



WOODFIRE HEATERS AND ASTHMA POLICY POSITION STATEMENT

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Introduction

Woodfire heater smoke is the largest source of winter air pollution in areas including Sydney, Canberra and Tasmania,¹ yet just 7% of Australian households use woodfire heaters as their main source of heating.² Evidence from Tasmania suggests more people die from woodfire heater smoke than bushfire smoke,³ yet consumer research shows more people are concerned by bushfire smoke.⁴

Woodfire heater smoke contains harmful pollutants including fine particulate matter and known carcinogens. There is no 'safe' level of air pollution and health impacts can occur even at low levels of pollution.⁵ Woodfire heater smoke is a serious risk factor for asthma, both in terms of developing asthma and triggering symptoms in people who already have asthma.⁶ It is also a risk factor for other respiratory illnesses, certain cancers, cardiovascular disease, premature birth and premature death.⁷

"People who have asthma and other respiratory conditions are very badly affected by the smoke from these heaters, my neighbour has asthma and suffers terribly because here in Canberra and in surrounding areas, there are a lot of these woodfire heaters."

Kambah (Canberra) ACT, 52

These health impacts result in substantial economic costs, which have been estimated at \$3,800 per woodfire heater.⁸ In Tasmania alone, the average yearly health cost of woodfire heater smoke is an estimated \$293 million.⁹

Woodfire heater smoke levels vary between regions. Woodfire heater use is more common in the colder states and territories where use peaks in winter.¹⁰ Smoke from woodfire heaters is more problematic in areas where conditions prevent it dispersing.¹¹ Woodfire heater smoke can be problematic in regional towns such as Armidale in NSW as well as in major population centres such as Greater Metropolitan Sydney.

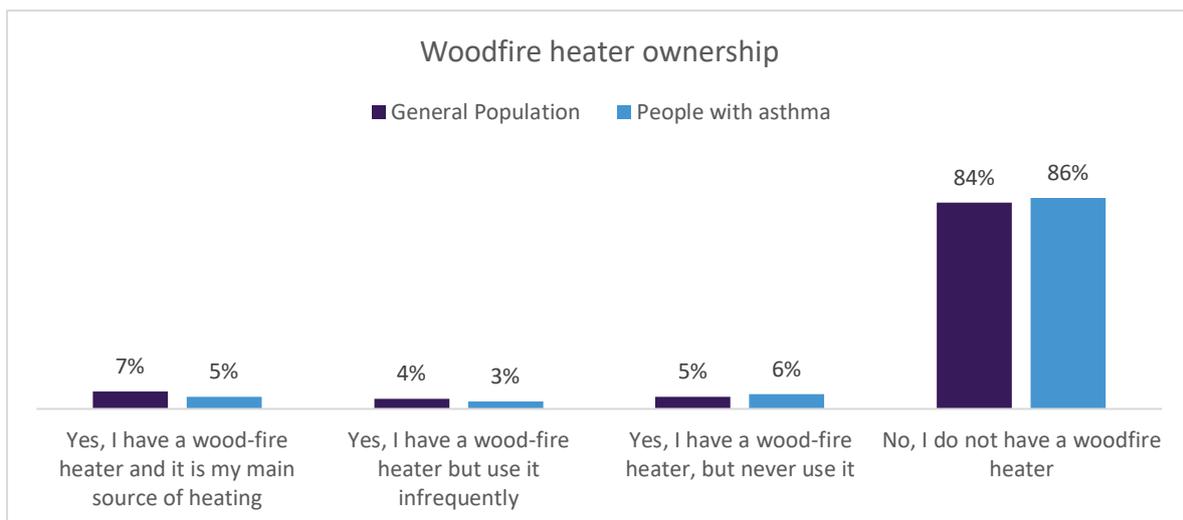
In November 2020, Asthma Australia commissioned a nationally representative survey of over 25,000 people.¹² We aimed to understand the impacts of woodfire heaters on the people who use them and their communities, and the beliefs people hold about woodfire heater use and relevant policy or public health actions. The research found people exposed to woodfire heaters are largely

unable to protect themselves against woodfire heater smoke when it is present, and that people are supportive of regulations to reduce the impact of woodfire heaters, with even stronger support among people with asthma.

Asthma Australia calls on all levels of government to implement reforms in order to minimise the health impacts of woodfire heater pollution in areas with high levels of smoke emissions, including programs to phase out woodfire heaters and a national AirSmart health promotion campaign to educate people about the health impacts of air pollution.

Woodfire heater use

Asthma Australia’s Woodfire Heaters and Health Survey¹³ found 11% of Australians reported owning and using a woodfire heater, with only 7% reporting they use it as their main source of heating. This is higher in cooler states and territories, with 13% of people in Tasmania and 14% of people in the Australian Capital Territory reporting they use a woodfire heater as their main source of heating. Woodfire heater ownership is also higher in regional and rural areas across the country. People with asthma are only marginally less likely to own and use a woodfire heater.



