

Department of Health

health

# The health and wellbeing of adult Victorians affected by the bushfires in 2009

Victorian Population Health Survey  
2011–12 supplementary report



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Suggested citation: Department of Health 2014, *The health and wellbeing of adult Victorians affected by the bushfires in 2009, Victorian population health survey 2011–12 supplementary report*, State Government of Victoria, Melbourne.

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Print managed by Finsbury Green. Printed on sustainable paper.

February 2014 (1309001)

# Foreword

The 2009 Victorian bushfires had a devastating impact on Victoria. There was significant loss of life and an unprecedented level of destruction of property and infrastructure across the state. Initially, emergency health services were involved in the response, but as the scale of the disaster became more apparent, planning began across the state to ensure support mechanisms were in place to meet both the immediate and ongoing physical health, emotional and psychosocial needs of those individuals affected.

The Department of Human Services, which incorporated health at the time of the event, was involved from the outset, working in collaboration with other state government departments, federal and local government, as well as non-government health and community agencies and service providers to meet the needs of those affected by the fires.

The Victorian Population Health Survey is a cornerstone of population health surveillance in Victoria. The survey is conducted annually by the department, with the first survey of adult Victorians undertaken in 2001. The survey findings fill an important void in the health information landscape, ensuring health policy and programs are relevant and responsive to emerging issues. In 2011–12 the sample size was expanded to allow survey findings to be reported at the local government area level. The survey also included questions about the bushfires and their impact.

This supplementary report is based on questions from the 2011–12 survey and provides a profile of the health and wellbeing of adult Victorians affected by the fires, three years on from the event. The survey findings offer insights into how people are faring and highlight some of the disparities in health that exist between those affected by the fires and other Victorians.

I would like to acknowledge and thank all of those people, organisations and government agencies that were involved in the bushfire response and recovery effort, and I commend this report to all of those Victorians who were affected by the fires in 2009.

**Hon David Davis MP**  
**Minister for Health**

# Acknowledgements

This report was prepared by the Health Intelligence Unit, Prevention and Population Health Branch, Department of Health. We thank Greg Ireton (Health and Human Services Emergency Management Branch, Department of Human Services), Pam Williams (Strategy and Policy, Department of Health and previously Director of the Department of Human Services Bushfire Recovery Services) and Vikki Sinnott (Prevention and Population Health Branch, Department of Health) for their advice and assistance in drafting this report.

Special thanks to all those people in Victoria who participated in the Victorian Population Health Survey 2011–12.

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# Summary



# Summary

## Key findings

- The survey showed 6.7 per cent of respondents were affected by the bushfires in 2009. This represents up to 320,000 Victorians aged 18 years or more.
- Although a large proportion of respondents affected by the bushfires in 2009 were living in bushfire affected areas three years after the event, many others who were affected lived outside these areas at the time of the survey in 2011–12.
- Three years after the bushfires, very high psychological distress was more prevalent for respondents affected by the bushfires in 2009, compared with respondents not affected by the bushfires (4.6 per cent and 2.5 per cent, respectively).
- Signs and symptoms of depression and anxiety were experienced by 21.9 per cent of respondents affected by the fires.
- The survey showed that 9.3 per cent of bushfire affected respondents accessed counselling or specialist mental health services, as a result of the impact of the bushfires.
- A higher proportion of respondents affected by the bushfires were current smokers (19.9 per cent), were at short-term risk of alcohol-related harm (51.7 per cent), compared with respondents not affected by the bushfires (15.5 per cent and 44.9 per cent, respectively).
- A lower proportion of respondents affected by the bushfires reported excellent health, compared with respondents not affected by the bushfires (9.3 per cent and 11.9 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported having ever been diagnosed with osteoporosis (6.8 per cent) and arthritis (25.1 per cent), compared with respondents not affected by the bushfires (5.1 per cent and 19.3 per cent, respectively).
- A lower proportion of bushfire affected females aged 50–69 years reported having had a mammogram in the previous two years, compared with non-bushfire affected females in the same age group (73.2 per cent and 83.9 per cent, respectively).
- Between 2008 and 2011–12, bushfire affected local government areas (LGAs) experienced:
  - an increase in the proportion of respondents having a cholesterol check (56.6 per cent and 61.3 per cent, respectively) and a blood glucose check (52.4 per cent and 57.5 per cent, respectively) in the previous two years.
  - a decrease in the proportion of respondents with 'good/very good' access to local recreational and leisure facilities (78.3 per cent and 74.4 per cent, respectively) and having opportunities to have a real say on issues that are important to them (43.8 per cent and 38.7 per cent, respectively).
- The survey showed those affected by the bushfires in 2009 have a supportive social environment, with strong social and support networks. As a group, those affected by the bushfires appear to be engaged with their community and they participate in civic activities – more so than their non-bushfire affected counterparts.

In late January and early February 2009 Victoria experienced one of its most significant periods of bushfire activity, culminating in the Black Saturday bushfires on 7 February, one of Australia's most significant natural disasters. Temperatures across the state climbed into the 40s on successive days during this period. The fires resulted in a number of deaths and many injuries and burns. Many people lost their homes and livelihoods, there were losses to local infrastructure, and large tracts of bush and productive farmland were burnt.

In 2011–12 the Department of Health (the department) conducted its annual health survey of Victorian adults aged 18 years or more (the Victorian Population Health Survey or VPHS), which included questions about the impact of the bushfires that occurred in early 2009. The survey was based on a representative sample of Victorians, so results could be extrapolated to the wider adult population. This report presents a profile of the health and wellbeing of those Victorians affected by the bushfires in 2009, three years on from the event.

The results of the 2011–12 VPHS showed about 6.7 per cent of adult Victorians (up to 320,000 adults) were affected by the bushfires in 2009 (table 2.1). They were affected in several ways, with many experiencing fire coming close to their home or property (13.5 per cent of all adults affected by the bushfires), or being emotionally affected by the bushfires (12.8 per cent); others lost friends (12.5 per cent), family (3.6 per cent), or their homes (3.9 per cent) to the bushfires.

Although a large proportion of those affected by the bushfires were living in bushfire affected areas at the time of the survey in 2011–12, many people affected by the 2009 bushfires were living outside these areas. Three years on, the survey showed up to 170,000 adults living in bushfire affected local government areas (LGAs) in 2011–12 and up to 150,000 adults living in other areas of the state were affected by the bushfires.

Overall, the survey showed Victorians affected by the bushfires enjoy good health and have similar patterns of primary and preventive health care service use as the wider population. However, there are a number of health disparities for Victorians affected by the bushfires.

In particular, the mental wellbeing of bushfire affected Victorians remains an issue. Exposure to natural disasters, such as the 2009 bushfires, can affect an individual's mental wellbeing. The impact of a disaster can also change over time for the individual, ranging from shock and confusion in the immediate aftermath of a disaster to distress, anger and sadness in the medium term and depression and anxiety over the longer term.

Three years on, a higher proportion of respondents affected by the bushfires reported having very high levels of psychological distress (4.6 per cent), compared with their counterparts not affected by the bushfires (2.5 per cent).

About one in ten (9.3 per cent) bushfire affected respondents reported having accessed counselling or specialist mental health services as a result of the impact of the bushfires. Most bushfire affected Victorians who felt they required these services actually accessed them. Further, the majority of those who did not access counselling or specialist mental health services reported not accessing these services because they didn't feel they needed them (82.3 per cent of all adults affected by the bushfires who did not access these services), or because they didn't want these services (6.8 per cent), or because they felt sufficiently supported by family (4.3 per cent). However, there was a small group of people who reported they did not access these services because the services were not offered or not available (2.6 per cent), or because people did not know where to go for help (1.0 per cent).

About one in five (21.9 per cent) adults surveyed in 2011–12, who reported having been affected by the bushfires in 2009, also reported having experienced signs and symptoms of depression and anxiety as a result of the bushfires. Psychological distress levels appear to be a particular concern for this group. They had higher rates of access to counselling or specialist mental health services for the impact of the bushfires than did those not experiencing symptoms of depression or anxiety; nonetheless, only about a quarter (24.0 per cent) of this group actually accessed these services.

The survey results also showed disparities in the physical health of adult Victorians affected by the bushfires. A lower proportion of adults affected by the bushfires reported their health status as 'excellent', compared with their counterparts not affected by the bushfires (9.3 per cent versus 11.9 per cent). A higher proportion reported engaging in certain health risk behaviours that have implications for their future health and wellbeing, including current smoking (19.9 per cent versus 15.5 per cent); being at risk of short-term harm from levels of alcohol consumption (51.7 per cent versus 44.9 per cent); and, having higher levels of excess body weight, as measured by body mass index (BMI  $\geq$ 25.0) (57.6 per cent versus 50.0 per cent). The results of the survey also showed adult Victorians affected by the bushfires had higher prevalence of arthritis (25.1 per cent versus 19.3 per cent) and osteoporosis (6.8 per cent versus 5.1 per cent) than did those not affected by the bushfires.

In terms of service use, there was no difference between those affected by the bushfires and those not affected by the bushfires in having had health checks for eyes, blood pressure, cholesterol or blood glucose and no difference in biennial bowel and Pap test screening rates. Further, there was no difference between the two groups in the timing of the last visit to either a dental professional or doctor. Breast screening was the only service area where the survey identified a significant difference in service use; 73.2 per cent of females aged 50–69 years affected by the bushfires had a mammogram in the last two years, compared with 83.9 per cent of females in the same age range not affected by the bushfires.

Adult Victorians affected by the bushfires appear to have a supportive social environment on the whole, with strong social and support networks. The survey results showed they were engaged in their community and participate in civic activities – more so than their non-bushfire affected counterparts. When it came to issues like trust and safety, those affected by the bushfires had similar levels of social and civic trust as did those not affected by the bushfires.

When asked to rate their local area for 'having facilities and services like shops, childcare, schools and libraries', a higher proportion of bushfire affected respondents rated their local area as 'poor to very poor', compared with their non-bushfire affected counterparts (8.3 per cent versus 3.5 per cent). However, when asked about access, more than 80 per cent of people in both groups said they could access local community services and resources like maternal and child health centres and neighbourhood centres when they needed them.

A higher proportion of those affected by the bushfires rated access to recreational and leisure facilities as 'poor to very poor' in their local area, compared with their non-bushfire affected counterparts (8.3 per cent versus 4.2 per cent). In part, this may be because many areas affected by the fires lost communal recreational and leisure facilities and these are still being rebuilt. Alternatively, it may simply reflect a difference in availability, and thus accessibility of recreational and leisure facilities in rural versus metropolitan areas.

The results of the VPHS 2011–12 were compared with the results of the VPHS conducted in 2008. The two surveys had a similar methodology and sample size, and a similar set of questions about health status were asked of respondents. This allowed a pre- and post-fire comparison of health status in LGAs that were affected by the bushfires in 2009. However, the analysis showed little evidence of a change in health status at the LGA level between 2008 and 2011–12. Analysis at the LGA level may not have been sensitive enough to pick up health status disparities, or alternatively, many of those most affected by the bushfires, with presumably poorer health status, may have moved from bushfire affected areas in the years between the two surveys.

This survey provided valuable information about those affected by the bushfires in 2009. The results largely accord with results from similar studies of people who have experienced disaster. The service response to the bushfires by both government and non-government health and community support agencies, along with the wider community, was unprecedented in scale. People all over Victoria, and indeed Australia, offered their support to assist others in their recovery. Collectively, these efforts have had a positive impact on wellbeing, which will continue to be felt into the future by those affected by the bushfires in 2009.

# 1. Introduction



# 1. Introduction

In late January and early February 2009 bushfires broke out across the state. Victoria experienced several days of extreme heat with temperatures in excess of 40 °C recorded in a number of areas. Initially, several fires broke out on 28 and 29 January 2009 in the Delburn area in Gippsland, 150 kilometres south-east of Melbourne. The Delburn fires merged and continued to burn through the first week of February and were still burning on 7 February 2009, when Victoria experienced its worst natural disaster with the Black Saturday bushfires. On Black Saturday alone, there were 173 deaths, with many more injuries and burns from the bushfires, more than 2,100 homes were destroyed and an area of more than 350,000 hectares was burnt out. These fires resulted in lost infrastructure and facilities in communities across the state.

This report profiles the health and wellbeing of those Victorians who were affected by these bushfires, three years on from the event. The profile is based on an analysis of the Victorian Population Health Survey (VPHS) 2011–12, a population-level survey conducted by the Department of Health, which included a sample of Victorians who reported being affected by the bushfires in 2009.

## About the survey

The VPHS is an important component of the department's health surveillance capacity. It aims to provide quality, timely information that can be used to inform policy and program development, strategic planning, decisions about health priorities and monitor trends over time.

The survey has been conducted annually since 2001. For the years 2001 to 2007 and 2009 to 2010, the survey sampled approximately 7,500 Victorians aged 18 years or more. In 2008 and again in 2011–12, the survey sample was expanded to approximately 34,000 to enable reliable analysis at the local government area (LGA) level.

The 2011–12 survey included questions about the personal impact of the bushfires that occurred in early 2009. Survey respondents were asked initially if they were affected by the bushfires. If they were affected, they were also asked how they were affected. This was followed by a question about whether those affected experienced any signs or symptoms of depression or anxiety as a result of the bushfires. Those affected were also asked whether they accessed any counselling, or mental health services as a result of the impact of the bushfires. Finally, if they did not access any counselling or mental health services, those affected were asked why not.

## About the report

Chapter 2 of this report presents a socio-demographic profile of adult Victorians affected by the bushfires in 2009. The percentage and number of adult Victorians affected by the bushfires in 2009 is broken down by age and gender. There is an analysis of socioeconomic status and the ethnicity of bushfire affected respondents. This section also includes an overview of where those who were affected by the bushfires were living in Victoria in 2011–12, three years after the bushfires. Most of the analysis compares the health and wellbeing of respondents who reported being affected by the bushfires with those who reported they were not affected by the bushfires (remainder of survey respondents).

Chapter 3 explores mental wellbeing, while Chapter 4 focuses on modifiable health and lifestyle behaviours. Chapter 5 discusses health outcomes for adults affected by the bushfires, while Chapter 6 examines health service use.

Chapter 7, which explores connections with others, profiles community and social characteristics for those affected by the fires. This chapter is based on a series of indicators associated with the social environment, social and support networks, community and civic engagement, and trust and safety.

Finally, Chapter 8 compares the health status in 2008 (before the bushfires) of all survey respondents living in LGAs that were affected by the bushfires and the health status of respondents living in those same LGAs in 2011–12 (after the bushfires).

The conclusion summarises the health and wellbeing of Victorians affected by the bushfires by drawing on the key findings and implications emerging from the analysis.

Appendix 1 includes a methods section (which describes the VPHS design and methodology), statistical analysis, interpretation of survey data and a profile of the survey sample. Appendix 2 lists the most damaging, or potentially damaging, fires of the 2008–09 bushfire season, while Appendix 3 lists the LGAs affected by the bushfires in January and February 2009 (also see Figure 8.1).

### Interpreting tables and graphs

- The significance of differences between two proportions (percentages), or prevalence rates, was determined by comparing the 95 per cent confidence intervals of proportions. The proportions in this report are described as being ‘higher’ or ‘lower’ than one another if there is a statistically significant difference between them (that is, the 95 per cent confidence intervals do not overlap). If there is no statistically significant difference between two proportions (that is, the 95 per cent confidence intervals overlap), they are either not mentioned in the text or they are described as being ‘similar’.
- Ordinary least squares linear regression models were used to test for trends in the data. A significant trend was determined where the *p-value* from a model was less than 0.05 ( $p < 0.05$ ).
- With the exception of age specific rates, and unless otherwise stated, proportions were age standardised to the 2011 Victorian population to eliminate the effect that differences in age structure may have on rates from different population groups.
- The reliability of rates from the survey was determined using relative standard errors. All proportions in tables and graphs are reliable, unless otherwise stated. Asterisks are used in tables and graphs to indicate proportions with relative standard errors above 25 per cent. For further information, see Appendix 1 (Methods).
- The population numbers were rounded to the nearest 1,000 population. The population numbers that are provided reflect the upper limit of the relevant 95 per cent confidence interval of a proportion, or prevalence rate.

## 2. Socio-demographics



## 2. Socio-demographics

### Key findings

- The survey showed 6.7 per cent of respondents were affected by the bushfires in 2009. This represents up to 320,000 Victorians aged 18 years or more.
- Many of those who reported being affected were affected in multiple ways.
- Although a large proportion of respondents affected by the bushfires in 2009 were living in bushfire affected areas three years later, many others who were affected were living outside these areas at the time of the survey in 2011–12.

The VPHS included a series of socio-demographic questions, which have evolved since the first survey was conducted in 2001. Socio-demographic characteristics are associated with health and wellbeing. This section focuses on gender, age, ethnicity, socioeconomic factors and the place where a person resides.

In 2011–12 the survey asked respondents whether they were directly affected by the bushfires in 2009 and, if so, respondents were asked how they were affected. The results of these questions are also presented in this chapter.

### Gender and age

Table 2.1 shows 6.7 per cent of survey respondents reported having been affected by the bushfires in 2009. This represents up to 320,000 adult Victorians (aged 18 years or more) in 2011–12. The rates for males and females did not increase or decrease by age group ( $p \geq 0.05$ ). However, the table shows the rates for males peaked in the 50–64 years age group, with 8.6 per cent of male respondents in this age group having been affected by the bushfires. Among females, the rates peaked in the 35–49 years age group, with 7.1 per cent of females in this age group having been affected by the fires. For males, the lowest rate was observed in the oldest age group, with 5.0 per cent of males aged 65 years or more having been affected by the bushfires. For females, the lowest rate was observed in the youngest age group, with 5.2 per cent of female respondents aged 18–34 years having been affected by the bushfires.

**Table 2.1: Proportion of Victorians affected by the 2009 bushfires, by age group and gender, 2011–12**

Age group (years)	Males		Females		Persons	
	%	95% CI	%	95% CI	%	95% CI
18–34	6.5	4.8 – 8.7	5.2	4.1 – 6.5	5.8	4.8 – 7.1
35–49	8.3	7.1 – 9.8	7.1	6.3 – 8.1	7.7	7.0 – 8.6
50–64	8.6	7.5 – 9.9	7.0	6.2 – 7.9	7.8	7.1 – 8.5
65+	5.0	4.2 – 5.9	5.5	4.7 – 6.3	5.2	4.7 – 5.8
<b>Total</b>	<b>7.2</b>	<b>6.5 – 8.0</b>	<b>6.2</b>	<b>5.7 – 6.7</b>	<b>6.7</b>	<b>6.2 – 7.2</b>

95% CI: 95 per cent confidence interval.

Data are crude estimates, except for the totals, which represent the estimates for Victoria, age standardised to the 2011 Victorian estimated resident population (18 years+).

Table 2.2 shows how survey respondents reported having been affected by the bushfires in 2009. The question that was asked in the survey allowed respondents to report multiple effects from the fires, because people were affected in many different ways, and in many cases, individuals suffered multiple effects. Among those who reported having been affected by the fires, 13.5 per cent reported having had fire come close to their property or home, 12.8 per cent reported having been affected emotionally and 12.5 per cent reported having lost a friend(s). In addition, 4.3 per cent of those affected reported having lost a holiday home or property, 3.9 per cent reported losing their home and 3.6 per cent reported having lost a family member(s).

**Table 2.2: How Victorians reported being affected by the 2009 bushfires, 2011–12**

How affected by the bushfires...	%	95% CI
Amenities were affected – water/gas/power etc	1.4*	0.9 – 2.3
Damaged home/ holiday home/property/but not lost	2.0	1.3 – 2.9
Emotionally affected – stressed/anxious/afraid/depressed	12.8	10.4 – 15.5
Employment/income affected	0.8	0.6 – 1.2
Fire came close to property/house	13.5	11.4 – 15.9
Fires were a reminder of previous loss/trauma	3.0*	1.6 – 5.4
Health affected by smoke	1.1	0.7 – 1.8
I fought the fires/involved in the process – CFA/state emergency service etc	10.0	7.6 – 13.1
Live in a bushfire prone or affected area – no mention of loss or damage/or close proximity with home	5.2	4.0 – 6.6
Lost employment or business as a direct effect of fires	2.7	1.8 – 3.8
Lost family member(s)	3.6	2.6 – 5.1
Lost friend(s)	12.5	10.2 – 15.3
Lost holiday home or property	4.3	3.4 – 5.6
Lost home	3.9*	2.4 – 6.3
Lost others – work colleagues/students etc	0.7*	0.3 – 1.3
Partner fought the fires/involved in the process – CFA/state emergency service etc	2.0	1.3 – 2.9
Smoke damage/smoked out	3.1	2.2 – 4.4
Was evacuated	10.8	8.8 – 13.2
Was on standby for evacuation/almost evacuated	1.4	0.9 – 2.3
Was stuck/isolated – at home/work or away	2.7	1.9 – 3.9
Worked in post fire role – counselling/assessment/insurance/rebuilding/cleaning/medical etc	6.6	4.8 – 8.9
Other	24.7	21.9 – 27.8

95% CI: 95 per cent confidence interval.

Figures do not add up to 100 per cent because respondents could provide more than one response to the question.

Data are crude estimates; they were not age standardised.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

## Current area of residence

The 2009 Victorian Bushfires Royal Commission was advised the Country Fire Authority (CFA) and the Department of Sustainability and Environment<sup>1</sup> attended or patrolled hundreds of fires during the 2008–09 bushfire season (2009 Victorian Bushfires Royal Commission 2010). The most damaging, or potentially damaging, fires occurred in late January and early February 2009 (see Appendix 2 for a list of these fires).

This section looks at where survey respondents affected by the bushfires in late January and early February 2009 said they were living at the time of the survey in 2011–12, three years on from the bushfires. This does not necessarily reflect where these respondents lived at the time of the fires. Many of those in communities directly affected by the fires have since moved from where they lived in 2009. Many others who were affected by the bushfires lived outside these communities at the time. They include relatives and friends of those who died as a result of the bushfires, property owners, fire fighters and those providing support. All of these people were affected by the fires, but did not necessarily live in areas affected by the fires in 2009.

Table 2.3 shows the proportion of respondents living in each Department of Health region in 2011–12 that reported they were affected by the bushfires in 2009. In this context, the metropolitan area reflects the greater Melbourne area, where approximately 75.3 per cent of the Victorian population reside (ABS 2012a). Rural areas include the balance of the state – which includes urban communities such as Bendigo and Ballarat. The table shows a significantly higher proportion of respondents living in rural areas reported being affected by the bushfires, compared with respondents living in the metropolitan area (11.2 per cent versus 5.3 per cent). This difference is mainly due to the large number and proportion of respondents in the Gippsland and Hume regions who reported having been affected by the fires.

