other paid employment. Access to paid or unpaid leave to participate in volunteering is not universally available. Table 6 shows that 22% of volunteers were not provided with time off from their paid employment while responding to the fires.

Table 6: Volunteers with paid employment: whether they were provided with time off to undertake their volunteer role

Provided with time off	(%)
No	22
Yes, paid leave	33
Yes, unpaid leave	26
Yes, both paid and unpaid leave	19

Volunteers with paid employment who have access to paid or unpaid leave to undertake their volunteering spent more time on average responding to the fires than those without access to leave. Those with no access to leave spent an average of 2 weeks responding, those with access to paid leave spend on average 2.6 weeks, those with access to unpaid leave spent on average 3.1 weeks and those with access to both paid and unpaid leave spent on average 3.7 weeks responding to the fires (Figure 2).

Figure 2: Volunteers with paid employment: time spent responding to the 2019-20 bushfires by access to paid or unpaid leave to undertake their volunteer role



ECONOMIC VALUE OF VOLUNTEER FIREFIGHTING

In economic terms, the monetary value of volunteer labour contributed to responding to the Black Summer bushfires was significant. Calculated at the average pay rate of a junior career firefighter, the total value of volunteer labour was an estimated $637.2 million (Table 7).

An estimated 64,500 volunteers contributed approximately 1,840,000 person-days at an estimated value of $577 million worth of labour to the bushfire response. They each spent an average of three weeks responding to the fires.

Many of the volunteers were self-employed or no longer working. Of those who were in paid employment (not self-employed), the total value of paid leave taken to respond to the fires was estimated at $143.5 million. Additionally, some volunteers were able to take unpaid leave from their jobs, with an estimated value of $116.5 million. The survey

did not distinguish between people who were self-employed, retired or otherwise not in the labour force. The estimated value of volunteer time for those who were self-employed or no longer working was estimated at $316.9 million.

Among volunteers aged 65 years or less, approximately one-third of the value of volunteer labour was taken in the form of paid leave from other employment, while paid leave represented only 4.3% of the value of volunteer labour for those aged over 65 years.

In addition to their paid roles, a substantial proportion of employed firefighters contributed additional volunteer time to the Black Summer response. The value of this contribution was estimated to be $60.3 million if it were to have been paid.

Table 7: Estimated value of volunteer labour contributed to responding to the Black Summer bushfires ($millions)

Age	Estimated value of paid leave	Estimated value of unpaid leave	Estimated value of unpaid labour for those self-employed or no longer working	Total estimated value of volunteer labour
Volunteers				
65 years or less	139.2	106.8	175.8	421.8
Over 65 years	4.3	9.7	141.1	155.1
Total	143.5	116.5	316.9	576.9
Employees				
Total				60.3
Volunteer labour of volunteers and employees combined				
Total				637.2

PREPAREDNESS

Personnel were asked how well prepared they were for the 2019-20 bushfire season physically, psychologically, and technically. Table 8 shows the majority of volunteers and employees had high levels of preparedness across all three domains.

Respondents were also asked about taking on roles for which they were insufficiently trained and how much stress that might have caused them. While most personnel reported that they were well prepared for the 2019-20 bushfire season, an estimated 7,300 volunteers (11%) and 3,500 employees (19%) reported that they were asked to take on roles for which they were not sufficiently trained. Additionally, 1,200 volunteers (2%) and 1,100 employees (6%) reported that they experienced a lot of stress or extreme stress due to lack of training.

Table 8: Preparedness for the 2019-20 bushfire season among personnel who played an active role in responding to the 2019-20 bushfires

Level of preparedness	Volunteers (%)	Employees (%)
Physically—		
Not at all prepared	2	1
Somewhat prepared	27	22
Well prepared	56	54
Very well prepared	15	23
Psychologically—		
Not at all prepared	4	4
Somewhat prepared	25	26
Well prepared	53	50
Very well prepared	19	20
Technical skills—		
Not at all prepared	1	1
Somewhat prepared	12	13
Well prepared	57	54
Very well prepared	30	32

DFES Incident Photographer Evan Collis

Community criticism

While there was widespread community appreciation, respect and admiration for the personnel who responded to the bushfires, some communities suffered devastating impacts in the fires, and some responders have faced criticism relating to operational and other decisions taken.

Volunteers were asked about experiences of conflict with the community after the bushfire season. An estimated 11,000 volunteers (17%) reported that they had experienced criticism from, or conflict with, members of the community about the volunteer roles they played during the 2019-20 fires, and 2,300 (3.5%) reported that they experienced a lot of stress or extreme stress as a result.

Focus group discussions echoed these experiences with several participants reporting ongoing interactions in their communities that served to trigger them and hamper their mental health recovery. Perceived and actual receipt of blame from individuals in the community was something that volunteers had to deal with routinely while also being members of their communities. This left some participants struggling to move on from their traumatic experiences. Mental health impacts included unresolved guilt, helplessness, continued hypervigilance, defeatism, and disillusionment.

> *[Recounting village that was impacted] We were held accountable (for an impacted site) and there was a point where we get called to some kind of a job, like a backyard fire or whatever, and we get abused…like they lost 80 houses in one little area of the village you know. And you can understand people being upset. And unfortunately, they have to target somebody to take the blame, and they targeted the firefighters of course, they weren't where they were supposed to be, and that's because there just weren't enough of us…. they say it was our incompetence slowing the back burn. (Firefighter, NSW)*

MENTAL HEALTH AND WELLBEING

Measures

After the Fires measured several aspects of mental health and wellbeing, including probable PTSD, psychological distress, mental wellbeing and suicidal thoughts and behaviours. Probable PTSD (see Glossary) was assessed using a scale that was specifically developed and tailored to the emergency services sector to include the assessment of PTSD related to cumulative trauma exposure and not just a single traumatic experience. The surveys also included specific questions to assess the level of functional impairment associated with symptoms of PTSD.

The K10 psychological distress scale was used to measure psychological distress. It is widely used around the world in studies of mental health and wellbeing. The K10 primarily focusses on symptoms of depression and anxiety. The very high category on the K10 has been designed to match the definition of serious mental illness in the United States. Serious mental illness is defined as mental illness associated with serious functional impairment, which substantially interferes with or limits one or more major life activities, and people with very high psychological distress are likely to be in need of specialist mental health services. Using this definition, 3.7% of Australian adults have very high psychological distress, and among employed Australians working in professional occupations (such as doctors, nurses and teachers) 1.5% have very high psychological distress. The high category of the Kessler 10 scale is indicative of having a mental disorder, and people with high psychological distress are likely to benefit from mental health treatment.

The short form of the Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) was used to assess positive mental wellbeing. It consists of seven positively worded questions that cover both feelings and functioning. The scale was originally developed for use in the United Kingdom, and population reference data on the distribution of wellbeing are available for the adult populations of England and Scotland. The scale was designed so that the top 15% of the population would have high wellbeing, and the bottom 15% would have low wellbeing.

Mental health and wellbeing at Wave 1

Tables 9 and 10 show prevalence rates for indicators of mental health concerns (probable PTSD, high and very high psychological distress, and suicidal ideation) for those with selected characteristics (e.g., bushfire experience, level of training, traumatic events, levels of social support). Overall higher rates of distress and mental health concerns were observed for volunteers and employees who were exposed to life threatening events or traumatic events during the bushfires, who had lower levels of preparedness, were asked to take on roles for which they were not sufficiently trained, and who had low levels of social support.

Logistic regression modelling found that low levels of social support was the factor most strongly associated with mental health concerns (Tables 11 & 12). Having a low level of social support was strongly associated with having a mental health condition for all participants, although more so for employees. Other associations with poor mental health outcomes were found with a low level of preparedness (for

employees), being insufficiently trained for a role they were asked to undertake during the fires (for volunteers), experiencing a time when their life was threatened, and experiencing a traumatic event that impacted them deeply (more so for volunteers).

Fighting the fires had a significant impact on those involved, with up to a quarter of those who responded experiencing life-threatening events. Poor mental health outcomes for both employed and volunteer firefighters were associated with this trauma exposure, with volunteers being more affected. Volunteers were five times more likely to have probable PTSD if they had experienced a traumatic event during the fires, compared with employees who were twice as likely to have probable PTSD if they had experienced a traumatic event. Volunteer firefighters are known to be at an increased risk of PTSD development when they have been exposed to unpredictable, dangerous, and life-threatening situations. Even though employed firefighters receive a greater level of training related to critical incident exposure, which may put them at less risk for PTSD, the unprecedented ferocity, duration, and geographic spread of the Black Summer bushfires meant that all firefighting personnel were exposed to similar levels of traumatic and life-threatening experiences. This may explain why both employed and volunteer firefighters and emergency services personnel were impacted in similar ways.

> *We were pretty convinced that they sent us down to die.*
> *(Volunteer firefighter, SA)*

Travelling interstate to assist with the bushfires was associated with a reduced likelihood of developing any of the measured mental health conditions for employees but associated only with less likelihood of developing high psychological distress for volunteers.

Table 9: Wellbeing of volunteers actively involved in responding to the 2019-20 bushfires 12 months after the fires: rates of probable PTSD, psychological distress and suicidal ideation by selected characteristics

	Probable PTSD (%)	High K10 (%)	Very High K10 (%)	Suicidal ideation (%)
All volunteers	4.5	10.5	4.6	4.6
Time spent fighting fires—				
Less than 2 weeks	3.2	8.5	3.4	3.7
3 - 4 weeks	4.6	9.1	4.0	5.3
1 - 2 months	5.2	13.7	4.5	5.6
over 2 months	6.0	12.9	7.2	4.7
Travelled interstate (excluding NSW/ACT) to fight fires—				
No	4.4	11.4	4.6	4.6
Yes	4.8	7.3	4.7	4.8
Level of preparedness—				
Low	10.1	20.2	9.5	8.8
Moderate	3.8	13.8	3.7	4.4
High	4.1	7.7	4.4	4.1
Asked to perform a role they were not sufficiently trained for—				
No	3.3	9.4	3.6	3.9
Yes	14.2	19.1	12.4	10.2
Experienced a time when they felt that their life was threatened—				
No	2.4	7.3	3.4	3.2
Yes	9.1	17.6	7.3	7.6
Experienced a traumatic event that impacted deeply—				
No	2.2	7.9	3.2	3.7
Yes	13.0	19.9	9.8	8.0
Level of social support—				
Low	15.5	25.7	16.3	13.3
Moderate	5.5	20.5	5.0	7.7
High	4.4	10.8	3.6	4.7
Very high	1.2	2.2	1.8	1.0

Table 10: Wellbeing of employees actively involved in responding to the 2019-20 bushfires twelve months after the fires: rates of probable PTSD, psychological distress and suicidal ideation by selected characteristics

	Probable PTSD (%)	High K10 (%)	Very High K10 (%)	Suicidal ideation (%)
All employees	5.2	14.3	5.5	4.9
Time spent fighting fires—				
Less than 2 weeks	3.4	10.8	3.4	2.5
3 - 4 weeks	4.5	11.3	4.9	2.1
1 - 2 months	4.2	20.1	4.7	8.2
over 2 months	7.7	16.1	8.2	6.9
Travelled interstate (excluding NSW/ACT) to fight fires—				
No	5.6	14.1	5.8	5.0
Yes	3.7	15.4	4.2	4.1
Level of preparedness—				
Low	10.2	28.8	14.7	6.7
Moderate	8.6	17.6	8.5	7.2
High	3.3	11.2	3.2	3.7
Asked to perform a role they were not sufficiently trained for—				
No	4.0	12.9	4.2	4.6
Yes	10.2	20.0	10.9	6.0
Experienced a time when they felt that their life was threatened—				
No	3.3	12.3	4.5	3.9
Yes	11.0	20.1	8.6	7.8
Experienced a traumatic event that impacted deeply—				
No	3.5	13.1	4.4	3.7
Yes	12.3	19.4	10.5	10.0
Level of social support—				
Low	25.6	30.7	30.8	22.7
Moderate	8.9	29.1	13.3	9.6
High	5.9	20.4	3.9	5.2
Very high	1.9	7.8	1.3	1.7

