Hazelwood HEALTH STUDY

Research Summary

Emergency department visits and hospital admissions - 5 year follow up of young children exposed to mine fire smoke

July 2024

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 (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 **Latrobe Early Life Follow up (ELF) Study** is the part of the Hazelwood Health Study that follows the health and growth of children who were younger than two years old when the fire occurred. This includes children whose mothers were pregnant with them at the time.

Analysis aims

We aimed to find out if exposure to smoke from the mine fire during the first two years of childhood, was associated with increased emergency department (ED) presentations and hospital admissions over a five-year period after the fire. This followed our previous study, where we looked at ED presentations and hospital admissions during a one-year period after the fire amongst children whose mothers were exposed during pregnancy or who were aged up to one year.

What we did

We obtained anonymous birth records for all infants who were born in the Latrobe Valley and aged up to 2 years at the time of the mine fire (born 1st March 2012 to 8th February 2014). For those infants, we obtained records of presentations to the ED or admissions to hospital from the Victorian Data Linkage Unit. We used air pollution data provided by CSIRO and the approximate residential address at the time of birth to estimate how much mine fire smoke each child was exposed to during the fire period.

We looked to see if different levels of mine fire smoke exposure were associated with higher rates of ED visits or hospital admissions during the five years after the fire (1st April 2014 to 31st March 2019). In our analysis we considered other factors that can affect the health of children, such as infant sex, health vulnerability at birth (such as low birth weight or premature birth), the mother's smoking status during pregnancy, the distance to the local hospital and usual background levels of air pollution, to distinguish the specific influence of the mine fire smoke.

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What we found

When we combined all ED presentations together, regardless of the reason for the presentation, we found that infants with high or medium levels of mine fire smoke exposure, had higher rates of ED presentation than infants with low exposure, particularly between 2.5 and 5 years after the fire. When the reasons for ED presentation were restricted by excluding causes unlikely to be smoke-related (such as injuries, burns, poisoning, primary diagnoses missing, scheduled and follow-up appointments, and presentations for which no health problem was identified), we could still observe that infants with medium exposure (but not high), compared to infants with low exposure, had higher rates of ED presentation. When the reasons for ED presentation were restricted to three diagnoses categories that were plausibly smoke related, those being respiratory conditions, infections and allergies/skin rashes, we found no associations between smoke exposure level and ED presentation for those conditions. We also found no association between smoke exposure level and any type of hospital admission.

These new findings differed from our previous work which showed increased ED presentations for respiratory and infectious conditions, in the first year after the fire, amongst smoke exposed infants who were aged up to 1 year at the time of the fire, compared with infants who were never exposed. Potentially, this indicates some recovery from respiratory and infectious conditions since that first year after the fire.

A detailed paper describing the findings from this analysis can be requested from the study team by emailing contact@hazelwoodhealthstudy.org.au

Considerations

We can never be certain that smoke exposure was the cause for the increased ED presentations. For example, geographical areas which were exposed to high and medium smoke levels, were also closer to the local hospital than areas which had low exposure, likely contributing to the increase in ED presentations. There may have been other unknown factors contributing to the pattern of ED presentation. Also, it's possible that exposure level was inaccurately classified for some infants. The levels were based on the residential area of the mothers' home address at the time of the child's birth. Because the children were anonymous, we were unable to capture changes in exposure resulting from families' movements within and outside of the Latrobe Valley during the fire.

Meet the team

Myriam Ziou
Fay Johnston
Graeme Zosky
Lieke Scheepers
Amanda Wheeler
Caroline Gao
Luke Knibbs
Marita Dalton
Grant Williamson

Where to from here?

The researchers are awaiting new data from the Medicare Benefits Schedule and Pharmaceutical Benefits Scheme. These will be used to provide additional information about any association between children's mine fire smoke exposure and health service use.

The Latrobe ELF Study is led by the Menzies Institute for Medical Research at the University of Tasmania with collaborations from Melbourne University and the Telethon Kids Institute.

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

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