When the metropolitan and rural rates are applied to the population, the results show up to 190,000 adults living in the metropolitan area and up to 130,000 adults living in rural areas in 2011–12 were affected by the bushfires in 2009. Although the proportion of the population affected was higher for rural areas, the number of people affected was higher in the metropolitan area.

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1. The Victorian Government Department of Sustainability and Environment is now the Department of Environment and Primary Industries.

**Table 2.3: Proportion of Victorians affected by the 2009 bushfires, by Department of Health region, 2011–12**

Region	%	95% CI
Barwon-South Western	4.8*	2.9 – 8.0
Eastern Metropolitan	7.8	6.6 – 9.2
Gippsland	20.7	18.2 – 23.5
Grampians	6.8	5.6 – 8.3
Hume	16.4	14.1 – 19.0
Loddon Mallee	9.6	6.8 – 13.5
North and West Metropolitan	4.6	4.0 – 5.2
Southern Metropolitan	4.3	3.5 – 5.3
<b>Metropolitan</b>	<b>5.3</b>	<b>4.8 – 5.8</b>
<b>Rural</b>	<b>11.2</b>	<b>10.0 – 12.4</b>

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

Table 2.4 shows where respondents affected by the bushfires in 2009 were living at the time of the survey in 2011–12, by LGA. The numbers in the table reflect the proportion of adults living within each LGA in 2011–12 who were affected by the bushfires in 2009. Once again, these estimates do not reflect where people lived at the time of the bushfires in 2009.

Around 73.0 per cent of adults living in the Murrindindi LGA in 2011–12 were affected by the bushfires in 2009. This was followed by 33.8 per cent of adults resident in Alpine, 32.5 per cent in Baw Baw, 29.7 per cent in Yarra Ranges, 26.6 per cent in La Trobe, 26.3 per cent in Mitchell and 25.8 per cent in Horsham.

Although more than a quarter of adults in each of these LGAs in 2011–12 were affected by the fires in 2009, the actual number of adults affected varies in each area because of the population size of each LGA. Although 73.0 per cent of survey respondents living in Murrindindi were affected by the bushfires, this represents a maximum of 8,500 adults, for example. By contrast, up to 42,000 adults were affected by the bushfires in Yarra Ranges, although those affected by the bushfires comprised a smaller proportion (29.7 per cent) of the overall adult population in this LGA.

**Table 2.4: Proportion of Victorians affected by the 2009 bushfires, by LGA, 2011–12**

LGA	%	95% CI	LGA	%	95% CI
Alpine	33.8	25.9 – 42.8	Horsham	25.8	17.9 – 35.6
Ararat	5.2	3.4 – 8.0	Hume	4.1	2.6 – 6.3
Ballarat	2.8*	1.4 – 5.5	Indigo	21.6	17.1 – 26.9
Banyule	6.5	4.5 – 9.2	Kingston	1.4*	0.6 – 3.0
Bass Coast	10.3*	5.9 – 17.3	Knox	5.1*	3.1 – 8.3
Baw Baw	32.5	26.9 – 38.6	Latrobe	26.6	21.2 – 32.7
Bayside	4.9*	2.8 – 8.5	Loddon	3.6*	1.9 – 6.7
Benalla	9.7	6.2 – 14.8	Macedon Ranges	7.3	4.4 – 11.7
Boroondara	5.1*	2.8 – 9.0	Manningham	4.2*	2.3 – 7.5
Brimbank	2.9*	1.4 – 5.9	Mansfield	23.0	17.8 – 29.1
Buloke	**		Maribyrnong	3.5*	2.0 – 6.2
Campaspe	3.8*	1.7 – 8.1	Maroondah	4.2	2.7 – 6.4
Cardinia	15.7	12.0 – 20.2	Melbourne	1.3*	0.6 – 2.7
Casey	5.8	3.9 – 8.7	Melton	3.6*	2.1 – 6.1
Central Goldfields	2.4*	1.3 – 4.4	Mildura	3.1*	1.5 – 6.4
Colac-Otway	4.3*	2.1 – 8.5	Mitchell	26.3	21.4 – 31.8
Corangamite	4.3*	2.3 – 8.0	Moira	4.4*	2.1 – 9.0
Darebin	1.9*	0.9 – 3.8	Monash	2.2*	1.1 – 4.0
East Gippsland	10.0	6.4 – 15.3	Moonee Valley	3.0*	1.5 – 5.9
Frankston	3.0*	1.3 – 7.0	Moorabool	5.2	3.2 – 8.2
Gannawarra	3.3*	1.4 – 7.4	Moreland	3.3*	1.9 – 5.4
Glen Eira	3.7*	1.7 – 8.1	Mornington Peninsula	3.6*	1.6 – 7.7
Glenelg	4.5*	2.7 – 7.4	Mount Alexander	5.9*	3.3 – 10.4
Golden Plains	3.2*	1.8 – 5.4	Moyne	2.3*	1.2 – 4.3
Greater Bendigo	18.5	11.8 – 27.7	Murrindindi	73.0	65.5 – 79.3
Greater Dandenong	2.7*	1.4 – 5.1	Nillumbik	24.2	18.5 – 31.0
Greater Geelong	5.2*	2.4 – 10.9	Northern Grampians	9.8	6.6 – 14.5
Greater Shepparton	8.7*	3.3 – 20.9	Port Phillip	**	
Hepburn	15.4	12.1 – 19.4	Pyrenees	7.8*	4.1 – 14.2
Hindmarsh	6.8*	3.9 – 11.6	Queenscliffe	4.7*	2.4 – 9.1
Hobsons Bay	2.4*	1.2 – 4.8	South Gippsland	10.6	7.2 – 15.2

**Table 2.4: Proportion of Victorians affected by the 2009 bushfires, by LGA, 2011–12 (con't)**

LGA	%	95% CI	LGA	%	95% CI
Southern Grampians	7.6	4.8 – 11.9	West Wimmera	4.7*	2.7 – 7.9
Stonnington	2.7*	1.5 – 4.8	Whitehorse	4.9*	3.0 – 8.1
Strathbogie	12.2*	7.3 – 19.5	Whittlesea	9.1	6.4 – 12.8
Surf Coast	3.1*	1.9 – 5.0	Wodonga	4.9	3.2 – 7.5
Swan Hill	6.6*	3.5 – 12.2	Wyndham	4.1*	2.5 – 6.8
Towong	12.3	9.1 – 16.5	Yarra Ranges	29.7	23.5 – 36.7
Wangaratta	13.2	8.5 – 20.0	Yarra	3.0*	1.4 – 6.3
Warrnambool	3.3*	1.8 – 6.0	Yarriambiack	5.9*	3.1 – 11.2
Wellington	21.3	14.9 – 29.5	<b>Total</b>	<b>6.7</b>	<b>6.2 – 7.2</b>

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

\*\* Estimate has a relative standard error greater than 50 per cent and is not reported because it is not reliable.

Table 2.5 also presents information on where respondents affected by the bushfires in 2009 were living at the time of the survey in 2011–12, based on whether the LGA they were living in when surveyed was affected by the fires in 2009 (see Appendix 3 and Figure 8.1 for more information). LGAs were grouped into two categories in the table – those that were highly affected by the 2009 bushfires and those that were not. The percentages in the table reflect the proportion of respondents living within bushfire affected LGAs versus non-bushfire affected LGAs in 2011–12, who reported having been affected by the bushfires in 2009.

In 2011–12, three years after the event, 17.4 per cent of survey respondents living in LGAs affected by the bushfires reported having been affected by the fires. When the rates in the table are applied to the population, they suggest up to 170,000 adults now living in bushfire affected LGAs and up to 150,000 adults now living in other areas of the state were affected by the fires in 2009.

**Table 2.5: Proportion of Victorians affected by the fires, by whether LGA was affected by bushfires, 2011–12**

LGA Status	%	95% CI
Bushfire affected LGA	17.4	15.9 – 19.0
Non-bushfire affected LGA	4.0	3.6 – 4.4

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

## Socioeconomic status

There are many different indicators of socioeconomic status, but they can be broadly categorised into occupation, education, income and area-based indicators (ABS 2008; Galobardes et al. 2006). The VPHS 2011–12 collected household and individual level information on a number of socioeconomic characteristics. This report explored socioeconomic status using annual household income, highest level of educational attainment, occupation and the Index of Relative Socioeconomic Disadvantage (IRSD) – an area-based indicator of socioeconomic disadvantage developed by the Australian Bureau of Statistics (ABS 2008).

IRSD is derived from relevant Census 2006 variables such as income, educational attainment, unemployment, and dwellings without motor vehicles. The ABS determines an overall IRSD score for a given geographic area, such as an LGA, and assigns socioeconomic status based on area of residence. Area-based scores can then be grouped into larger units (percentiles, deciles, quintiles etc), based on nominal values, for socioeconomic analysis. The advantage of this indicator is it considers a range of socioeconomic indices, but the limitation is an area-based IRSD score does not necessarily represent the socioeconomic position of a person or household, and individuals within a given geographical area can differ markedly in terms of socioeconomic status.

Table 2.6 shows the proportion of respondents that reported being affected by the bushfires, within different categories for each socioeconomic indicator. None of the indicators in the table shows a significant socioeconomic pattern or trend for those respondents who reported being affected by the bushfires in 2009 ( $p \geq 0.05$ ).

**Table 2.6: Proportion of Victorians affected by the 2009 bushfires, by selected socioeconomic indicator, 2011–12**

Socioeconomic indicator	%	95% CI
<b>Index of relative socioeconomic disadvantage quintile</b>		
Quintile 1: Most disadvantaged	5.4	4.7 – 6.3
Quintile 2	8.2	6.9 – 9.7
Quintile 3	7.1	6.3 – 8.0
Quintile 4	7.3	6.3 – 8.4
Quintile 5: Least disadvantaged	5.6	4.6 – 6.8
<b>Highest level of education attained</b>		
None or just primary	2.3*	1.2 – 4.3
Some secondary	8.6	7.5 – 9.9
Completed secondary	7.0	6.2 – 7.9
Tertiary	5.7	5.1 – 6.3
<b>Annual household income level</b>		
<\$20,000	7.5	5.5 – 10.2
>=\$20–<40,000	6.3	5.3 – 7.5
>=\$40–<80,000	8.1	6.4 – 9.3
>=\$80,000	7.2	7.2 – 10.0
<b>Occupation</b>		
Professional	7.1	6.2 – 8.0
Non-professional	8.0	7.0 – 9.1

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

The Index of Relative Socioeconomic Disadvantage (IRSD) is an area-based measure of socioeconomic disadvantage developed by the Australian Bureau of Statistics (ABS 2008).

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

## Ethnicity

Ethnicity is a social construct that influences health through biological factors and cultural practice. It varies in definition, but is usually self-assessed using complementary indicators that capture some of the more recognisable elements of ethnicity (ABS 2011). The VPHS 2011–12 asked respondents whether they were of Aboriginal or Torres Strait Island origin, the country they were born in and whether they spoke a language other than English at home. These questions provide the basis for some of the more common measures of ethnicity currently found in the medical literature in Australia.

Table 2.7 shows the proportion of respondents that reported being affected by the bushfires, within a category, for each indicator of ethnicity. The proportion of respondents that were born in Australia and affected by the fires was significantly higher than the corresponding proportion that was born overseas (7.8 per cent versus 3.8 per cent). Similarly, the proportion of respondents that reported only speaking English at home and were affected by the fires was significantly higher than the corresponding proportion that reported speaking a language other than English at home (8.0 per cent versus 2.9 per cent).

There was no significant difference in the proportion of respondents that reported being bushfire affected, by Aboriginal status.

**Table 2.7: Proportion of Victorians affected by the 2009 bushfires, by selected indicator of ethnicity, 2011–12**

Indicator of ethnicity	%	95% CI
<b>Country of birth</b>		
Overseas	3.8	3.2 – 4.6
Australia	7.8	7.2 – 8.4
<b>Language spoken at home</b>		
Speak language other than English at home	2.9	2.3 – 3.5
Only speak English at home	8.0	7.4 – 8.6
<b>Aboriginal status</b>		
Aboriginal	12.3*	6.2 – 22.9
Non-Aboriginal	6.7	6.2 – 7.1

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

The term 'Aboriginal' includes persons who identified as being of Aboriginal and/or Torres Strait Islander origin in the survey.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

## Bushfire affected and non-bushfire affected respondents

Table 2.8 compares the socio-demographics of respondents that reported being affected by the 2009 bushfires with respondents who were not affected by the bushfires. A significantly higher proportion of bushfire affected respondents were in their middle years (35–64 years), lived in rural areas, reported being born in Australia and living in quintile 2 (IRSD) areas of the state, compared with their non-bushfire affected counterparts. A significantly lower proportion of bushfire affected respondents were aged 65 years or more, reported being overseas born, reported living in the metropolitan area or living in the most disadvantaged areas of the state (IRSD quintile 1), compared with respondents not affected by the bushfires.

**Table 2.8: Proportion of Victorians, by selected socio-demographic indicator, 2011–12**

Socio-demographic indicator	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
<b>Gender</b>				
Males	52.6	48.9 – 56.2	48.7	47.7 – 49.7
Females	47.4	43.8 – 51.2	51.3	50.3 – 52.3
<b>Age group</b>				
18–34 years	27.7	23.7 – 32.2	32.2	31.1 – 33.4
35–49 years	30.5	27.6 – 33.6	26.1	25.3 – 26.9
50–64 years	27.7	25.1 – 30.5	23.5	22.8 – 24.2
65 years+	14.1	12.5 – 15.8	18.2	17.7 – 18.8
<b>Area of residence</b>				
Metropolitan	58.7	55.1 – 62.3	75.9	75.3 – 76.4
Rural	41.3	37.7 – 44.9	24.2	23.6 – 24.7
<b>Country of birth</b>				
Australia	83.2	80.4 – 85.6	70.3	69.3 – 71.2
Overseas	16.6	14.2 – 19.4	29.5	28.6 – 30.4
<b>Index of relative socioeconomic disadvantage quintile</b>				
Quintile 1: Most disadvantaged	16.8	14.4 – 19.5	20.9	20.4 – 21.4
Quintile 2	23.1	19.8 – 26.7	18.3	17.7 – 18.9
Quintile 3	21.4	19.0 – 24.1	20.3	19.8 – 20.9
Quintile 4	23.3	20.2 – 26.7	21.7	21.1 – 22.3
Quintile 5: Least disadvantaged	15.4	12.7 – 18.7	18.8	18.3 – 19.4

95% CI: 95 per cent confidence interval.

Data for age groups are crude estimates. All other data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

The Index of Relative Socioeconomic Disadvantage (IRSD) is an area-based measure of socioeconomic disadvantage developed by the Australian Bureau of Statistics (ABS 2008).

## Discussion

In January and February 2009, Victoria experienced a series of devastating bushfires. The immediate impact of these fires has been previously documented – especially the Black Saturday bushfires (7 February 2009) (2009 Victorian Bushfires Royal Commission 2010). However, the number of people who were affected by these bushfires across the state has not previously been quantified.

The results of the VPHS 2011–12 showed about 6.7 per cent of adult Victorians were affected by the bushfires in some way. However, this is only an estimate, based on a representative sample of Victorians who responded to a survey questionnaire. This report describes the population number affected by the bushfires as being ‘up to 320,000 adults’. This number was derived from the upper limit of the 95 per cent confidence interval (7.2 per cent) for the proportion of respondents who reported being affected by the bushfires (see Table 2.1). A more precise estimate of the number affected cannot be derived from a survey.

Many of those who reported being affected, were affected in multiple ways. Some respondents reported having experienced fire coming close to their home or property (13.5 per cent), some reported being emotionally affected by the bushfires (12.8 per cent), while others reported losing friends (12.5 per cent), or family (3.6 per cent), or their homes (3.9 per cent) to the bushfires. There was no attempt to interpret these responses any further because the number of respondents in each category was too small to undertake more detailed analysis and produce reliable results. Neither was there any attempt to aggregate response categories. This was deemed impractical, open to interpretation and potentially misleading, given the range of impacts reported by respondents.

The results of the survey also showed that although a large proportion of those affected by the bushfires in 2009 were living in bushfire affected areas in 2011–12 (up to 170,000 adults), many others who were affected by the bushfires in 2009 were living outside these areas in 2011–12 (up to 150,000 adults). It is not known whether this pattern was evident in early 2009, or how many people who lived in bushfire affected areas of the state in 2009 moved to Melbourne or other areas of the state after the bushfires; the survey questionnaire did not follow this line of enquiry.

Respondents affected by the bushfires in 2009 had a different age structure to respondents who reported not having been affected by the bushfires, with a larger proportion in the middle years (35–64 years) and a smaller proportion aged 65 years or more. There were also differences in ethnicity, with a higher proportion of bushfire affected respondents being Australian born and coming from English speaking backgrounds. Both age and ethnicity are associated with health and wellbeing (AIHW 2012). Although the analysis in this report was adjusted for age to account for the difference in age structure between those affected by the bushfires and their counterparts, the analysis was not adjusted for the difference in ethnicity. This is worth considering when interpreting the results in subsequent sections of this report.



# 3. Mental wellbeing



## 3. Mental wellbeing

### Key findings

- Three years after the fires, very high psychological distress was more prevalent for respondents affected by the bushfires in 2009, compared with respondents not affected by the bushfires (4.6 per cent and 2.5 per cent, respectively).
- Low psychological distress was less prevalent for respondents who were affected by the bushfires, compared with respondents not affected by the bushfires (57.6 per cent and 65.4 per cent, respectively).
- Signs and symptoms of depression and anxiety were experienced by 21.9 per cent of respondents affected by the bushfires.
- The survey showed that 9.3 per cent of bushfire affected respondents accessed counselling or specialist mental health services, as a result of the impact of the bushfires.

Exposure to natural disasters, such as the bushfires in 2009, can affect the mental wellbeing of people involved in many ways. Although the majority of those exposed to a disaster are able to manage and have only mild, transitory symptoms, some people will develop a mental health disorder post-disaster (Department of Health 2010a; Department of Human Services 2009; Norris et al. 2002). This includes illness that is secondary to physical injury and sickness, as well as specific trauma-related mental health disorders, such as acute stress disorder. Recent evidence shows those indirectly exposed to trauma, including those who witness traumatic events, can also experience psychological impacts (Shultz et al. 2012). The impact of a disaster can also change over time for the individual, ranging from shock and confusion in the immediate aftermath of a disaster to distress, anger and sadness in the medium term and depression and anxiety over the longer term (Department of Human Services 2009). The extent of the illness that develops generally depends on factors such as individual resilience, the type of disaster, the degree of injury sustained, the amount of life threat, the duration of community disruption and the level of support provided in the wake of a disaster (Department of Health 2010a; Department of Human Services 2009; Galea et al. 2005; Norris et al. 2002).

This chapter explores aspects of mental wellbeing for survey respondents who reported being affected by the bushfires in 2009, three years after the event.

### Psychological distress

Psychological distress is a risk factor for a range of health conditions, including depression and cardiovascular disease (Holden et al. 2010; Kelly et al. 2009). The VPHS 2011–12 included the Kessler 10 Psychological Distress Scale (K10). It is a 10 item questionnaire designed to yield a measure of psychological distress in the previous four weeks, based on questions about anxiety levels and depressive symptoms individuals experienced, such as nervousness, hopelessness, restlessness, sadness and worthlessness. Each K10 question has the same response categories – all of the time, most of the time, some of the time, a little of the time and none of the time – that are scored from 5 to 1. The 10 items are summed to yield scores ranging from 10 to 50. Individuals are categorised to four levels of psychological distress, based on their total score: low (<16), moderate (16–21), high (22–29) and very high (30–50). Although the K10 cannot be used to determine the presence of major illness, it is a valid tool to measure anxiety, depression and worry (psychological distress) (Andrews and Slade 2001).

Table 3.1 shows a significantly higher proportion of respondents affected by the bushfires had very high levels of psychological distress, compared with respondents not affected by the bushfires (4.6 per cent versus 2.5 per cent). A significantly lower proportion of respondents affected by the bushfires had low levels of psychological distress, compared with respondents not affected by the fires (57.6 per cent versus 65.4 per cent).

There was no significant difference between bushfire affected males and females (Figure 3.1), or between bushfire affected respondents living in bushfire affected areas and other areas of the state (Figure 3.3). However, Figure 3.2 and Figure 3.4 show the proportion of respondents affected by the bushfires with low levels of psychological distress increased significantly with age and increasing levels of annual household income (age:  $p=0.014$ ; household income:  $p=0.041$ ). So, low levels of distress were more prevalent in older people affected by the bushfires and those with higher levels of annual household income.

**Table 3.1: Level of psychological distress in Victorians, 2011–12**

Level of psychological distress	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Low (<16)	57.6	53.8 – 61.4	65.4	64.4 – 66.4
Moderate (16–21)	24.4	21.1 – 28.0	21.2	20.4 – 22.0
High (22–29)	11.1	8.7 – 14.0	8.2	7.6 – 8.8
Very high (30–50)	4.6	3.4 – 6.3	2.5	2.2 – 2.8

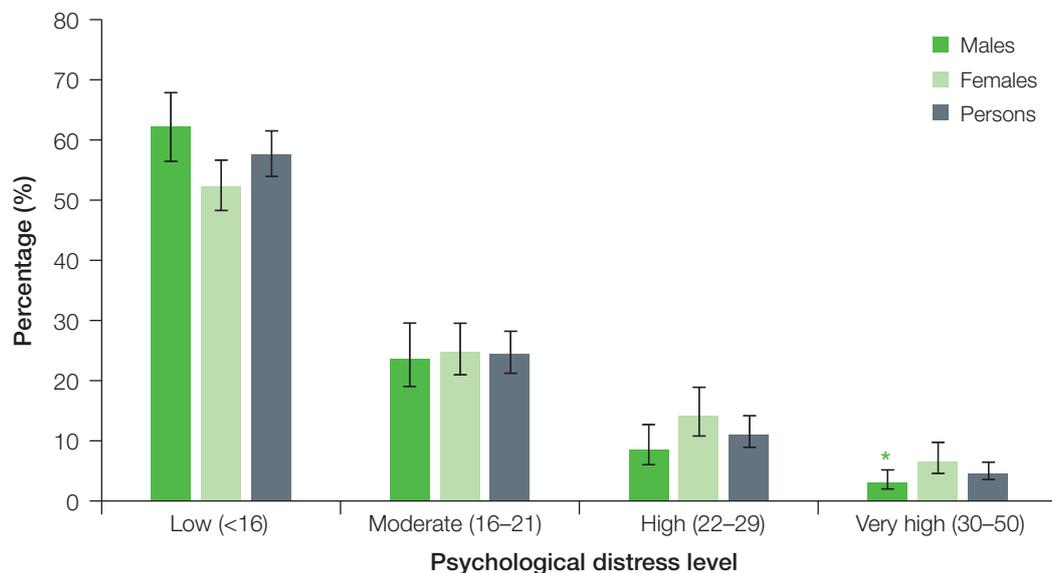
95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

**Figure 3.1: Levels of psychological distress in bushfire affected Victorians, by gender, 2011–12**



Error bars represent 95 per cent confidence intervals.