Table 11: Wellbeing of volunteers actively involved in responding to the 2019-20 bushfires 12 months after the fires: likelihood of probable PTSD, psychological distress and suicidal ideation by selected characteristics

	Probable PTSD (odds ratio)	High K10 (odds ratio)	Very High K10 (odds ratio)	Suicidal ideation (odds ratio)
Time spent fighting fires—				
Less than 2 weeks	1	1	1	1
3 - 4 weeks	0.83	0.91	0.86	1.09
1 - 2 months	0.80	1.12	0.94	1.04
over 2 months	**0.55**	0.96	1.11	**0.66**
Travelled interstate (excluding NSW/ACT) to fight fires—				
No	1	1	1	1
Yes	0.94	**0.66**	1.05	1.00
Level of preparedness—				
Low	1.10	**1.54**	0.91	1.23
Moderate	**0.50**	**0.85**	**0.49**	**0.65**
High	1	1	1	1
Asked to perform a role they were not sufficiently trained for—				
No	1	1	1	1
Yes	**2.75**	**1.80**	**2.28**	**1.84**
Experienced a time when they felt that their life was threatened—				
No	1	1	1	1
Yes	**1.94**	**1.94**	**1.40**	**1.92**
Experienced a traumatic event that impacted deeply—				
No	1	1	1	1
Yes	**5.02**	**2.50**	**2.40**	**1.53**
Level of social support—				
Low	**13.9**	**19.0**	**10.5**	**14.5**
Moderate	**4.73**	**9.43**	**3.00**	**8.61**
High	**3.71**	**4.03**	**1.98**	**4.77**
Very high	1	1	1	1

Odds ratios relative to an arbitrarily chosen reference category for each factor (indicated by odds ratio of 1). Categories where the odds were statistically significantly different than for the reference category are shown in bold type.

Table 12: Wellbeing of employees actively involved in responding to the 2019-20 bushfires 12 months after the fires: likelihood of probable PTSD, psychological distress and suicidal ideation by selected characteristics

	Probable PTSD (odds ratio)	High K10 (odds ratio)	Very High K10 (odds ratio)	Suicidal ideation (odds ratio)
Time spent fighting fires—				
Less than 2 weeks	1	1	1	1
3 - 4 weeks	1.10	0.99	1.21	0.74
1 - 2 months	0.73	**1.51**	0.95	**3.01**
over 2 months	1.14	**1.34**	**1.61**	**2.04**
Travelled interstate (excluding NSW/ACT) to fight fires—				
No	1	1	1	1
Yes	**0.54**	**0.84**	**0.59**	**0.62**
Level of preparedness—				
Low	**1.45**	**2.73**	**1.95**	0.88
Moderate	**1.70**	**1.33**	**1.56**	**1.23**
High	1	1	1	1
Asked to perform a role they were not sufficiently trained for—				
No	1	1	1	1
Yes	**1.58**	**1.35**	**1.47**	**0.67**
Experienced a time when they felt that their life was threatened—				
No	1	1	1	1
Yes	**2.81**	**1.68**	**1.41**	**1.29**
Experienced a traumatic event that impacted deeply—				
No	1	1	1	1
Yes	**2.07**	**1.37**	**1.55**	**1.94**
Level of social support—				
Low	**13.5**	**15.0**	**30.1**	**17.1**
Moderate	**4.19**	**6.89**	**10.1**	**5.72**
High	**2.91**	**2.97**	**2.57**	**2.94**
Very high	1	1	1	1

Odds ratios relative to an arbitrarily chosen reference category for each factor (indicated by odds ratio of 1). Categories where the odds were statistically significantly different than for the reference category are shown in bold type.

Changes in wellbeing since 2020-21

Wave 2 survey

Table 13 shows changes in wellbeing of emergency services personnel in Wave 1 and Wave 2. Overall,12.4% of personnel had indicators of mental health distress at both Wave 1 and Wave 2. Among personnel responding to the 2019-20 bushfires, 7.5% had worsened mental health conditions in between Waves 1 and 2, and 5.7% had improved mental health conditions.

Table 13: Change in mental health status between Wave 1 and Wave 2

Probable PTSD, psychological distress or suicidal ideation at Wave 1	Probable PTSD, psychological distress, or suicidal ideation at Wave 2	
	No	Yes
No	74.4% (Mental health remained good)	7.5% (Mental health worsened)
Yes	5.7% (Mental health improved)	12.4% (Mental health remained poor)

Table 14 shows that levels of mental health distress persisted between Wave 1 and Wave 2. Among personnel responding to the 2019-20 bushfires, Wave 1 reports indicate 4.2%of volunteers and 5.1% of employees had probable PTSD at the time of the survey, and 4.2% of volunteers and 7.3% of employees had probable PTSD in the following two years as reported in Wave 2, representing an estimated 2,900 volunteers and 920 employees.

An estimated 4.2% of volunteers and 7.0% of employees had very high psychological distress indicative of serious mental illness (Wave 1), 4.5% of volunteers and 7.0% of employees had very high psychological distress indicative of serious mental illness (Wave 2), representing an estimated 3,000 volunteers and 1,000 employees, compared with 4.0% of the Australian population.

Levels of loneliness also persisted between Wave 1 and Wave 2. At Wave 1, 16.9% of volunteers were moderately, very or extremely lonely, while 18.9% were moderately, very or extremely lonely at Wave 2. Both employees and volunteers alike reported a decrease in basic sleep quality and impairment of physical health since the Wave 1 survey (Table 14).

Table 14: Changes in wellbeing of emergency services personnel

	Volunteers		Employees	
	Wave 1 (%)	Wave 2 (%)	Wave 1 (%)	Wave 2 (%)
Probable PTSD—				
Sub-threshold	6.3	6.3	6.7	9.4
Diagnostic criteria	4.2	4.2	5.1	7.3
Psychological distress—				
High	8.8	12.3	12.9	13.5
Very high	4.2	4.5	7.0	7.0
Suicidal behaviours—				
Ideation	5.5	5.6	5.7	4.0
Plan	2.8	2.3	2.4	1.9
Attempt	0.2	0.5	0.3	0.3
Probable PTSD, High or very high psychological distress or suicidal ideation	16.1	19.1	21.6	21.3
Sleep quality—				
Good	52.5	49.7	40.7	36.7
Fair	37.0	38.3	27.4	47.7
Poor	10.5	12.0	11.9	15.6
Resilience—				
High	70.6	68.9	69.8	67.3
Moderate	26.9	27.5	26.1	26.7
Low	2.5	3.6	4.0	6.0
Social support—				
Very high	46.4	43.8	64.4	61.5
High	24.7	26.3	12.7	13.4
Moderate	18.9	18.1	15.1	16.7
Low	10.0	11.9	7.8	8.5
Loneliness—				
Moderately	11.1	13.0	15.1	13.5
Very/Extremely	5.8	5.9	7.0	8.9
Physical health—				
Excellent	8.9	9.5	15.1	15.6
Very good	35.2	32.7	43.7	33.7
Good	44.8	42.0	30.5	38.5
Fair/Poor	11.1	15.8	10.8	12.1

Table 15 shows personnel experiencing psychological distress, and changes in these feelings since before the 2019-20 bushfires. An estimated 40% of volunteers and 30% of employees had reported no change in their mental health and wellbeing after receiving formal mental health care.

Among personnel experiencing psychological distress after the fires, 4.4% of volunteers and 4.3% of employees felt their feelings had much improved, however, 16.8% of volunteers and 10.0% of employees felt their feelings were much worse. While distress can be due to many facets of life and not just to experiences while working and volunteering, the large-scale impacts of the Black Summer fires, the challenges associated with rebuilding communities, and the accompanying financial hardships would all have been contributing factors.

> *We've just lost too many houses and people have lost too much, you know, you stand there, and you watch people's lives just disappearing in front of you. (Volunteer, CFS)*

Table 15: Personnel experiencing psychological distress, change in these feelings since before the 2019-20 bushfires

How much have these feelings changed?	Volunteers (%)	Employees (%)
Much improved	4.4	4.3
Slightly improved	13.3	11.8
No change	32.3	40.7
Slightly worse	33.2	33.2
Much worse	16.8	10.0

Table 16 shows that personnel whose mental health improved between Wave 1 and Wave 2 were more likely to exercise regularly, work in an inclusive workplace and with a team that is supportive of mental health issues, and to have someone to open up to.

Personnel whose mental health worsened or remained poor between Waves had high levels of binge drinking and were more likely to drink alcohol to manage their feelings or help them forget about problems. They were also likely to have high levels of anger symptoms, to have low levels of social support, and to be very or extremely lonely.

Table 16: Characteristics of individuals whose mental health improved, worsened, or remained poor between Waves 1 and 2

	Mental health worsened (%)	Mental health improved (%)	Mental health remained poor (%)
Experienced additional traumatic event(s) in Wave 2	85	63	77
Received treatment—			
in Wave 1	21	33	48
in Wave 2	29	26	43
Very or extremely lonely—			
in Wave 1	0	10	35
in Wave 2	25	5	31
Anger symptoms—			
in Wave 1	28	48	73
in Wave 2	55	29	73
Low social support—			
in Wave 1	38	46	69
in Wave 2	48	36	65
Binge drinking—			
in Wave 1	30	57	54
in Wave 2	39	40	48
Reasons for drinking—			
Helps when depressed or nervous	27	13	41
To cheer up when in a bad mood	26	8	32
To forget your problems	25	15	36
Makes social gatherings more fun	34	19	36
To enjoy a celebration	26	19	35
Like the feeling	30	25	43
Exercise more than 3 times per week	34	48	32
Talks to manager about mental health concerns	11	14	10
Talks with colleagues about mental health concerns	63	65	53
Has no-one to open up to	21	12	29
Would be hesitant to disclose a mental health issue at work/volunteer work	56	61	72
Workplace is inclusive	44	53	41
Team is supportive of people with mental health issues	58	71	56
Supervisor is supportive of people with mental health issues	63	68	55

Since the Wave 1 interviews, participants showed increased self-reflection, prioritising and understanding about their own mental health. This also included a shift to speaking about 'not if but when' the next big fire would happen. This 'acceptance', whilst expressed with conviction and concern, seemed to help give participants a greater sense of 'knowing' about their mental health, being prepared, and the potential for further trauma in the future. They no longer expressed a sense of having no control or being as naïve. These processes of learning, reflection and growth were described as predominantly situated within everyday peer interactions, with some being gained from more formal therapy.

> *This is something that's not just a case of if, it's a case of when… they've found that it actually is helpful to them because…they're prepared, they're realistic, they're not naïve anymore. (Firefighter, talking about his fire crew, SA)*

> *Irrespective of what governments do about addressing the impact of the global climate crisis it is likely that the damage that has already been done will continue to trigger more disasters. We cannot escape the conclusion that the new normal will be characterised by uncertainty. This makes it important that we learn as much as we can from our responses to these disasters. (Community Volunteer, SA)*

Participants were able to 'unpack' their trauma to understand it more, rather than simply feeling overwhelmed by it. This was particularly exemplified by the focus group participants who, in the first-round interviews, had previously struggled to come to terms with their near-death experiences whilst fighting the fires, and were expressing significant trauma, anger and distress at that time. They now had a greater understanding of their mental health reactions. Even though they had lengthy experience as firefighters, this time was not wholly about saving others; this was personal.