“...It gets pretty bad here (Bendigo) because even in the new housing areas where we are, a lot of people have installed wood-fire heaters, I would say at least half of the homes built in the last five years that I know would have one.”

Bendigo VIC

Woodfire heater smoke and human health

Woodfire heater smoke contains a range of pollutants including particulate matter, carbon monoxide and volatile organic gases.¹⁴ Fine particulate matter, known as PM2.5, is small enough to enter the lungs and bloodstream.¹⁵ Evidence shows there is no safe level of exposure to PM2.5.¹⁶

People with asthma are among those most vulnerable to particulate matter exposure, including from woodfire smoke.¹⁷ Findings from Asthma Australia’s survey show people with asthma are twice as likely to experience respiratory symptoms when exposed to woodfire heater smoke compared to the general population: nearly one-quarter of people with asthma (23%) reported respiratory symptoms compared with 11% of the general population.¹⁸

People with other respiratory illnesses are also particularly vulnerable to woodfire heater emissions, as are pregnant people, children and elderly people.¹⁹ Exposure to emissions has been associated with certain cancers, cardiovascular and respiratory hospital admissions and emergency department visits, premature birth and premature death.²⁰

Local air quality information is essential for people to be able to understand when woodfire heater emissions reach harmful levels in their neighbourhood. However, the number of locations where air quality data is collected varies between jurisdictions. Air quality monitoring sites are often selected based on population density and size, which means many regional and rural populations lack adequate local air quality monitoring. In 2020, a NSW Parliamentary Committee Inquiry into the health impacts of poor air quality recommended the NSW Government expand its Air Quality Monitoring Network and consider using low cost sensors to ensure local air quality data is available in as many localities as possible.²¹

Consumer understanding of woodfire heater health impacts

According to Asthma Australia's Woodfire Heaters and Health Survey, the health impacts on vulnerable populations are widely understood, with 75% of the general population and 85% of people with asthma agreeing woodfire heaters can cause health impacts for certain people. However, the potential impact on the broader population of low-level exposure is less widely recognised. Just over half (55%) of the general population recognise that woodfire heaters cause health problems for the general population.

The survey results also show most people who experience respiratory symptoms do not feel they are able to reduce their exposure to woodfire heater smoke. Only 28% of the general population and 18% of people with asthma said they are able to protect themselves from woodfire heater smoke when present. A common response from people on how they attempt to protect themselves is staying inside with their doors and windows closed when smoke is present. This is not a practical solution, as woodfire heater smoke is a persistent problem throughout affected regions in the colder months and people may be exposed daily or multiple times a week. It is also unlikely to protect the many people living in homes which aren’t well-sealed.

People with asthma like my sister-in-law suffer the most in terms of health impacts, she lives in the Lenah Valley (Hobart) and basically has to live in the house with all the doors and windows shut from May-September because it induces asthma attacks.”

Mount Stuart (Hobart) TAS, 56

Research focus: The health costs of woodfire heater smoke²²

University of Tasmania research suggests woodfire heater smoke is significantly more problematic from a health perspective than bushfire or hazard reduction burn smoke in Tasmania.

Researchers modelled the health impacts of smoke from woodfire heaters and landscape fires (including bushfires and hazard reduction burns) in Tasmania between 2010 and 2019, and the associated health costs. They estimated that, in total, wood smoke caused 69 premature deaths, 86 hospital admissions and 15 asthma emergency department visits annually, with over 74% of impacts attributable to woodfire heaters.

The researchers calculated that wood smoke exposure in Tasmania resulted in \$309 million in health costs each year, and that woodfire heater smoke was responsible for nearly 95% of costs. The average yearly health costs of woodfire heater smoke were estimated at \$293 million.

Research focus: Greater Metropolitan Sydney PM2.5 health impacts²³

Woodfire heater smoke has been found to be the largest source of fine particulate matter in the Greater Metropolitan Region of Sydney. Researchers modelled the impacts of PM2.5 from eight major sources in Region in 2010-11. They found woodfire heaters were the largest source of PM2.5 emissions, contributing nearly one-quarter of total anthropogenic emissions despite being used by just 4.4% of Sydney residents as their main source of heating. The highest levels of PM2.5 were found to be in areas with high population density (with the one exception being a coal mining area). Long-term exposure to PM2.5 was found to be responsible for 1.2% of all mortality in the region, with woodfire heaters the largest contributor.

