

Bushfire and Planned Burn Smoke – Is it a public health concern?

Dr Martine Dennekamp
Senior Environmental Epidemiologist
EPA Victoria



Environment
Protection
Authority Victoria



Introduction

Exposure to smoke expected to increase in the future

Particles are the main component, but there are other pollutants in smoke

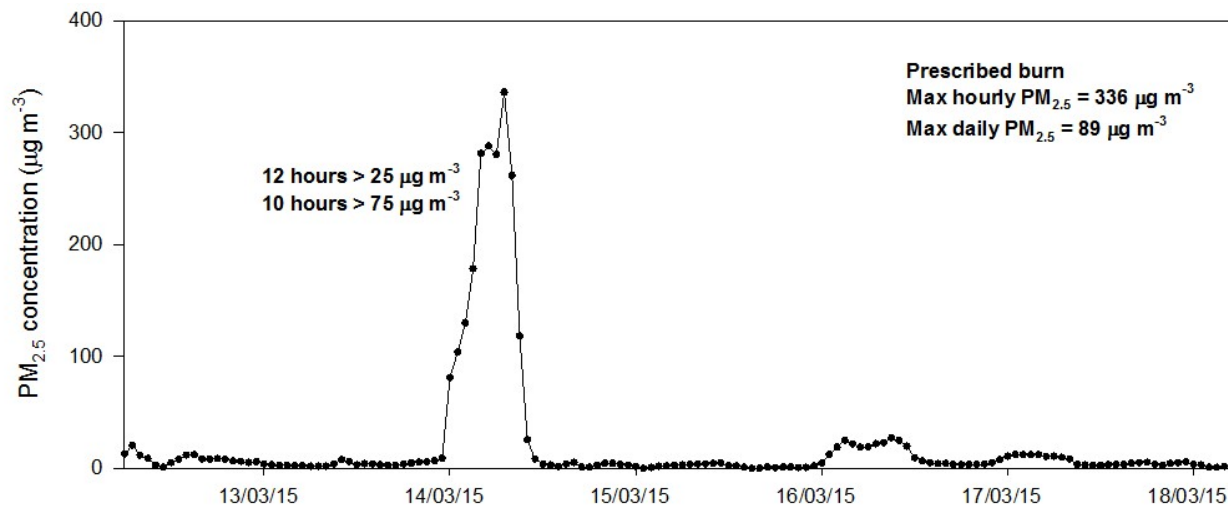


Warburton 2014

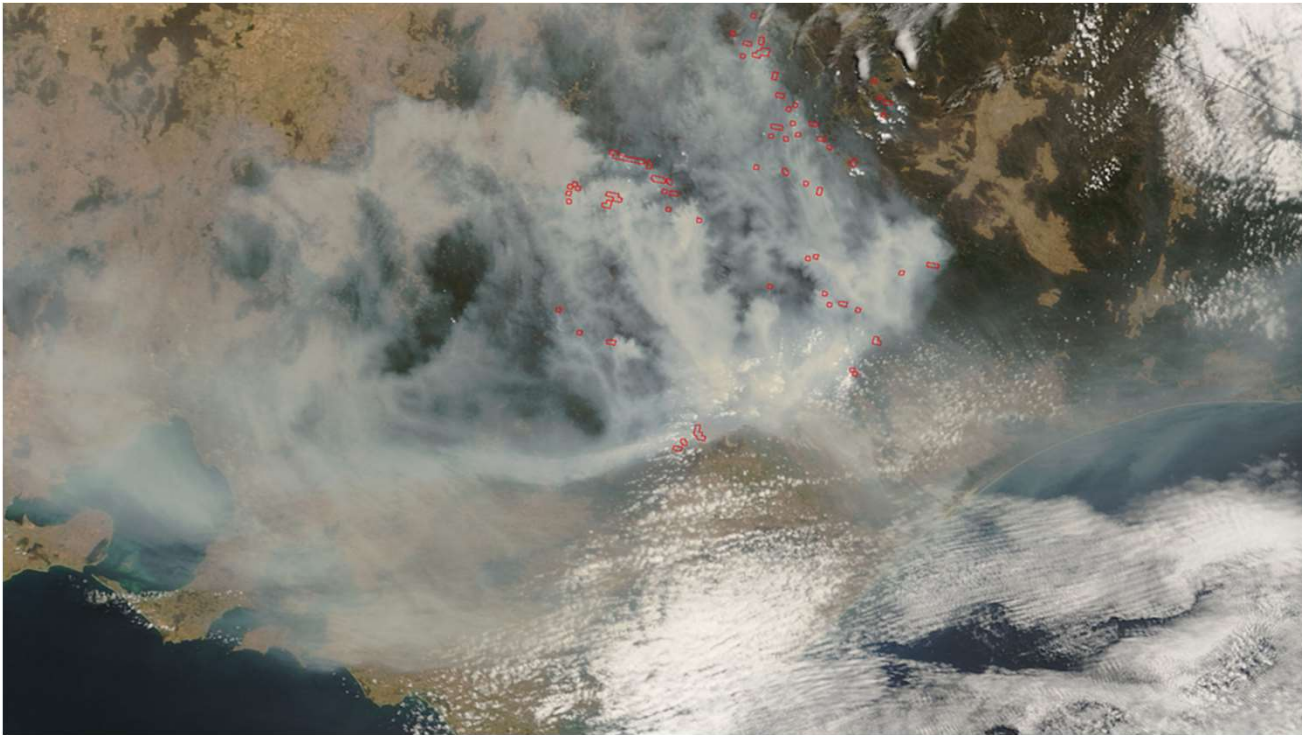
Planned Burn Smoke

- Planned burns are generally cool low intensity burns that can produce large amounts of smoke
- Plumes are of short duration
- Conducted on a regular basis
- Conducted under certain weather conditions including low wind speeds, which promotes build-up of smoke
- Can have a significant impact particularly in regional areas