> *Whereas, after the [fires] stuff, I felt a lot of guilt. And I felt a lot of hopelessness. I had felt really angry about a whole lot of stuff. And the guilt was about responsibility. Did I make right decisions along the way? And as the psychiatrist pointed out, well they're still talking to you, so you probably did alright basically. And I just needed someone to actually … to put it into context. (SA Firefighter Focus Group)*

Participants emphasised the importance of needing 'time' to process and learn from their experiences as part of a learning, self-management process that could be drawn upon in future. They also discussed the importance of doing so with others who had directly shared their experiences, and how this process of 'recovery' strengthened the group's bonds.

> *[Talking about being together over time] They had space to learn for themselves what they needed for themselves. And that it was a learning – how they were learning themselves. It wasn't about some external sort of expert treating them for something. It was about them themselves learning it. (Firefighter, SA)*

I think it's really important to revisit. And I think I even revisit after a traumatic event. That sits really well with me. The potential is to re-traumatise people. But sometimes you need to go through some tough times to heal as well.

Looking back, and the question would you do it again? Obviously, I wouldn't do it again because it was such a disaster. But I've actually learnt a lot about myself, and other people because of this incident. Which I probably wouldn't ever have appreciated. So, I see some real positives for me coming out of this. (SA Focus Group)

SUICIDAL THOUGHTS AND BEHAVIOURS

In both Waves 1 and 2, personnel were asked if in the past 12 months they had seriously thought about ending their own life, if they had a plan to do so, and if they had attempted to take their life. Overall, 4.6% of volunteers and 4.9% of employees reported that they had seriously thought about ending their own life in the 12 months prior to the Wave 1 survey, while 1.6% of volunteers and 2.4% of employees said they had a suicide plan, and 0.2% of volunteers and 0.3% of employees said that they had attempted to take their own life in the past 12 months. These figures increased slightly in the second year after the fires (Table 17).

In comparison, in the 2007 Australian National Survey of Mental Health and Wellbeing (Slade et al, 2009), 2.3% of Australian adults had seriously thought about ending their own life in the 12 months prior to the survey, 0.6% of adults said that they had a suicide plan, and 0.4% of adults reported that they had attempted to take their own life in the 12 months prior to the survey.

Twelve months after the fires, 27% of volunteers and 34% of employees reported that their thoughts about taking their own life had increased since the bushfires, while only 16% of volunteers and 6% of employees said that their thoughts about taking their life had decreased since the bushfires. These rates correspond to an estimated 790 volunteers and 250 employees who reported a negative impact on their suicidal ideation as a result of their experiences with the 2019-20 bushfires.

Table 17: Suicidal thoughts and behaviours in the second year after the fires

	Volunteers (%)	Employees (%)
Suicidal ideation	3,550 (5.5%)	1,020 (5.7%)
Suicide plan	1,800 (2.8%)	400 (2.3%)
Suicide attempt	120 (0.2%)	50 (0.3%)

Table 18 focuses on personnel who had suicidal thoughts in the second year after the fires, but had not had suicidal thoughts in the first year, and in particular what the characteristics of this group were at Wave 1, as an indicator of whether there were opportunities to provide enhanced support to this group prior to onset of suicidal thoughts.

Overall, 63% of this group reported that they had needed help for mental health issues in the Wave 1 survey, and 57% had received some help by Wave 1. High alcohol consumption was common in this group, with 50% reporting having indulged in risky drinking and 38% reporting binge drinking (Table 18). Additionally, 38% of personnel who developed suicidal ideation after Wave 1 reported that they felt they were very or extremely lonely in Wave 1. Concerningly, only 2% of this group had talked to their manager about mental health concerns, suggesting that barriers to discussion of mental health issues in the workplace involving career concerns may play a role in developing suicidal thoughts. However, 68% of this group had talked with colleagues about their mental health concerns.

These findings suggest that other indicators of mental health distress such as developing concerns about wellbeing, maladaptive coping via excessive alcohol consumption, and isolation from managers in the workplace may play a role in mental health concerns progressing to suicidal thoughts. Additionally, the fact that a majority of this group had discussed their mental health with colleagues and had sought help for their mental health issues, suggests that many people who develop suicidal thoughts do try to obtain help.

> *There were times when I went down, and made an appointment, and got in in a couple of days. Which I thought was pretty amazing. That I actually walked in there to see – that I was actually suicidal. (Firefighter Focus Group)*

DFES Incident Photographer Evan Collis

Table 18: Characteristics of individuals who had suicidal thoughts in Wave 2 but not in Wave 1

	Proportion (%)
Needed help for mental health issues at Wave 1	63
Received help by Wave 1	57
Received treatment by Wave 1	42
Binge drinking at Wave 1	38
Risky drinking at Wave 1	50
Very or extremely lonely at Wave 1	38
Talks to manager about mental health concerns	2
Talks with colleagues about mental health concerns	68
Fair or poor sleep quality at Wave 1	71
Low social support at Wave 1	54
Probable PTSD at Wave 1—	
Sub-threshold	21
Diagnostic criteria	25
High or very high psychological distress at Wave 1	63
Reasons for not seeking help at Wave 2—	
Didn't think anything would help	47
Asked for but didn't receive help	26
Due to COVID-19 unable to access support	33
Wouldn't be able to access support confidentially	33

LIFE-THREATENING EXPERIENCES DURING THE 2019-20 BUSHFIRE SEASON

Participants were asked if, during the 2019-20 bushfires, there was a time when they felt that their life was threatened. An estimated 31% of volunteers and 25% of employees reported that they had felt that their life was threatened.

Among personnel who said that their life had been threatened, there were higher proportions who reported indicators of poor mental health at the time of Wave 1, approximately 9-12 months after the end of the fire season. Amongst volunteers who had experienced a life-threatening situation, the rate of probable PTSD was 9.1% compared with 2.4% among those without this experience. Among employees, 11.0% of those whose life was threatened during the fires had probable PTSD compared with 3.3% of those who had not experienced a life-threatening situation. Similarly, there were higher rates of high and very high psychological distress, lower rates of wellbeing, and higher rates of suicidal thoughts and behaviours among those whose life had been threatened during the bushfires (Table 19).

Table 19: Mental wellbeing of personnel who felt their life was threatened during the 2019-20 bushfires

Wellbeing indicator	Was there a time when you felt that your life was threatened?			
	No (%)		Yes (%)	
Volunteers				
Proportion of volunteers	68.9		31.1	
	Wave 1	Wave 2	Wave 1	Wave 2
Probable PTSD	2.4	2.6	9.1	8.8
K10 Psychological distress—				
Low	71.6	69.5	49.2	48.3
Moderate	17.7	16.9	25.9	24.8
High	7.3	9.1	17.6	19.3
Very high	3.4	4.5	7.3	7.6
Suicidal behaviours—				
Suicidal ideation	3.2	3.4	7.6	7.2
Suicide plan	1.0	1.2	2.9	2.2
Suicide attempt	0.0	0.0	0.5	0.7
Employees				
Proportion of employees	74.9		25.1	
	Wave 1	Wave 2	Wave 1	Wave 2
Probable PTSD	3.3	4.5	11.0	12.2
K10 Psychological distress—				
Low	59.3	58.3	45.2	43.7
Moderate	23.8	24.0	26.1	25.7
High	12.4	12.8	20.1	22.6
Very high	4.5	4.9	8.6	8.0
Suicidal behaviours—				
Suicidal ideation	3.9	2.8	7.8	6.1
Suicide plan	1.8	1.6	3.9	3.0
Suicide attempt	0.2	0.0	0.6	0.7

TRAUMATIC EVENTS DURING THE 2019-20 BUSHFIRE SEASON

Participants were also asked if, in responding to the Black Summer bushfires, they experienced a traumatic event that affected them deeply in the course of their work or volunteer work. An estimated 22% of volunteers and 19% of employees reported that they had experienced one or more such events (Table 20).

There was some, but not complete, overlap between having experienced a situation where they felt that their life was threatened and having experienced a traumatic event that affected them deeply in the course of the bushfires. An estimated 13.6% of volunteers reported that they had experienced a traumatic event that affected them deeply and a situation where they felt that their life was threatened, 17.5% said they had experienced a life-threatening situation but not a traumatic event that affected them deeply, and 7.8% reported they had experienced a traumatic event but not a life-threatening situation. Similarly, 10.5% of employees reported they had experienced a traumatic event that affected them deeply and had felt that their life was threated, 14.6% said they had experienced a situation where they felt their life was threated but had not experienced a traumatic event that affected them deeply, and 8.7% reported they had experienced a traumatic event that affected them deeply but not a life-threatening situation.

There were higher rates of poor mental health among those who had experienced a traumatic event that affected them deeply during the bushfires. Amongst volunteers who had experienced a traumatic event, the rate of probable PTSD was 13.0% compared with 2.2% among those who did not experience a traumatic event and among employees 12.3% of those who had experienced a traumatic event had probable PTSD compared with 3.5% of those who had not. Similarly, there were higher rates of high and very high psychological distress, lower rates of wellbeing, and higher rates of suicidal thoughts and behaviours among those who had experienced a life-threatening situation (Table 20).

Among volunteers who had experienced both a traumatic event and a life-threatening event, the prevalence of probable PTSD was 16.0%, and an additional 9.4% had symptoms of PTSD with impairment of functioning but did not meet all diagnostic criteria for PTSD. In this same group, 26.2% had high psychological distress and 10.7% had very high psychological distress. Among employees who had experienced both, the prevalence of probable PTSD was 17.2% and 10.1% had sub-threshold symptoms of PTSD with impairment of functioning but did not meet all diagnostic criteria for PTSD (see Glossary). In this same group, 21.7% had high psychological distress and 13.2% had very high psychological distress.

In general, there were only small changes in levels of indicators of mental health distress between Wave 1 and Wave 2 for people who experienced traumatic events in the bushfires. This suggests that the mental health issues that were observed 12 months after the fires generally were not transient or short-term issues, but rather issues that continued to impact people's lives over the subsequent 12 months as well. This highlights the importance of taking proactive actions to address mental health concerns when they arise, as they are often persistent over long periods.

Table 20: Mental wellbeing of personnel who experienced traumatic event(s) which deeply affected them in the course of their work during the 2019-20 bushfire season

Wellbeing indicator	Traumatic event experienced in the course of work during the 2019-20 bushfire season			
	No (%)		Yes (%)	
Volunteers				
Proportion of volunteers	78.5		21.5	
	Wave 1	Wave 2	Wave 1	Wave 2
Probable PTSD	2.2	2.9	13.0	12.6
K10 Psychological distress—				
Low	69.8	67.7	46.0	46.5
Moderate	19.1	18.8	24.3	22.5
High	7.9	9.7	19.9	21.9
Very high	3.2	3.8	9.8	9.1
Suicidal behaviours—				
Suicidal ideation	3.7	3.9	8.0	7.8
Suicide plan	1.0	1.2	3.9	3.7
Suicide attempt	0.0	0.0	0.7	0.8
Employees				
Proportion of employees	80.7		19.3	
	Wave 1	Wave 2	Wave 1	Wave 2
Probable PTSD	3.5	4.7	12.3	12.7
K10 Psychological distress—				
Low	59.3	59.2	40.9	43.1
Moderate	23.3	23.8	29.2	25.2
High	13.1	12.8	19.4	20.9
Very high	4.3	4.2	10.5	10.8
Suicidal behaviours—				
Suicidal ideation	3.7	2.8	10.0	7.7
Suicide plan	1.7	1.4	5.1	4.3
Suicide attempt	0.2	0.2	0.7	0.7

Impact of traumatic events on mental health and wellbeing

The rates of probable PTSD, high or very high psychological distress and suicidal ideation 12 months after the fires were higher in people who had experienced a traumatic event and/or life-threatening situation while responding to the 2019-20 bushfires. The study has found that over 5,000 personnel responding to the fires, mostly volunteers, have probable PTSD, very high psychological distress, or suicidal ideation, indicating high needs for mental health support (Table 21). This was more than double the number that would be expected in the absence of events of this nature.