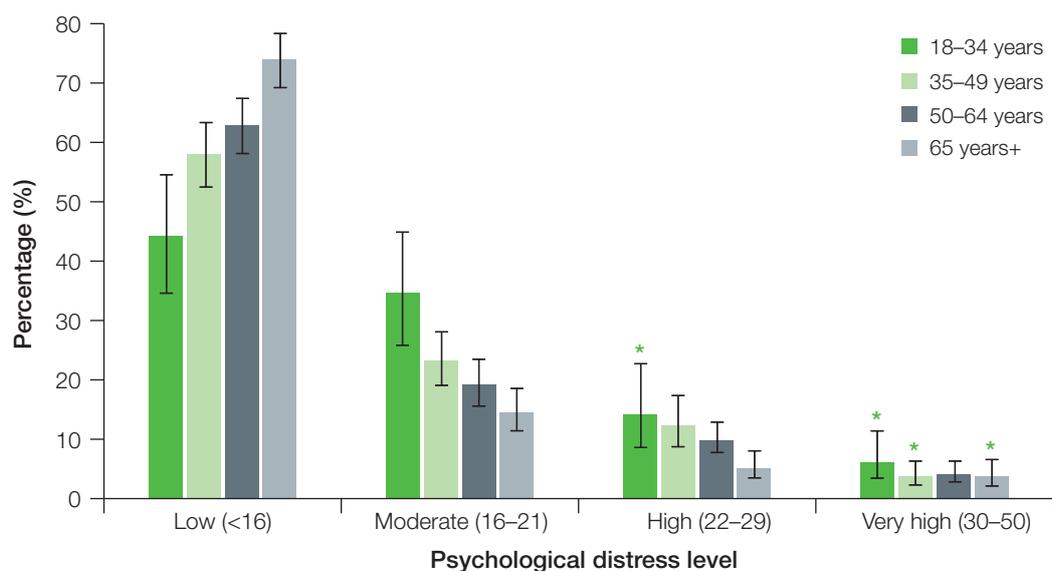
Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.2: Levels of psychological distress in bushfire affected Victorians, by age group, 2011–12**



Error bars represent 95 per cent confidence intervals.

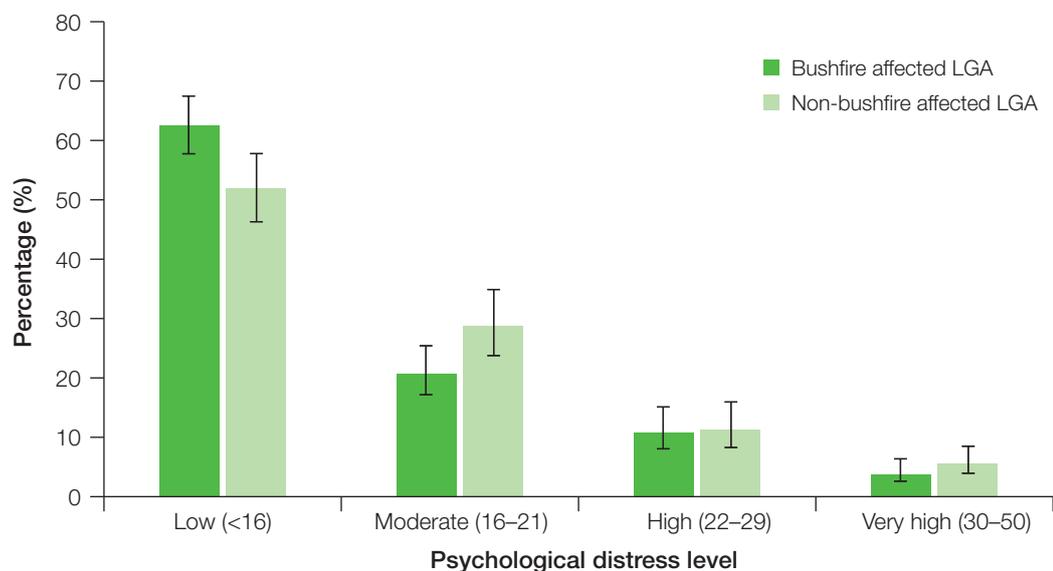
Data for age groups are crude estimates, they have not been age standardised.

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.3: Levels of psychological distress in bushfire affected Victorians, by whether LGA was affected by bushfires, 2011–12**



Error bars represent 95 per cent confidence intervals.

LGA: Local government area.

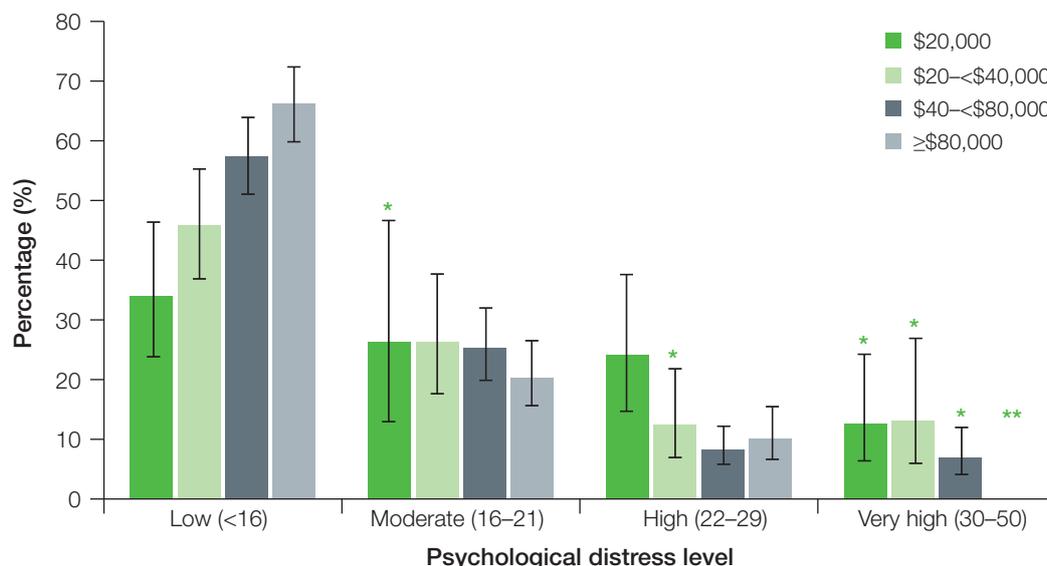
Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

Bushfire affected LGA: LGAs significantly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

**Figure 3.4: Levels of psychological distress in bushfire affected Victorians, by annual household income, 2011–12**



Error bars represent 95 per cent confidence intervals.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

\*\* Estimate has a relative standard error greater than 50 per cent and is not reported because it is not reliable.

## Depression and anxiety

Depression and anxiety are frequently observed among individuals who were exposed to trauma, including natural disasters such as the bushfires in 2009 (Gordon 2009; Ursano et al. 2007).

Major depression including adjustment disorder is also common and persists long after disaster, reflecting individual reaction to disaster as a part of complicated grief disorder (Bonanno et al. 2007; Department of Human Services 2009). Both depression and anxiety have implications for physical health because both are associated with physical illness. They are also associated with poorer health outcomes among those with existing physical illness (Clarke and Currie 2009).

The VPHS 2011–12 asked respondents if they experienced any signs or symptoms of anxiety or depression as a result of the bushfires. About one in five (21.9 per cent<sup>2</sup>) respondents affected by the bushfires reported experiencing signs or symptoms of anxiety or depression as a result of the bushfires, three years on from the event. In comparison, about one in five (20.1 per cent) adults in the general population have ever (lifetime prevalence) been diagnosed with depression or anxiety (Department of Health 2012a).

Table 3.2 shows levels of psychological distress for bushfire affected respondents who experienced/ did not experience signs and symptoms of anxiety or depression as a result of the bushfires. A significantly higher proportion of respondents who experienced signs and symptoms of anxiety or depression as a result of the bushfires had very high levels of psychological distress, compared with

2. 95 per cent confidence interval: 18.9–25.3 per cent.

respondents who did not experience signs and symptoms of anxiety or depression. At the other end of the scale, low levels of psychological distress were more prevalent among respondents who did not experience signs and symptoms of anxiety or depression than among those who did experience signs and symptoms of anxiety or depression.

There was no significant difference in psychological distress levels between bushfire affected males and females (Figure 3.5) or between bushfire affected respondents living in bushfire affected areas and bushfire affected respondents living in other areas of the state (Figure 3.7). However, Figure 3.6 and Figure 3.8 show the proportion of bushfire affected respondents with low levels of psychological distress, who experienced signs and symptoms of anxiety/depression as a result of the 2009 bushfires, increased significantly with age and levels of annual household income (age:  $p=0.013$ ; household income:  $p=0.002$ ). So, low levels of distress in those who had experienced anxiety/depression as a result of the bushfires were more prevalent in older people and those with higher levels of annual household income.

**Table 3.2: Levels of psychological distress in Victorians, by signs and symptoms of anxiety/depression as a result of the 2009 bushfires, 2011–12**

Level of psychological distress	Experienced signs/ symptoms of anxiety/ depression		Did not experience signs/symptoms of anxiety/depression	
	%	95% CI	%	95% CI
Low (<16)	41.7	33.0 – 51.0	62.3	58.1 – 66.4
Moderate (16–21)	27.3	20.5 – 35.3	23.3	19.6 – 27.4
High (22–29)	18.8	12.3 – 27.7	8.9	6.7 – 11.9
Very high (30–50)	10.4	6.3 – 16.5	3.0	2.0 – 4.6

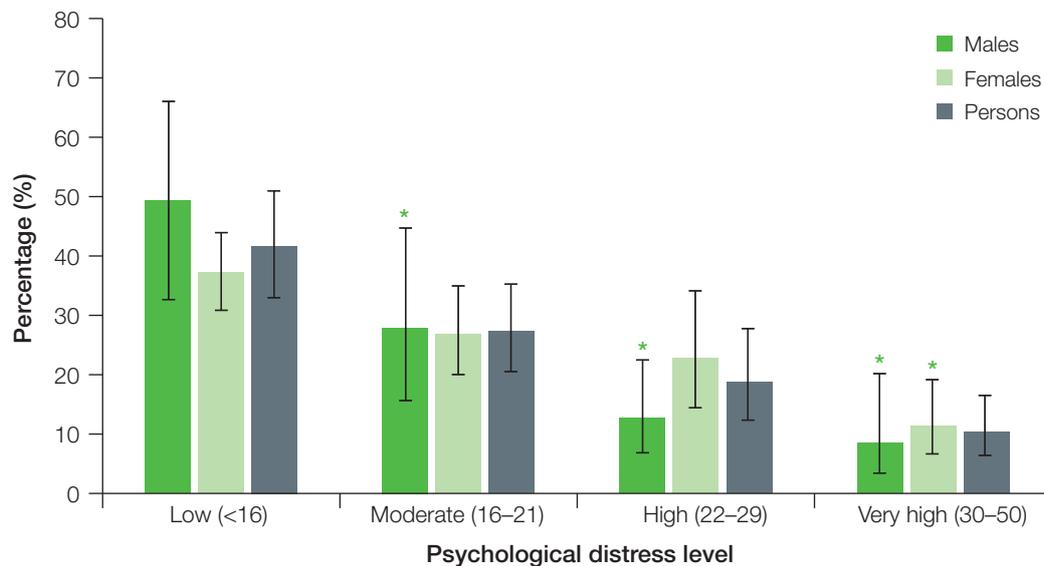
95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

**Figure 3.5: Levels of psychological distress in Victorians who experienced signs and symptoms of anxiety/depression as a result of the 2009 bushfires, by gender, 2011–12**



Error bars represent 95 per cent confidence intervals.

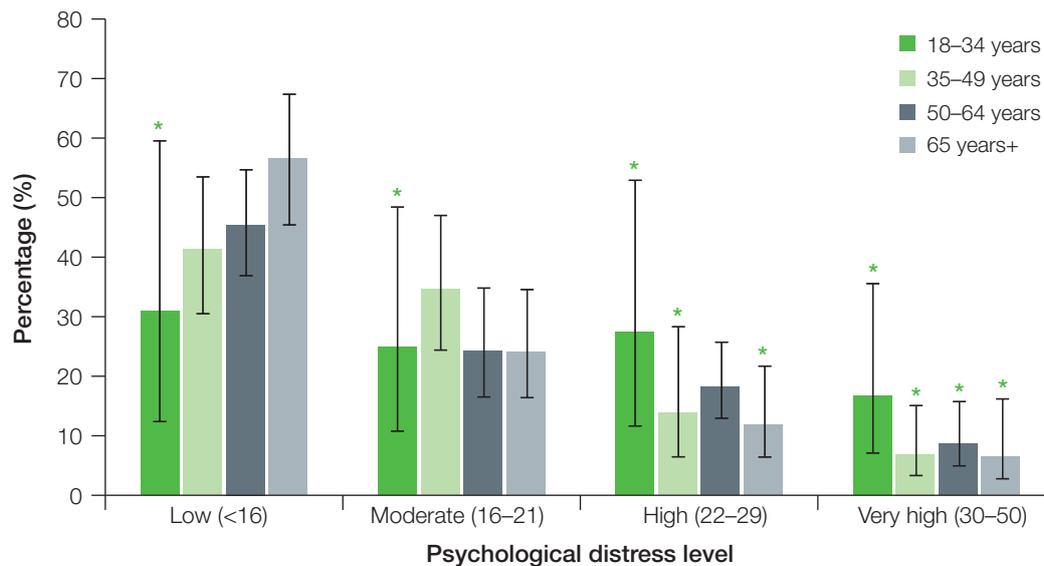
Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.6: Levels of psychological distress in Victorians who experienced signs and symptoms of anxiety/depression as a result of the 2009 bushfires, by age group, 2011–12**



Error bars represent 95 per cent confidence intervals.

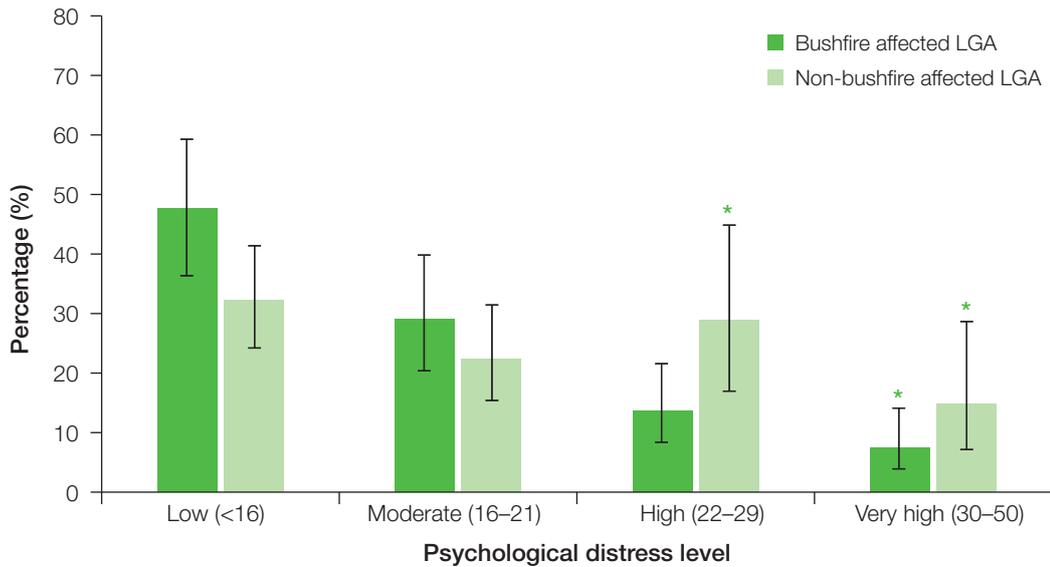
Data for age groups are crude estimates, they have not been age standardised.

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.7: Levels of psychological distress in Victorians who experienced signs and symptoms of anxiety/depression as a result of the 2009 bushfires, by whether LGA was affected by bushfires, 2011–12**



Error bars represent 95 per cent confidence intervals.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

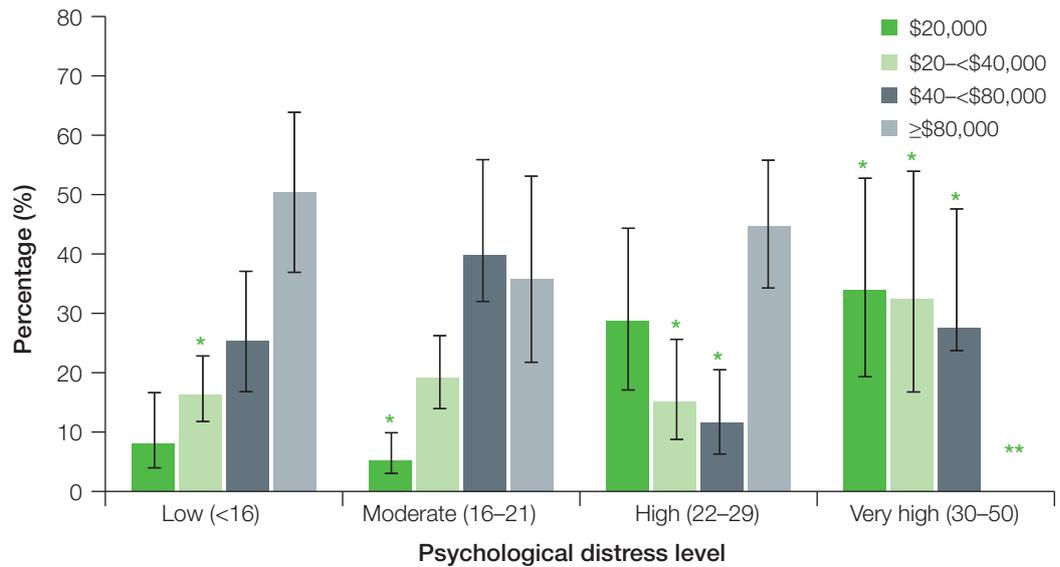
Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

Bushfire affected LGA: Those LGAs significantly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.8: Levels of psychological distress in Victorians who experienced signs and symptoms of anxiety/depression as a result of the 2009 bushfires, by annual household income, 2011–12**



Error bars represent 95 per cent confidence intervals.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

\*\* Estimate has a relative standard error greater than 50 per cent and is not reported because it is not reliable.

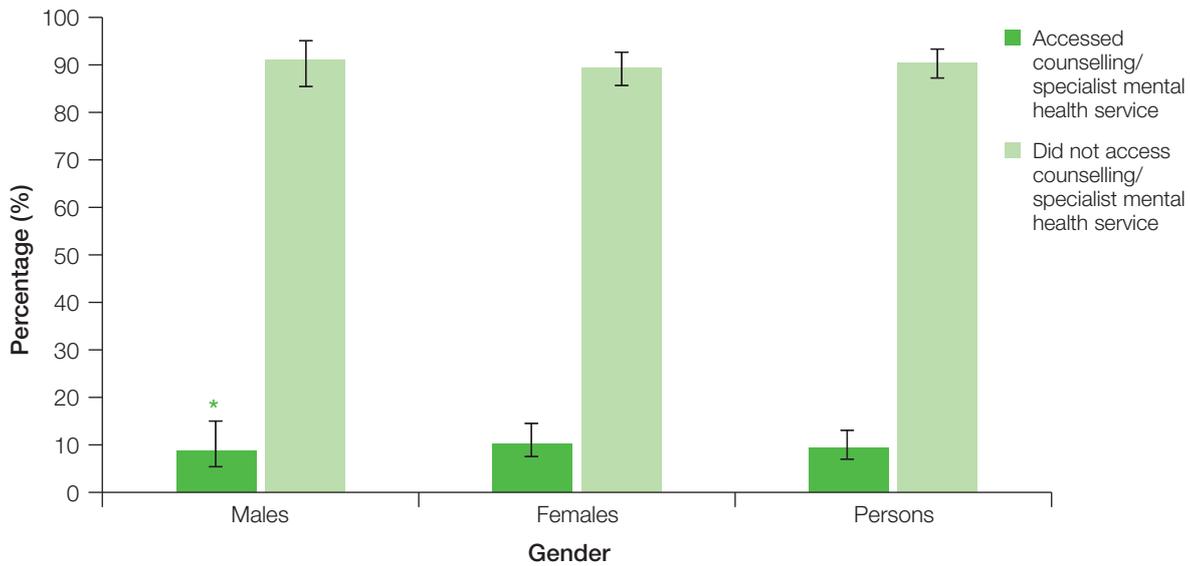
### Access to counselling/specialist mental health services

Survey respondents who reported having been affected by the bushfires in 2009 were asked if they accessed any counselling or specialist mental health services as a result of the impact of the fires. Three years on from the event, about one in ten (9.3 per cent<sup>3</sup>) bushfire affected respondents reported accessing counselling or specialist mental health services.

There was no significant difference in access rates to these services between males and females (Figure 3.9), age groups (Figure 3.10), between bushfire affected respondents living in bushfire affected areas and bushfire affected respondents living in other areas of the state (Figure 3.11), or in terms of annual household income level (Figure 3.12).

3. 95 per cent confidence interval: 6.7–12.8 per cent.