Regional impacts of woodfire heater smoke

The health burden of woodfire heater smoke is not evenly distributed. Unsurprisingly, woodfire heaters are a bigger problem in states and territories which experience colder weather. In Tasmania, the ACT and NSW, woodfire heaters are the largest source of air pollution in winter.²⁴

Asthma Australia's survey revealed 7% of respondents used woodfire heaters as their main source of heating nationally. This is higher in cooler states and territories, with 13% of people in Tasmania and 14% of people in the Australian Capital Territory reporting they use a woodfire heater as their main source of heating. Woodfire heaters are responsible for two-thirds of PM10 emissions in Canberra.²⁵

The prevalence of woodfire heaters also varies between regions. For example, around half of households use woodfire heaters in Armidale²⁶ compared with just 4% of households in the Greater Metropolitan Region of Sydney.²⁷ Yet despite the relatively low number of woodfire heaters in the Sydney region, they are still the largest contributor to air pollution in winter. (See Research focus: Greater Metropolitan Sydney PM2.5 health impacts, above).

Woodfire heater smoke is also a bigger problem in areas where conditions mean woodfire heater smoke is less likely to disperse.²⁸ Topographic features can 'trap' pollution, as seen in Sydney, which

has a basin shape,²⁹ and in Launceston in Tasmania, which is in a river valley.³⁰ These features can combine with meteorological conditions to create inversion layers which further limit dispersal of pollution.³¹

Case Study: Armidale, New south Wales

Woodfire heaters are prevalent in the NSW regional town of Armidale. The town experiences problematic woodfire heater smoke as a result of geographic features that create inversion layers and other environmental aggravators of air pollution. Woodfire heater smoke has been estimated to cause an additional 750 GP visits each winter, and a local GP reportedly advised people to move away if they had lung conditions.³² There has been considerable local action to minimise the health impacts of woodfire heater smoke. Armidale Regional Council now requires an application to be submitted for any installation or replacement of woodfire heating appliances with the aim of ensuring compliance with air pollution standards and prevention of smoke inhalation by neighbours.

Case Study: The cost of woodfire heater emissions in Victoria

A Policy Impact Assessment³³ prepared for Victoria's Environment Protection Authority in 2017 assessed the health costs of woodfire heater emissions and the benefits of various regulatory interventions to reduce emissions. It quantified the total health costs of woodfire heater emissions at more than \$8 billion over 10 years. The Policy Impact Assessment found that accelerating replacement of existing woodfire heaters was by far the most effective intervention in terms of avoiding particulate matter emissions and would result in the greatest net benefit at over \$462 million. In comparison, adopting an efficiency standard would deliver a net benefit of under \$33 million and tightening the emissions standard for woodfire heaters would have a net benefit of just over \$28 million. (In late 2020, the Victorian Government announced a household energy efficiency package which included funding to replace old heaters, including woodfire heaters, with energy efficient alternatives.³⁴ However, detail on this program is not available.)

Case Study: Launceston, Tasmania

Woodfire heater smoke has been recognised as the biggest air quality concern in Tasmania³⁵ where the second largest city of Launceston became a focus for strategies to reduce woodfire heater pollution.³⁶ Woodfire heaters became more popular throughout Tasmania in the 1980s and 1990s and they could be found in two-thirds of Launceston households in 2001. A program of interventions began that year and by the end of the program in 2004, woodfire heater prevalence was reduced to 30% of households. Researchers studying the impact of these interventions measured air pollution before and after the interventions, finding a significant decrease in annual particulate matter pollution and an even greater decrease in winter air pollution levels.³⁷

Backyard fire pits

Anecdotally, backyard fire pits are becoming more popular. Consumer reports to Asthma Australia indicate fire pits became problematic in Brisbane after the city's council lifted a ban on backyard burning in 2020.³⁸ Health and environmental authorities across the world have issued warnings about their use with concerns about air pollution, bushfire danger and the impact on groups vulnerable to air pollution, including people with respiratory conditions.³⁹

Woodfire heating and climate change

Woodfire heating exacerbates the impacts of climate change. Firewood production and use can be considered carbon dioxide-neutral if the carbon dioxide emitted is accounted for by replacement trees. However, this is not the case in Australia where emissions studies have shown domestic woodfire heating emissions were significantly underestimated.⁴⁰ Burning wood – even the more sustainable types – produces toxic pollutants such as methane and black carbon particles which damage the environment, aggravate climate change and negatively impact human health.⁴¹

Regulatory approaches to woodfire heaters

In Australia, regulation of woodfire heaters is complex, with responsibility shared across all levels of government. Woodfire heating appliances and their emissions are governed by Australian Standards which need to be legislated by state and territory governments to be enforceable. State and territory governments are also responsible for monitoring and regulating emissions, although this is often delegated to local governments.