Table 21: Number of cases of probable PTSD, high or very high psychological distress or suicidal ideation one year after the fires among personnel who were exposed to either a life-threatening situation or a traumatic event in the bushfires[a]

Wellbeing indicator	Number of cases	Expected number based on rates in remainder of workforce	Excess number of cases
Volunteers			
Probable PTSD	2,260	450	1,810
Very high psychological distress	1,900	720	1,180
High or very high psychological distress	5,970	2,520	3,450
Suicidal ideation	1,820	770	1,050
Probable PTSD, very high psychological distress or suicidal ideation	4,150	1,610	2,540
Probable PTSD, high or very high psychological distress or suicidal ideation	6,680	3,150	3,530
Employees			
Probable PTSD	610	210	400
Very high psychological distress	520	280	240
High or very high psychological distress	1,710	1,070	640
Suicidal ideation	500	200	300
Probable PTSD, very high psychological distress or suicidal ideation	1,040	520	520
Probable PTSD, high or very high psychological distress or suicidal ideation	1,880	1,150	730

a compared to the expected number based on the rates among people who did not experience these traumatic situations in the bushfires

In order to estimate the magnitude of the impact of traumatic experiences during the 2019-20 bushfires, the number of cases that would have been expected in people who experienced traumatic events was calculated for comparison assuming that these problems occurred at the same rate as in the group who did not have these experiences during the bushfires. This was used to calculate the extra number of cases in excess of expectations.

This provides an estimate of the number of additional personnel who may be in need of support following the bushfires. Overall, 4,150 volunteers and 1,040 employees who were exposed to traumatic events or life-threatening experiences during the bushfires had indicators of high need for mental health support – probable PTSD, very high psychological distress or suicidal ideation. This is 2,540 volunteers and 520 employees more than would have been expected to have such needs in the absence of the bushfires.

CUMULATIVE TRAUMA

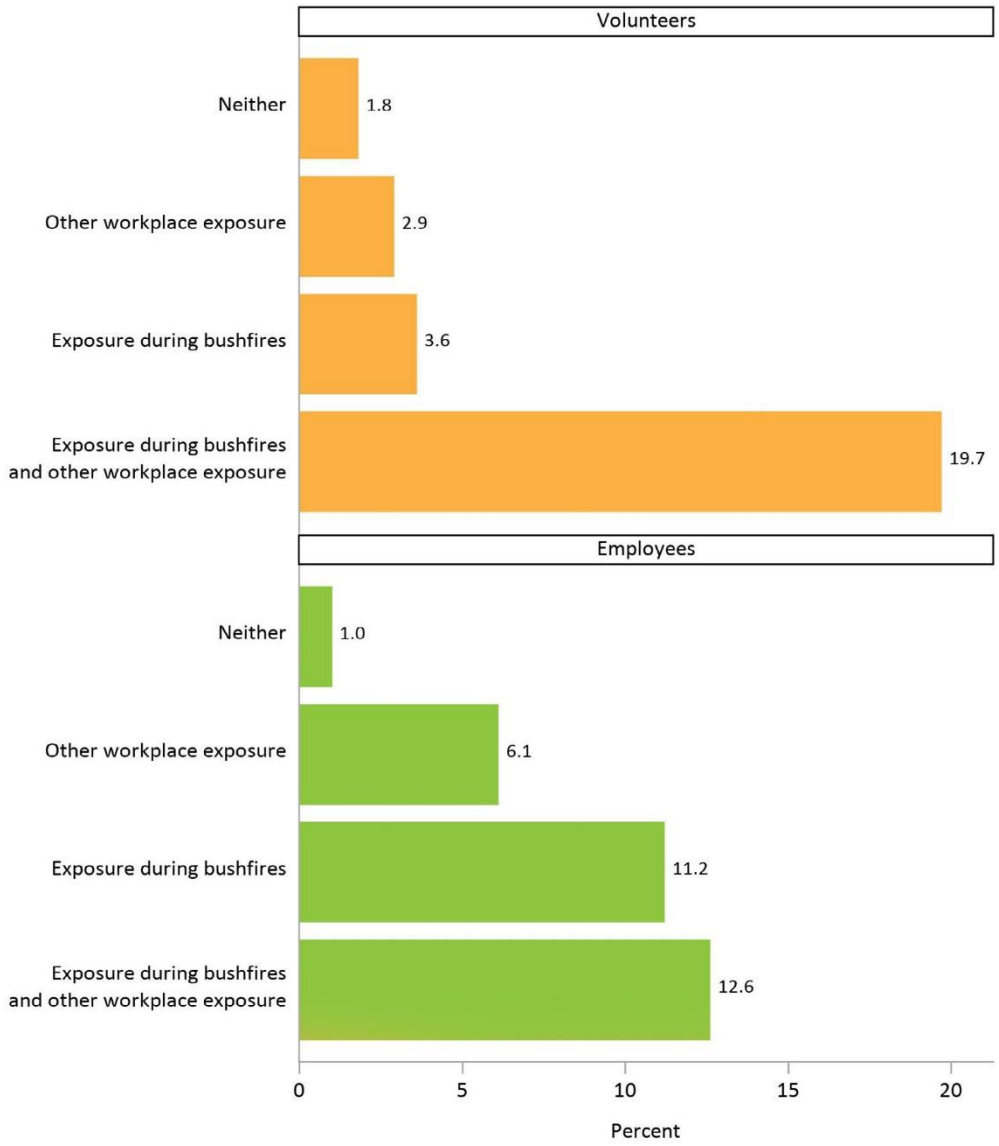
After the Fires confirms previous research that cumulative exposure to traumatic events over the course of a career is the main pathway to developing mental health problems in the emergency services sector, more than the impact of any single traumatic experience. One impact of more frequent, large-scale emergency events is that the increase in the number of people exposed to individual traumatic situations also increases the number of personnel experiencing cumulative trauma exposure over time. This would have been especially true due to the high mobilization of the volunteer and paid workforce during the Black Summer fires. Increasing numbers of large-scale events, coupled with the finite pool of volunteers and employees in the sector, often with long-term tenures, poses a potential problem for maintaining a sustainable volunteer workforce into the future.

Volunteers participating in qualitative interviews also talked about the impact of attending road traffic accidents. In smaller regional communities it can sometimes be the same small pool of volunteers who attend each incident, and in small communities there is a higher likelihood of knowing the people involved.

Among volunteers who experienced a traumatic event while responding to the 2019-20 bushfires, 58% reported that they had experienced other traumatic events that had affected them deeply in the course of their volunteer work not related to the 2019-20 bushfires. The rate of probable PTSD among these volunteers was 19.7% (Figure 3). In comparison, among volunteers who had not experienced a traumatic event in the course of their volunteer work, the rate of probable PTSD was 1.8%.

Among employees who experienced a traumatic event while responding to the 2019-20 bushfires, 77% reported that they had experienced other traumatic events that had affected them deeply in the course of their work not related to the 2019-20 bushfires. Their rate of probable PTSD was 12.6% (Figure 3). Whereas, for those employees who had not experienced a traumatic event in the course of their work, the rate of probable PTSD was 1.0%.

Figure 3: Probable PTSD after 1 year by exposure to traumatic events in the bushfires and other workplace exposure to trauma



While there are over 200,000 registered volunteers in fire and SES organisations across Australia, volunteer work is not evenly distributed across the entire cohort. Some volunteers have more capacity than others to volunteer, and in many areas the burden of volunteer duties falls to the same group of volunteers repeatedly.

The survey asked participants about their experiences of additional traumatic events between Wave 1 and Wave 2. Overall, one-fifth of volunteers and one-third of employees experienced at least one traumatic event that affected them deeply in this period. However, volunteers and employees who had experienced traumatic events during the Black Summer bushfires were more likely to have experienced subsequent traumatic events as well, with 28% of volunteers and 45% of employees who experienced a traumatic event during the bushfires having experienced another traumatic event in the 12 months between the Wave 1 and Wave 2 surveys (Table 22). These proportions illustrate the extent to which cumulative trauma exposure occurs within the emergency services sector.

Table 22: Proportion of personnel who have experienced a traumatic event that affected them deeply at work/volunteer work between Wave 1 and Wave 2

	Volunteers	Employees
All personnel	18.6	35.2
Experienced a traumatic event during 2019/20 bushfires—		
No	16.2	33.1
Yes	27.9	45.2

All survey participants were asked the number of times that they had experienced stressful events that had affected them deeply. Most volunteers and employees had multiple exposures to stressful events, with the majority reporting that they had experienced such events a few times (Table 23).

Table 23: How many times have you experienced stressful events that affected you deeply

	Volunteers	Employees
None	19.8	13.8
Once	11.1	7.3
A few times	57.5	57.7
Many times	11.6	21.3

There was an association between ongoing experience of traumatic events and persistence of PTSD. Amongst volunteers and employees who experienced one or more traumatic events affecting them deeply in the bushfires, around 12% had probable PTSD at both Waves 1 and Wave 2. However, 22% of volunteers who experienced additional traumatic events since the bushfires had PTSD at Wave 2 compared with only 5% of those who had not, suggesting that additional exposure to

trauma is associated with persistence of PTSD.

Table 24: Personnel who experienced a traumatic event during the 2019-20 bushfires, proportion with probable PTSD after 2 years, by experience of additional traumatic events after the bushfires

Experienced traumatic event(s) which deeply affected them in the course of their work during the 2019-20 bushfire season	Volunteers		Employees	
	Wave 1	Wave 2	Wave 1	Wave 2
No	2.2	2.9	3.5	4.7
Yes—	13.0	12.6	12.3	12.7
Experienced additional traumatic events since—				
No		5.3		8.1
Yes		22.0		17.8

As well as collecting information about involvement in the 2019-20 bushfires, participants in the survey who had PTSD or sub-threshold symptoms of PTSD (see Glossary) were asked if their feelings or reactions were mainly due to one particular event or a series of events. The majority of personnel with probable PTSD or sub-threshold symptoms of PTSD reported that their symptoms were related to a series of events (Table 25). This suggests that cumulative exposure to traumatic events is adding to the mental health burden for both volunteers and employees. Volunteer and paid fire and rescue and emergency services personnel are involved in many more incidents than just bushfires, including motor vehicle accidents, search and rescue missions, storms, floods, and cyclones. Volunteers and employees typically spend many years in emergency services roles, with one-third of volunteers having been volunteering in emergency services for over 20 years. Some of the volunteers participating in the study had also been involved in previous major fires including Ash Wednesday and Black Saturday.

> *This is just one too many … I sort of walked away thinking this is just one too many, you know, we're just over, over 30 years in the CFS, you know we've just lost too many houses … It just gnawed at me (Firefighter SA)*

Table 25: Personnel with probable PTSD or sub-threshold PTSD symptoms, number of contributing events

Number of stressful events	Volunteers		Employees	
	Probable PTSD (%)	Sub-threshold PTSD symptoms (%)	Probable PTSD (%)	Sub-threshold PTSD symptoms (%)
One event	8.2	20.5	1.7	6.2
A few events	47.5	45.1	26.6	32.0
Many events over a period of time	44.3	34.4	71.7	61.8

Community members also reported experiencing ongoing triggers in their daily lives that hindered their mental health recovery. Notably, the researcher delayed interviews with one community which had experienced lightning strikes which 'set everyone on edge again many months after the fires. Sometimes, the triggers were less obvious.

