Hazelwood Health Study 2014 - 2024

The Hazelwood Health Study monitored the health of the Latrobe Valley community for 10 years, after bushfire embers ignited a fire in the Hazelwood coal mine in 2014. The fire burned for 6 weeks, cloaking the town of Morwell and beyond in dense smoke for much of that time. With few previous events of this kind to draw experience from, State and local authorities struggled to provide appropriate health protection messages for the effected communities. Led collaboratively by Monash University, the University of Tasmania and Federation University, the Hazelwood Health Study has collected a diverse array of data.

The researchers also worked with the CSIRO to measure the concentrations of smoke that people were exposed to. The Study was particularly interested in the concentrations of extremely small smoke particles called $PM_{2.5}$, which have a diameter almost 30 times smaller than a human hair. These particles can travel deep into the lungs and cross into the bloodstream. In pregnant women these smoke particles can even cross into the placenta and circulate in their babies' blood.

This flyer briefly describes some of the study's key findings. For more detailed information go to www.hazelwoodhealthstudy.org.au

What we found

The community's perception of how the mine fire was handled by the authorities

Interviews with community members revealed that there was a notable loss of trust in the authorities which were dealing with the crisis. Factors leading to the loss of trust included that:

* Official communication was perceived to be flawed, at times non-existent, not reflecting the community's experiences nor meeting their needs;
* An emergency management plan seemed to be lacking and coordination between authorities was perceived as poor;
* Government, lead response agencies and the mine owners were perceived as not accepting responsibility nor being held accountable for what happened.

Voices of older people, especially those usually robust older people living independently in the community, were perceived to have been paid little attention during the event.

Local media outlets and social media groups were important in filling communication gaps and empowering the community to self-organise and demand answers to their questions and concerns.

Pregnant mothers

At the time of the fire

Mine fire smoke exposure during pregnancy was associated with an increased rate of gestational diabetes in the mothers.

Their babies who were in the womb during the mine fire

At Birth

No impact of smoke exposure on measures of the developing babies' growth and maturity.

First year of life

No impact of smoke exposure on GP visits, hospital admissions or use of medications for asthma, dermatitis or bacterial infections. However, increasing smoke exposure was associated with hospital emergency department visits for allergies or skin rashes.

First 2 years of life

Increasing smoke exposure was associated with use of medications for croup and asthma.

2 to 4 years after the fire

Increasing smoke exposure was associated with parental reports of cough, wheeze, health service visits, and doctor diagnosed respiratory infections, colds and flu. No impact of smoke exposure on measures of blood vessel stiffness or thickness.

7 years after the fire

Increasing smoke exposure was associated with small increases in blood vessel stiffness, but there was no impact on measures of lung health or allergies.

9 years after the fire

The small increases in blood vessel stiffness that were observed 7 years after the fire, were no longer evident at 9 years, suggesting recovery.

Infants aged up to 2 years during the mine fire

First year after the fire

Increasing smoke exposure was associated with use of antibiotics, GP visits and emergency department visits for respiratory causes.

Second year after the fire

Increasing smoke exposure was associated with use of steroid creams commonly used for eczema.

2 to 4 years after the fire

Increasing smoke exposure was associated with small adverse changes in lung and blood vessel stiffness, and with parental reports of cough, runny nose and use of inhaled medication for asthma or wheeze. Increased blood vessel stiffness was also observed in the children of mothers who smoked during pregnancy.

Up to 5 years after the fire

Increasing smoke exposure was associated with emergency department visits but not hospital admissions.

7 years after the fire

The small adverse changes in lung stiffness and blood vessel stiffness observed 2 to 4 years after the fire, were no longer evident at 7 years, suggesting recovery. No impact of mine fire smoke exposure on allergies.

9 years after the fire

Increasing smoke exposure was associated with small increases in blood pressure.

School children

At the time of the fire

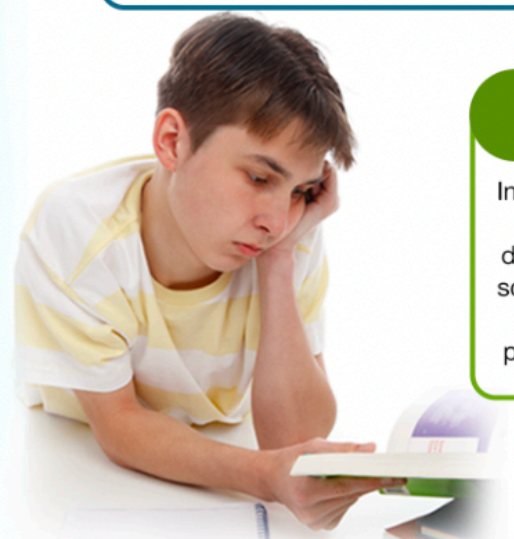
Whilst all schools faced challenges, specialist school students and staff experienced particular difficulties including anxiety, frustration, difficulty adjusting to the relocation environment, reduced sense of safety and declines in attendance and schoolwork.

1 year after the fire

Morwell students reported more mine fire-related posttraumatic stress symptoms than students from outside of Morwell. Primary school students, regardless of their distance from the fire, reported more symptoms than secondary school students.