**Figure 3.9: Proportion of Victorians affected by the 2009 bushfires, by gender and counselling/specialist mental health service use, 2011–12**



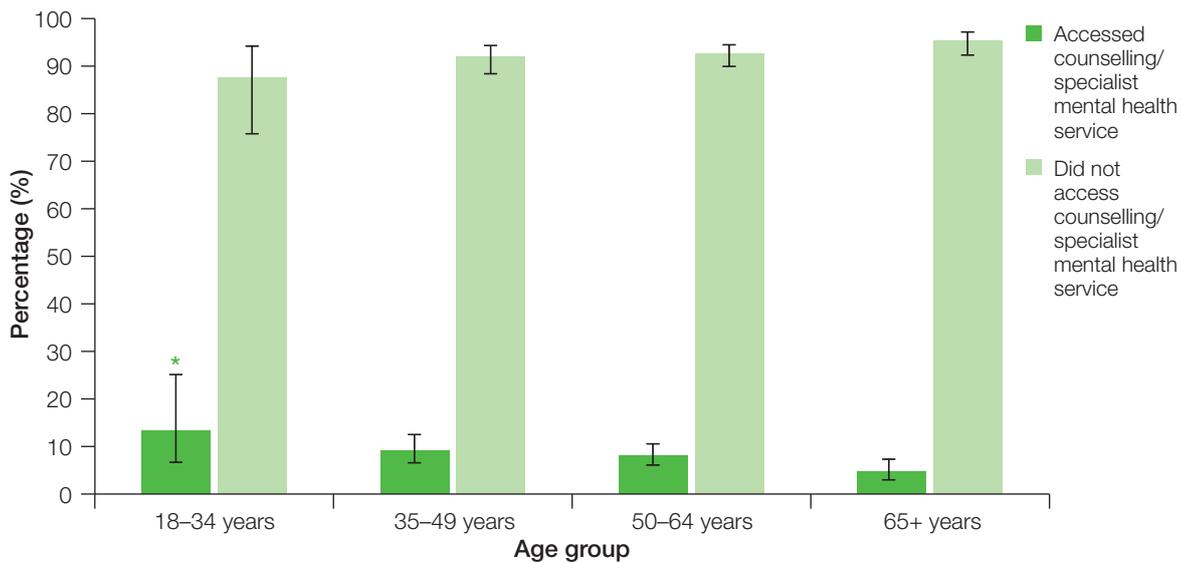
Error bars represent 95 per cent confidence intervals.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.10: Proportion of Victorians affected by the 2009 bushfires, by age group and counselling/specialist mental health service use, 2011–12**



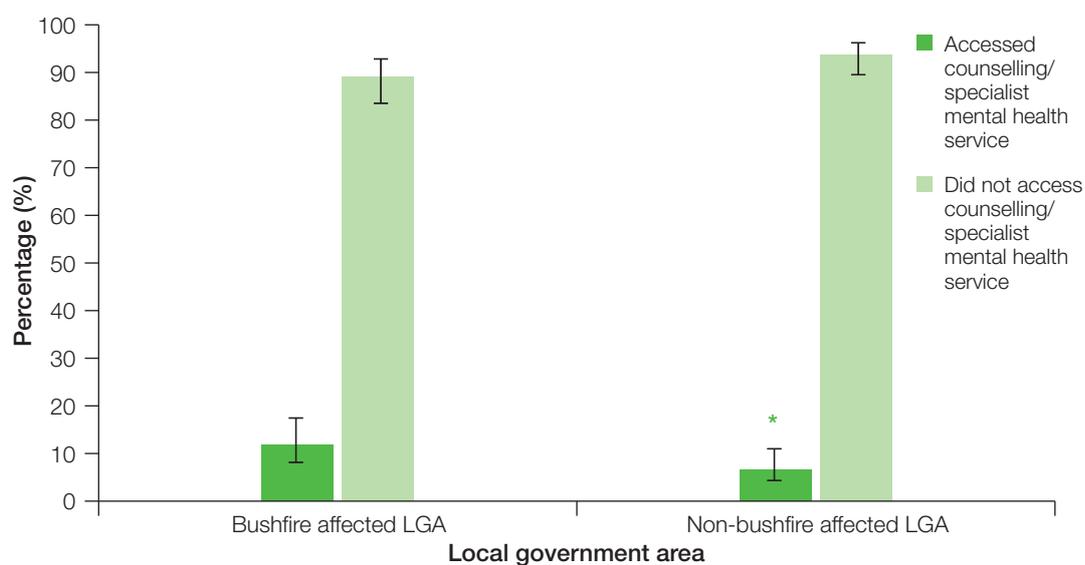
Error bars represent 95 per cent confidence intervals.

Data for age groups are crude estimates, they have not been age standardised.

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.11: Proportion of Victorians affected by the 2009 bushfires, by whether LGA was affected by bushfires and counselling/specialist mental health service use, 2011–12**



Error bars represent 95 per cent confidence intervals.

LGA: Local government area.

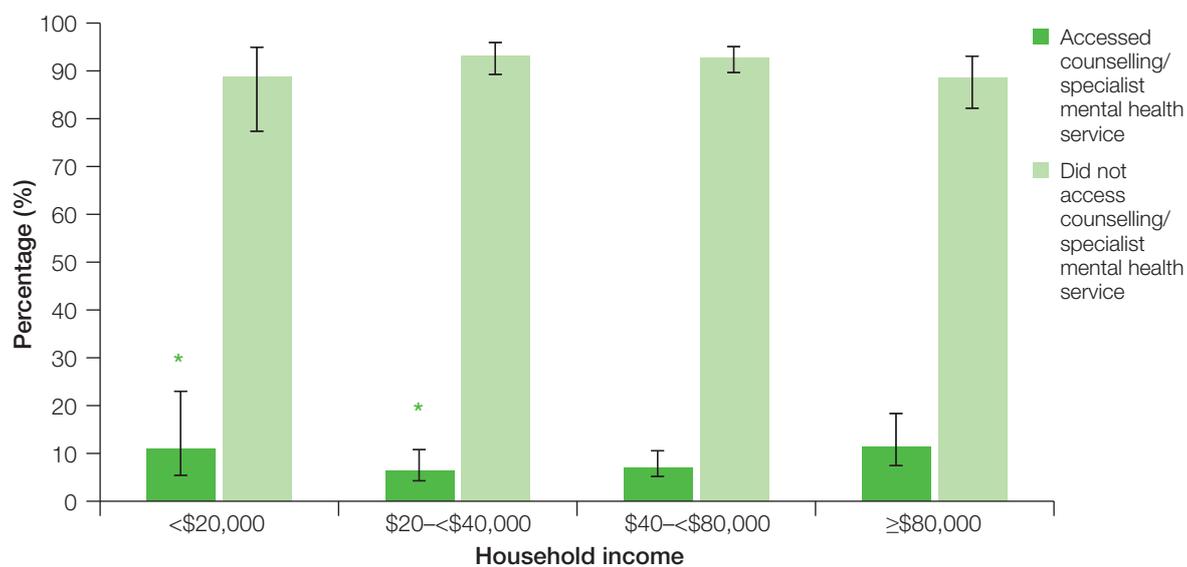
Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Bushfire affected LGA: Those LGAs significantly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

**Figure 3.12: Proportion of Victorians affected by the 2009 bushfires, by annual household income and counselling/specialist mental health service use, 2011–12**



Error bars represent 95 per cent confidence intervals.

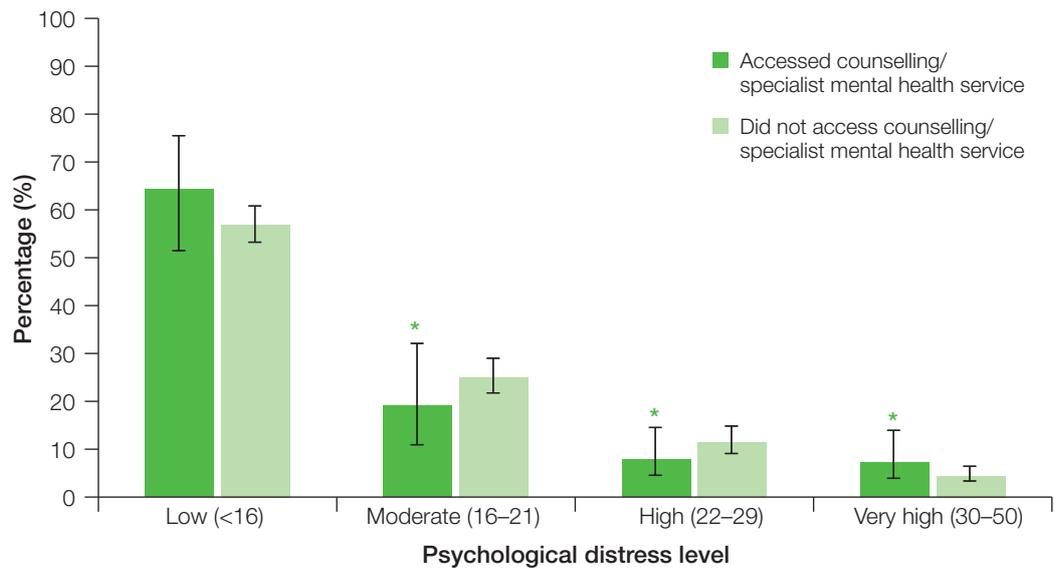
Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of ‘don’t know’ or ‘refused’ responses.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

Figure 3.13 shows there was no significant difference in the proportion of bushfire affected respondents who accessed/did not access counselling or specialist mental health services, by level of psychological distress.

**Figure 3.13: Levels of psychological distress in Victorians affected by the 2009 bushfires, by counselling/specialist mental health service use, 2011–12**



Error bars represent 95 per cent confidence intervals.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

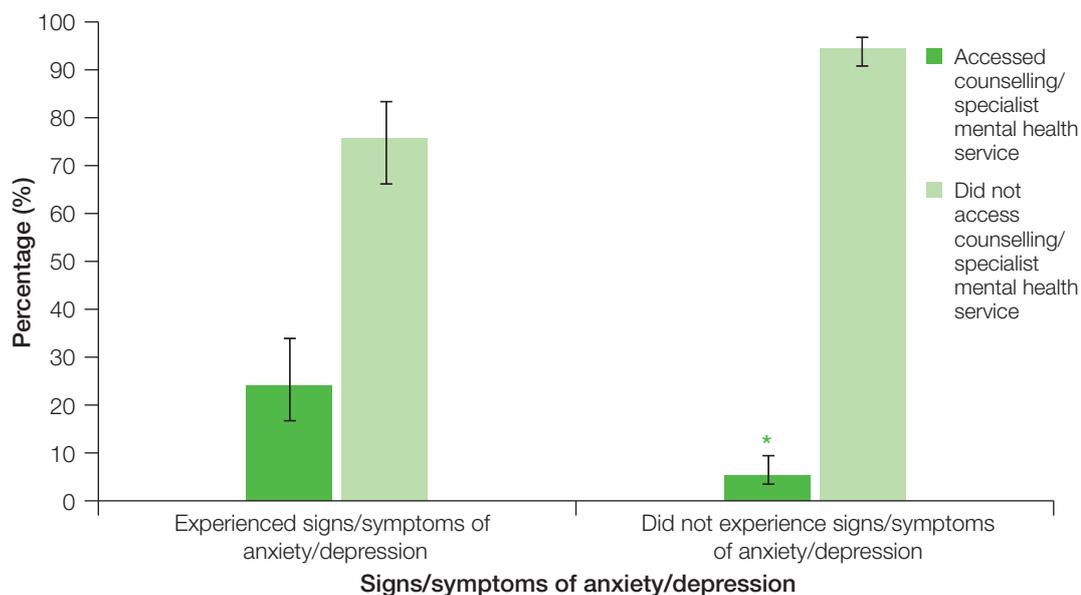
Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

The data presented in Figure 3.14 shows that about one in four (24.0 per cent<sup>4</sup>) bushfire affected respondents who experienced anxiety or depressive symptoms accessed these services.

**Figure 3.14: Proportion of Victorians affected by the 2009 bushfires, by whether experienced signs and symptoms of anxiety/depression and counselling/specialist mental health service use, 2011–12**



Error bars represent 95 per cent confidence intervals.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

4. 95 per cent confidence interval: 16.4–33.6 per cent.

The majority of respondents (90.4 per cent<sup>5</sup>) who reported being affected by the bushfires did not access counselling or specialist mental health services. Survey respondents were also asked why they did not access these services. Respondents could report multiple reasons for not accessing these services (Table 3.3).

The majority of bushfire affected respondents who did not access these services felt they did not need counselling (82.3 per cent). Respondents also reported:

- they 'don't want to' access services (6.8 per cent)
- they 'felt sufficiently supported through contact with family' (4.3 per cent)
- the service 'wasn't offered/available' (2.6 per cent).

**Table 3.3: Proportion of Victorians affected by the 2009 bushfires, by reasons for not accessing counselling/specialist mental health services, 2011–12**

Reasons given for why didn't access counselling or specialist mental health service	%	95% CI
Already seeing someone – counsellor/psychologist etc	0.2*	0.1 – 0.5
Didn't feel I needed counselling	82.3	79.6 – 84.7
Don't know where to go for help	1.0*	0.5 – 2.0
Don't want to	6.8	5.1 – 9.0
Felt others needed it more	0.4*	0.2 – 0.8
Felt sufficiently supported through contact with family	4.3	3.3 – 5.6
I was supporting others	0.3*	0.1 – 0.6
I wasn't in the area/didn't live in the area/wasn't directly affected	1.3*	0.8 – 2.1
It wasn't offered/available	2.6	1.6 – 4.0
No reason/ not really	0.8*	0.4 – 1.5
Too busy	0.9*	0.4 – 2.1
Other	1.2*	0.7 – 2.1

95% CI: 95 per cent confidence interval.

Data are crude estimates; they were not age standardised.

Figures do not add up to 100 per cent because respondents could provide more than one response to the question.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

## Discussion

The results of the VPHS 2011–12 showed the mental wellbeing of bushfire affected Victorians remains an issue. Three years on from the bushfires, the survey showed very high psychological distress was more prevalent in those affected by the bushfires, than it was in those not affected by the bushfires. This is not unexpected, given observations elsewhere of the long term impacts of disasters such as the bushfires (Ursano et al. 2007; Gordon 2009). Research shows following exposure to disaster, some people develop post traumatic stress disorder, anxiety, depression and complicated grief disorder, which can lead to insomnia, suicide, hypertension and substance abuse (Gordon et al. 2009; Kessler et al. 2008; Shultz et al. 2012; Ursano et al. 2007).

5. 95 per cent confidence interval: 87.0–93.1 per cent.

The Department of Human Services developed a framework for meeting the psychosocial needs of those affected by the bushfires (Department of Human Services 2009). The framework guided efforts by federal, state and local government, along with health and community service providers to support those affected and ensure their needs were met. A comprehensive range of supports were put in place to assist with the recovery, including providing vouchers for counselling sessions, telephone counselling, and support and referral services; establishing support groups within affected communities; as well as providing targeted programs aimed at supporting specific groups such as women, parents and older people (VBRRA 2009; 2011).

About one in 10 bushfire affected respondents reported accessing counselling or specialist mental health services as a result of the impact of the bushfires. Encouragingly, most Victorians affected by the bushfires who felt they required these services actually accessed them. The majority of those who did not access counselling or specialist mental health services reported they didn't feel they needed them (82.3 per cent). A further 6.8 per cent reported not wanting these services and 4.3 per cent said they felt sufficiently supported by family. However, there was a small group of bushfire affected respondents who reported the services were either not offered or not available (2.6 per cent), or they did not know where to go for help (1.0 per cent). It was not possible to explore this group any further because the number of respondents involved was too small to analyse and produce reliable results.

About one in five bushfire affected respondents reported having signs and symptoms of depression and anxiety as a result of the bushfires, and psychological distress levels appear to be particularly concerning for this group. Although they had higher rates of access to counselling or specialist mental health services for the impact of the bushfires than did those who did not experience symptoms of depression or anxiety, only about a quarter of this group actually accessed these services. Again, the number of respondents involved was too small to investigate the reasons given for not accessing counselling or specialist mental health services.

Research on risk factors for mental health disorder following disaster highlights the importance of individual characteristics such as gender, ethnicity and individual ability to cope (Brewin et al. 2000; Norris et al. 2002). The analysis showed the mental wellbeing indicators for bushfire affected respondents did not vary significantly by gender or for bushfire affected LGAs versus non-fire affected LGAs. However, the prevalence of low levels of psychological distress did increase with age and increasing annual household income levels. This trend was also observed among those who experienced signs and symptoms of depression as a result of the 2009 bushfires.

The findings showed both age and household income were important factors in this context, but gender and living in bushfire affected LGAs were not related to mental health disorder. The result for gender was unexpected, given its importance as a risk factor in the literature and that survey findings for the general Victorian population previously showed the prevalence of psychological distress and lifetime prevalence of depression vary by gender in Victoria (Department of Health 2010b; 2012b).

The result for bushfire affected LGAs is also worth noting, given the analysis focused on those respondents who reported being affected by the 2009 bushfires and were living in bushfire affected LGAs, three years on from the event. It would be reasonable to expect those affected by the bushfires, who were living in bushfire affected LGAs at the time of the survey in 2011–12, would have higher prevalence of mental health disorder. Surprisingly, the results showed the impact of the bushfires on mental wellbeing was similar across the state, at least in 2011–12.

There are three possible explanations. First, those affected by the bushfires in 2009 and living in bushfire affected areas were more likely to be in communities that received high levels of assistance and service support and have very strong social support networks as a result of their experience (see subsequent chapters on Health service use and Connections with others).

Second, many of those who were most affected by the fires in 2009 and living in fire affected areas at the time may have moved away from bushfire affected LGAs to non-bushfire affected areas by 2011–12 when the survey was conducted. Although a previous study of bushfire affected areas showed about three-quarters (73 per cent) of households that lost a home during the fires either rebuilt or relocated within the same LGA after the fires (DPCD 2012), migration of the most affected may have moderated results between LGAs in the data derived from the VPHS 2011–12.

Third, the LGA may not be sufficiently sensitive to detect disparities in mental wellbeing (if they exist), as a unit of geographic analysis. The actual geographic areas affected by the bushfires within each LGA would have been more specific to the population affected and thus preferable for use as the unit of geographic analysis, but this was not possible with the survey design used.



## 4. Health and lifestyle behaviours



## 4. Health and lifestyle behaviours

### Key findings

- A higher proportion of respondents affected by the bushfires met the guidelines for vegetable consumption, compared with respondents not affected by the bushfires (9.4 per cent and 7.2 per cent, respectively).
- A higher proportion of respondents affected by the bushfires met the guidelines for physical activity, compared with respondents not affected by the bushfires (71.1 per cent and 63.5 per cent, respectively).
- A lower proportion of respondents affected by the bushfires were normal weight, compared with respondents not affected by the bushfires (33.9 per cent and 41.2 per cent, respectively).
- A higher proportion of respondents affected by the bushfires were current smokers, compared with respondents not affected by the bushfires (19.9 per cent and 15.5 per cent, respectively).
- A lower proportion of respondents affected by the bushfires were non-smokers, compared with respondents not affected by the bushfires (52.4 per cent and 58.7 per cent, respectively).
- A higher proportion of respondents affected by the bushfires were at short-term risk of alcohol-related harm, compared with respondents not affected by the bushfires (51.7 per cent and 44.9 per cent, respectively).
- A lower proportion of respondents affected by the bushfires were non-drinkers, compared with respondents not affected by the bushfires (14.5 per cent and 18.6 per cent, respectively).

This chapter presents information on health and lifestyle behaviours that influence health, including the intake of fruit and vegetables, alcohol consumption, smoking, levels of physical activity and body weight status. These behaviours contribute to the burden of disease in Victoria, influencing the onset, maintenance and prognosis of a variety of health conditions and their complications. Because they are modifiable, these behaviours provide considerable scope for future health gain. The information is presented for respondents affected by the bushfires in 2009 and compared with all other respondents to the VPHS 2011–12.

### Nutrition

The National Health and Medical Research Council recently released a revised set of dietary guidelines (NHMRC 2013). However, the 2003 dietary guidelines were in effect when the VPHS 2011–12 was conducted (NHMRC 2003a; 2003b). Therefore, this chapter uses the 2003 guidelines as a reference point for the intake of fruit and vegetables.

Box 4.1 explains how recommended intake of fruit and vegetables is defined.

## Box 4.1: Daily intake of fruit and vegetables

The 2003 dietary guidelines recommend a minimum daily vegetable intake of four serves for people aged 12–18 years and five serves for people aged 19 years and over, where a serve is defined as half a cup of cooked vegetables or a cup of salad vegetables. The recommended minimum daily fruit intake is three serves for people aged 12–18 years and two serves for people aged 19 years and over, where a serve is defined as one medium piece or two small pieces of fruit or one cup of diced fruit.

### Recommended daily intake of fruit and vegetables

Guideline	Age group	Recommended daily intake
Fruit	Persons aged 12–18 years	Three serves
	Persons aged 19 years or more	Two serves
Vegetables	Persons aged 12–18 years	Four serves
	Persons aged 19 years or more	Five serves

Excludes pregnant or breastfeeding women.

Source: NHMRC 2003a; NHMRC 2003b.

Table 4.1 compares the proportion of respondents affected by the bushfires who met the guidelines for fruit and vegetable consumption with their counterparts not affected by the bushfires. A significantly higher proportion of respondents affected by the fires met the guidelines for vegetable consumption, compared with respondents who were not affected by the fires (9.4 per cent versus 7.2 per cent).

**Table 4.1: Proportion of Victorians who met the guidelines for fruit and vegetable consumption, 2011–12**

Met the guidelines for...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Fruit ( $\geq 2$ serves a day)	41.7	38.1 – 45.4	45.7	44.7 – 46.8
Vegetables ( $\geq 5$ serves a day)	9.4	7.7 – 11.4	7.2	6.7 – 7.6

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Based on the national dietary guidelines (NHMRC 2003a; NHMRC 2003b).

A serve of vegetables is equal to half a cup of cooked vegetables or a cup of salad vegetables.

A serve of fruit is equal to one medium piece or two small pieces of fruit, or one cup of diced fruit.

## Physical activity

Physical inactivity is a major modifiable risk factor for a range of conditions including cardiovascular disease, diabetes, some cancers, obesity and falls for older people. The evidence suggests health benefits accrue with increasing levels of physical activity and this protective effect occurs even if adopted in middle and later life. This makes physical activity an obvious target for health promotion, and monitoring physical activity levels at the population level can be used to investigate the outcomes of health promotion efforts.

Box 4.2 explains how physical activity levels are defined.

### Box 4.2: Levels of physical activity

The survey collected information on three types of physical activity to estimate whether respondents engage in sufficient physical activity to achieve a health benefit and meet the current national guidelines:

- time spent walking (for more than 10 minutes at a time) for recreation or exercise, or to get to and from places
- time spent doing vigorous household chores (excluding gardening)
- time spent doing vigorous activities other than household chores and gardening (for example, tennis, jogging, cycling or keep-fit exercises).

Respondents provided information on the number of sessions and the duration of each type of physical activity undertaken.