> *Every Monday when I hear the CFS siren or a plane overhead, I stand there and look up and catch my breath without really realising I'm doing it. These triggers are clearly just under the surface. (Community Volunteer, SA)*

> *I need to be careful about what I read. So, if it's in the context of firefighting, I've got to be really careful about picking that. Also, what's on TV, or – or Netflix or whatever. There's some really good stuff that I need to be really careful about that, because that night I usually don't sleep very well. (SA Firefighter Focus Group)*

Fire and Rescue NSW

PERCEIVED NEED FOR HELP OR SUPPORT

After the Fires used a model of perceived needs for help with mental health or emotional wellbeing that splits people with probable PTSD, very high psychological distress or suicidal ideation into two categories—those who received help and those who did not. Those who did not receive help were further subdivided into those who did not believe they had a problem, despite reporting symptoms of mental health issues and associated impairment, those who recognised they had a problem but did not think they needed any help, and those who recognised a need for help but did not seek or receive help. Those who did receive help were asked if they received sufficient help or needed more help for their mental health concerns.

Figure 4: Perceived need for help among personnel with probable PTSD, very high psychological distress, or suicidal ideation

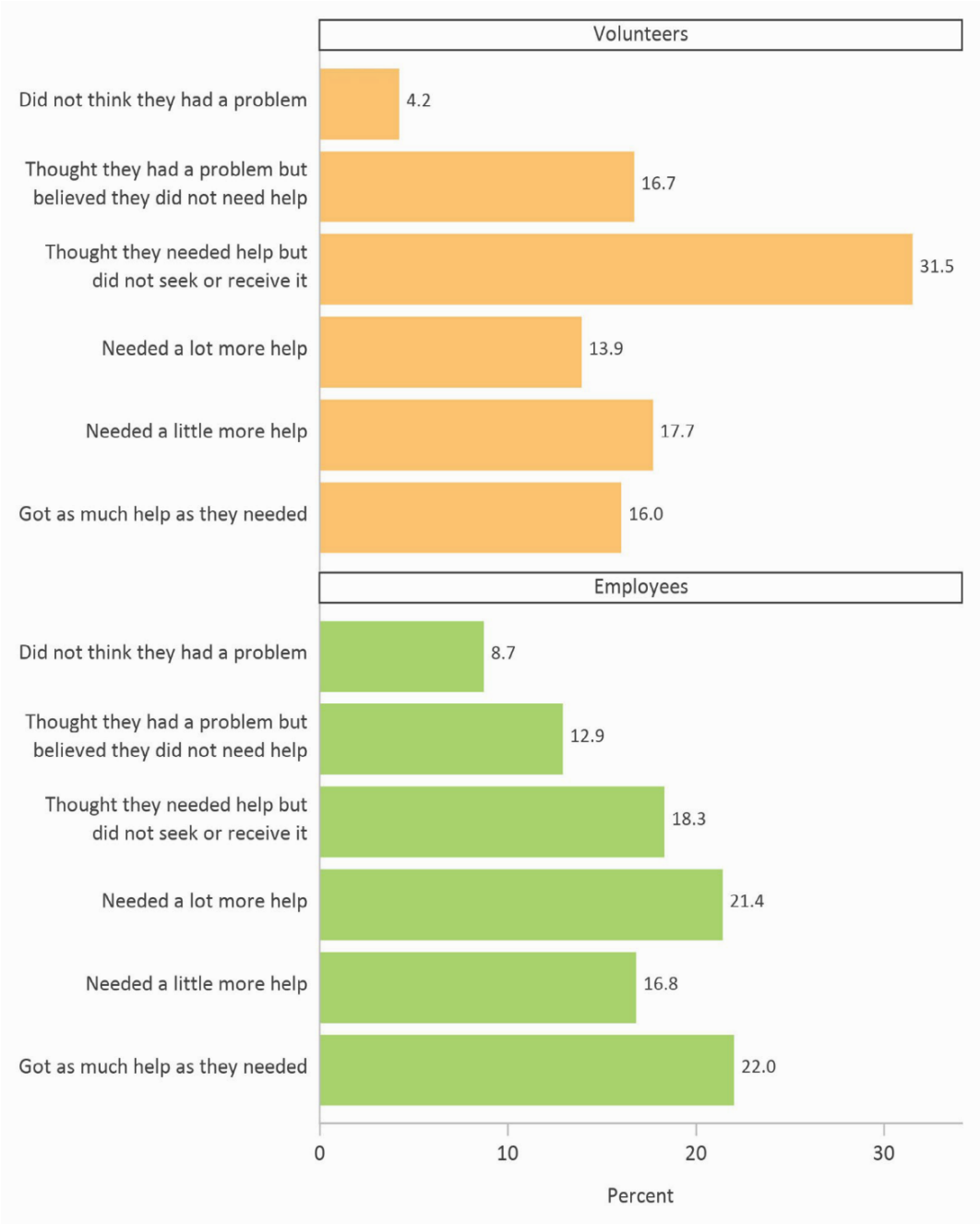


Figure 4 shows perceived needs for help among personnel with probable PTSD, very high psychological distress or suicidal ideation, all of whom would be expected to have high need for mental health support. Over half (52.4%) of volunteers and 39.9% of employees with indicators of high need for mental health support did not receive any help. The proportion of those with high needs who did not believe they had a problem or needed help suggests there are still issues to be addressed with mental health literacy in the sector, in terms of understanding what types of mental health issues can be treated and what types of treatments are available. Overall, only 16.0% of volunteers and 22.0% of employees with high needs reported receiving sufficient help for their needs, suggesting that among those who do seek help there are still issues to resolve regarding access to appropriate and sufficient levels of support.

Table 26 shows there was little evidence of change in levels of perceived need or levels of help received between Wave 1 and Wave 2. Still less than one in five volunteers or employees with either probable PTSD or high or very high levels of psychological distress felt that they had received sufficient help for their needs. This suggests that it is unlikely to be changes in individual levels of receiving help that would be associated with general improvements in the mental health of the workforce. Volunteers with probable PTSD or high psychological distress were more likely to think they needed help but not seek it in the Wave 2 survey, and fewer volunteers received as much help as they needed.

Table 26: Help seeking experiences two years post bushfires: personnel who had probable PTSD, high or very high psychological distress or suicidal ideation at Wave 1

Needed help at Wave 1	Wave 1 (%)	Received help by Wave 2		
		None (%)	Some but needed more (%)	Received sufficient help (%)
Volunteers				
Help received—				
None	47.6	77.6	14.3	8.2
Some but needed more	27.2	35.7	42.9	21.4
Received sufficient help	25.5	Continued receiving help: 57.7%		
Employees				
Help received—				
None	41.8	81.8	6.1	12.2
Some but needed more	40.5	46.9	28.1	25.0
Received sufficient help	17.7	Continued receiving help: 28.0%		

The lower proportions of volunteers receiving adequate help may be explained by the fact that some are relying on informal rather than formal support processes. Many focus group participants in Wave 2 recounted processes of ongoing learning about their traumatic experiences, both as individuals but also with others in their immediate crew or station. They emphasised the value of informal emotional support among volunteer firefighters as the main trusted form of ongoing mental health support and as the key vehicle for supporting volunteers to receive and seek support and eventually, for some, to seek out more formal mental health support.

Help-seeking and help-offering need to fit with fire-fighter volunteer culture which is predominantly underpinned by and starts with informal peer support, and also an emphasis on self-reliance, stoicism, and community leadership, being 'strong' for the community and being there for each other. (Firefighter, SA)

You can talk to your mates because they know exactly what you're talking about because they've been there … they won't think that you're weak or they won't think that you're not up to scratch, so they will back you up and they'll help you out. (Firefighter, SA)

For some participants, the process of healing was even more explicit and occurred as a group, such as revisiting the fire ground together, which was emphasised as a significant activity that must be done with informal peers, as explained by an SA fire crew:

[Revisiting the fire affected areas with family] And I haven't been able to go. And that was holidaying. And I just really, I – I didn't want to. I think my wife understood, yeah. Hard to explain because I couldn't really understand it either. But I've been back with these guys [peers] twice. It was different going back with them, rather than going back as a family holiday, because when we went back, it was about repairing for us basically. And trying to get some positives out. (Firefighter, SA)

A number of volunteers mentioned dedicated group retreats for volunteer firefighters as a safe model of peer support.

[Talking about joining a veteran/first responder peer retreat (Trojans Trek)] It was actually a bit useful to be just a little bit out of your comfort zone, definitely was. It sets you up for just telling the truth, and not brushing stuff aside. And what you put in is what you get out. And I think if you're with all your mates, you kind of just gloss over the details, and she'll be right mate…. But yeah, especially with what these people have been through – you're not talking to a professional that's been to uni for 10 minutes, but someone else who's gone through their own shit. (Firefighter, SA)

Importantly, focus group participants emphasised several qualities they saw as crucial for mental health professionals in supporting volunteers' engagement with them. These qualities included ensuring transparency regarding expectations, not making the person retell their story or feel that they have to justify why they are seeking help (i.e., helping them feel safe and not re-traumatised), presenting as calm and attentive, being invested and proactive in monitoring the volunteer's wellbeing, and being responsive by being available and flexible with appointments.

Well, the doctor said to me – are you suicidal? And I said, "hell no". So that's something a doctor can say, where someone else couldn't say it. They don't muck around. They just – they just ask you. And they say it calmly. And then it gives you permission then to not keep it to yourself.

BARRIERS TO HELP SEEKING

Seeking help for mental health issues was clearly a complicated and complex issue for many volunteers. It was noticeable that all focus group participants in Wave 2 still recounted vividly the events of the Black Summer fires, down to the details of days, dates, hours, specific interactions, decisions taken, and so forth. Several participants had sought psychological counselling or other formal mental health support, but they were aware of other volunteers who were still struggling with mental health issues who had not sought support or refused to do so. There were ongoing impacts on the whole group – positively by encouraging them to then seek support for themselves, or negatively by mentally unsettling the crew. Mental health impacts were seen as a process that lingered over time, not only arising from distinct events, then resolving.

> *It's just the great denial, you know. I'm alright, but you know they're not. But yeah, it'll be, everybody in the brigade is seeing it, there's always a bit of an edge when it's about - it's unsettling. Just don't know when someone's going to go off - tipping the other way you know. So, yeah anyway we'll do, we'll move on and they'll have to find support where they can, we do as much as we can, so…. It's difficult for the other brigade members, but I guess there's a lesson in it isn't there? (Firefighter, NSW)*

Personnel who perceived a need for help with mental health issues who either did not seek help or delayed seeking help at least three months after the first time they felt they needed help were asked about barriers to help seeking in both waves. The most common barrier to help seeking was wanting to deal with problems informally either by themselves or with family and friends, suggesting that personnel in the sector with emerging mental health needs may be waiting rather than seeking formal help when problems first arise (Table 27). This was reflected in the earlier comments from volunteers about relying on peer support for help.

> *Volunteers are the stronger, more determined people in your community… so they tend to want to look after their problems themselves. They will resist getting help, because it's a sign of weakness, isn't it? (Firefighter, VIC)*

Other barriers highlighted the persistent impact of negative stigma surrounding issues related to mental health and wellbeing, such as people feeling as if they would be treated differently, or that it would harm their career prospects. For volunteers, being seen as weak or feeling it would negatively impact on their colleagues were identified as common barriers. These barriers to help seeking have been identified in previous research and remain as commonly cited issues for emergency services personnel. This highlights the persistence of negative stigma and stereotypes around mental health issues in the sector. There is an ongoing need to address mental health stigma and culture around emotional wellbeing.

Table 27: Barriers to seeking help among employees who perceived a need for help with mental health issues who either did not seek help or delayed seeking help

Barrier	Volunteers (%)	Employees (%)
Wouldn't know where to get help	11.1	9.9
Would have difficulty getting time off work	14.1	17.5
Wouldn't be able to do it confidentially	18.9	27.4
Would harm my career prospects	20.7	35.1
People would treat me differently	32.0	40.7
Would be seen as weak	26.3	33.8
Would stop me doing operational work	17.4	31.8
Would be a burden to my team or family	21.2	28.9
Prefer to deal with problems informally	68.8	74.6
Would negatively impact my colleagues	21.2	25.0
Don't believe treatments are effective	13.3	8.9
Don't trust mental health professionals	13.0	8.0
Unable to access support due to COVID	9.1	7.7

During the focus groups, participants raised a number of concerns about available mental health support and a range of barriers to seeking it. These included actual or perceived inexperienced or unaligned counselling and treatment options, fear of stigma or being misunderstood and feeling vulnerable in unfamiliar settings, along with organisational 'red tape' that undermined their attempts to connect with support services.