Hourly PM_{2.5} during planned burning event over 6 days

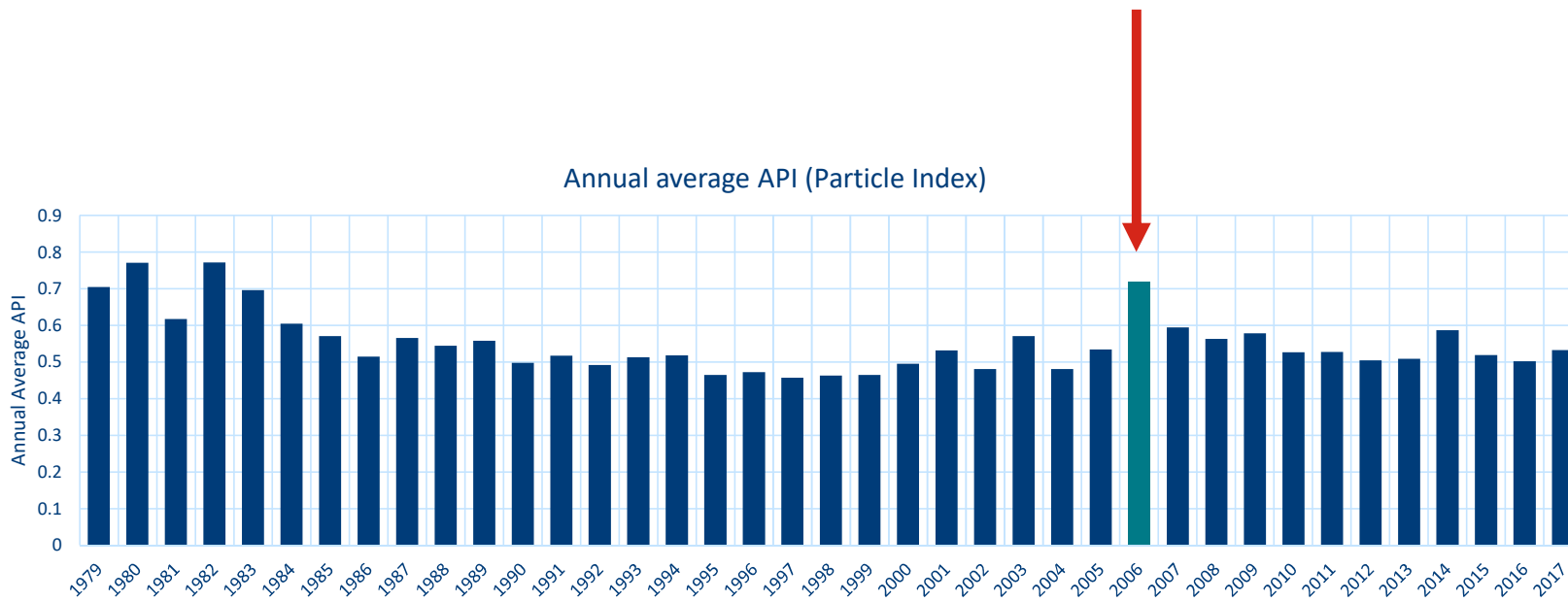


South-East of Australia during 