Hazelwood HEALTH STUDY

Research Summary

Self-reported respiratory health after the Hazelwood coalmine fire and the COVID-19 pandemic

August 2023

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

8.5 years after the mine fire, this research aimed to investigate whether adults who had been heavily exposed to smoke from the fire were more likely to report respiratory symptoms than adults who were less or minimally exposed. The analysis also aimed to investigate whether the relationship between mine fire smoke exposure and respiratory symptoms was made worse by COVID-19 infection.

What we did

In 2016/2017, approximately 2.5 years after the mine fire event, 3,096 Morwell and 960 Sale residents completed the Hazelwood Health Study Adult Survey. Participants answered questions about their locations on different days during the mine fire (e.g. home, work or leave). Based on those locations, air pollution data modelled by CSIRO was used to estimate each participant's level of exposure during the fire to fine airborne smoke particles less than 2.5 thousandths of a mm in diameter ($PM^{2.5}$). Participants also reported whether they had experienced any of seven respiratory symptoms in the year prior to the survey; those being current wheeze, chest tightness, shortness of breath at night, shortness of breath at rest, nasal symptoms, chronic cough and phlegm. At that time, we found that people who had been exposed to higher levels of $PM^{2.5}$ (that is, higher levels of mine fire smoke) were more likely to report chronic cough and current wheeze than people who had been exposed to less smoke.

In 2022, approximately 8.5 years after the fire, 612 participants were resurveyed. We looked to see whether their previously reported respiratory symptoms had improved, stayed the same or worsened. We also investigated whether contracting COVID-19 had made any difference to the association between mine fire smoke exposure and respiratory symptoms. This analysis took into consideration other factors that could influence health such as age, socioeconomic status and cigarette smoking.

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What we found

Compared with the symptoms reported 2.5 years after the event, mine fire smoke-exposed participants reported a sustained and worsening increase in chronic cough and possibly a worsening increase in current wheeze, 8.5 years after the event. That is, the effect of mine fire smoke exposure on cough and wheeze seemed to have increased over time.

Mine fire smoke-exposed people who had contracted COVID-19, compared to mine fire smoke-exposed people who had not contracted COVID-19, were more likely to report shortness of breath at night, chronic phlegm and possibly chest tightness. That is, mine fire smoke exposure and COVID-19 combined, resulted in more respiratory symptoms than mine fire smoke exposure alone.

A detailed paper describing the findings from this analysis is freely available at
www.medrxiv.org/content/10.1101/2023.04.12.23288500v1

Meet the team

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Considerations

Only 34% of Morwell adults participated in the original 2016/2017 Adult Survey and, of those, 26% participated in the 2022 Survey. Whilst this was comparable to participation rates in other Australian research studies, there is the possibility that participants were not completely representative of their town.

Where to from here?

The finding will be shared with relevant health and emergency services to ensure they are used to guide current health service provision and future responses to smoke events. The HHS is continuing to investigate the long term effects of smoke from the mine fire through health surveys and clinical testing.

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

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