> *[Recounting veteran/first responder inpatient ward closure and move to general psychiatric hospital inpatient ward] But at this new one, you walk in there and no one knows you, and no one knows why you're there…. We don't want to go down there and have people think that there's bloody something wrong with us…. You know not the pressures of having to be confronted with strangers who may or may not understand, and the pressure of having to try and explain yourself. (Firefighter, SA)*

> *We attended a real bad accident, and we had a couple of members that were pretty upset about this, so somebody actually rang downtown, and they got a counsellor to come up…. So, when we got back to the brigade there was a counsellor there, a young lady. And we came in and as we backed the truck in and we started cleaning up, she actually come out and she said, "Do you mind if I have a look at your truck, I've never been this close to one before?" And she's coming into counsel the firefighters on an incident that they've been to, and she has got no, hasn't got a clue, not a clue about what we've done or where we've been. (Firefighter, SA)*

AGENCY SUPPORT FOR MENTAL HEALTH

Levels of agency support for mental health issues showed a small improvement between Wave 1 and Wave 2 (Table 28), although other workplace culture measures for volunteers and employees alike showed no variation between waves. There has been increased public awareness of the challenges associated with the Black Summer bushfires, as well as a Royal Commission into National Natural Disaster Arrangements. Both of these outcomes may have provided an added impetus to agencies to address some of the shortfalls identified in post-fire fora. This slight improvement is encouraging and will hopefully lead to further improvements once the National Disaster Mental Health and Wellbeing Framework is implemented more widely.

Table 28: Perceptions of agency support for the mental health and wellbeing of its personnel

	Volunteers	Employees
Agency supports mental health of its personnel	94%	96%
Implemented changes since bushfires	45%	41%
Average rating of mental health support (from 1 to 7)—		
Prior to the 2019/20 bushfires	5.7	5.5
Now	6.3	6.0
Change	0.6	0.5

While the survey results indicated small improvements, the sentiments expressed by the focus group participants two years after the bushfires indicate there is still some way to go in organisational culture. Participants discussed the lack of transparency and accuracy in how their organisations undertook post-fire assessment of the events and logistical decisions during the fires - how they were reported on, and the actions taken, based on those reports. They described these processes as damaging and re-triggering; and perceived their purpose as 'finding someone to blame', rather than constructively learning from the events and improving future responses.

Moreover, the process used to capture the information from volunteers was also perceived as damaging. Several participants described how they were 'shut down' in meetings held to debrief and assess the events in hindsight, or to communicate to them the findings of reports. This lack of acknowledgement of the volunteers' perspective was particularly problematic for their mental health and recovery. For some, it was a source of ongoing anger, a sense of betrayal, and distrust in the management of their organisations.

They will ask for feedback, but it doesn't get written down if it's spoken and if you send it to them, they won't prove they ever wrote it down if you ask to see the list. The guy at the front asked people for feedback, so I gave some. It was a fairly sensible suggestion, and after speaking to everyone afterwards, they agreed that my suggestion was sensible. But in a public forum, I outspokenly said, "we should do this, that and the other", and he shot me down. I was publicly humiliated for having made a suggestion. (Firefighter, QLD)

The ongoing negative mental health impacts of these post-fire organisational responses and reports were apparent.

A couple of the workshops where they discussed the reports came out pretty much all the guys that did divisional command work, the report pretty much threw them under the bus…. And we try to say to them, like you know the reason it didn't work was there weren't enough of us, … you can't run a fire without a communication plan that works from top to bottom, and there was no middle, there was no one to put in the middle. (Firefighter, SA)

Finally getting that report made a difference in that it confirmed to me that there was some really major stuff ups here. And that was an acknowledgement about what we believed. But then it made us angry because nothing actually changed after that report. Well, it didn't seem to be anything changing. And now I know that there have been some changes, but they're subtle changes that actually haven't impacted on us yet. (SA Firefighter Focus Group)

When a firefighter is also a community member in a fire-affected area, their community environment can also play an important role in their mental health recovery. A participant described how many in her community continued to struggle with their mental health and how this impacted her, given her strong commitment to others in her community. She emphasised the importance of governments and emergency service organisations acknowledging the inherent harms that are part of the role for all firefighters.

I think to me it's not a possibility but a probability that when you work in a disaster response or recovery space that you will be exposed to risk of psychological harm and that psychological safety is not built into current operational procedures. And I think that there is an acknowledgement that some may be impacted afterwards, but I would argue that it is more probable than possible that everybody will have some impact. The Heads of the MFS and the CFS they just didn't understand. They said, "Oh well, you know we've had awards; we've said thank you". (Community volunteer, SA)

COMMITMENT TO VOLUNTEERING

Volunteers were asked whether their experience of the 2019-20 bushfires impacted on their commitment to volunteering (Table 29). Overall, commitment to volunteering was strengthened for a substantial proportion of volunteers after the fires, with a much smaller proportion indicating their commitment had lessened. This was particularly notable among younger volunteers. Almost 60% of volunteers under 25 years, and 40% of volunteers aged 25-34 were more committed to volunteering after the 2019-20 bushfires. For older volunteers, they remained committed to volunteering but in different roles.

> *And it was getting very physically draining you know; I was not able to cope as well as I could after 30 years. But we had a heap of younger people come in … it gives you some hope I guess, and we can take a step back now and work on the logistics and communication side. (Volunteer firefighter)*

Table 29: Commitment to volunteering by age group

Age group	Has the experience of the 2019-20 bushfires changed your commitment to volunteering in the emergency services in the future?		
	I am more committed to volunteering (%)	My commitment hasn't changed (%)	I am less committed to volunteering (%)
Less than 25 years	57	41	2
25 - 34 years	40	50	10
35 - 44 years	25	70	5
45 - 54 years	20	73	7
55 - 64 years	17	74	9
65 years or over	16	80	4
Total	22	72	6

However, not all volunteers involved in the Black Summer fires felt positively about continuing in their roles. Focus group participants described a range of circumstances that had adverse cumulative impacts on their mental health, which has been reinforced elsewhere in this report. Some participants sought out formal treatment and therapy (some continue to receive regular clinical support), whilst others expressed feeling defeated and have left the volunteering role. The decision to leave was also underpinned by the accumulation of traumatic events and experiences over time. Volunteers typically attend road and other accidents, as well as fighting fires, all of which are potentially traumatic. These incidents continued on for these personnel during the crisis period of the Black Summer fires, testing their resilience and their ongoing commitment to volunteering in general.

> *And then not long after that [the fires], you know we had a fellow who had a bad accident out at the recycling plant…and we spent, oh an hour and a half I think doing CPR on this bloke. And you know the rescue helicopter came in with a doctor and crews, and we couldn't save this bloke, and it's the same*

thing, isn't it - you know we've lost. You look at it and you think all this work that we've done, and you're put in a position where you can't win, you know you can't even bloody break even. (Firefighter, SA)

IMPACT OF COVID-19 PANDEMIC

COVID-19 was first detected in Australia in January 2020, and lockdowns started in March 2020, very soon after the end of the 2019-20 bushfire season. This may have impacted on personnel's connections with colleagues, particularly for volunteers who may not have been able to attend regular training sessions in the aftermath of the fires. Elsewhere in this report, we have demonstrated the significant role of social support in ensuring good mental health after traumatic events, and this was borne out during the qualitative phase of the study, where the importance of camaraderie was apparent among volunteers. Therefore, this loss of peer contact may have had a detrimental effect on some people.

Respondents were asked about the impact of the COVID-19 pandemic on their mental health and wellbeing and on their income (Table 30). An estimated 36% of volunteers and 40% of employees indicated a small negative impact on their mental health and 7% of volunteers and 6% of employees indicated a large negative impact. An estimated 31% of volunteers and 25% of employees reported reduced income.

According to Volunteering Australia, volunteering rates for those in the emergency services/disaster relief organisations dropped by 26.3% due to COVID-19. This rate was lower than that for all of the other types of volunteering activities, which indicates the strong connection regional emergency services volunteers, in particular, have to their role and their communities. Disaster events, such as the Black Summer bushfires or the widespread floods which followed in 2022, have demonstrated how volunteers can mean the difference between life and death for those living in affected regional areas. These volunteers are often the only form of defense in extreme emergencies. Consequently, being an emergency services volunteer calls for a level of commitment which is regardless of pandemic impacts, such as job loss or family ill-health.

Clearly, Australia places great reliance on its volunteer workforce to continue their work under any circumstance, which emphasises the fact that volunteers require sufficient levels of health services and financial support, if necessary, to ensure they can continue in their roles, without detriment to their own quality of life. Our changing climate is likely to bring about more frequent and more intense natural disasters. This report has highlighted the mental health impacts of such events. Strategies to address any shortfalls in service accessibility and delivery, and to address community preparedness are essential and should be implemented without delay.

Table 30: Impact of COVID-19 pandemic

	Volunteers (%)	Employees (%)
Impact on mental health and wellbeing—		
Large positive impact	1.5	1.8
Small positive impact	6.1	6.0
No impact	49.9	46.1
Small negative impact	35.6	40.3
Large negative impact	6.9	5.8
Impact on income since March 2020—		
Reduced a lot	14.5	8.7
Reduced a little	16.5	16.8
About the same	58.3	65.5
Increased a little	9.0	7.7
Increased a lot	1.7	1.3

IMPLICATIONS

> *I think it should be the fabric of the organisation to acknowledge, especially when we don't pay people, that this job may have a lifelong negative impact on your psychological wellbeing.*

The Australian Black Summer bushfires were unprecedented in magnitude, duration and intensity. The scale of devastation was greater than ever experienced before in Australia. In total, 33 lives were lost, more than 3,000 homes were destroyed, wildlife was decimated, and over 20 million hectares of community and farming land and national parks were burnt. *After the Fires* has documented a less easily seen but nevertheless profound impact in the additional 3,000 personnel suffering ongoing mental health issues at least two years post fires. While post-COVID the popular consciousness may have moved on to other news headlines, this remains an important after effect that requires ongoing commitment to address.

Improving Australia's disaster preparedness

After the Fires set out to study the experiences of emergency services personnel in responding to the bushfires and the impacts these experiences have had. While the Black Summer response was an exceptional commitment for emergency services, the increasing number of disasters and emergencies makes it important to learn from these experiences to improve Australia's preparedness to respond to future disasters. While almost all available paid personnel were involved in the response to the 2019-20 bushfires, 78% of responding personnel were volunteers - evidence that Australia is highly dependent on volunteers to respond to major bushfire events. A positive finding from the study was that commitment to volunteering in these roles remains strong. However, it is equally apparent that volunteering can come at a cost. Repeated exposures to traumatic experiences can have negative impacts, and such wide scale events as the Black Summer fires increase cumulative exposure to traumas for career volunteers and paid personnel alike.

It is likely that volunteers will continue to play a key role in responding to major bushfires and other natural disasters in the foreseeable future. As such, a critical part of planning for future events of this nature is ensuring that Australia has a sustainable volunteer workforce. The results from *After the Fires* highlight the importance of supporting mental health and wellbeing as part of preparedness for future disasters. The Royal Commission into National Natural Disaster Arrangements (2020) also emphasised the importance of planning for and ensuring enhanced preparedness for responding to natural disasters. In response, the National Disaster Mental Health and Wellbeing Framework (the Framework) has identified a number of strategies and actions, all of which recognise the need for several layers of support that are flexible, accessible, and appropriate. The Framework also acknowledges the role of stigma and its detrimental effect in help-seeking, recommending proactive outreach to those affected.