The level of health benefit achieved from physical activity partly depends on the intensity of the activity. Generally, individuals must participate in moderate-intensity activities (at least) to obtain a health benefit from physical activity. Accruing 150 or more minutes of moderate-intensity physical activity (such as walking) regularly over one week is believed to be 'sufficient' for health benefits and is the recommended threshold for physical activity according to the *National physical activity guidelines for Australians* (DoHA 1999). Those with an adequate baseline level of fitness may also gain extra health benefits by undertaking at least 30 minutes of vigorous exercise three to four times each week.

The sum of the proportion of respondents who undertake only vigorous physical activity or walking and vigorous activity sets the upper limit for the proportion that may satisfy both the health benefit and health fitness criteria to meet the guidelines on physical activity. The actual proportion of respondents who fulfil both criteria is reduced if individuals do not spend sufficient time on physical activity and/or do not participate in physical activity regularly.

The 'sufficient time and sessions' measure of physical activity is the preferred indicator of the adequacy of physical activity for a health benefit because it addresses the regularity of the activity undertaken. Under this measure, the requirement to participate in physical activity regularly (that is, on five, preferably seven, days per week) is an accrued 150 or more minutes of at least moderate-intensity physical activity.

Those respondents who satisfied both criteria (time and number of sessions) were classified as doing 'sufficient' physical activity to achieve an added health benefit.

## Box 4.2: Levels of physical activity (con't)

The number of minutes spent on physical activity was calculated by adding the minutes of moderate-intensity activity and twice the minutes of vigorous activity (that is, the minutes of vigorous intensity activity were weighted by a factor of two).

Respondents were classified as doing 'insufficient' physical activity if they reported undertaking physical activity during the week before the survey, but did not accrue 150 minutes and/or did fewer than five sessions. Respondents were considered to be 'sedentary' if they reported no physical activity for the relevant time period. Those classified as 'sedentary' or 'insufficient' are referred to as doing an 'insufficient' amount of physical activity to achieve health benefits.

### Definition of physical activity levels

Physical activity level	Time and sessions per week
Sedentary	0 minutes
Insufficient time and/or sessions	<150 minutes or $\geq$ 150 minutes, but fewer than five sessions
Sufficient time and sessions	$\geq$ 150 minutes and $\geq$ five sessions

Source: DoHA 1999.

According to Table 4.2, a significantly higher proportion of respondents affected by the bushfires met the guidelines for physical activity, compared with respondents not affected by the bushfires (71.1 per cent versus 63.5 per cent).

**Table 4.2: Proportion of Victorians who met the guidelines for physical activity, 2011–12**

Physical activity level	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Sedentary	4.4	3.3 – 5.8	5.5	5.0 – 6.0
Insufficient time/sessions to meet guidelines	21.0	18.2 – 24.0	27.2	26.3 – 28.2
Sufficient time/sessions to meet guidelines	71.1	67.9 – 74.1	63.5	62.5 – 64.4

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Based on *National physical activity guidelines for Australians* (DoHA 1999).

## Body weight status

There are serious health risks associated with being underweight, overweight, and obese. Health risks associated with being underweight include increased susceptibility to infection, amenorrhea, osteoporosis, problems with body temperature regulation, anaemia and hair loss. Health risks associated with being overweight or obese include type 2 diabetes, cardiovascular disease and hypertension, gallbladder disease, psychosocial disturbances and certain types of cancers.

Box 4.3 explains how body weight status is defined.

### Box 4.3: Classification of body weight status

The body mass index (BMI) provides a measure of weight in relation to height and can be used to estimate levels of unhealthy weight in a population. It is calculated as weight in kilograms divided by height in metres squared:

$$\text{BMI} = \text{weight (kg)} / \text{height squared (m}^2\text{)}.$$

The World Health Organisation (WHO) classifications for adult body weight status are based on BMI scores:

#### World Health Organisation classifications for adult body weight status

BMI score	Body weight category
< 18.5	Underweight
18.5–24.9	Normal
25.0–29.9	Overweight
≥ 30.0	Obese

Source: WHO 2013.

Survey respondents reported their height and weight. Their BMI was calculated and they were then assigned to body weight categories, according to the WHO classifications for body weight status.

This indicator does have some limitations. First, studies comparing self-reported height and weight with actual physical measurement show that people tend to underestimate their weight and overestimate their height, and so underestimate their BMI. Therefore, estimates of the prevalence of overweight and obesity in a population based on self-reported data are likely to be an underestimate. Second, BMI cannot distinguish between body fat and muscle. Therefore, an individual who is very muscular with low body fat could have a high BMI estimate and be classified as being obese. Third, the recommended BMI cut-offs for overweight and obese from the WHO are based on pooled data from a number of countries and do not account for specific differences between different populations.

However, self-reported BMI estimates still have a place in health monitoring because self-reported height and weight information is relatively inexpensive and easy to collect, and self-reported BMI can be useful in monitoring trends in body weight status over time.

Table 4.3 shows a significantly higher proportion of respondents affected by the bushfires were overweight or obese, compared with respondents not affected by the bushfires (57.6 per cent versus 50.0 per cent).

**Table 4.3: Proportion of Victorians, by body weight status, 2011–12**

Body weight status	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Underweight (BMI <18.5)	2.0*	1.1 – 3.5	2.2	1.9 – 2.6
Normal weight (BMI 18.5–24.9)	33.9	30.4 – 37.7	41.2	40.2 – 42.2
Overweight/obese (BMI ≥25.0)	57.6	53.8 – 61.4	50.0	49.0 – 51.0

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Based on the World Health Organisation classifications for adult body weight status (WHO 2013).

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

## Smoking

Tobacco smoking is the single most preventable cause of morbidity and mortality in Australia (AIHW 2008a). It is a major risk factor for coronary heart disease, stroke, peripheral vascular disease, several cancers and respiratory disorders.

Respondents were asked to describe their current smoking status. In this report 'current smokers' includes both daily smokers and occasional smokers. Respondents were also asked if they had ever smoked, and if so, whether they consumed a total of 100 commercial or hand-rolled cigarettes in their lifetime. If they answered 'yes' to this question, but did not currently smoke, they were classified as ex-smokers.

Table 4.4 shows a significantly higher proportion of respondents affected by the bushfires were current smokers, compared with respondents not affected by the bushfires (19.9 per cent versus 15.5 per cent). Further, a significantly lower proportion of respondents affected by the bushfires were non-smokers, compared with respondents not affected by the fires (52.4 per cent versus 58.7 per cent).

**Table 4.4: Proportion of Victorians, by smoking status, 2011–12**

Smoking status	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Current smoker	19.9	17.1 – 23.1	15.5	14.7 – 16.3
Ex-smoker	27.2	24.5 – 30.0	25.4	24.7 – 26.2
Non-smoker	52.4	48.8 – 56.1	58.7	57.7 – 59.7

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Current smoker: Includes respondents who smoked daily or occasionally.

## Alcohol use

Regular, excessive alcohol consumption over time places people at increased risk of chronic ill health and premature death (long-term risk). Episodes of heavy drinking may also place the drinker (and others) at risk of injury or death (short-term risk). The consequences of heavy, regular use of alcohol may include cirrhosis of the liver, cognitive impairment, heart and blood disorders, ulcers, cancers and damage to the pancreas.

The NHMRC released a revised set of guidelines to reduce the harm caused by alcohol consumption in 2009 (NHMRC 2009). The VPHS has historically included questions about alcohol consumption, based on the 2001 guidelines. Future surveys will adopt a set of standard questions based on the 2009 guidelines. However, this chapter uses the 2001 guidelines as a reference point for comparisons.

Box 4.4 explains how risk of harm from alcohol consumption is defined.

### Box 4.4: Alcohol consumption and risk of harm

The 2001 *Australian alcohol guidelines: health risks and benefits* (NHMRC 2001) emphasise patterns of drinking as opposed to levels of consumption (the average amount consumed). The concept of drinking patterns refers to aspects of drinking behaviour other than the level of drinking, and includes when, where and with whom drinking behaviour occurs, the type of drinks consumed, the number of heavy drinking occasions undertaken and the norms associated with drinking behaviour. The 2001 guidelines identified patterns of drinking behaviour as creating a risk to health, defining these risks in the following way.

- Short-term risk is excessive alcohol intake on a particular occasion.
- Long-term risk is high-level intake over months and years.

The 2001 guidelines specified the risks for various drinking levels for males and females of average or larger than average body size ( $\geq 60$  kg for males and  $\geq 50$  kg for females), over the short and long-term. The guidelines categorised risk according to three levels:

- low risk – a level of drinking at which the risk of harm is minimal and there are possible benefits for some of the population
- risky – a level of drinking at which the risk of harm outweighs any possible benefit
- high risk – a level of drinking at which there is substantial risk of serious harm and above which risk increases rapidly.

The 2001 guidelines defined short-term risk in terms of the number of standard drinks consumed per drinking occasion.

## Box 4.4: Alcohol consumption and risk of harm (con't)

### 2001 Australian alcohol guidelines for risk to health in the short-term

	Low risk	Risky	High risk
Males	Up to six on one day; no more than three days per week	Seven to 10 on any one day	11 or more on any one day
Females	Up to four on one day; no more than three days per week	Five to six on any one day	Seven or more on any one day

Alcohol quantities are expressed as standard drinks.

Source: NHMRC 2001.

The 2001 guidelines defined long-term risk in terms of the amount typically consumed each week.

### 2001 Australian alcohol guidelines for risk to health in the long-term

	Low risk	Risky	High risk	
Males	On an average day	Up to four per day	Five to six per day	Seven or more per day
	Overall weekly level	Up to 28 per week	29–42 per week	43 or more per week
Females	On an average day	Up to two per day	Three to four per day	Five or more per day
	Overall weekly level	Up to 14 per week	15–28 per week	29 or more per week

Based on a standard drink containing 10g or 12.5mL of alcohol.

Source: NHMRC 2001.

Respondents were asked if they consumed any alcoholic beverage in the preceding 12 months. If they replied 'yes', they were asked further questions about the frequency and quantity consumed. Their answers were used to calculate their average consumption and this was compared with the 2001 NHMRC guidelines to assess whether their consumption put them at short-term and/or long-term risk of alcohol-related harm.

Table 4.5 shows a significantly higher proportion of respondents affected by the bushfires were at short-term risk of alcohol-related harm, compared with respondents not affected by the bushfires (51.7 per cent versus 44.9 per cent). However, a significantly lower proportion of respondents affected by the bushfires were abstainers (non-drinkers), compared with respondents not affected by the fires (14.5 per cent versus 18.6 per cent).

**Table 4.5: Proportion of Victorians, by risk of alcohol-related harm, 2011–12**

Risky/high risk pattern of alcohol consumption leading to...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Abstainers	14.5	12.6 – 16.7	18.6	17.9 – 19.4
Short-term risk	51.7	48.3 – 55.2	44.9	43.9 – 45.9
Long-term risk	5.4	3.5 – 8.0	3.2	2.9 – 3.6

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Assessment of risk is based on the *Australian alcohol guidelines: health risks and benefits* (NHMRC 2001).

Abstainers: Includes long-term and recent abstainers (that is, those who had a drink in the last 12 months but reported they no longer drink).

## Discussion

The survey results for modifiable behaviours associated with health and lifestyle showed bushfire affected Victorians consume more vegetables on average and had higher rates of physical activity at levels sufficient to meet the national guidelines, than their non-bushfire affected counterparts. However, the prevalence of being overweight or obese was higher in bushfire affected Victorians. This has implications for future health and wellbeing, because excess body weight contributes to developing chronic conditions such as type 2 diabetes, heart disease, arthritis and some cancers.

The results of the survey also showed bushfire affected Victorians had a lower level of prevalence for abstinence from alcohol than did their non-bushfire affected counterparts. They also had a higher prevalence of short-term alcohol-related harm, and higher prevalence of current smoking.

There are few studies that consider the prevalence of substance use in groups exposed to trauma, like the VPHS 2011–12. However, increases in the level of substance use (smoking more cigarettes, consuming higher levels of alcohol, etc) has previously been observed in existing substance users following exposure to a traumatic event or disaster (Flory et al. 2009; Rubonis and Bickman 1991; Stein et al. 2004; Vlahov et al. 2002) and explained as a coping mechanism for emotional distress, or in terms of self-medication for those affected (Vetter et al. 2008). While these studies observed an increase in consumption in existing substance users, they did not observe higher prevalence. Nor did they consider whether prevalence of substance use was higher in groups exposed to trauma versus control groups (the non-exposed).



# 5. Health outcomes



## 5. Health outcomes

### Key findings

- A lower proportion of respondents affected by the bushfires reported excellent health, compared with respondents not affected by the bushfires (9.3 per cent and 11.9 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported having ever been diagnosed with osteoporosis (6.8 per cent) and arthritis (25.1 per cent), compared with respondents not affected by the bushfires (5.1 per cent and 19.3 per cent, respectively).

This chapter explores disparities in health outcome for respondents affected by the bushfires in 2009 and those respondents not affected by the bushfires (remainder of survey respondents).

### Self-reported health status

Self-reported health status is a reliable predictor of ill-health, future healthcare use and premature mortality, independent of other medical, behavioural or psychosocial risk factors (Burstrom and Fredlund 2001; Idler and Benyami 1997; Miilunpalo et al. 1997). Survey respondents were asked to summarise their perceptions of their health status by indicating whether, in general, they would say their health was excellent, very good, good, fair or poor.

Table 5.1 shows a significantly lower proportion of respondents affected by the bushfires reported 'excellent' health, compared with respondents not affected by the bushfires (9.3 per cent versus 11.9 per cent).

**Table 5.1: Proportion of Victorians, by self-reported health status, 2011–12**

Self-reported health	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Excellent	9.3	7.6 – 11.2	11.9	11.3 – 12.6
Very good	36.3	32.5 – 40.3	34.9	33.9 – 35.9
Good	37.8	34.2 – 41.4	37.3	36.3 – 38.3
Fair	12.4	10.4 – 14.6	12.9	12.2 – 13.5
Poor	4.1	3.0 – 5.4	2.9	2.6 – 3.2

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Selected health conditions

Respondents were also asked if they had ever been diagnosed by a doctor with any of the following conditions:

- cancer
- heart disease
- stroke
- high blood pressure
- arthritis
- osteoporosis
- asthma
- type 2 diabetes.

Table 5.2 shows a significantly higher proportion of respondents affected by the bushfires reported having ever been diagnosed with osteoporosis (6.8 per cent) and arthritis (25.1 per cent) than did respondents not affected by the fires (5.1 per cent and 19.3 per cent, respectively). There were no significant differences in prevalence between the two groups for other conditions.

**Table 5.2: Proportion of Victorians, by selected health condition, 2011–12**

Ever told by a doctor you have...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Heart disease	8.5	6.6 – 11.0	6.6	6.3 – 7.0
Stroke	2.5	1.8 – 3.4	2.2	2.0 – 2.4
Cancer	7.5	6.2 – 9.0	6.9	6.5 – 7.3
Osteoporosis	6.8	5.7 – 8.0	5.1	4.8 – 5.3
Arthritis	25.1	23.0 – 27.3	19.3	18.7 – 19.8
Type 2 diabetes	4.6	3.7 – 5.7	5.0	4.7 – 5.3
High blood pressure	27.3	24.8 – 29.9	24.3	23.7 – 25.0
Asthma	26.1	22.8 – 29.6	22.0	21.1 – 22.9

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

## Discussion

There were a few differences observed between the two groups in terms of health outcomes. A lower proportion of respondents affected by the bushfires reported excellent health than did respondents not affected by the bushfires. However, prevalence at the lower end of the scale was very similar between the two groups of interest, with less than one in five respondents in both groups reporting fair/poor health status.

Arthritis and osteoporosis were more prevalent among those affected by the bushfires than among those not affected. Although these are both age-related conditions, the data were age standardised to remove any age-related effect on comparisons between the two groups.

The higher prevalence of arthritis might be explained by the fact that many of those affected by the bushfires were in rural areas of the state in 2009 and were perhaps engaged in physical labour or pursuits that contribute to joint wear. Others affected by the bushfires included fire fighters, and the nature of their work contributes to joint wear. Further, the prevalence of being overweight or obese were higher among the bushfire affected, which is a risk factor for arthritis.

An explanation for the higher prevalence of osteoporosis was less obvious. After adjusting for sex, in addition to age, the difference in prevalence of osteoporosis between the two groups remained (data not shown). A review of disaster-related literature did not unearth any similar findings about the higher prevalence of arthritis and osteoporosis in the affected group.



## 6. Health service use



## 6. Health service use

### Key findings

- A lower proportion of bushfire affected women aged 50–69 years reported having had a mammogram in the previous two years, compared with non-bushfire affected women in the same age group (73.2 per cent and 83.9 per cent, respectively).
- There was no difference in the proportions of respondents affected or not affected by the bushfires that had an eye examination; or that had a blood pressure check, a cholesterol check or blood glucose check in the previous two years.
- There was no difference in the proportions of respondents affected or not affected by the bushfires that had a bowel examination or Pap test in the previous two years.
- There was no difference in the duration of time since their last visit to a doctor for respondents affected or not affected by the bushfires.
- There was no difference in the duration of time since their last visit to a dentist for respondents affected or not affected by the bushfires.

In Victoria, the department has major responsibility for public health services. The private sector and other government agencies also play an important role in the health system, providing general practice, specialist medical and surgical, pharmaceutical, dental, allied health, aged care and private hospital services. This chapter examines the use of selected health services by respondents affected by the bushfires in 2009 and respondents not affected by the bushfires. The scope is limited to those services that were included in the VPHS 2011–12 questionnaire.

### Health checks

Regular health checks can detect the presence of a disorder, which is essential for early diagnosis and intervention and which in turn can lead to better outcomes for a range of health conditions. This is especially the case for chronic conditions such as cardiovascular disease and diabetes.

The VPHS 2011–12 asked respondents whether they had a blood pressure check, a cholesterol check or a blood glucose check in the previous two years. High blood pressure, or hypertension, is an important risk factor for cardiovascular disease and the risk of disease increases with increasing blood pressure levels (AIHW 2004). There are several modifiable causes of high blood pressure including poor nutrition, low levels of physical activity, obesity and high levels of alcohol consumption.

Elevated blood cholesterol is an important risk factor for coronary heart disease, stroke and peripheral vascular disease (AIHW 2004). Cholesterol checks are recommended for people at high risk of disease, such as smokers, those with a significant family history of coronary heart disease, those who are overweight or obese, those who have hypertension and those who are aged 45 years or more (National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand 2001).

Blood glucose tests detect the development of, or a predisposition to, diabetes mellitus. Individuals at risk of the disease are advised to have their blood glucose levels checked periodically. At risk groups include those who are physically inactive, those who are overweight or obese, those with high total cholesterol and those with high blood pressure (AIHW 2008b).

The VPHS 2011–12 also asked respondents whether they had ever had an eye examination. Individuals at risk of specific eye conditions are advised to have regular eye examinations to detect problems and seek treatment at an early stage (DoHA 2010), while those who experienced a recent change in vision are also advised to see an eye health professional.

Table 6.1 shows there was no significant difference in the prevalence of health checks between respondents affected by the bushfires and respondents not affected by the bushfires.

**Table 6.1: Proportion of Victorians who had selected health checks, 2011–12**

Health check	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Blood pressure check (last two years)	85.3	81.9 – 88.1	82.1	81.2 – 83.0
Cholesterol check (last two years)	62.3	58.8 – 65.6	60.9	60.0 – 61.8
Blood glucose check (last two years)	56.9	53.3 – 60.4	56.1	55.1 – 57.0
Eye examination (ever had)	81.9	78.4 – 84.9	79.6	78.7 – 80.5

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

## Cancer screening

Cancer screening can detect early signs of disease or indications that a person is more likely to develop cancer in the future. In most cases, early detection increases the chances of successful treatment. Screening tests done on a large scale – usually through a national program – are called population screening. Large groups of otherwise healthy people are tested for signs of disease. Examples include the breast, bowel and cervical cancer screening programs conducted on target groups in Victoria.

The VPHS 2011–12 asked respondents aged 50 years or more whether they had a bowel examination to detect bowel cancer in the last two years. Bowel cancer is the third most common cancer for people living in Victoria (CCV 2012) and can be treated successfully if detected early.

Female respondents were asked whether they had a Pap test in the last two years. Cervical cancer is largely preventable through regular screening. However, at least 80 per cent of Victorian women who develop cervical cancer have either never had a Pap test, or have not followed the recommended two-yearly screening in the 10 years before diagnosis (VCCR 2012).

Female respondents aged 50 years or more were also asked if they had a mammogram in the last two years. Breast cancer is the most common new cancer for Victorian women, and the second highest cause of cancer death (CCV 2012). Finding breast cancer early offers women the best chance of successful treatment and recovery. The BreastScreen Australia program, established in 1991, provides breast screening via mammography. The program specifically targets women aged 50–69, although women aged 40–49 and 70 years or more can also access the program.

Table 6.2 shows there was no significant difference in the proportion of respondents affected by the bushfires who had a bowel examination or Pap test in the last two years, compared with those not affected by the bushfires. However, women aged 50–69 years affected by the bushfires had a significantly lower rate for mammogram than did their non-bushfire affected counterparts (73.2 per cent versus 83.9 per cent).

**Table 6.2: Proportion of Victorians who had a cancer screen, 2011–12**

Cancer screen	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Bowel examination last two years (50 years+)	29.5	26.3 – 32.9	31.0	30.0 – 31.9
Pap smear last two years (females, 20–69 years)	75.0	70.9 – 78.8	74.9	73.7 – 76.1
Mammogram last two years (females, 50–69 years)	73.2	66.5 – 79.0	83.9	82.5 – 85.2

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bowel examination includes x-ray of bowel, colonoscopy, faecal occult blood test or barium enema.

## Last visit to a doctor

Doctors diagnose, treat and manage health issues. They provide preventive advice to their patients, prescribe medicines, and refer patients to other health services when required (AIHW 2012). General practitioners (GPs) provide a high proportion of these services, with more than 80 per cent of the population visiting a GP, at least once, in any one year (AIHW 2010).

Survey respondents were asked about the last time they visited a doctor. Table 6.3 shows 88.9 per cent of bushfire affected respondents visited a doctor at least once in the previous 12 months. There was no significant difference in the timing of the last visit to a doctor for respondents affected by the bushfires, compared with respondents not affected by the bushfires.