There have been a number of successful programs to reduce the number of woodfire heaters in areas where their emissions are problematic:

- In 2001, a coordinated approach to reduce air pollution was implemented in Launceston including a community education campaign, enforcement of environmental regulations and a woodfire heater replacement program. These interventions resulted in a dramatic drop in woodfire heater prevalence, from 66% of homes having woodfire heaters to just 30% by the end of the program in 2004. Evaluation of the intervention found there was decreased air pollution which was associated with reduced cardiovascular and respiratory mortality during winter in Launceston, compared to Hobart where no interventions were implemented.⁴²
- The ACT Government runs the Actsmart Wood Heater Replacement Program, with the aim of improving Canberra's air quality by offering financial incentives to remove and dispose of woodfire heaters.⁴³ The Australian Medication Association and other health groups have called for similar schemes to be introduced in other states and territories.⁴⁴
- The Christchurch Clean Heat Project in New Zealand intended to improve air quality by removing woodfire heaters. It provided financial support towards replacement low emission heaters and improved insulation. As a result, woodfire heaters were replaced with reverse cycle air conditioners in 1,973 households.⁴⁵

Other regulatory approaches to phasing out woodfire heaters include banning their installation in new residential developments and requiring them to be removed when a home is sold.

In addition to reforms aimed at phasing out woodfire heaters, governments have implemented education campaigns around minimising emissions from existing woodfire heaters. For example, the NSW Environmental Protection Agency has a resource kit for local governments to help educate communities.⁴⁶

Consumer attitudes towards regulating woodfire heaters

In Asthma Australia’s consumer survey into woodfire heaters, more than half of the general population supported woodfire heaters being phased out with a subsidy (55%) or banned (54%). People with asthma were particularly supportive of phasing out (71%) or banning (65%) woodfire heaters.

In general, people seemed to be more supportive of regulations or restrictions of woodfire heaters, compared to requiring neighbours to inform prior to use or community education about correct use and how to reduce smoke. This suggests people want stronger action which takes it out of their individual control to manage, given people largely feel unable to protect themselves from woodfire heater smoke.

People were most supportive of regulations which restrict the use of woodfire heaters in built up or metropolitan areas, where people live in close proximity. However, results from our survey show that people in regional and rural areas are more likely to be exposed to woodfire heaters, and on a more frequent basis than those in metropolitan areas.

Statement	All (%)			PWA (%)		
	Disagree	Neutral	Agree	Disagree	Neutral	Agree
Woodfire heaters should not be allowed in urban or built-up areas	20	3	77	14	2	84
People should be able to use their preferred heating source	35	4	61	59	3	38
Woodfire heaters should be phased out (e.g. a subsidy or rebate scheme)	40	5	55	25	4	71
Woodfire heaters should be banned	39	7	54	31	4	65
Governments should regulate woodfire heater use	41	9	50	28	6	66
People using woodfire heaters should inform neighbours prior to use	39	13	48	35	9	56
There should be community education about how to correctly use and reduce smoke from woodfire heaters	57	6	37	42	8	50

“These wood-fire heaters don’t have a place in a city where people live in close proximity, just a cluster of a few homes with one can have a large impact on a lot of people in the neighbouring area. I used to live in Kenthurst (suburb of Sydney) and every winter people in the area would be affected and complain about the smoke to the local council.”

Macquarie Park (Sydney) NSW, 36

“I don’t know why they haven’t been totally banned in residential areas in major cities and large towns, my mother lives in Tamworth and when I was there in July, the smoke from the wood-fire heaters was so bad, luckily I don’t have asthma but it still made me unwell with a headache and sore throat.”

Speers Point (Newcastle) NSW, 43

Recommendations

All levels of government will need to implement reforms in order to minimise the health impacts of woodfire heater pollution in areas with high levels of smoke emissions. Asthma Australia recommends the following interventions.

Recommendation 1: Prohibit installation of woodfire heaters in new homes.

Recommendation 2: Require woodfire heaters to be removed when a home is sold.

Recommendation 3: State, territory and local governments introduce financial support programs to remove woodfire heaters and replace them with low emission alternatives and home improvements to reduce need for heating.

Recommendation 3: State, territory and local governments implement localised air quality monitoring in areas with high woodfire heater usage, including the use of low-cost monitors.

Recommendation 4: Local governments enforce environmental regulations by investigating complaints of excessive woodfire heater smoke, educating individuals around reducing emissions and issuing infringement notices when needed.

Recommendation 5: In addition to implementing measures to phase out woodfire heaters, state, territory and local governments implement programs to educate people using woodfire heaters around minimising emissions.

Recommendation 6: Commonwealth, state and territory governments support the development and implementation of an AirSmart public education campaign to minimise the health impacts of poor air quality.

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