While individual responses will vary, it is entirely predictable that some people will be negatively affected by their experiences in responding to large scale disasters such as the Black Summer fires. Supporting the expected consequences of emergency

services work is part of the community's responsibility to the volunteers and paid staff who undertake these critical roles. Intense work demands sustained over a long period can also pose a risk to wellbeing. One of the many challenges of the 2019-20 fires was their duration and intensity, which saw many volunteers undertaking challenging levels of work for long periods of time. This can expose people to risk of burnout and also negatively impact people if they don't have time to process the experience of one event before moving on to the next. Previous research has stressed the importance of taking a break after attending a particularly traumatic or intense event before going on to the next job. In large-scale disasters, it is not always possible to take time out, and first responders will keep working as long as they are needed and are able to.

A challenge for our future bushfire preparedness is sustaining a volunteer workforce of sufficient size and capacity to be able to respond to large-scale events without overtaxing volunteers to the point where they are at risk of ill health. This means both maintaining the existing volunteer workforce through providing the support, training, and resources they need, but also recruiting and training new volunteers, in recognition of the increasing demands being placed on existing volunteers through more intense fire seasons and other disasters and emergencies.

The nature of volunteer firefighting has been considered by other groups that have investigated the 2019-20 bushfires and the response to those fires. There is a recognition that it is important to ensure that volunteers have access to appropriate equipment and infrastructure, and suitable training opportunities. Emergency services agencies are investing in improved equipment and infrastructure to increase readiness and preparedness. It is important that a similar investment is made in increasing organisational resources for mental health and wellbeing. As the nature of volunteer firefighting evolves, it is also important to ensure that organisational capability to support wellbeing is increased proportionately.

Mental health reform in the emergency services sector

The study has found that over 5,000 personnel responding to the fires, mostly volunteers, have PTSD, very high psychological distress, or suicidal ideation, indicating high needs for mental health support. This was more than double the number that would be expected in the absence of events of this nature. While all emergency services agencies have policies and procedures in place to support the wellbeing of their personnel and provide support to those with mental health issues, an important issue to consider is how to build a capacity to scale up the level of support available following major disasters. In many areas, available mental health supports are at or above capacity in ordinary times and have limited or no spare capacity to provide additional support when needed in the wake of major disasters. The Framework recommends the use of local services, if available and able to cope with the surge in demand. As there is rarely spare capacity at the local community level, alternative means to increase capacity following large-scale events should be actively considered and planned for. This planning also needs to account for the observed pattern that mental health consequences of trauma can be long-lasting and support is often required years after the event and not just in the immediate aftermath when additional resources may be flown into communities. These transient resources don't remain in situ for sufficient time to have a lasting impact on the communities before

they move on, abandoning the ongoing needs of the volunteers and paid staff who work so assiduously and under such strained circumstances. While telehealth has been considered as one option for bolstering local community resources, it does come with limitations, including the lack of local knowledge, the lack of continuity of care, and the challenges of forming trusting relationships in a telehealth setting. Focus groups identified that telephone support was considered as much less effective by people in regional and rural areas. One way to consider enhancing support capacity is whether there are opportunities for people who no longer wish to work full time to return to occasional employment when extra demand occurs. A supported temporary registration scheme to allow suitably qualified retirees to provide support at a community level could provide local benefits.

Another factor that needs to be considered in future planning is how the changing nature of bushfires in Australia might contribute to the impact of cumulative trauma. We know that it is often the repeated exposure to major traumatic events rather than just the impact of isolated traumatic events that is the major risk factor for developing mental health issues, a finding confirmed by many other studies (e.g., Centre for Traumatic Stress Studies, 2017). If the frequency and intensity of bushfires continues to increase, there is the strong potential for personnel involved in the 2019-20 fires to be involved in more large-scale fire events in the future. The high proportion of available personnel who were involved in the fires, and the high numbers that experienced traumatic events during the fires, could increase the number of personnel experiencing cumulative traumas over their careers in the event of subsequent disasters.

The nature of emergency services work means that it is not always possible to shield personnel from exposure to traumatic events. How teams and organisations respond in the wake of traumatic events can also have a significant impact on wellbeing. There are some encouraging signs in the *After the Fires* results of some overall improvements in mental health amongst the paid workforce, along with improvements in perceptions of organisational support for mental health. Organisations should be encouraged to continue with reforms in this area to seek further improvements. In contrast, there was little evidence of overall change in wellbeing among volunteers. To date, organisations with a predominantly paid workforce have been better equipped and have more programs and resources to support employee wellbeing than has been the case in the volunteer sector, as historically there were differences in the level of intensity and amount of engagement with major fires between volunteers and paid staff. Particularly in light of the high reliance on volunteers in responding to the 2019-20 bushfires, it may be appropriate to consider how supports that are provided to paid firefighters can be extended so that they are also accessible to volunteers.

Addressing barriers to talking about mental health

The study results also highlight the need to continue investigating some of the barriers to obtaining appropriate support for people with emerging mental health issues. Only about 20% of those with indicators of high needs for mental health support had received a sufficient level of help, a finding which has not changed from research conducted several years earlier (e.g., *Answering the Call*). This indicates that there is still substantial progress to be made in this area.

After the Fires found that many personnel are concerned about adverse career impacts and being taken away from operational work if they raise mental health concerns. The emergency services continue to have a culture of personnel believing that they need to be strong and impervious to the situations they experience in order to support their communities in times of need and that mental health issues would undermine this appearance of strength. In reality, the overwhelming majority of volunteer and paid firefighters do the work they do because they want to serve their communities and help in times of need. Naturally, they care about their communities and are likely to be impacted, as anyone would be, when they witness disasters befalling their communities. Changing this longstanding culture will be a slow process. It is a vitally important step to supporting the wellbeing of firefighters and other first responders. Ignoring emerging mental health issues, waiting to see if they go away, or if they can be handled informally, can lead to worsening symptoms, higher levels of functional impact, greater levels of impairment and longer recovery times and reduced likelihood of complete recovery when people finally do seek help.

Material from the interviews conducted for this study confirms that the mental health impacts of fighting bushfires are real but underestimated and often poorly managed. In the words of a community volunteer:

> *It's not a possibility but a probability that when you work in a disaster response or recovery space, you will be exposed to risk of psychological harm. Psychological safety is not built into current operational procedures. (Community Volunteer, SA)*

Focus group participants provided insights that are aimed at supporting the ongoing mental health and wellbeing of volunteers in bushfire prone communities. Key issues that arose include the benefits of acknowledging, enhancing, and making use of the strengths of existing support networks and recognising the importance of fostering cohesive community environments. Volunteers expressed a strong desire to embrace improved collaboration and coordination between different groups (firefighter volunteers, paid staff, and community volunteers) before, during, and especially after the fire season.

Recommendations

Recommendation 1

Emergency service agencies should consider a multifaceted approach to early intervention and prevention of mental health conditions that includes:

(i) training on the early warning signs of mental distress and when to seek help.
(ii) peer support.
(iii) regular check-ins to encourage openness to discuss emotional concerns and to reduce stigma.
(iv) access to professionals with the cultural expertise and experience to understand service life and what is means to be firefighter.
(v) educational workshops about the potential impacts of cumulative trauma exposure and how to proactively support their own mental health using evidence informed self-care strategies.

(vi) family involvement in both training and educational workshops to enable family members to support their loved ones in an evidence informed way.

This holistic approach not only supports their mental wellbeing but also contributes to a resilient and cohesive firefighting team.

Recommendation 2

Firefighting agencies should encourage a workplace culture that recognizes the importance of self-care and taking breaks as a key aspect of operational performance, including:

(i) Strategically planned scheduled breaks in a designated rest zone.
(ii) A rotation system to ensure individual firefighters are not physically or mentally overloaded.

Recommendation 3

Scaling up mental health support services for volunteer firefighters is a critical step in promoting well-being and resilience. This should include:

(i) establishing partnerships with other community organisations in order to expand the range of services available during large-scale disasters.
(ii) training volunteers to become peer supporters equipping them with the skills to recognize the early warning signs of distress and how to respond.
(iii) regular check-ins with volunteers firefighters for at least 2 years following a major disaster, conducted by professionals or trusted peers with the appropriate training.

Conclusion

After the Fires has documented the mental health impacts of responding to a major fire event. Australia relies predominantly on volunteers in times of disasters such as these. Volunteers give a lot and take on substantial risk to do so. Government should in return recognise the ongoing impacts of this work and ensure emergency services agencies are provided with the resources needed to create and maintain mentally healthy environments.

The negative impacts and consequences of the Black Summer fires have been well documented. One benefit that could come out of this tragedy is if we learn from the lessons of the past to be better prepared for future events. Australia has already made some investments in improving disaster response preparedness. Improving mental health support and creating mentally healthy emergency services cultures are important pillars of improved preparedness. Tragedy and loss have immediate and enduring consequences. While the property and stock lost can be replaced, the internal scars are less readily seen, can take longer to heal and may resurface in future fires. Our largely volunteer workforce is the most valuable resource we have for disaster response. Their wellbeing deserves commensurate community support and investment. *After the Fires* was conducted to provide agencies and governments with information to focus the investment for the next phase of mental health reform across the sector to achieve the most positive outcomes.

Over 5,000 personnel who responded to the fires had PTSD, very high psychological distress or suicidal ideation two years after the fires. Only about 20% have received a sufficient level of help.

DFES Incident Photographer Wade Ranson

APPENDIX 1:

PARTICIPATION IN THE SURVEY, RESPONSE PATTERNS AND WEIGHTING

A total of 4,136 people participated in the Wave 1 survey, including 2,147 volunteers and 1,989 paid staff. Each participating organisation provided the survey team with a breakdown of the demographics of their paid and volunteer workforce, by gender, age group, rank and area. Where they were able to, we also asked agencies to provide a breakdown of the participation of their staff and volunteers in responding to the 2019-20 bushfires.

Amongst paid employees, the distribution of the participants in the survey very closely matched the distribution of the workforce. Amongst volunteers, the comparison showed the sample matched the volunteer workforce by gender, but there was a higher proportion of survey participants among older age groups. More active volunteers (i.e. volunteers who more regularly participate in brigade activities) and volunteers who were involved in responding to the bushfires were more likely to participate in the survey. This was particularly noticeable in terms of responding to the 2019-20 bushfires. Over 80% of the volunteer sample played an active role in responding to the 2019-20 bushfires. Based on information provided by the agencies in combination with the survey data, we have estimated approximately 64,500 volunteers nationwide were involved in responding to the 2019-20 fires. Agencies reported that there are around 250,000 volunteers in fire and rescue, rural fire, fire and emergency, and SES organisations across the country. Based on our experience with *After the Fires* Wave 2, it appears that maintaining accurate records of volunteer members can be challenging and a number of agencies have people on their books who are unlikely to have participated in active volunteering for lengthy periods. A similar pattern was observed in Answering the Call where more active volunteers were more likely to participate in the survey. Response rates were much lower among non-active volunteers.

Survey responses have been weighted based on the demographic characteristics of each organisation's paid and volunteer workforce so that estimates from the survey can be made to represent the population of paid employees in fire and rescue and emergency services, and active volunteers in the sector.