**Table 6.3: Proportion of Victorians, by the duration of time since their last visit to a doctor, 2011–12**

Health professional	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
<b>Doctor</b>				
Less than 3 months ago	62.5	58.5 – 66.2	59.4	58.4 – 60.4
3 months to less than 6 months ago	18.0	14.9 – 21.6	17.7	16.9 – 18.5
6 months to less than 12 months ago	8.4	6.6 – 10.6	10.5	9.9 – 11.2
12 months ago or more	10.1	7.8 – 13.0	11.9	11.2 – 12.7

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Last visit to a dental professional

Oral health is fundamental to overall health and wellbeing and there is an association between regular dental check ups (at least once a year) and favourable oral health outcomes (AIHW 2011). Although most oral health care is provided by general dental health practitioners in private practice in Victoria, public dental services are available for children (<18 years of age) and for some adults (for further information see: <http://health.vic.gov.au/dentistry/public-dental-system.htm>).

Survey respondents were asked about the last time they visited a dental professional. Table 6.4 shows more than half (54.6 per cent) of all bushfire affected respondents visited a dental professional in the last 12 months. There was no significant difference in the timing of the last visit to a dental professional for respondents affected by the bushfires, compared with respondents not affected by the bushfires.

**Table 6.4: Proportion of Victorians, by the duration of time since their last visit to a dental professional, 2011–12**

Health professional	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
<b>Dental professional</b>				
less than 12 months ago	54.6	50.7 – 58.4	57.5	56.4 – 58.5
1 year to less than 2 years ago	19.9	16.8 – 23.4	18.1	17.2 – 18.9
2 years to less than 5 years ago	14.0	11.9 – 16.4	14.0	13.3 – 14.7
5 years to less than 10 years ago	5.9	4.1 – 8.5	4.9	4.5 – 5.4
10 years ago or more	5.1	3.9 – 6.7	4.8	4.4 – 5.3

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Discussion

Health service use focuses on primary and prevention services, although the scope is limited. It does not include community health services and hospital based services, for example. Survey results show little difference in primary and preventive health service use between those affected by the bushfires in 2009 and their non-bushfire affected counterparts. There was no difference between the two groups in terms of having had eye examinations or blood pressure, cholesterol or blood glucose checks. The prevalence of having seen a doctor or dentist at different time intervals was very similar between groups, as was bowel examination and Pap test rates.

The similarity in service use is a positive outcome and may be partially explained by the health and community support service response to the bushfires, which was unprecedented in Victoria. Emergency health services (including ambulance and public hospital emergency department services) provided emergency care initially to people from bushfire affected communities (VBRRA 2011). The Department of Human Services was responsible for public health services in Victoria at the time and was involved in the health and community support service response from the outset. It also provided health and safety advice and assistance to address potential hazards during the clean up after the bushfires.

The department established 10 community service hubs in bushfire affected communities in February 2009, with outreach services provided to a further seven communities (VBRRA 2011). The hubs provided an integrated, comprehensive range of information, services and support from a single contact point within communities, allowing for access to both regular services and special services established to aid in the recovery. The department also worked with other agencies to maintain access to general practice and other primary and preventive services in bushfire affected communities.

The only difference observed in service use was for breast screening. The proportion of women aged 50–69 years who reported having a mammogram in the last two years was lower in the bushfire affected group. Analysis of socioeconomic, demographic and residency indicators could not explain this difference. BreastScreen Victoria services were not directly affected by the bushfires. There was also no difference in mammogram rates for bushfire affected women living in LGAs affected by the fires and bushfire affected women living in other areas of the state, which suggests access to breast screening services was not affected in bushfire affected areas.

The survey also included questions about whether women were screened by a private or public service and if there were any specific reasons for their last mammogram (family history of breast cancer, had found a lump in breast, etc). There was no difference in the reasons given for screening or the private/public screening ratio for those affected by the bushfires, compared with their non-bushfire affected counterparts.



## 7. Connections with others



## 7. Connections with others

### Key findings

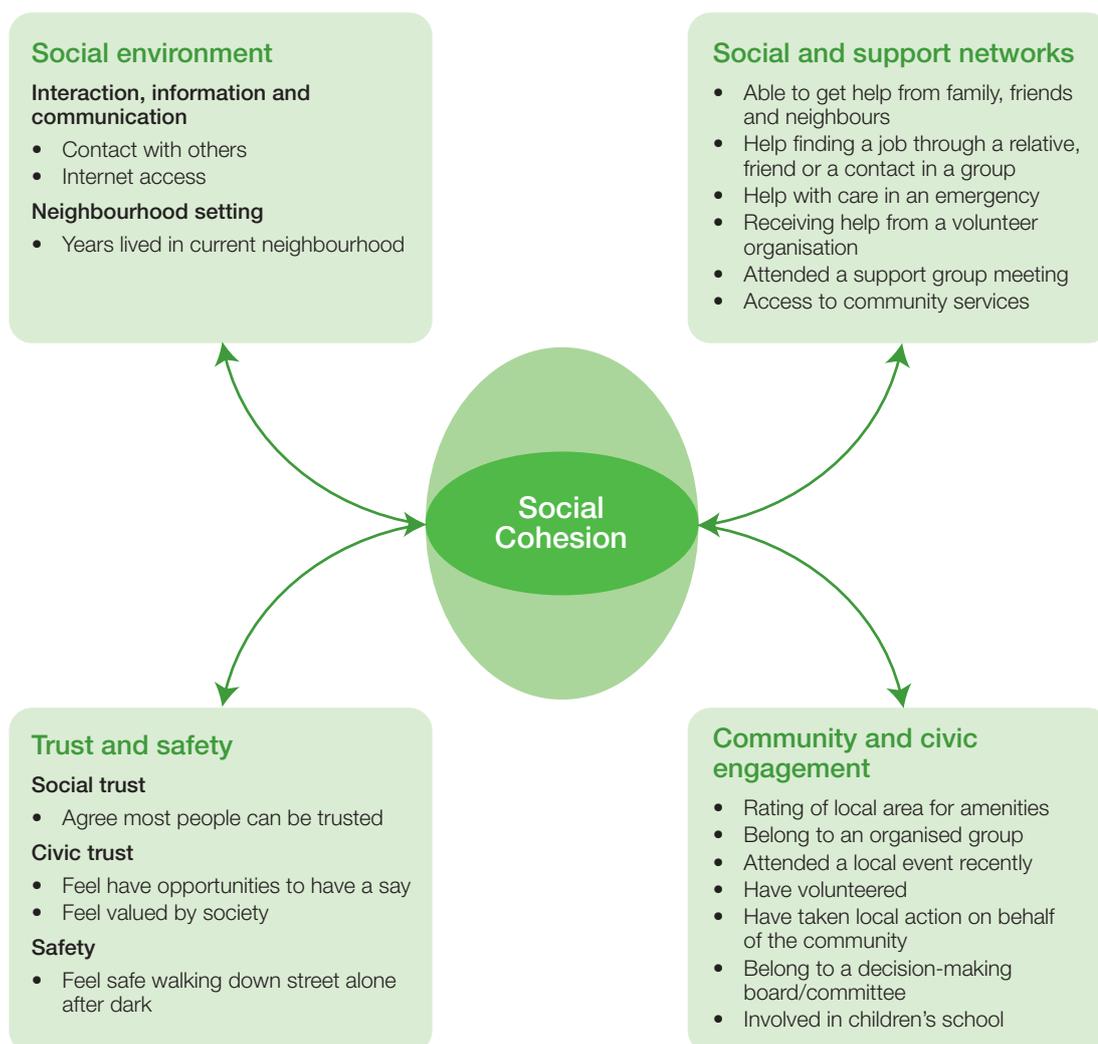
- A higher proportion of respondents affected by the bushfires in 2009 reported speaking to 10 or more people the previous day, compared with respondents not affected by the bushfires (61.1 per cent and 50.7 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported having internet access at home, compared with respondents not affected by the bushfires (91.1 per cent and 88.7 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported being able to get help from neighbours when needed, compared with respondents not affected by the bushfires (61.7 per cent and 54.0 per cent).
- A higher proportion of respondents affected by the bushfires reported being able to get a job through a relative or friend (62.6 per cent) or through a contact in a group (66.3 per cent), compared with respondents not affected by the bushfires (55.3 per cent and 59.6 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported being able to get help with care from a relative or friend in an emergency, compared with respondents not affected by the bushfires (92.2 per cent and 89.7 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported attending a support group meeting in the last two years, compared with respondents not affected by the bushfires (15.1 per cent and 8.8 per cent).
- A higher proportion of respondents affected by the bushfires rated their local area as 'poor or very poor' in terms of access to recreational and leisure facilities (8.3 per cent) and facilities and services (8.3 per cent), compared with respondents not affected by the bushfires (4.2 per cent and 3.5 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported belonging to a community or action group, compared with respondents not affected by the bushfires (29.1 per cent and 18.1 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported attending a local community event in the past six months, compared with respondents not affected by the bushfires (69.6 per cent and 54.9 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported helping out a local group as a volunteer, compared with respondents not affected by the bushfires (36.9 per cent and 22.9 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported taking local action on behalf of the community in the last two years, compared with respondents not affected by the bushfires (57.9 per cent and 40.4 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported being on a decision-making board or committee, compared with respondents not affected by the bushfires (25.2 per cent and 17.6 per cent, respectively).
- A higher proportion of respondents affected by the bushfires reported feeling safe walking down their street alone after dark, compared with respondents who were affected by the bushfires (66.7 per cent and 60.9 per cent, respectively).

The VPHS includes questions about social cohesion, although the makeup of these questions has evolved since the first survey in 2001. The 2011–12 survey included questions about the social environment in which respondents lived, their social and support networks, levels of community and civic engagement and perceptions of trust and safety. This chapter presents the findings from these questions.

## Social health

Social health – defined as the ability to develop, maintain and nurture major social relationships – is an important dimension of health. It is defined at the individual level; at a societal level, the corresponding concept is social cohesion, which focuses on interrelatedness and unity among individuals, groups and associations within society. Unity is established and maintained through social relationships based on trust, shared values, feelings of inclusion and belonging, and expectations of reciprocity. Information on social and community characteristics from the VPHS 2011–12 was organised under the umbrella of social cohesion (Figure 7.1).

Figure 7.1: Selected indicators of social cohesion



Source: Adapted from AIHW 2007, figure 8.9, p. 390.

## Social environment

### Interaction, information and communication

Communication is central to developing and maintaining social ties, sharing knowledge and information, and staying in touch with events. There are many ways to stay in touch, apart from meeting face to face or speaking on the telephone. Computer and internet technology is increasingly being used as a means of finding information and of becoming, and staying, informed.

#### Contact with others

The 2011–12 survey collected information on the number of people with whom a respondent spoke, either face to face or on the telephone, on the day before they were interviewed. The number of contacts on an average day does not necessarily reflect social isolation or detachment, but a lack of social contact may imply some vulnerability from not being in touch with people or events.

Table 7.1 shows the proportion of respondents who reported speaking to no one the previous day, less than five people, 5–9 people and 10 or more people the previous day. The proportion of respondents affected by the bushfires who reported speaking to 10 or more persons the previous day was significantly higher than the proportion reported by non-bushfire affected respondents (61.1 per cent versus 50.7 per cent).

**Table 7.1: Proportion of Victorians, by the number of persons spoken with on the previous day, 2011–12**

Number of persons	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
None at all	1.5*	0.9 – 2.4	2.7	2.4 – 3.1
Less than five persons	14.1	11.9 – 16.5	18.9	18.2 – 19.7
5 to 9 persons	23.2	20.9 – 25.7	27.4	26.5 – 28.3
10 persons or more	61.1	58.0 – 64.1	50.7	49.6 – 51.7

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

#### Internet access

Use of the internet for social and commercial purposes has become increasingly common. Individuals who do not have ready access to the internet may be disadvantaged because they cannot retrieve up-to-date information conveniently, or routinely engage in different types of electronic social interaction. The VPHS 2011–12 collected information on whether the internet was accessible from a respondent's household.

Table 7.2 shows the proportion of respondents affected by the bushfires who reported having internet access at home was significantly higher than the proportion reported by non-bushfire affected respondents (91.1 per cent versus 88.7 per cent).

**Table 7.2: Proportion of Victorians, who had household internet access, 2011–12**

Internet access	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	91.1	89.2 – 92.6	88.7	88.3 – 89.1
No	8.1	6.6 – 9.9	10.4	10.1 – 10.8

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Neighbourhood setting

### Years lived in current neighbourhood

Neighbourhoods/local areas are an important unit in society. One indicator of the stability of neighbourhoods is the number of years that a person has lived in their current neighbourhood.

Table 7.3 shows there was no significant difference in the number of years bushfire affected respondents reported living in their current neighbourhood, compared with respondents who were not affected by the bushfires.

**Table 7.3: Proportion of Victorians, by the number of years lived in current neighbourhood, 2011–12**

Number of years	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Less than a year	2.7*	1.5 – 4.7	3.9	3.5 – 4.4
1 to 5 years	17.1	14.0 – 20.6	18.8	17.9 – 19.6
5 to 9 years	21.0	18.2 – 24.2	19.1	18.3 – 19.9
10 years or more	59.2	55.4 – 62.9	58.1	57.1 – 59.1

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

\* Estimate has a relative standard error of 25–50 per cent and should be interpreted with caution.

## Social and support networks

Families, friends and neighbours are among the more immediate sources of care and support for individuals if they need help with everyday activities or unforeseen contingencies. They are part of the social environment in which adults spend a large part of each day and in which children grow and develop. Social and support networks refer to informal relationships that individuals have with family, friends, neighbours and other members of their community. These networks often serve as a resource, providing individuals with information or emotional, practical and financial support in times of need. Often, these resources are provided without further obligation from an individual in need of support, except for a norm of reciprocity. At a social level, social and support networks provide individuals with a sense of belonging.

Many individuals also receive help from volunteer organisations and support groups. Volunteer organisations can help individuals or groups address human, environmental and social needs. Support groups provide an opportunity for people to share experiences with others with similar backgrounds or experiences, and often benefit from the work of volunteers.

### **Able to get help from family, friends or neighbours when needed**

The informal relationships that individuals have with family, friends, and neighbours provide valuable sources of support in times of need. The 2011–12 survey asked respondents whether they were able to get help from family, friends or neighbours if they needed it.

Table 7.4 shows the majority of bushfire affected respondents reported 'yes, definitely' to being able to get help from family (82.5 per cent) and friends (84.3 per cent) when needed. However, there was no significant difference between respondents affected by the bushfires and those not affected by the bushfires and their reported ability to get help from family and friends when needed.

By contrast, the proportion of respondents affected by the bushfires that reported 'yes, definitely' to being able to get help from neighbours when needed was significantly higher than the proportion reported by non-bushfire affected respondents (61.7 per cent versus 54.0 per cent). The proportion of respondents affected by the bushfires that reported 'sometimes' being able to get help from neighbours when needed was significantly lower than the proportion reported by non-bushfire affected respondents (17.5 per cent versus 22.6 per cent).

**Table 7.4: Proportion of Victorians, by whether able to get help from family, friends or neighbours when needed, 2011–12**

Able to get help...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
<b>From family when needed?</b>				
No or not often	6.1	4.9 – 7.5	6.5	6.0 – 6.9
Sometimes	11.2	9.3 – 13.4	10.7	10.1 – 11.3
Yes, definitely	82.5	80.0 – 84.7	82.4	81.7 – 83.1
<b>From friends when needed?</b>				
No or not often	4.1	3.1 – 5.5	4.5	4.1 – 4.9
Sometimes	11.2	9.3 – 13.4	13.0	12.3 – 13.7
Yes, definitely	84.3	81.8 – 86.5	82.0	81.2 – 82.8
<b>From neighbours when needed?</b>				
No or not often	19.2	16.4 – 22.3	21.1	20.3 – 22.0
Sometimes	17.5	14.6 – 20.8	22.6	21.7 – 23.5
Yes, definitely	61.7	57.9 – 65.4	54.0	53.0 – 55.0

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Help finding a job through a relative, friend or a contact in a group

The 2011–12 survey asked respondents whether they could find a job through a relative or friend or through a contact in a sports, religious, school, professional, community or other action group. Table 7.5 shows a significantly higher proportion of respondents affected by the bushfires reported being able to get a job through a relative or friend (62.6 per cent), or through a contact in a group (66.3 per cent) than did respondents not affected by the fires (55.3 per cent and 59.6 per cent, respectively).

**Table 7.5: Proportion of Victorians, by whether able to find a job through a relative, friend or a contact in a group, 2011–12**

Able to find a job...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
<b>Through a relative or friend?</b>				
Yes	62.6	59.1 – 66.0	55.3	54.1 – 56.4
No	31.6	28.4 – 35.1	37.0	35.9 – 38.1
<b>Through a contact in a group?</b>				
Yes	66.3	61.8 – 70.5	59.6	58.1 – 61.0
No	28.3	24.2 – 32.8	32.1	30.8 – 33.5

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

Groups include sports, religious, school, professional or other community or action groups.

### Help with care in an emergency

Table 7.6 shows the proportion of respondents that reported being able to rely on a relative or a friend not living with them who could care for them (or their children) in an emergency. A significantly higher proportion of respondents affected by the bushfires reported being able to get help with care from a relative or friend in an emergency than did their non-bushfire affected counterparts (92.2 per cent versus 89.7 per cent).

**Table 7.6: Proportion of Victorians, by whether a relative or friend could help with care in an emergency, 2011–12**

Care in an emergency...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	92.2	90.7 – 93.5	89.7	89.1 – 90.2
No	6.5	5.3 – 8.0	8.4	7.9 – 9.0

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Receiving help from a volunteer organisation

There are many volunteer organisations that seek to address human, environmental and social needs within the community. An important principle of volunteering is that the rights, dignity and culture of those who are afforded material or other assistance are respected. The 2011–12 survey asked respondents whether they currently received help from any volunteer organisations. Table 7.7 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported currently receiving help from a volunteer organisation and their non-bushfire affected counterparts.

**Table 7.7: Proportion of Victorians, by whether currently receive help from a volunteer organisation, 2011–12**

Currently receive volunteer help...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	5.7	4.6 – 7.1	4.6	4.2 – 5.0
No	93.9	92.5 – 95.1	95.1	94.7 – 95.5

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Attended a support group meeting

There are a range of support groups where individuals support one another to deal with an issue that they have in common, sometimes with the aid of a facilitator, counsellor or other professional. The 2011–12 survey asked respondents if they attended any support group meetings in the last two years. Table 7.8 shows a significantly higher proportion of respondents affected by the bushfires reported attending a support group meeting in the last two years than did their non-bushfire affected counterparts (15.1 per cent versus 8.8 per cent).

**Table 7.8: Proportion of Victorians, by whether attended any support group meetings in the last two years, 2011–12**

Attended support group meeting...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	15.1	12.5 – 18.1	8.8	8.3 – 9.3
No	84.7	81.7 – 87.3	91.0	90.5 – 91.5

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Access to community services

The 2011–12 survey asked respondents whether they could access community services or resources, like libraries, maternal and child health centres and neighbourhood centres when they needed them. Table 7.9 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported ‘yes, definitely’ being able to access community services or resources when needed and their non-bushfire affected counterparts.

**Table 7.9: Proportion of Victorians, by level of agreement on whether able to access community services or resources when needed, 2011–12**

Level of agreement	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
No or not often	4.6	3.4 – 6.2	4.7	4.3 – 5.1
Sometimes	7.3	5.8 – 9.1	7.9	7.4 – 8.5
Yes, definitely	86.2	83.9 – 88.3	85.2	84.4 – 85.9

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of ‘don’t know’ or ‘refused’ responses.

## Community and civic engagement

Being involved in community or civic activities is a form of socialisation. Networks formed through community and civic engagement tends to bring together individuals from different backgrounds that may not otherwise interact or communicate. Community and civic engagement facilitates social cohesion because it allows people to express different perspectives and it fosters greater appreciation of diversity and understanding throughout the community.

Whether individuals take up opportunities for social interaction and community engagement may depend in part on fulfilling a number of conditions:

- whether they trust casual acquaintances and strangers
- whether they feel valued as members of society
- whether they consider there are opportunities to be involved in different institutions and activities.

There are various ways for expressing community and civic engagement, including being involved in the community through volunteering, being on a committee or decision-making body, or taking local action on behalf of an organised group (for example, a sporting group, a church group or a school group).

### Rating local area for amenities

The 2011–12 survey asked respondents to rate their local area for:

- access to recreational and leisure facilities such as parks, bike tracks and recreational areas
- having good facilities and services like shops, childcare, schools and libraries
- having opportunities to volunteer in local groups
- having a wide range of community and support groups
- being an active community – people do things and get involved in local issues and activities
- being a pleasant environment – nice streets, well planned, open spaces.

Table 7.10 shows a significantly higher proportion of respondents affected by the bushfires rated their local area as 'poor or very poor' in terms of access to recreational and leisure facilities (8.3 per cent) and facilities and services (8.3 per cent), than did their non-bushfire affected counterparts (4.2 per cent and 3.5 per cent, respectively). By contrast, a significantly higher proportion of respondents affected by the bushfires rated their local area as 'good or very good' in terms of having opportunities to volunteer in local groups (74.4 per cent) and being an active community (64.7 per cent), than did their non-bushfire affected counterparts (66.4 per cent and 58.4 per cent, respectively).

Table 7.10: Proportion of Victorians, by rating of local area for amenities, 2011–12

Rating of local area for...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
<b>Easy access to recreational and leisure facilities like parks, bike tracks, recreational areas etc</b>				
Poor or very poor	8.3	6.5 – 10.5	4.2	3.8 – 4.6
Average	15.0	12.9 – 17.4	14.4	13.8 – 15.1
Good or very good	76.4	73.4 – 79.1	80.7	80.0 – 81.5
<b>Facilities and services like shops, childcare, schools, libraries etc</b>				
Poor or very poor	8.3	6.3 – 11.0	3.5	3.1 – 3.8
Average	14.8	12.3 – 17.8	11.3	10.7 – 11.9
Good or very good	76.2	72.6 – 79.4	84.8	84.1 – 85.5
<b>Having opportunities to volunteer in local groups</b>				
Poor or very poor	5.6	3.8 – 8.1	4.6	4.1 – 5.1
Average	12.6	10.6 – 15.0	15.5	14.8 – 16.3
Good or very good	74.4	70.8 – 77.6	66.4	65.4 – 67.4
<b>Having a wide range of community and support groups</b>				
Poor or very poor	7.5	5.6 – 10.0	5.2	4.8 – 5.7
Average	18.3	15.7 – 21.2	18.6	17.8 – 19.4
Good or very good	63.7	59.9 – 67.3	61.2	60.2 – 62.2
<b>Being an active community – people get involved in local issues, activities etc</b>				
Poor or very poor	7.7	5.9 – 9.9	7.7	7.1 – 8.4
Average	19.8	17.2 – 22.8	23.2	22.4 – 24.1
Good or very good	64.7	61.0 – 68.2	58.4	57.4 – 59.4
<b>Being a pleasant environment – nice streets, well planned, open spaces</b>				
Poor or very poor	5.4	4.1 – 7.2	4.0	3.7 – 4.5
Average	13.3	11.0 – 15.9	14.5	13.8 – 15.2
Good or very good	80.7	77.7 – 83.4	80.7	79.9 – 81.5

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Belonging to an organised group

Participating in recreational and leisure activities provides opportunities for social interaction and engagement with a broader cross-section of the community. These activities also contribute to individual wellbeing through benefits to physical and mental health, including social health. This chapter interprets recreation and leisure broadly, to include activities that may be undertaken during leisure time. It may include belonging to and participating in a variety of organised groups (including church or other religious groups and social or action groups) and attending local events (for example, church fetes, school concerts, etc).

