

## Research Summary

### A good diet quality reduces the effects of mine fire-related smoke on chronic cough and phlegm

April 2024



## Background

The fire in the Morwell open cut brown coal mine adjacent to the Hazelwood Power Station blanketed the town of Morwell and the surrounding area in smoke and ash for six weeks in February and March 2014. The smoke event was recognised as one of the most significant air quality incidents in Victoria's history. It caused considerable concern within Morwell and the broader community. In response to these concerns, and following extensive community consultation, the Hazelwood Health Study was established to examine the impacts of the mine fire. The Hazelwood Health Study involves multiple research streams targeting different health outcomes and different vulnerable groups.



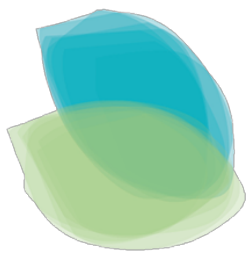
### Analysis aims

Mine fire smoke exposure is known to increase respiratory symptoms whereas diet quality, specifically, fruit and vegetable quality, is thought to protect against respiratory symptoms. We aimed to investigate whether good diet quality weakened the effects of mine fire smoke on respiratory health.



### What we did

We surveyed 282 residents of Morwell and 166 residents of Sale, 8.5 years after the mine fire. We asked about respiratory symptoms including chronic cough and phlegm, along with diet quality using the Australian Eating Survey. We worked with CSIRO to estimate the levels of fine particles in the mine fire smoke smaller than 2.5 thousandths of a mm in diameter (PM<sub>2.5</sub>). Particles this fine can travel deep into people's lungs. We investigated whether higher PM<sub>2.5</sub> exposure was associated with increased respiratory symptoms and whether a better diet quality weakened the adverse impact of smoke exposure on those symptoms.



## What we found

Fire-related PM<sub>2.5</sub> was associated with self-reported chronic cough, current wheeze and chronic phlegm. But when we looked at this association together with diet quality, we found that overall diet quality and specifically fruit and vegetable quality diminished the effect of fire-related PM<sub>2.5</sub> on chronic cough and chronic phlegm. It's possible that antioxidants found in fruits and vegetables, especially vitamin C, carotenoids and flavonoids, may reduce respiratory damage caused by PM<sub>2.5</sub>.

A more detailed paper describing these findings can be found at [www.hazelwoodhealthstudy.org.au/study-findings/publications](http://www.hazelwoodhealthstudy.org.au/study-findings/publications)



### Meet the team

Thara Govindaraju  
Martin Man  
Alice Owen  
Matthew Carroll  
Brigitte Borg  
Catherine Smith  
Caroline Gao  
David Brown  
David Poland  
Shantelle Allgood  
Jillian Ikin  
Michael Abramson  
Tracey McCaffrey  
Tyler Lane



## Considerations

Both diet quality and respiratory symptoms were self-reported and may not have been accurate. Considering diet quality was measured 8.5 years after mine fire, it might not reflect the diet that participants had at the time of the event.



## Where to from here?

The finding will be published in a peer reviewed journal and shared with relevant health and community services to ensure they are used to guide current health service provision and continuous improvement of lifestyle behaviours including healthy eating in the community.

The HHS is led by Monash University with collaborators from Menzies Institute for Medical Research, Federation University, The University of Adelaide, and CSIRO.

The research was funded by the Department of Health.

Hazelwood Health Study website: [www.hazelwoodhealthstudy.org.au](http://www.hazelwoodhealthstudy.org.au)