

Adult Survey: Mine fire smoke exposure and health Research Summary

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Analysis aims

This research aimed to assess whether adults who were heavily exposed to air pollution from the mine fire, had poorer psychological, respiratory or cardiovascular health, compared with adults who were less or minimally exposed.

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 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

Almost all Morwell participants, and some Sale participants, were exposed to mine fire-related air pollution. For some participants, their average daily exposure level exceeded World Health Organization guidelines. Compared to participants with no fire-related air pollution exposure, participants with medium or high exposure were more likely to report only fair or poor health than to report excellent or very good health. Participants with low, medium or high exposure were also more likely to report respiratory symptoms (wheeze, night-time and resting shortness of breath, chronic cough and phlegm, chest tightness and nasal symptoms). The increases in respiratory symptoms ranged from 15% to 110%. Cough, in particular, appeared to increase with each increase in air pollution exposure level. Asthma symptom severity was also slightly higher in asthmatics who had low or high air pollution exposure compared to asthmatics with no exposure.

Compared to participants with no exposure, participants with low, medium or high exposure also reported more symptoms of psychological distress that they associated with the mine fire that occurred 2.5 years earlier. These included symptoms like intrusive thoughts about the fire, avoidance behaviours (such as trying not to think about it) and being jumpy or easily startled. Intrusive thoughts, in particular, appeared to increase with each increase in air pollution exposure level.

We did not find a relationships between mine fire-related air pollution exposure and risk of having high blood pressure, high cholesterol, any cardiovascular condition, diabetes or cancer which had been diagnosed by a doctor in 2014 or later.

A detailed report on this research can be found at
<http://hazelwoodhealthstudy.org.au/study-findings/study-reports/>





What we did

We surveyed 3,096 adults from Morwell and 960 from Sale approximately 2.5 years after the mine fire event. Participants answered questions about their locations (e.g. home and work) during the mine fire and their recent general, psychological, respiratory and cardiovascular health. Using air pollution modelling conducted by CSIRO, we calculated each participant's level of exposure during the fire, to fine air particles < 2.5 thousandths of a mm in diameter (PM_{2.5}). We then compared the self-reported health of people with high, medium, low or no PM_{2.5} exposure. This analysis took into consideration other factors that can influence health, such as participant's jobs that involved exposure to dusts or fumes, their education level and cigarette smoking.



Considerations

Only 34% of Morwell adults, and 23% of Sale adults participated. Whilst this is comparable to participation rates in other Australian research studies, there is the possibility that participants were not representative of their towns. The researchers used a number of statistical methods to correct for known differences between participants and non-participants, and between Morwell and Sale. However, there remains the possibility that factors other than the mine fire air pollution were responsible for some of the differences in health reported by exposed and not exposed participants.

The HHS is led by Professors Michael Abramson and Judi Walker at Monash University with collaborators from the Menzies Institute, Federation University, University of Adelaide and CSIRO.

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Where to from here?

Some Adult Survey participants have gone on to have lung function tests, cardiovascular health tests or psychological health interviews. Many have also agreed to the researchers accessing their ambulance, hospital and cancer data. Future research will combine these data sources in order to provide a fuller description of participants' health.