The VPHS 2011–12 collected information on whether respondents belonged to a number of organised groups, including a sports, religious, school, professional or other community or action group. Table 7.11 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported belonging to a sports, religious, school, or professional group and their non bushfire affected counterparts. However, a significantly higher proportion of respondents affected by the bushfires reported belonging to a community or action group than did their non-bushfire affected counterparts (29.1 per cent versus 18.1 per cent).

**Table 7.11: Proportion of Victorians, by whether belong to an organised group, 2011–12**

Belong to the following group...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Sports group	30.4	26.9 – 34.1	26.3	25.4 – 27.2
Religious group	17.0	14.7 – 19.4	18.0	17.3 – 18.8
School group	15.3	13.1 – 17.8	12.5	11.9 – 13.2
Professional group	23.6	20.9 – 26.6	24.1	23.2 – 25.0
Other community or action group	29.1	25.9 – 32.5	18.1	17.4 – 18.8

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures do not add up to 100 per cent because the question asked was multiresponse (respondents could provide more than one response to the question).

## Attending a local event recently

A further indicator of participation in recreational and leisure activities is attendance at a local community event within the past six months. Table 7.12 shows a significantly higher proportion of respondents affected by the bushfires reported attending a local community event in the past six months than did their non-bushfire affected counterparts (69.6 per cent versus 54.9 per cent).

**Table 7.12: Proportion of Victorians, by whether attended a local community event in the past six months, 2011–12**

Attended a local event...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	69.6	66.0 – 72.9	54.9	53.9 – 55.9
No	30.0	26.7 – 33.5	44.8	43.8 – 45.8

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Volunteering with a local group

The VPHS 2011–12 asked respondents whether they help out a local group as a volunteer. Table 7.13 shows a significantly higher proportion of respondents affected by the bushfires reported helping out a local group as a volunteer than their did non-bushfire affected counterparts (36.9 per cent versus 22.9 per cent, respectively).

**Table 7.13: Proportion of Victorians, by whether help out a local group as a volunteer, 2011–12**

Help out as a volunteer...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
No or not often	48.3	44.5 – 52.2	65.7	64.8 – 66.6
Sometimes	14.4	11.6 – 17.6	11.2	10.6 – 11.8
Yes, definitely	36.9	33.4 – 40.5	22.9	22.1 – 23.7

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Taking local action on behalf of the community

The VPHS 2011–12 asked respondents whether they belonged to a sports, religious, school, professional or other community or action group (see Table 7.11). The survey also asked respondents whether they took local action on behalf of the community as a member of any of these groups in the last two years. Table 7.14 shows a significantly higher proportion of respondents affected by the bushfires reported taking local action on behalf of the community in the last two years than did their non-bushfire affected counterparts (57.9 per cent versus 40.4 per cent).

**Table 7.14: Proportion of Victorians, by whether taken action on behalf of the community in the last two years, 2011–12**

Taken action in last two years...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	57.9	53.2 – 62.4	40.4	39.2 – 41.7
No	39.2	34.7 – 43.8	54.2	52.9 – 55.5

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Belonging to a decision-making board/committee

The VPHS 2011–12 asked respondents whether they were on a decision-making board or committee, which is a common form of civic engagement. Examples include being a member of a sports club committee, a church committee, a body corporate or a resident action group. Table 7.15 shows a significantly higher proportion of respondents affected by the bushfires reported being on a decision-making board or committee than did their non-bushfire affected counterparts (25.2 per cent versus 17.6 per cent).

**Table 7.15: Proportion of Victorians, by whether on a decision-making board/committee, 2011–12**

Belong to a decision making board/committee...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	25.2	22.3 – 28.3	17.6	16.9 – 18.4
No	74.7	71.6 – 77.7	82.2	81.5 – 82.9

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

### Involved in children's school

The VPHS 2011–12 asked respondents whether they had any children at primary or secondary school, and if so, they were asked if they were involved in their child/children's school. More than a quarter (28.6 per cent<sup>6</sup>) of bushfire affected respondents reported having at least one child at primary or secondary school, which was similar to the proportion of non-bushfire affected respondents (26.9 per cent<sup>7</sup>) with at least one child at school. Table 7.16 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported being involved in their child/children's school and their non-bushfire affected counterparts.

6. 95 per cent confidence interval: 26.2–31.1 per cent.

7. 95 per cent confidence interval: 26.3–27.6 per cent.

**Table 7.16: Proportion of Victorians, by whether involved in child/children’s school, 2011–12**

Involved in children’s school...	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
Yes	59.1	49.4 – 68.2	50.6	47.0 – 54.2
No	40.9	31.8 – 50.6	49.4	45.7 – 53.0

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of ‘don’t know’ or ‘refused’ responses.

## Trust and safety

Trust is important for positive relationships between individuals and among groups. Trust in others is sometimes defined with reference to the type of relationship involved. The concept of interpersonal trust refers to trust between individuals that are known to one another. To describe social wellbeing, a distinction is sometimes made between:

- social trust – trust among casual acquaintances or strangers in the course of everyday social interaction
- civic trust – trust in public or high-profile institutions and the respect that citizens are accorded in their relationships with institutions.

The 2011–12 survey included several questions about social and civic trust.

### Social trust

#### Agree most people can be trusted

The 2011–12 survey asked respondents whether they agreed most people can be trusted. Table 7.17 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported ‘yes, definitely’ most people can be trusted and their non-bushfire affected counterparts.

**Table 7.17: Proportion of Victorians, by level of agreement on whether most people can be trusted, 2011–12**

Level of agreement	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
No or not often	15.4	12.8 – 18.4	16.7	16.0 – 17.6
Sometimes	46.8	43.1 – 50.5	43.1	42.1 – 44.1
Yes, definitely	37.1	34.1 – 40.3	39.3	38.3 – 40.2

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of ‘don’t know’ or ‘refused’ responses.

## Civic trust

Civic trust can be measured by whether individuals feel they have a say and feel valued by their society. The 2011–12 survey collected information on whether respondents felt there are opportunities to have a real say on issues that are important to them and whether they felt valued by society.

### Feel have opportunities to have a say

Table 7.18 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported 'yes, definitely' there are opportunities to have a real say on issues that are important to them and their non-bushfire affected counterparts.

**Table 7.18: Proportion of Victorians, by level of agreement on whether they have opportunities to have a say, 2011–12**

Level of agreement	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
No or not often	25.0	21.8 – 28.5	25.0	24.1 – 25.9
Sometimes	33.6	30.0 – 37.4	32.4	31.5 – 33.4
Yes, definitely	39.9	36.3 – 43.6	40.3	39.3 – 41.3

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

### Feel valued by society

Table 7.19 shows there was no significant difference between the proportion of respondents affected by the bushfires who reported 'yes, definitely' they felt valued by society and their non-bushfire affected counterparts.

**Table 7.19: Proportion of Victorians, by level of agreement on whether they feel valued by society, 2011–12**

Level of agreement	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
No or not often	12.1	9.9 – 14.7	11.9	11.3 – 12.6
Sometimes	31.8	28.2 – 35.7	30.7	29.7 – 31.7
Yes, definitely	52.2	48.3 – 56.0	53.0	51.9 – 54.0

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Safety

Like trust, a sense of safety is an important determinant of a willingness to engage in the cultural, community and civic activities that a society offers. Feelings of safety are usually measured in terms of whether people feel safe in selected situations when they are unaccompanied. In this sense, safety refers to individual perceptions of exposure to personal harm or vulnerability.

### Feel safe walking down street alone after dark

The 2011–12 survey asked respondents whether they felt safe walking down their street alone after dark.<sup>8</sup> Table 7.20 shows a significantly higher proportion of respondents affected by the bushfires reported 'yes, definitely' feeling safe walking down their street alone after dark than did their non-bushfire affected counterparts (66.7 per cent versus 60.9 per cent). A significantly higher proportion of bushfire affected respondents reported the question was 'not applicable' to them than did non-bushfire affected respondents (4.5 per cent versus 2.9 per cent).

**Table 7.20: Proportion of Victorians, by level of agreement on whether they feel safe walking down the street at night, 2011–12**

Level of agreement	Affected by the bushfires		Not affected by the bushfires	
	%	95% CI	%	95% CI
No or not often	16.4	14.1 – 19.0	19.3	18.6 – 20.0
Sometimes	12.1	9.8 – 14.8	16.2	15.4 – 16.9
Yes, definitely	66.7	63.3 – 69.9	60.9	60.0 – 61.9
Not applicable	4.5	3.6 – 5.6	2.9	2.8 – 3.1

95% CI: 95 per cent confidence interval.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

## Discussion

The results of the VPHS 2011–12 showed the social environment for those affected by the bushfires was strong, with good social and support networks. As a group, those affected by the bushfires in 2009 appear to be engaged with their community and they participate in civic activities – more so than their non-bushfire affected counterparts. However, there were a few important findings that require further consideration. There was no difference between the two groups in terms of the length of time they lived in their current neighbourhood, for example. At first, this seems to contradict early reports in the media that emphasised mass displacement of people affected by the bushfires.

8 .This question was not applicable to all survey respondents.

However, anecdotal reports about bushfire affected Victorians as a whole, three years on from the event, suggest people tended to move within, rather than away from, their local area (pers. comm. Principal Adviser, Health and Human Services Emergency Management Branch, Department of Human Services, 2013). This is supported by a recent survey that found 73 per cent of households that lost a home in the bushfires either rebuilt on the same site or relocated somewhere else within the same LGA (DPCD 2012).

The VPHS survey also showed a higher proportion of bushfire affected survey respondents rated access to recreational and leisure facilities as 'poor to very poor' in their local area, than did their non-bushfire affected counterparts. This may reflect that many communal recreational and leisure facilities are yet to be rebuilt in bushfire affected areas. Alternatively, it may simply reflect a difference in availability, and thus accessibility, of recreational and leisure facilities in those bushfire affected LGAs.

The VPHS survey also showed a higher proportion of bushfire affected respondents attended a support group meeting in the past two years, than did their non-bushfire affected counterparts. After the bushfires, there was an emphasis on community involvement in recovery: a large number of community committees were formed, which then became local community groups. Although the survey did not ask what type of support group respondents attended, it is likely many of those affected attended a support group meeting relevant to the bushfires.

These results are encouraging; building strong and resilient communities, along with achieving high levels of community participation, were important objectives of the recovery effort (VBRRA 2011). Many studies recognise social capital promotes social cohesion and it is an important factor in building community resilience (Mayunga 2007). Although social capital is defined in a variety of ways, there is common emphasis on the aspects of social structure, trust, norms, and social networks that facilitate collaborative action (Coleman 1988; Coleman 1990; Green and Haines 2002; Putnam 1995; Woolcock 2002). Community ties and networks allow individuals to draw on social resources, increasing the likelihood that communities can adequately address their collective concerns (Green and Haines 2002). The most resilient communities are those that work together toward a common goal (Mayunga 2007).

There was a comprehensive range of supports provided to affected communities in the wake of the bushfires, including initiatives to strengthen the social environment. The Victorian Bushfire Recovery and Reconstruction Authority (VBRRA), for example, established a community engagement team to build on connections within communities (VBRRA 2011). There were donations to rebuild community infrastructure that was lost during the bushfires. The Australian Red Cross was funded to provide an outreach service to bushfire affected communities. It provided personal support to those affected, but also reviewed community connectedness and assessed communication methods with affected households.

The Department of Human Services set up community support groups and put people in touch with these groups. It also established other support programs and services, through its community service hubs. The department funded local councils to recruit community development officers to

support social networks and promote social cohesion in affected areas. The department's case management service helped people develop recovery plans, helped them find employment, and assisted with accommodation issues and financial problems. The department's re-establishment grants and housing assistance services helped keep the local community together. In 2011 the department established the Bushfire Community Support Program to provide ongoing support to bushfire affected communities around the state.

Collectively, these efforts had an important impact on the social environment of communities affected by the bushfires and assisted the recovery process across Victoria.



## 8. Comparisons between 2008 and 2011–12



# 8. Comparisons between 2008 and 2011–12

## Key findings

Between 2008 and 2011–12, survey data shows bushfire affected LGAs experienced:

- an increase in the proportion of respondents having a cholesterol check (56.6 per cent and 61.3 per cent, respectively) and a blood glucose check (52.4 per cent and 57.5 per cent, respectively) in the previous two years.
- a decrease in the proportion of respondents with a 'fair' level of health (15.3 per cent and 12.5 per cent, respectively).
- a decrease in the proportion of respondents with 'good/very good' access to local recreational and leisure facilities (78.3 per cent and 74.4 per cent, respectively) and having opportunities to have a real say on issues that are important to them (43.8 per cent and 38.7 per cent, respectively).
- no change in the socio-demographic profile.
- no change in the proportion of respondents with various levels of psychological distress.
- no change in the proportion of respondents with selected health and lifestyle behaviours.
- no change in the proportion of respondents with selected chronic diseases (heart diseases, stroke, cancer, osteoporosis, arthritis, type 2 diabetes, hypertension and asthma).
- no change in the proportion of respondents having a bowel cancer screen, a Pap test and a mammogram in the previous two years.

This chapter explores the health status of survey respondents living in LGAs that were highly affected by the bushfires, both before (VPHS 2008) and after (VPHS 2011–12) the bushfires occurred in 2009. The 2008 VPHS had a similar sample design, survey methodology and sample size to the 2011–12 VPHS<sup>9</sup> and both surveys included several of the same questions, making it possible to compare health status for bushfire affected LGAs, both before and after the bushfires.

The estimates from the VPHS 2011–12 in this chapter differ from those presented in earlier chapters because they represent the health status of all respondents living in LGAs that were highly affected by the bushfires in 2009. By contrast, the earlier chapters presented estimates of the health status of those respondents who reported being directly affected by the fires in some way.

Figure 8.1 shows the LGAs highly affected by the bushfires in January and February of 2009: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges (see Appendix 3).

9. The department conducts the VPHS annually, but it is not a longitudinal study. A random sample of adult Victorians is taken each year, so the respondents surveyed in 2008 are different from those surveyed in 2011–12. However, the sample is representative of the wider adult Victorian population, so the survey results are extrapolated, or applied to the wider population.

Figure 8.1: Local government areas affected by the bushfires in 2009

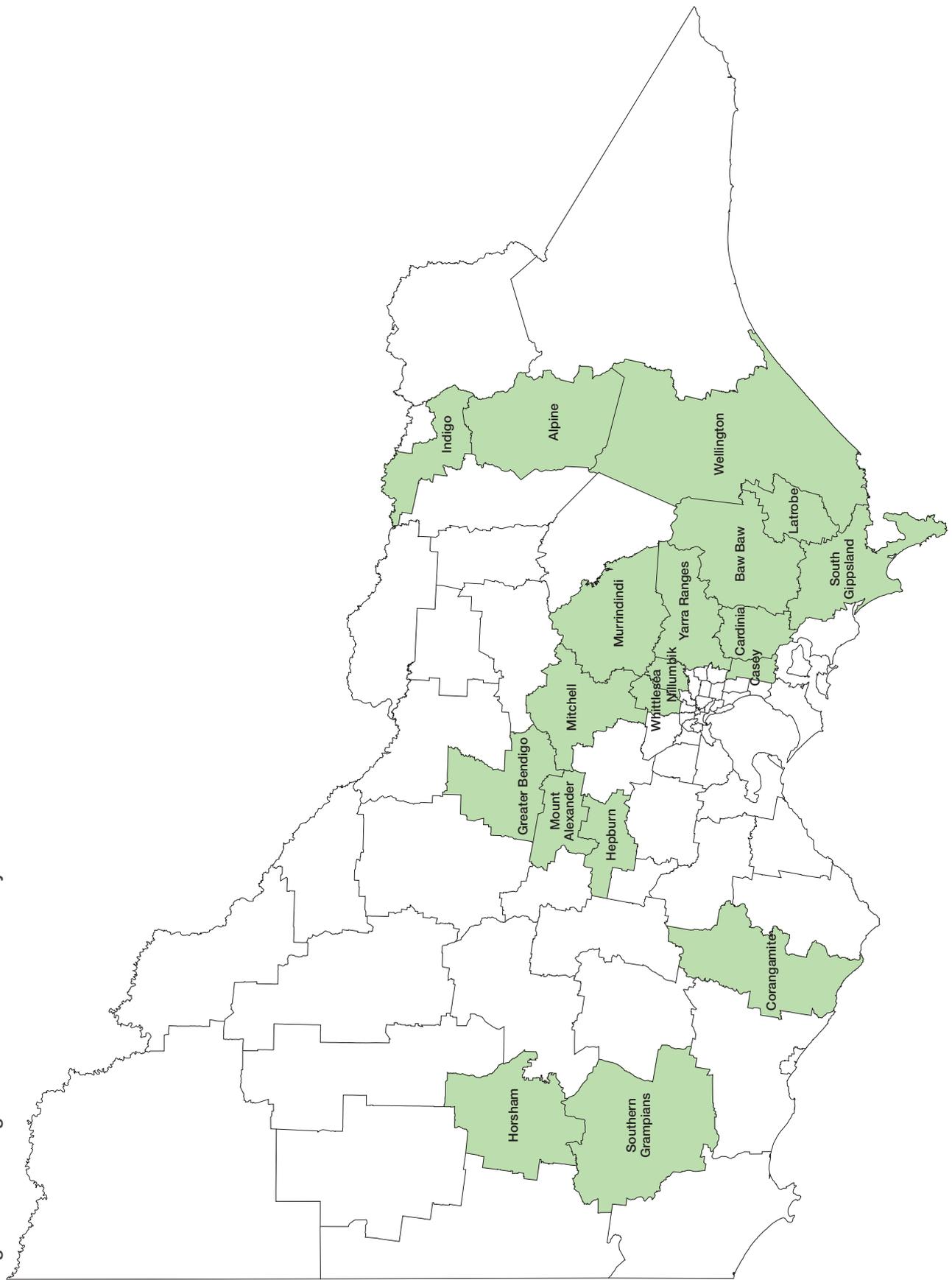


Table 8.1 compares the socio-demographics of respondents living in LGAs affected by the bushfires, before the bushfires in 2008 and after the bushfires in 2011–12. There was no significant change in the socio-demographics of respondents living in bushfire affected LGAs, between 2008 and 2011–12.

**Table 8.1: Proportion of Victorians living within bushfire affected LGAs, by selected socio-demographic indicator, 2008 & 2011–12**

Socio-demographic indicator	2008		2011–12	
	%	95% CI	%	95% CI
<b>Gender</b>				
Males	49.3	47.5 – 51.1	49.2	47.1 – 51.4
Females	50.7	48.9 – 52.5	50.8	48.6 – 52.9
<b>Age group</b>				
18–34 years	29.3	27.4 – 31.2	29.8	27.4 – 32.2
35–49 years	30.4	28.9 – 32.0	27.7	26.1 – 29.5
50–64 years	24.6	23.3 – 26.0	25.7	24.3 – 27.2
65 years+	15.7	14.8 – 16.7	16.8	15.8 – 17.9
<b>Country of birth</b>				
Australia	77.5	75.9 – 78.9	75.9	74.0 – 77.8
Overseas	22.6	21.1 – 24.1	23.8	22.0 – 25.8
<b>Index of relative socioeconomic disadvantage quintile</b>				
Quintile 1: Most disadvantaged	7.0	6.6 – 7.4	6.5	6.0 – 7.0
Quintile 2	35.6	34.6 – 36.6	35.4	34.0 – 36.8
Quintile 3	32.7	31.7 – 33.8	33.6	32.2 – 35.0
Quintile 4	19.0	18.2 – 19.9	19.3	18.2 – 20.4
Quintile 5: Least disadvantaged	5.7	5.3 – 6.1	5.3	4.8 – 5.9

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data for age groups are crude estimates. All other data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent, reflecting a proportion of 'don't know' or 'refused' responses.

The Index of Relative Socioeconomic Disadvantage (IRSD) is an area-based measure of socioeconomic disadvantage developed by the Australian Bureau of Statistics (2008).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.2 shows there was no significant change in the proportion of respondents reporting various levels of psychological distress in bushfire affected LGAs, between 2008 (before the bushfires) and 2011–12 (after the bushfires).

**Table 8.2: Levels of psychological distress in Victorians living within bushfire affected LGAs, 2008 & 2011–12**

Level of psychological distress	2008		2011–12	
	%	95% CI	%	95% CI
Low (<16)	62.4	60.6 – 64.1	65.2	63.2 – 67.3
Moderate (16–21)	22.8	21.3 – 24.4	20.8	19.1 – 22.5
High (22–29)	8.8	7.8 – 9.9	8.2	7.0 – 9.6
Very high (30–50)	3.1	2.6 – 3.8	3.2	2.4 – 4.3

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

Levels of psychological distress are based on the Kessler 10 Psychological Distress Scale.

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.3 shows the proportion of all respondents living in bushfire affected LGAs, by selected health and lifestyle behaviours, both before (2008) and after (2011–12) the fires. There was no significant change in the proportion of respondents reporting these behaviours over the period.

**Table 8.3: Proportion of Victorians living within bushfire affected LGAs, by selected health and lifestyle behaviours, 2008 & 2011–12**

Health and lifestyle behaviour	2008		2011–12	
	%	95% CI	%	95% CI
Met the guidelines for fruit <sup>a</sup>	45.4	43.6 – 47.2	42.8	40.8 – 44.8
Met the guidelines for vegetables <sup>a</sup>	9.1	8.2 – 10.0	7.4	6.6 – 8.2
Met the guidelines for physical activity <sup>b</sup>	61.6	59.9 – 63.4	62.7	60.6 – 64.7
Body mass index $\geq 30$ (obese)	18.6	17.3 – 19.9	20.3	18.7 – 22.0
Current smoker	20.3	18.9 – 21.9	17.7	16.1 – 19.5
At risk of harm in short-term from alcohol use	44.8	43.1 – 46.5	46.2	44.1 – 48.3
At risk of harm over long-term from alcohol use	3.1	2.6 – 3.7	3.6	3.0 – 4.3

a NHMRC 2003a; NHMRC 2003b.

b DoHA 1999.

