



Research Summary | The Latrobe ELF Study: Indicators of lung and blood vessel function three years after the fire

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Analysis aims

Three years after the mine fire event, we aimed to find out if smoke from that fire affected the health of the lungs and blood vessels in very young children from the Latrobe Valley including children whose mothers were pregnant with them at the time.

Meet the team

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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 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 happened. This includes children whose mothers were pregnant with them at the time.



What we found

Blood vessel health

In children who were aged up to two years at the time of the fire, we found weak evidence for a link between higher mine fire smoke exposure and very small increases in blood vessel stiffness, and no evidence for a link with blood vessel thickness. We did not find any links between smoke exposure and blood vessel health in children whose mothers were pregnant with them at the time of the fire.

We also found that smoking during pregnancy was linked with thicker blood vessels in children.

Lung health

In children who were aged up to two years at the time of the mine fire, we found weak evidence for a link between higher mine fire smoke exposure and slightly increased lung stiffness, but not with other lung function measures. We also found that lung function was reduced in children whose mothers smoked during pregnancy.

Two detailed reports describing these findings can be found at
www.hazelwoodhealthstudy.org.au/study-reports



What we did

We tested the blood vessel thickness and stiffness of 248 children using ultrasound. Increases in the thickness or stiffness of blood vessels indicate poorer blood vessel health.

We did a simple lung test on 105 children, known as the forced oscillation technique. It uses small vibrations to see how easily air goes in and out while children are breathing through a tube. We measured the resistance to air flow, the stiffness of the lungs, and if lung function changed after using an asthma puffer containing salbutamol. Fewer children had lung checks than blood vessel checks because many ELF participants were too young for the lung test.

We worked out how much smoke each child had been exposed to by looking at where the child was each day during the fire and how polluted the air was in the area.

When we analysed the data we took into account other factors that can affect blood vessel and lung function such as age, sex, height, weight and exposure to tobacco smoke.



Considerations

The evidence for a link between mine fire smoke exposure and the stiffness of blood vessel or lungs was present but not strong. We cannot rule out the possibility that the results occurred by chance, or were due to other unmeasured factors that can affect blood vessel or lung health.

Blood vessel stiffness and thickness varies among healthy children. Greater stiffness does not automatically mean that children will later develop blood vessel or heart problems. Stiffer or thicker blood vessels are two of many things, including genetic make-up, smoking tobacco, stress, diet and physical activity that can influence the risk of heart disease in later life.

Lung function varies a lot between children and from day to day. Lower than expected results on the day of testing do not automatically mean that there are lung problems. However, children with symptoms like shortness of breath, wheezing, or frequent coughing should always have these checked by a doctor.



Where to from here?

Further studies are needed to confirm these results. ELF participants born during 2015 were not included in the lung health testing because they were mostly too young to participate. They are an important group because they were never exposed to the mine fire smoke. Their inclusion in the testing planned for 2020 will improve the ability of the ELF study to identify, with more certainty, possible lung health impacts linked with exposure to the mine fire smoke.

HHS results will be shared with relevant organisations to ensure they are used to shape services for the future health of the Latrobe Valley

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

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

