



Emergency Presentations and Hospital Admissions **Research Summary**

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Meet the team

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Analysis aims

The aim of this analysis was to examine whether coal mine fire-related pollutants were associated with increased risks of emergency presentations or hospital admissions for cardiovascular and respiratory diseases.



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, with the concentration of smoke contaminants reaching high levels.

The smoke event caused considerable community 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 HHS involves multiple research streams targeting different health outcomes and different vulnerable groups.



What we found

This analysis examined the impacts of the 2014 Hazelwood mine fire on emergency presentations and hospital admission in the Latrobe Valley and surrounding areas. We found that most fire-impacted areas had higher rates of emergency presentations and hospital admissions during the coal mine fire period (9 February 2014 to 10 March 2014) compared with the broader period from January 2009 to June 2015.

We found that the rates of emergency presentations and hospital admissions for asthma and Chronic Obstructive Pulmonary Disease (COPD) and all respiratory diseases were higher during the Hazelwood mine fire period, in comparison with the non-fire periods (30 days before and 30 days after the fire). However, there was no evidence of increased rates for cardiovascular disease. Coal mine fire-related pollutants were associated with emergency presentations for asthma and COPD after 6 days' exposure and for all respiratory diseases after 5 days' exposure.

Attributable to the coal mine fire-related pollutants, there were estimated to be 14 emergency presentations for asthma and COPD, 22 emergency presentations for 'all' respiratory diseases and 132 for 'all' conditions included in the analysis. Of this number, Morwell residents counted for 9 emergency presentations for asthma and COPD, 14 for respiratory diseases and 83 for all conditions.

A full report describing the findings from this analysis can be found at hazelwoodhealthstudy.org.au/study-findings/study-reports



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What we did

Researchers first collected emergency presentations, hospital admissions, air pollution and temperature data to be used in the analysis.

Data relating to hospital emergency presentations and hospital admissions were both obtained from the Department of Health and Human Services. Daily data were obtained for the period 1 January 2009 to 30 June 2015. These data were de-identified so that it was not possible to recognise which person the information was connected with.

Air pollution estimates were based on level of particulate matter in the air measuring less than 2.5 thousandths of a millimetre in diameter ($PM_{2.5}$). These were modelled by the Commonwealth Scientific and Industrial Research Organisation for the areas impacted by the mine fire smoke. Daily maximum temperatures were collected from the Australian Bureau of Meteorology.

A statistical method called *time series analysis* was used to measure the association between daily air pollution levels and emergency presentations and hospital admissions, while taking into account the influences of other contributing factors such as season and temperature.



Considerations

This analysis only investigated the impact of coal mine fire-related $PM_{2.5}$ and did not include other criteria pollutants (e.g. carbon monoxide, ozone, nitrogen dioxide, sulphur dioxide). Future work will assess the impacts of other air pollutants.

While the findings suggest an increase in hospital presentations or admissions associated with the mine fire smoke, the data is not sufficient to link any individual case to the mine fire.

Where to from here

Further analysis will be conducted later this year to examine the effects of coal mine fire-related $PM_{2.5}$ on ambulance call-outs, medical services and dispensing of medications, and to assess the effects of other air pollutants, particularly carbon monoxide on health outcomes.

HHS results will be shared with relevant organisations to ensure that findings are used to shape services for the future health of the Latrobe Valley.

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