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.4 shows there was a significant decrease in the proportion of respondents reporting a ‘fair’ level of health status between 2008 and 2011–12 (15.3 per cent versus 12.5 per cent). This was the only significant change in self-reported health status for respondents living in bushfire affected LGAs between 2008 and 2011–12.

**Table 8.4: Proportion of Victorians living within bushfire affected LGAs, by self-reported health status, 2008 & 2011–12**

Self-reported health	2008		2011–12	
	%	95% CI	%	95% CI
Excellent	10.3	9.2 – 11.4	9.7	8.7 – 10.8
Very good	31.0	29.4 – 32.7	33.9	31.8 – 36.0
Good	39.6	37.8 – 41.4	40.3	38.2 – 42.4
Fair	15.3	14.1 – 16.7	12.5	11.3 – 13.9
Poor	3.7	3.1 – 4.4	3.4	2.6 – 4.5

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.5 shows the proportion of all respondents living in bushfire affected LGAs who reported having ever been diagnosed by a doctor with a selected health condition. There was no significant change in the proportion of respondents with these conditions in bushfire affected LGAs, between 2008 (before the bushfires) and 2011–12 (after the bushfires).

**Table 8.5: Proportion of Victorians living within bushfire affected LGAs, who had ever been diagnosed with a selected health condition, 2008 & 2011–12**

Ever told by a doctor you have...	2008		2011–12	
	%	95% CI	%	95% CI
Heart disease	6.9	6.2 – 7.6	7.2	6.5 – 8.0
Stroke	2.7	2.3 – 3.2	2.3	1.9 – 2.8
Cancer	6.1	5.5 – 6.8	6.9	6.2 – 7.7
Osteoporosis	4.4	4.0 – 5.0	5.2	4.7 – 5.8
Arthritis	23.0	21.9 – 24.2	21.0	19.8 – 22.2
Type 2 diabetes	5.2	4.6 – 5.9	5.3	4.7 – 6.0
High blood pressure	29.2	27.9 – 30.7	26.4	25.0 – 27.9
Asthma	21.2	19.7 – 22.8	23.0	21.2 – 24.9

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.6 shows the proportion of all respondents living in bushfire affected LGAs who reported ever having an eye examination, or a blood pressure check, a cholesterol check or a blood glucose check in the previous two years. There was a significant increase in the proportion of respondents having a cholesterol check (56.6 per cent and 61.3 per cent, respectively) and having a blood glucose check (52.4 per cent and 57.5 per cent, respectively) between 2008 and 2011–12. However, subsequent analysis (data not shown) showed this increase in testing over time was also observed in other areas of the state; it was not confined to the population living in bushfire affected LGAs.

**Table 8.6: Proportion of Victorians living within bushfire affected LGAs, by selected health checks, 2008 & 2011–12**

Health check	2008		2011–12	
	%	95% CI	%	95% CI
Eye examination (ever had)	78.5	76.9 – 80.0	77.8	75.8 – 79.7
Blood pressure check (last two years)	79.4	77.7 – 80.9	81.8	79.8 – 83.6
Cholesterol check (last two years)	56.6	55.1 – 58.2	61.3	59.4 – 63.2
Blood glucose check (last two years)	52.4	50.7 – 54.0	57.5	55.5 – 59.4

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.7 shows the proportion of all respondents living in bushfire affected LGAs who reported having a bowel examination, a Pap test or a mammogram. There was no significant change in the proportion of respondents in these LGAs who reported having a cancer screen between 2008 and 2011–12.

**Table 8.7: Proportion of Victorians living within bushfire affected LGAs, who had a cancer screen, 2008 & 2011–12**

Cancer screen	2008		2011–12	
	%	95% CI	%	95% CI
Bowel examination last two years (50 years+)	27.8	26.0 – 29.7	30.2	28.3 – 32.1
Pap smear last two years (females, 20–69 years)	72.7	70.5 – 74.7	74.7	72.3 – 77.0
Mammogram last two years (females, 50–69 years)	82.9	79.7 – 85.6	82.2	79.2 – 84.9

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

Table 8.8 shows the proportion of all respondents living in bushfire affected LGAs by selected indicators of social cohesion. Between 2008 and 2011–12, there was a significant increase in the proportion of respondents in bushfire affected LGAs reporting having lived in their current neighbourhood for 10 years or more (52.5 per cent versus 57.6 per cent). Over the same period, there was also a significant decrease in the proportion of respondents in bushfire affected LGAs, reporting:

- ‘good/very good’ access to local recreational and leisure facilities (78.3 per cent versus 74.4 per cent)
- ‘yes, definitely’ there are opportunities to have a real say on issues that are important to them (43.8 per cent versus 38.7 per cent).

**Table 8.8: Proportion of Victorians living within bushfire affected LGAs, by selected indicator of social cohesion**

Indicator of social cohesion	2008		2011–12	
	%	95% CI	%	95% CI
Contact with others	51.9	50.1 – 53.7	52.1	50.0 – 54.1
Years lived in current neighbourhood	52.5	50.8 – 54.3	57.6	55.5 – 59.7
Help with care in an emergency	88.9	87.8 – 90.0	90.0	88.9 – 91.1
Attended a support group meeting	11.3	10.3 – 12.3	9.7	8.5 – 11.1
Access to community services/resources	86.0	84.7 – 87.2	85.5	84.0 – 86.9
Local access to recreational/leisure facilities	78.3	76.7 – 79.7	74.4	72.5 – 76.2
Local facilities/services	81.1	79.7 – 82.4	79.9	78.2 – 81.4
Attended a local community event	55.1	53.3 – 56.9	57.7	55.6 – 59.8
Taken local action on behalf of community	43.1	40.8 – 45.4	45.1	42.4 – 47.8
Feel have opportunities to have a say	43.8	42.1 – 45.6	38.7	36.7 – 40.7
Feel valued by society	50.8	48.9 – 52.6	52.2	50.1 – 54.3

95% CI: 95 per cent confidence interval.

LGA: Local government area.

Data are age standardised to the 2011 Victorian estimated resident population (18 years+).

Bushfire affected LGA: LGAs highly affected by the 2009 bushfires, including: Alpine, Baw Baw, Cardinia, Casey, Corangamite, Greater Bendigo, Hepburn, Horsham, Indigo, Latrobe, Mitchell, Mount Alexander, Murrindindi, Nillumbik, South Gippsland, Southern Grampians, Wellington, Whittlesea and Yarra Ranges.

## Discussion

There is little evidence of a change in the socio-demographic profile and health status of people living in LGAs affected by the fires between 2008 and 2011–12. Although the results treat LGAs affected by the fires as a collective group, analysis of individual LGAs (data not shown) yielded a similar result. This was unexpected given the disparities, shown in earlier chapters, between respondents affected by the bushfires and those not affected by the bushfires in 2011–12. It was assumed bushfire affected LGAs would have lower levels of health status in 2011–12 compared with 2008, but this was not the case.

One explanation for the similarity in health status between surveys is the LGA (as a unit of geographic analysis) is not sensitive enough to detect disparities (if they exist). Analysis by census collection districts (CDs), which are smaller geographical areas, may have been more sensitive as an aggregate of bushfire affected CDs would have better reflected the actual geographical area that was burnt than the LGA. It was not possible to perform analysis on a geographical area smaller than the LGA because of the way the survey was designed.

Alternatively, although the bulk of people affected by the bushfires may have remained or returned to their local area (see Chapter 7), those most affected who were surveyed in 2011–12 may have moved away from the LGA they were living in at the time of the bushfires in 2009. This would moderate the results from bushfire affected LGAs in the 2011–12 survey and it may account for the similarity in health status in these LGAs between 2008 and 2011–12.

The population density of bushfire affected LGAs was analysed, both before (2006) and after (2011) the 2009 bushfires. This was to determine whether there was any discernable change in population density following the fires, because an increase in density is an important indicator of community resilience in areas affected by disaster (Aldrich 2010). Between the 2006 Census and the 2011 Census, the population density of bushfire affected LGAs increased by 9.9 per cent, higher than the increase for all of Victoria over the same period (8.0 per cent). Although this is a positive result for bushfire affected areas, it is based on the collective and does not reflect the experience of individual LGAs. Also, as an indicator, it is specific to social resilience (Cutter et al. 2010); it does not necessarily reflect other aspects of recovery such as economic, infrastructure or institutional resilience in a community. A comprehensive analysis of resilience within communities that incorporates these dimensions was beyond the scope of this report because the VPHS survey did not collect all this information.



# 9. Conclusion



## 9. Conclusion

The results of the VPHS 2011–12 showed the bushfires of January and February 2009 affected a large number of adult Victorians (up to 320,000). They were affected in a number of different ways, and as a group, are dispersed across the state. Although it is not possible to identify where people lived at the time of the fires, the survey showed a large number of those affected were living outside of bushfire affected LGAs in 2011–12 (up to 150,000).

The survey showed overall, Victorians who were affected by the bushfires enjoy good health. However, there are disparities in their health status, compared with those not affected by the bushfires. The level of depression and anxiety as a result of the bushfires was high for those affected by the bushfires and the level of psychological distress experienced, in particular, continues to be an issue for bushfire affected Victorians. The psychosocial impacts of trauma from events like the bushfires in 2009 are well known and the timely, comprehensive, collaborative response by the health and community service sectors was no doubt an important factor in limiting the extent of the burden of disorder that was experienced. The success of the service response is reflected in the survey with the majority of those who felt they needed counselling or related services reporting having accessed these services.

The service response also likely limited physical health disparities between those affected by the bushfires and those not affected. Together, government and health agencies helped to maintain access to general practice and other primary and preventive health and community services in most bushfire affected areas.

Nevertheless, the survey showed those affected by the bushfires were less likely to report 'excellent' health than their non-bushfire affected counterparts. They had higher prevalence of arthritis, which may be partially explained by higher rates of being overweight and obese and by the rural lifestyle. They also had higher prevalence of osteoporosis, which is less clearly understood. Their higher prevalence of substance use – smoking and risky alcohol consumption – may reflect the psychosocial impact of the bushfires and may be partially explained as a coping mechanism. The survey also revealed a low level of breast screening for eligible women affected by the bushfires.

More positively, the survey showed those affected by the bushfires have a supportive social environment, with strong social and support networks – more so than their non-bushfire affected counterparts. A higher level of engagement in the community and participation in civic activities suggests those affected reached out to others in their community for support to aid their recovery. These results are encouraging and demonstrate the resilience of those affected by the bushfires across the state.



# Appendix



# Appendix 1: Methods

## Overview

The VPHS is conducted by computer assisted telephone interview (CATI) in a randomly selected representative sample of Victorians aged 18 years or more who reside in private dwellings. The department's Human Research Ethics Committee (HREC) approved the 2011–12 survey method and questionnaire.

Only one person per household was interviewed and this was the adult with the most recent birthday. Respondents were asked during interview whether they were affected by the bushfires in 2009.

A total of 33,673 Victorians were interviewed in 2011–12, including 800 (2.4 per cent) in languages other than English. A total of 2,924 (8.7 per cent of unweighted sample) respondents identified as having been affected by the bushfires.

## Stratification

There are five rural and three metropolitan Department of Health regions in Victoria that comprise 79 LGAs. The survey sample was stratified by LGA in 2011–12, with a target sample of 426 interviews per LGA.

## Sampling frame

An electronic listing of Victorian six-digit telephone exchange prefixes and localities was generated to form the basis of the sampling frame. All eligible prefixes were allocated to each of the 79 LGA sampling areas, using locality and postcode information.

## Sample generation

Random digit dialling (RDD) was used to generate a sample of telephone numbers that formed the household sample for the CATI. All residential households with landline telephone connections were considered in-scope for the survey. A telephonic mode of survey delivery excludes various population groups, such as people who are homeless or itinerant, people in hospitals or institutions, the frail and aged, and people with disabilities who cannot participate in an interview.

The department appended randomly generated suffixes to current eligible six-digit telephone number prefixes. The numbers were then 'washed' against current electronic business listings to remove known business numbers.

## Data collection

Almost two-thirds of all completed interviews were achieved within the first four calls.

## Call routine

The interviewers made up to six call attempts to establish contact with a household and up to another nine call attempts to complete an interview where required.

Call attempts were spread over different times of the day and different days of the week, and were controlled by a customised call algorithm in the survey management system. Except for engaged numbers at the first call attempt, a non-contact in any specific time block was automatically scheduled for call back in a different time block as per the call back routine. A scripted message was left at the first and second calls to an answering machine, encouraging respondents to contact the VPHS 1-800 number. After establishing contact, interviewers could make calls, by appointment, outside the time block hours.

After contacting a household, an interviewer would select for interview the person (usually a resident) aged 18 years or over with the most recent birthday.

## Interviewing in languages other than English

Interviews were conducted in nine community languages other than English: Italian, Greek, Mandarin, Cantonese, Vietnamese, Arabic, Turkish, Serbian and Croatian. Translated survey questionnaires were used by CATI interviewers who were recruited to undertake interviews in these other languages, as required.

## Fieldwork period

The average interview length was 25.5 minutes and interviewing was conducted between 9 February and 7 August 2012. This followed two pilot tests of the questionnaire earlier in January 2012 and subsequent modification of the questionnaire.

## Participation

The participation rate, defined as the proportion of households where contact was made and an interview was then completed, was 66.8 per cent. The participation rate was higher for rural LGAs (69.9 per cent), compared with metropolitan LGAs (62.8 per cent). Participation rates varied by LGA, ranging from 53.7 per cent to 76.5 per cent.

## Weighting

The survey data was weighted to reflect the following:

- (i) the probability of selection of the respondent within the household – Although a single respondent was randomly selected from within a household, the size of any household can vary upwards from one person. To account for this variation, the project team treated each respondent as representing the whole household, so his or her weight factor included a multiplier of the number of people in the household. Further, a household may have more than one telephone line (that is, landlines used primarily for contact with the household), which would increase that household's probability of selection over those households with only one telephone line. To ensure the probability of contacting any household was the same, the project team divided the weight factor by the number of telephone lines connected to the household.

The formula for the selection weight (sw) component was:

$$sw = nah/npl$$

where:

nah = the number of adults aged 18 years or over in the household

npl = the number of telephone lines in the household.

(ii) the age–gender–geographic distribution of the Victorian 2011 estimated resident population – The project team applied a population benchmark (pbmark) component to ensure the adjusted sample distribution matched the 2011 population distribution for the combined cross-cells of age group and gender by LGA. The categories used for each of the variables were:

- age group: 18–24, 25–34, 35–44, 45–54, 55–64 and 65 years or over
- gender: male, female
- geography: 79 LGAs.

The pbmark component was calculated by dividing the population of each cross-cell by the sum of the selection weight components for all the respondents in the sample within that cross-cell. For each cross cell, the formula for this component was:

$$pbmark_i = Ni/\sum sw_{ij}$$

where:

i = the ith cross-cell

j = the jth person in the cross-cell

Ni = the population of the ith cross-cell

$\sum sw_{ij}$  = the sum of selection weights for all respondents (1 to j) in the ith cross-cell.

### Calculating the person weight to be applied:

The project team assigned respondent records a weight factor (pwt) by multiplying the selection weight (sw) value by the population benchmark value (pbmark):

$$pwt_{ij} = sw_{ij} * pbmark_i$$

where:

i = the ith cross-cell

j = the jth person in the cross-cell.

## Statistical analysis

The survey data was analysed using the Stata statistical software package (StatCorp LP, College Station Texas), version 12.

### Crude rate

A crude rate is an estimate of a proportion of a population that experiences a specific event over a specified period. It is calculated by dividing the number of events recorded for a given period by the number at risk of the event in the population. Crude rates (percentages) were presented wherever estimates were broken down by age group (age specific rates).

### Age standardised rate

Age standardisation adjusts for the effects of differences in the age composition of different populations (for example, LGAs) and allows for comparison between these populations. The age standardised rates presented in this report are based on the direct method of standardisation – that is, the weighted sum of age specific rates in the population. The weights used in the calculation (the ‘standard’ population) are population ratios for age groups derived from the Census 2011 Victorian population.

### Standard error

The standard error is a measure of the variation in an estimate, produced by a sample from a population. The standard error can be used to calculate confidence intervals and relative standard errors, providing the likely true range of an estimate and an indication of the reliability of an estimate.

### Relative standard error

A relative standard error (RSE) indicates the reliability of an estimate and is expressed as a percentage. Estimates with an RSE of less than 25 per cent are regarded as ‘reliable’ for general use. Estimates with an RSE between 25 and 50 per cent should be interpreted with caution. Estimates with an RSE greater than 50 per cent are not considered reliable.

$$RSE (\%) = \text{standard error} / \text{point estimate} \times 100$$

### Confidence interval

The 95 per cent confidence interval (95% CI) indicates a 95 per cent probability that the true value of an estimate is contained within the interval. So, the confidence interval is the likely range of the true value for an estimate (percentage). Throughout the report, 95 per cent confidence intervals were included in tables and graphs.

$$95\% \text{ CI} = \text{point estimate} \pm \text{standard error} \times 1.96$$

### Statistical significance

The only trends and patterns in the data that are discussed in the report are statistically significant trends and patterns. Statistical significance indicates how likely a result is due to chance and was determined between two estimates by comparing 95 per cent confidence intervals. Significant differences between two estimates were deemed to exist where confidence intervals for those estimates did not overlap.

Ordinary least squares linear regression models were used to test for trend in the report. Significant trends were determined where the *p-value* from the model was less than 0.05 ( $p < 0.05$ ).

The term 'significance' is used in this report to denote statistical significance. It was not used to describe clinical significance, the relative importance of a particular finding, or the actual magnitude of difference between two estimates.

## Interpretation of tables and graphs

### Tables

Estimates with an RSE between 25 and 50 per cent are marked with an asterisk (\*) and should be interpreted with caution. Estimates with an RSE greater than 50 per cent are not reported because they are not reliable. A double asterisk (\*\*) is used in tables in place of estimates with an RSE greater than 50 per cent.

### Figures

All figures in the report are presented with point estimates (percentages) and 95 per cent confidence intervals. The confidence intervals are depicted as error bars that cross through a point estimate. Estimates with an RSE between 25 and 50 per cent are marked with an asterisk (\*) and should be interpreted with caution. Estimates with an RSE greater than 50 per cent are not reported because they are not reliable. A double asterisk (\*\*) is used in figures in place of estimates with an RSE greater than 50 per cent.

## Profile of respondents

Known population benchmarks for selected data items may be used to assess the representativeness of a survey sample. Table A shows the benchmark data and weighted and unweighted estimates obtained from the VPHS 2011–12 survey. A comparison between benchmark and survey data indicates that, as in previous years with the VPHS, the sample:

- under-represents males
- under-represents younger people generally, particularly young persons in regional locations
- over-represents persons aged 45 and over, and in particular, persons aged 65 and over, especially in metropolitan areas
- under-represents persons from the metropolitan area

The weighting strategy for the survey addresses these imbalances in the demographic profile of the sample.

Table A: Profile of respondents to the Victorian Population Health Survey 2011–12

Selected characteristics	Benchmark (%)	Survey outcome (%)	Weighted survey outcome (%)	95% CI
<b>Gender<sup>a</sup></b>				
Males	48.5	38.6	48.9	47.9 – 49.9
Females	51.5	61.4	51.1	50.1 – 52.1
<b>Age group (years)<sup>a</sup></b>				
18–24	13.0	3.4	13.0	12.1 – 13.9
25–34	18.9	6.2	18.9	17.9 – 20.0
35–44	18.4	14.6	18.4	17.7 – 19.1
45–54	17.3	19.5	17.3	16.7 – 17.9
55–64	14.5	22.6	14.5	14.0 – 15.0
65+	18.0	33.7	18.0	17.4 – 18.5
<b>Area of residence<sup>a</sup></b>				
Metropolitan	74.1	39.0	74.7	74.2 – 75.2
Rural	25.9	61.0	25.3	24.8 – 25.8
<b>Country of birth<sup>b</sup></b>				
Australia	68.6	79.4	71.0	70.1 – 71.9

95% CI: 95 per cent confidence interval.

a ABS 2012a – Benchmark figures from Census 2011 that apply to the Victorian population aged 18 years or more.

b ABS 2012b – Benchmark figures from Census 2011 that apply to the total Victorian population (all ages).

## Appendix 2: The most damaging, or potentially damaging, fires of the 2008–09 bushfire season

The Country Fire Authority and the Department of Sustainability and Environment<sup>10</sup> attended or patrolled hundreds of fires during the 2008–09 bushfire season. The most damaging, or potentially damaging, fires occurred in late January and early February 2009 and included the fires at:

- Delburn
- Bunyip
- Kilmore East
- Horsham
- Coleraine
- Pomborneit–Weerite
- Churchill
- Murrindindi
- Redesdale
- Narre Warren: Harkaway
- Narre Warren: Lynbrook–Coral Drive
- Narre Warren: Lynbrook–Golf Club Road
- Upper Ferntree Gully
- Bendigo
- Beechworth–Mudgegonga

(2009 Victorian Bushfires Royal Commission 2010).

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10. The Victorian Government Department of Sustainability and Environment is now the Department of Environment and Primary Industries.

## Appendix 3: Local government areas affected by the bushfires in January and February 2009

Nineteen LGAs experienced significant property loss and/or loss of human life as a result of the bushfires of January and February 2009. They included:

- Alpine
- Baw Baw
- Cardinia
- Casey
- Corangamite
- Greater Bendigo
- Hepburn
- Horsham
- Indigo
- Latrobe
- Mitchell
- Mount Alexander
- Murrindindi
- Nillumbik
- South Gippsland
- Southern Grampians
- Wellington
- Whittlesea
- Yarra Ranges

# Abbreviations

95% CI	95 per cent confidence interval
ABS	Australian Bureau of Statistics
BMI	Body mass index
CATI	Computer assisted telephone interview
CFA	Country Fire Authority
DoHA	Department of Health and Ageing
GP	General practitioner
HREC	Human Research Ethics Committee
IRSD	Index of relative socioeconomic disadvantage
K10	Kessler 10 Psychological Distress Scale
LGA	Local government area
NHMRC	National Health and Medical Research Council
RDD	Random digit dialling
RSE	Relative standard error
VBRRRA	Victorian Bushfire Reconstruction and Recovery Authority
VPHS	Victorian Population Health Survey
WHO	World Health Organisation



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