2006/2007 bushfire event

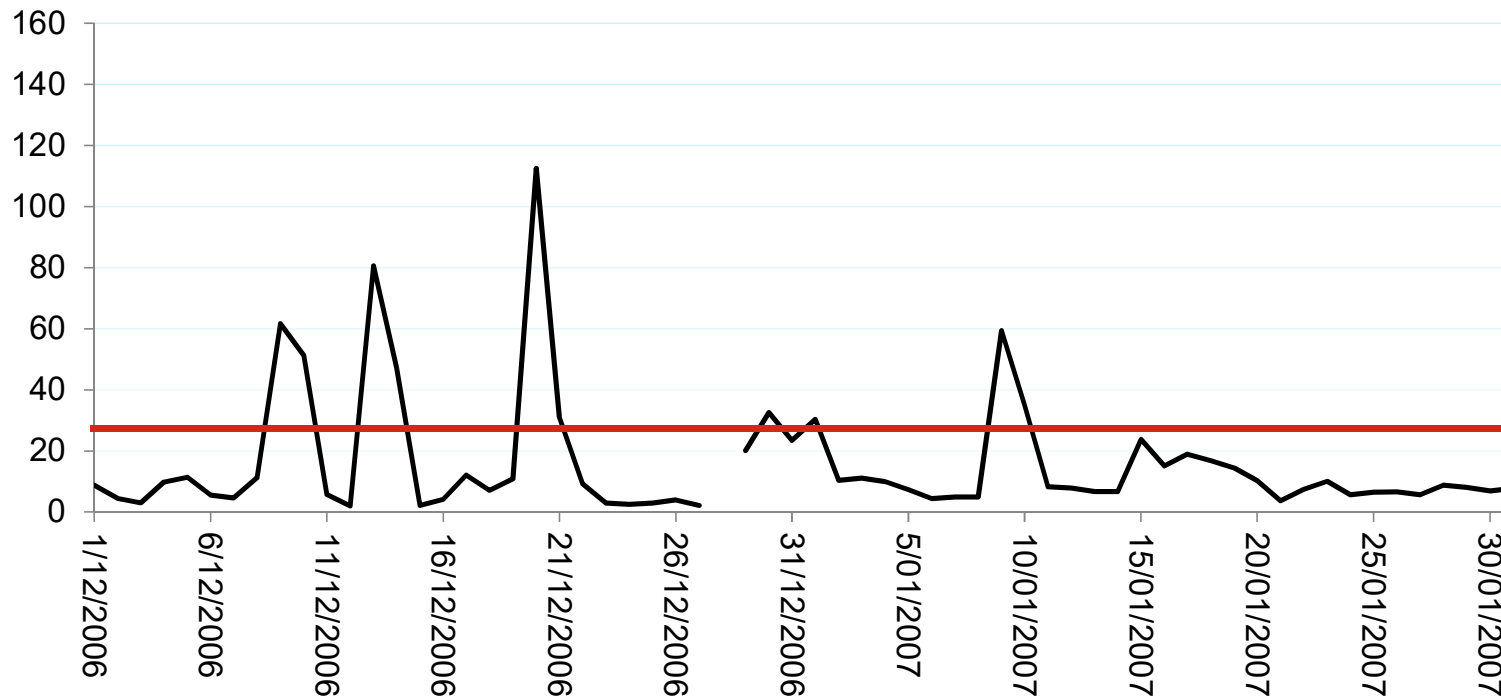


MODIS Terra satellite image taken on 20/12/2006 (courtesy of NASA)

