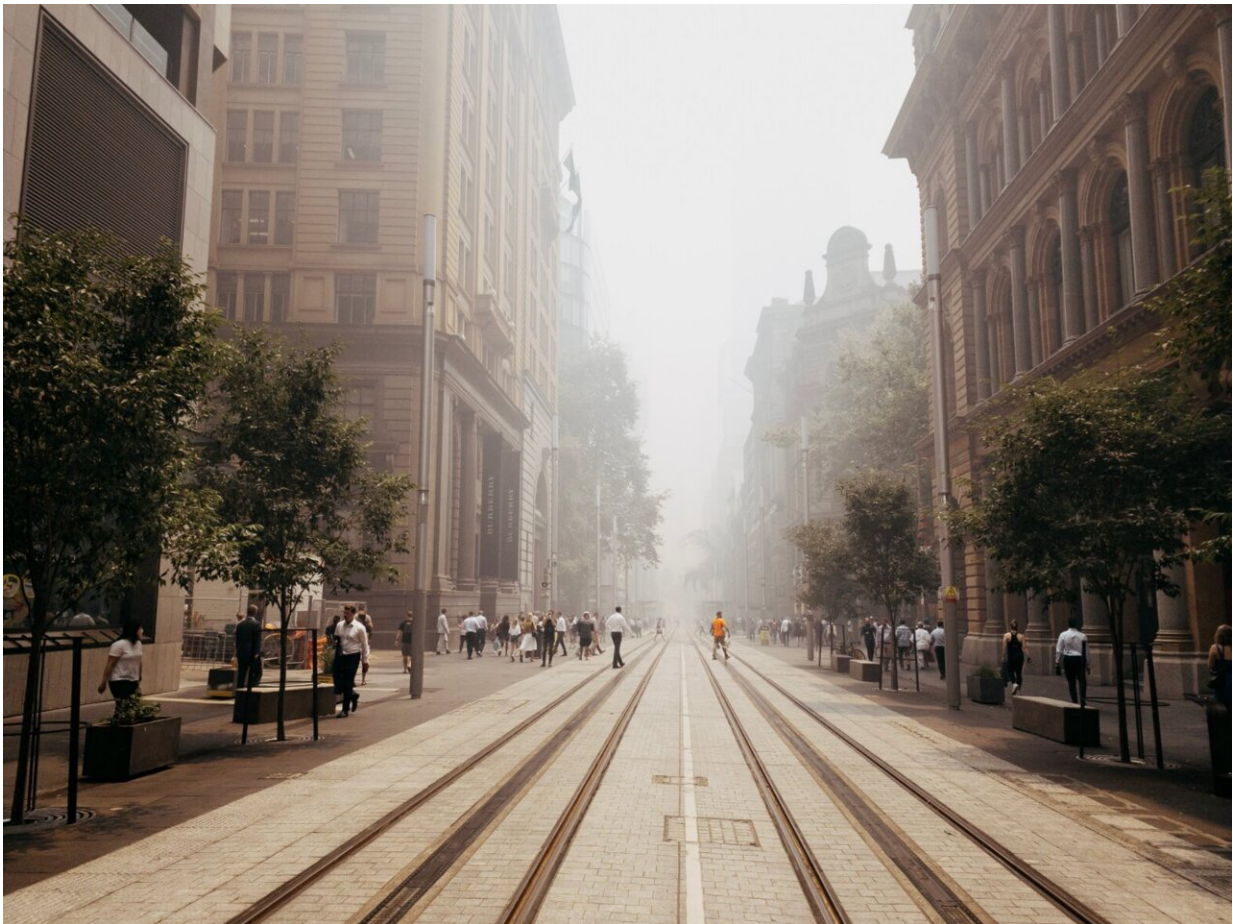


Study shows HEPA filters substantially improve air quality during bushfire season

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Researchers have shown that portable air cleaners, otherwise known as air purifiers, fitted with high-efficiency particulate air (HEPA) filters substantially improve air quality during prescribed burn events. Credit: VirtualWolf/Flickr <https://flickr.com/photos/7281432@N05/49197319478>

Portable air purifiers fitted with high-efficiency particulate air (HEPA) filters can substantially improve indoor air quality during bushfire events, according to new research from CSIRO, Australia's national science agency.

Published in *Public Health Research & Practice*, researchers found that HEPA [filters](#) have potential, when used appropriately, to substantially improve indoor air quality by 30–74% during smoke episodes caused by prescribed burns.

The findings could help to protect 2.7 million Australians currently affected by asthma—and around 7 million more at elevated risk of developing [health problems](#) during extreme smoke events.

[Previous research](#) has reported an increase of 44% of patients reporting asthma symptoms and presenting to emergency departments over one week during the Black Summer bushfires during January 2020.

While agencies often recommend vulnerable individuals use portable HEPA filters to reduce their exposure to smoke and stay inside, there has also been limited evidence so far that air purifiers fitted with HEPA filters reduce exposure or [health risks](#) to [fine particulate matter](#), or PM2.5.

Lead author and CSIRO scientist Dr. Amanda Wheeler said the results provide a strong point of evidence for agencies who are tasked with providing advice to the public during extreme smoke events.

"Staying inside and closing windows and doors during extreme smoke events is important, but ultimately what provides protection against smoke pollution indoors are air purifiers fitted with HEPA filters," Dr. Wheeler said.

"Using more than one, if possible, inside houses is likely to lead to improved health outcomes.

"While the research was focused on prescribed burns, the findings are relevant for protection during [bushfire](#) events more generally.

"They demonstrate that any smoke emissions, including from neighboring houses' wood heaters can be managed better."

These conclusions were drawn by monitoring indoor and outdoor concentrations of PM2.5 during prescribed burning periods. Researchers calculated improvements to [indoor air quality](#) in nine homes when operating a HEPA cleaner during a smoke episode.

The effectiveness of the HEPA filters was also found to be dependent on whether the house was compliant with the national construction code. Houses with a tighter envelope (less leaky) are more efficient in stopping the infiltration of outdoor smoke.

Dr. Wheeler said that bushfires are the greatest threat to air quality in Australia, with [climate change](#) increasing complexity for bushfire mitigation.

Fire managers rely on prescribed burns to reduce fuel loads and mitigate the hazard of uncontrolled bushfires.

Increased temperatures, a result of climate change, are leading to increased fire events which cause smoke pollution.

Climate change is also extending the length of the summer bushfire season in southern parts of Australia, potentially prolonging smoke exposure and associated adverse health effects.

"Prescribed burns are an important part of fire management, but outdoor smoke can easily infiltrate homes and buildings, so it's critical that we find ways to protect populations from serious health impacts." Dr. Wheeler said.

More information: Amanda Wheeler et al, *Public Health Research & Practice* (2023). [DOI: 10.17061/phrp33232307](https://doi.org/10.17061/phrp33232307)

Provided by CSIRO

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