



Use of health services and medications **Research Summary**

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Analysis aims

The aims of these analyses were to examine whether coal mine fire-related air pollutants were associated with increased use of health services, and increased dispensing of prescription medications, for cardiovascular, respiratory and mental health conditions.

Meet the team

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The Hazelwood Health Study is a collaborative program of research led by the Monash University Schools of Public Health and Preventive Medicine and Rural Health in partnership with Federation University, the Menzies Institute for Medical Research the University of Tasmania, The University of Adelaide and the CSIRO.



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 did

Data on health service use in the Latrobe Valley area were obtained from the Medicare Benefits Schedule (MBS) database for the period 1 July 2012 to 30 June 2016. Data on prescription medications dispensed by pharmacists were obtained from the Pharmaceutical Benefits Scheme (PBS) database for the period 1 January 2013 to 31 December 2016. MBS and PBS data were provided by the Commonwealth Department of Human Services. The Commonwealth Scientific and Industrial Research Organisation Oceans and Atmosphere modelled hourly levels of mine fire-related air pollutants based on concentrations of fine air particulate matter with a diameter of 2.5 thousandths of a millimetre or less (PM_{2.5}). Daily maximum temperatures were collected from the Australian Bureau of Meteorology. A statistical method called time series analysis was used to measure the associations between daily average PM_{2.5}, use of health services and dispensing of medications in the Latrobe Valley. These models took into account the influences of other contributing factors such as season, temperature and public holidays.

Website: www.hazelwoodhealthstudy.org.au/study-reports



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What we found

The analyses found that levels of mine fire-related $PM_{2.5}$ were associated with increased health service use and increased rates of dispensing prescription medications in the Latrobe Valley area. During the 30 day period from 9 February to 10 March 2014, it was estimated that there were an additional 3,274 General Practitioner consultations and 159 respiratory health service visits attributed to coal mine-fire related $PM_{2.5}$. Increased General Practitioner consultations occurred after about 4-5 days of smoke exposure. Increased respiratory health service visits occurred after about 7 days of smoke exposure. There was also a small increase in mental health consultations after about 15 days of exposure.

Furthermore, it was estimated that an additional 2,093 cardiovascular medications, 890 respiratory medications and 1,053 mental health related medications were dispensed as a result of coal mine-fire related $PM_{2.5}$.

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



Considerations

While the findings suggest there was an increase in the use of medical services and dispensing of medications in the Latrobe Valley associated with the coal mine fire smoke, the data are not sufficient to link any individual's case to the mine fire.

There are some limitations to interpretation of these data. Numbers of medications dispensed may not equal numbers of medications taken by recipients. Medications provided over the counter at pharmacies (without a prescription) are not included in the PBS dataset and medical services that do not qualify for Medicare benefits are not included in the MBS dataset.

Finally, in this instance measurement of air pollution was limited to $PM_{2.5}$ and did not include other possible pollutants such as carbon monoxide.

Where to from here

To complement these findings based on MBS and PBS data, the HHS is also evaluating data from clinical examinations and interviews to further assess cardiovascular, respiratory and mental health in smoke effected communities.

The 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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