Annual trends impacted by large scale events



Daily average PM_{2.5} during 2 month period of bushfire smoke



Bushfires in Australia with > 5 deaths as a direct result from the fire

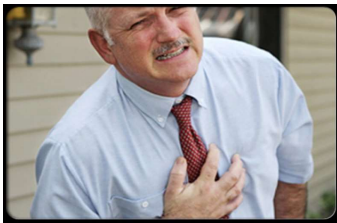
	Location	Area Burned (ha)	Deaths
1967 'Black Tuesday' bushfires	TAS	264,000	62
1983 'Ash Wednesday' bushfires	SA and VIC	418,000	75
2009 Black Saturday bushfires	VIC	450,000	173
2014 South Australia Bushfires	SA	300,000	10

	Location	Area Burned (ha)	Deaths
2006-07 Great Divide bushfires	VIC	1.2M – 1.3M	1

But what about the effects from the smoke?

Exposure to bushfire smoke and cardiac arrests in Melbourne

Aim: To estimate the number of excess out-of-hospital cardiac arrest and forest fire smoke exposures in Melbourne during the 2006/2007 bushfire season



Conclusion: It is estimated that in the 2006/2007 bushfire season the smoke in Melbourne was responsible for 24 - 29 excess out-of-hospital cardiac arrests in Melbourne (*Dennekamp et al, 2015*)

Deaths attributable to smoke

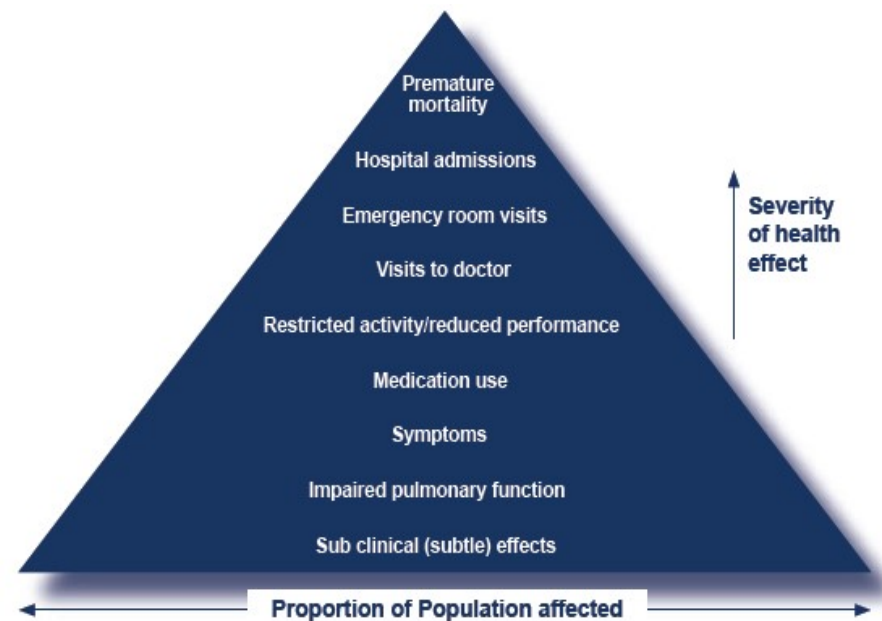
The impact of bushfire and planned burn smoke exposure during 2001–2013 was estimated as being approximately 14 premature deaths per year in Sydney (Horsley et al. 2018)



Code of Practice for bushfire management on public land. DSE Victoria June 2012

Health effects of bushfire smoke – The evidence

- Effect on the respiratory system
 - Emergency presentations and hospital admissions
- Increasing evidence of effects on the cardiovascular system
 - Hospital admissions
 - Cardiovascular mortality
 - Out-of-hospital cardiac arrests
- All cause mortality



Is it a public health concern?

What determines whether you are going to be affected?

- Susceptibility
- Level of pollution
- Duration of exposure

So is it a public health concern?

YES

What can be done to reduce exposure?

Much of the outdoor air pollutants generated from smoke are able to infiltrate indoors

Measures to minimise exposure to communities

Measures to reduce exposure indoors

Measures to avoid exposure by moving away from smoky areas