

Research Summary

Lung function in children whose mothers were exposed to mine fire smoke during pregnancy

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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 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

Seven years after the mine fire, this research aimed to discover whether there were differences in the lung function of children whose mothers were exposed to mine fire smoke during pregnancy compared to unexposed children.



What we did

We invited children from the Early Life Follow-up stream who were exposed to mine fire smoke during pregnancy and children that were not exposed ('unexposed') to attend clinical testing. We did a simple lung function test on 79 children, known as the forced oscillation technique. It uses small vibrations to measure how easily air moves in and out of the lungs while the children were breathing through a tube. We measured resistance to air flow, and the stiffness of the lungs. We worked out how much smoke each child had been exposed to by looking at where the child's mother was each day during the fire and how polluted the air was in that area. When we analysed the data, we considered other factors that can affect lung function such as age, sex, height, and exposure to tobacco smoke.

Meet the team

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What we found

We didn't find any difference in the lung function of children exposed to smoke during pregnancy compared to unexposed children. We also didn't find any differences in the lung function of children whose mothers were exposed to high levels of smoke during pregnancy compared to those whose mothers were exposed to lower levels of smoke.

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



Considerations

Lung function varies a lot between days and between children of different ages and genders. Although we did not find any evidence of changes to lung function resulting from the coal mine fire there are two plausible explanations. Firstly, the six-week extreme smoke exposure event may have been too short for any substantial changes to lung function to occur in children who were exposed during pregnancy. Secondly, there may have been short term changes in lung function that did occur, which disappeared before the seven-year follow-up test. It is also important to mention that the small number of participants may have limited our ability to see any differences if they did exist.



Where to from here?

Further studies are needed to confirm these results. Childhood is a rapid period of lung development and growth. Therefore, lung function should be evaluated at various time points to fully understand the health implications of mine fire smoke exposure during pregnancy.

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 with collaborators from Menzies Institute for Medical Research, Federation University, The University of Adelaide, and CSIRO.

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