SUPPLEMENTARY TABLES

Supplementary Table 1: Survey participants: participation in waves 1 and 2

	Participated in Wave 1	Sent Wave 2	Participated in Wave 2	Response Rate
Volunteers	2147	1126	640	57%
Employees	1989	812	371	46%
Total	4136	1938	1011	52%

Supplementary Table 2: Demographic characteristics of survey participants in waves 1 and 2

	Volunteers		Employees	
	Wave 1	Wave 2	Wave 1	Wave 2
Sex—				
Male	1708	532	1576	310
Female	439	108	413	61
Age group—				
Under 35 years	265	45	231	38
35 - 44 years	291	72	436	66
45 - 54 years	487	155	671	139
55 years and over	1104	368	651	128
Length of service—				
5 years or less	207	31	284	39
6-10 years	342	96	218	31
11-20 years	370	113	957	173
More than 20 years	1228	400	530	128

Diagnosis of mental health conditions

Participants were asked if they had ever been diagnosed with a mental health condition, if they still had the condition, and how long ago it was diagnosed. Overall, 17% of personnel reported having a current diagnosed mental health condition, and of these personnel one in eight (12%) reported being first diagnosed with the condition since the 2019-20 bushfires (Supplementary table 3).

Supplementary table 3: Current diagnosed mental health conditions at Wave 1, and proportion first diagnosed since the 2019-20 bushfires

Mental health condition	Proportion with diagnosed condition		Proportion first diagnosed since bushfires	
	Volunteers (%)	Employees (%)	Volunteers (%)	Employees (%)
Any	17.1	17.2	12	14
PTSD	7.6	7.2	13	11
Depression	11.8	10.6	11	11
Anxiety	9.8	9.5	10	16

Functional impairment associated with psychological distress

Participants who were experiencing psychological distress were asked about the impact of this distress on their day to day lives. Participants were asked how many days in the last four weeks they were totally unable to work or manage day-to-day activities due to their feelings of psychological distress and how many days they had to cut down on what they did. Additionally, they were asked to rate the level of interference caused by their feelings of distress in four domains of life: home management, work, family and social life, which were combined to provide an overall measure of functional impairment.

An estimated 11.3% of volunteers and 12.0% of employees were unable to work on at least one day in the last four weeks due to feelings of psychological distress, and 11.0% of volunteers and 12.7% of employees and had to cut down on their work for four or more days over the last four weeks (Table 18).

An estimated 4,300 volunteers (6.5%) reported that they had taken time off work from their paid job in the past 12 months due to stress or mental health reasons caused by their volunteer work, and 1,600 employees (17%) reported they had taken time off work during the past 12 months due to stress or mental health reasons caused by their work.

Supplementary table 4: Days out of role in last four weeks due to feelings of psychological distress among personnel who played an active role in responding to the 2019-20 bushfires

Days out of role	Volunteers		Employees	
	Unable to work (%)	Had to cut down (%)	Unable to work (%)	Had to cut down (%)
None	88.7	78.2	88.0	75.3
1-3	7.5	10.8	8.6	12.4
4-7	2.3	5.7	2.2	8.6
8 or more	1.5	5.3	1.2	3.7

An estimated 3.8% of volunteers and 4.3% were experiencing severe distress across home management, work, family and social life, and 5.8% of volunteers and 8.3% of employees were experiencing moderate distress (Table 19).

Supplementary table 5: Functional impairment due to feelings of psychological distress among personnel who played an active role in responding to the 2019-20 bushfires

Functional impairment	Volunteers (%)	Employees (%)
None	77.5	68.5
Mild	12.9	18.9
Moderate	5.8	8.3
Severe	3.8	4.3

REFERENCES

Beyond Blue (2018) *Answering the Call national survey. Beyond Blue's National Mental Health and Wellbeing Study of Police and Emergency Services - Executive Summary.* Melbourne: Beyond Blue.

Beyond Blue (2020) *National Mental Health and Wellbeing Study of Police and Emergency Services (2016-2020). A summary of the three phases of Beyond Blue's research examining mental health and wellbeing in Australia's police and emergency services sector.* Melbourne: Beyond Blue.

Biddle N, Boyer C, Gray M, & Jahromi M (2022) *Volunteering in Australia: The Volunteer Perspective*. Volunteering Australia. https://volunteeringstrategy.org.au/wp-content/uploads/2022/10/Volunteering-in-Australia-2022-The Volunteer Perspective.pdf

Centre for Traumatic Stress Studies (2017) *Metropolitan Fire Service Health and Wellbeing Study.* Adelaide: The University of Adelaide.

Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, Walters EE, Zaslavsky AM (2002) *Short screening scales to monitor population prevalences and trends in non-specific psychological distress.* Psychological Medicine. 32:959-976.

Kyron MJ, Rikkers W, Bartlett J, Renehan E, Hafekost K, Baigent M, Cunneen R, Lawrence D (2021) *Mental health and wellbeing of Australian Police and Emergency Services.* Archives of Environmental and Occupational Health. doi: 10.1080/19338244.2021.1893631

National Emergency Management Agency (2023) *National Disaster Mental Health and Wellbeing Framework*. Canberra: Commonwealth of Australia. https://nema.gov.au/about-us/budget-2023-24/Mental-Health-Wellbeing-Framework

Ng Fat L, Scholes S, Boniface S, Mindell J, Stewart-Brown S (2017) *Evaluating and establishing national norms for mental wellbeing using the short Warwick–Edinburgh mental well-being scale (SWEMWBS): findings from the health survey for England*. Quality of Life Research. 26:1129-1144.

Productivity Commission (2020) *Mental Health: Productivity Commission Inquiry Report.*

Canberra: Productivity Commission.

Royal Commission into National Natural Disaster Arrangements (2020) *Report of the Royal Commission into National Natural Disaster Arrangements.* Canberra: Commonwealth of Australia.

Senate Education and Employment References Committee (2019) *The people behind 000: mental health of our first responders.* Canberra: Parliament of Australia.

Slade T, Johnston A, Teesson M, Whiteford H, Burgess P, Pirkis J, Saw S (2009) *The mental health of Australians 2: Report on the 2007 National Survey of Mental Health and Wellbeing.* Canberra: Australian Government Department of Health and Ageing.

GLOSSARY

Mental health conditions

Participants were asked if they had been told by a doctor or medical professional that they had any of the following conditions:

- Panic disorder
- Social anxiety disorder
- Post-traumatic stress disorder (PTSD)
- Obsessive-compulsive disorder (OCD)
- Generalised anxiety disorder
- Any other anxiety conditions
- Depression
- Attention Deficit Disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD)
- Schizophrenia
- Bipolar disorder or any other psychosis
- Alcohol or drug dependence

Panic disorder, social anxiety disorder, OCD, Generalised anxiety disorder and any other anxiety conditions have been grouped as anxiety disorders.

Participants who reported having been told by a medical professional that they had a mental health condition were also asked if they still had that condition.

Mental wellbeing

The short form of the Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS) was used to assess mental wellbeing. It consists of seven positively worded questions that cover both feelings and functioning. The scale was originally developed for use in the United Kingdom, and population reference data on the distribution of wellbeing is available for the adult populations of England and Scotland. The scale was designed so that the top 15% of the population would be identified as having high wellbeing, and the bottom 15% would be identified as having low wellbeing.

Physical health

Physical health was assessed with the single question, 'In general, how would you describe your physical health?' with options of excellent, very good, good, fair and poor.

Probable Post-traumatic stress disorder (PTSD)

PTSD may develop after experiencing or witnessing a traumatic event, such as serious injury or death. Among police and emergency services personnel, PTSD may also develop after being exposed to details of traumatic events multiple times. Characteristic symptoms of PTSD include persistent re-experiencing of the traumatic event or events, persistent avoidance of situations or activities or other things that are reminders of traumatic events, numbing of emotional responses including feeling

detached from other people, and symptoms of increased arousal such as difficulty sleeping, difficulty concentrating, irritability and angry outbursts, being easily startled and hypervigilance.

After the Fires used the same scale to assess PTSD as was used in Answering the call. Probable PTSD has been assessed using an adaptation of the PCL-5 PTSD screening scale. The formal diagnostic criteria for PTSD specify that symptoms must last for a minimum of one month and they must be associated with clinically significant distress or functional impairment. The adapted scale included additional questions designed to assess the level of functional impairment associated with symptoms of PTSD.

The scale was adapted for three reasons:

(i) The PCL-5 and most other PTSD screening scales ask symptom questions in relation to a specific event which may be less appropriate for a population whether the impact of cumulative exposures to trauma may be more significant;

(ii) the PCL-5 does not assess DSM-5 criterion G that "the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning"; and

(iii) the adapted scale included a measure of severity consistent with the approach taken in Australia's National Survey of Mental Health and Wellbeing.

DSM-5 defines 7 symptom clusters for PTSD:

A: Exposure to traumatic event (includes repeated or extreme exposure to aversive details of traumatic events in first responders).

B: The traumatic event is persistently re-experienced.

C: Persistent avoidance of stimuli associated with the trauma

D: Negative alterations in cognitions and mood associated with the

traumatic event E: Marked alterations in arousal or reactivity

F: Duration of the disturbance is more than one month.

G: The disturbance causes clinically significant distress or impairment of functioning.

Respondents were considered to have probable PTSD if they met the criteria for all of the clusters A-G. Respondents who did not meet all the criteria for probable PTSD, but who met 3-5 symptom clusters A-F and had cluster G clinically significant distress were considered to have sub-threshold PTSD.

Psychological distress

The Kessler Psychological Distress Scale (K10) is a widely used instrument designed to measure levels of psychological distress. The Kessler 10 scale is used in many national studies and is useful for comparing different populations.

The K10 is based on 10 questions about negative emotional states in the four weeks prior to interview. The K10 is scored from zero to 40, with higher scores indicating

higher levels of distress. Scores are categorised as follows:

0 –5	Low levels of psychological distress
6-11	Moderate levels of psychological distress
12-19	High levels of psychological distress
20-40	Very high levels of psychological distress

The very high category on the K10 has been designed to match the definition of serious mental illness in the United States. Serious mental illness is defined as mental illness associated with serious functional impairment, which substantially interferes with or limits one or more major life activities.

Participants were also asked four questions about how much their psychological distress interfered with home management (cleaning, shopping, cooking, gardening), ability to work or undertake volunteer work, ability to form and maintain close relationships, and on their social life.

Service use

The use of all health and organisational support services, and telephone and online services where these provided structured or personalised information.

Stressful events

Participants were asked if they had experienced a stressful event or series of events that deeply affected them. The survey identified if this happened while working or volunteering in the emergency services sector, while working or volunteering elsewhere, or outside of work.

Participants who had experienced a stressful event at work were asked if the event or events were:

- traumatic event(s) in the course of their work
- personal injury received in the course of their work
- dismissal from, or demotion in their work
- being forced out of their job
- issues associated with poor management or being treated badly by managers
- conflict with other people they work closely with.

Suicidal behaviours

Suicidal thoughts and behaviours include suicidal ideation (serious thoughts about taking one's own life), making suicide plans and suicide attempts where the self-injury is intended to end in one's own death.

Participants were asked if they had ever had suicidal ideation, made suicide plans or attempted suicide, and whether they had suicide ideation, made a plan or attempted suicide in the past 12 months. Respondents who reported high levels of distress or who had suicidal thoughts or behaviours in the past 12 months were offered the opportunity to confidentially contact the Beyond Blue Support Service, Lifeline or other crisis support service

After the Fires: The impacts of the 2019-20 Black Summer bushfires on the wellbeing of emergency services personnel who responded to the fires.

ISBN: 978-0-646-88508-7

The study was funded by the Australian Government Medical Research Future Fund.

After the Fires was conducted by Curtin University in collaboration with Flinders University, Military and Emergency Services Health Australia (MESHA), The University of Western Australia, Roy Morgan Research and the Bushfire and Natural Hazards Cooperative Research Centre.

THIS REPORT AND ADDITIONAL INFORMATION ABOUT AFTER THE FIRES CAN BE ACCESSED VIA HTTPS://RESEARCH.CURTIN.EDU.AU/RESEARCH-AREAS/HEALTHY-COMMUNITIES/AFTER-THE-FIRES/

Back cover: DFES Incident Photographer Wade Ranson

AFTER THE fires