



Research Summary

Did mine fire smoke exposure reduce survival time in people who had cancer?

May 2024

Analysis aims

There are studies which show that air pollution can shorten the lives of people living with cancer. Our study investigated whether exposure to smoke from the Hazelwood mine fire shortened cancer survival in the Latrobe Valley.



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 (HHS) was established to examine the impacts of the mine fire. The HHS involves multiple research streams targeting different health outcomes and different vulnerable groups.

The Cancer Stream of the HHS investigates the long-term health of the smoke-exposed communities by using records from the Victorian Cancer Registry (VCR).



What we did

We searched the VCR for all new cancers diagnosed during the 5 years before the mine fire (January 2009 to February 2014). There were 488 cases of cancer in residents of Morwell (the area most exposed to the mine fire smoke), 1,738 in the rest of the Latrobe Valley (less exposed) and 42,738 in the rest of regional Victoria excluding Melbourne (not exposed). We looked at the monthly pattern of survival from these cancers in the years before and then after the mine fire up to August 2019. We used the August 2019 cut-off because, after that time, large parts of Eastern Victoria experienced high levels of smoke exposure from the 2019/2020 bushfires. The theory was that, if there was a change in the monthly pattern of cancer survival in smoke effected areas after the mine fire compared with before, that was not seen in other parts of regional Victoria, then a likely cause was the mine fire.

Meet the team

Tyler Lane
Pei Yu
Caroline Gao
Catherine Smith
Sherene Loi
Natasha Kinsman
Jillian Ikin
Yuming Guo
Malcolm Sim
Michael Abramson

Hazelwood Health Study website: <http://www.hazelwoodhealthstudy.org.au/>



What we found

When we combined all cancer types together, we found no change from before to after the fire, in the monthly pattern of cancer survival in Morwell and the rest of the Latrobe Valley. When we divided cancers into different subtypes, we found that survival was shortened after the fire for women residing in Morwell who had reproductive organ cancers (examples include cervical, ovarian and uterine cancers). However, there were only 27 cases of female reproductive cancers in Morwell and, with such small numbers, it was likely that this was a chance finding that was not due to the mine fire. There was also a small reduction in survival from breast cancers observed in the 'rest of the Latrobe Valley' after the fire. This was unlikely to be caused by the mine fire because the same pattern was not observed in the more highly exposed area of Morwell. There were no other changes in cancer survival observed for lung, blood, brain, melanoma, digestive, urinary and male reproductive cancers.

A detailed paper describing the findings from this analysis can be found at

<https://hazelwoodhealthstudy.org.au/study-findings/publications>



Considerations

It's very likely that the reduced survival time observed after the fire in Morwell women with reproductive cancers is a chance finding, however there are two other possibilities. 1. It is plausible that this was caused by smoke exposure from the mine fire. That would be consistent with emerging international studies indicating a possible link between air pollution and shortened survival from ovarian and cervical cancers. 2. It is also possible that some risk factors that influence cancer survival changed after the mine fire, such as an increase in cigarette smoking, alcohol consumption or stress, or a decrease in diet quality, physical activity, compliance with cancer treatment or the availability of healthcare services. However, if these factors changed in Morwell after the mine fire, then we would expect to see reduced survival across a number of cancer types and not just female reproductive cancers in Morwell.



Where to from here

Further VCR data are being collected to detect any new cancers diagnosed in 2200+ members of the Hazelwood Health Study Adult Cohort. For those people we have detailed mine fire smoke exposure data and also comprehensive information about other factors which could contribute to health such as family medical history, cigarette smoking and alcohol use, marital status and socioeconomic status. Those data may provide new information about whether the mine fire contributed to new cancer cases in the years after exposure.

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

The research was funded by the Victorian Department of Health.

Hazelwood Health Study website: <http://www.hazelwoodhealthstudy.org.au/>