3 years after the fire

Posttraumatic stress symptoms persisted for some children, however, most children reported that stress levels had declined.



Up to 4 years after the fire

In the year following the mine fire, major interruptions to academic progress across all NAPLAN learning domains were evident in the highly exposed Morwell schools. Compared to the Victorian regional average, this equated to a 4 to 5 month delay in academic progress which had not fully recovered 4 years later.

Adult respiratory (lung) health

At the time of the fire

Increasing smoke exposure was associated with visits to respiratory health-related specialists and services, use of prescribed respiratory medications, ambulance attendances, emergency department visits and hospital admissions.

Up to 5 years after the fire

Increasing smoke exposure was associated with increased reporting of respiratory symptoms, particularly cough, phlegm and wheeze; higher rates of ambulance attendances, emergency department presentations and hospital admissions; increased chest tightness, chronic cough and lung stiffness; and poorer distribution of gases in the lungs. Among mine fire exposed non-smokers, there were increased symptoms of possible Chronic Obstructive Pulmonary Disease. Among mine fire exposed smokers, there was increased chronic cough.

7.5 to 9 years after the fire

Previously observed associations between increasing smoke exposure, stiffer lungs and poorer distribution of gases in the lungs were no longer evident, suggesting recovery.

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9 years after the fire

Increasing smoke exposure was still associated with self-reported cough and possibly wheeze. Mine fire smoke exposure also possibly resulted in increased risk of COVID-19 infection. Better diet quality had a protective effect on respiratory health.

Adult cardiovascular (heart) health

At the time of the fire

No impact of smoke exposure on visits to health specialists or services, ambulance attendances, emergency department presentations or hospital admissions for cardiovascular conditions. However, increasing smoke exposure was associated with use of cardiovascular medications.

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Up to 6 months after the fire

There was a 62% increase in risk of death from cardiovascular conditions, particularly deaths from ischaemic (coronary) heart disease.

Up to 4 years after the fire

Increasing smoke exposure was associated with self-reporting of high blood pressure and heart attack, however numbers of cases were extremely small and self-reports of heart attacks can be unreliable. There was also an increase in cardiovascular-related ambulance attendances and emergency department presentations but not hospital admissions. No impact of smoke exposure on measures of underlying cardiovascular disease, reduced heart function, heart muscle damage, abnormal heart rhythm or blood vessel health.

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Up to 8.5 years after the fire

Increasing smoke exposure was associated with an increase in cardiovascular-related deaths over this time period. Dietary vegetables, grains, fresh meat and non-fried fish were associated with better cardiovascular health, while soft drinks were associated with poorer cardiovascular health.

Psychological impacts in adults

At the time of the fire

Increasing smoke exposure was associated with visits to mental health-related specialists and services, ambulance attendances for anxiety, emergency department presentations for depression and use of psychiatric medications.

Up to 3 years after the fire

Increasing smoke exposure was associated with symptoms of fire-related posttraumatic stress and general psychological distress. Vulnerable groups included younger adults and those with pre-existing respiratory or mental health conditions. Approximately 10% of Morwell participants recorded levels of posttraumatic stress indicating possible PTSD, such as heightened alertness, poor sleep and intrusive thoughts.

Up to 6 years after the fire

There was a continuing association between level of smoke exposure at the time of the mine fire and level of fire-related posttraumatic stress. General psychological distress also increased over the same time period, but this increase was no longer linked with level of exposure to the mine fire.

Higher levels of both mine fire-related posttraumatic stress and general psychological distress were associated with physical symptoms such as fatigue, limb pain, trouble sleeping, headaches and shortness of breath.

Up to 9 years after the fire

In Morwell there was an increase in mental health-related emergency department presentations and hospital admissions during the 8 years following the fire, particularly in the first 3 years.

General psychological distress continued to rise.

Cancer Research

Cancer survival up to 5.5 years after the fire

In people already living with cancer at the time of the mine fire, no impact of smoke exposure on survival time.

New cancers up to 8 years after the fire

No impact of smoke exposure on rates of new cancers up to 8 years after the fire. However, cancers can take many years to appear. Therefore, a longer time period is likely to be necessary to confidently assess the impact of mine fire smoke exposure on cancer.

Recovery and community wellbeing

Recovery, and improvements in community wellbeing, are about more than health. They depend on the community feeling listened to and empowered to shape their own future.

The need for an emergency plan

The lack of an appropriate emergency plan at the time of the mine fire had negative consequences for community wellbeing. The development of a new, improved emergency management plan will be complex but essential. What is needed is a plan tailored to this community's specific needs and risks. The plan should include clear lines of responsibility and a communications strategy which includes trusted local spokespeople.

Broader perspectives

Two years on from the mine fire, community groups had broadened their focus beyond the health impacts of the fire. There was a shift towards discussions around the economic and social future for the Latrobe Valley. Nine years on, the community's wellbeing was perceived in terms of its economy, environment, health, services, infrastructure and, particularly importantly, social connections. The mine fire was no longer viewed as having a major impact on community wellbeing. Instead, the community perception was that there had been a series of adverse events that were impacting wellbeing.

Shaping the future

Nine years on from the mine fire, there were mixed views on how recovery and community wellbeing were going. Most people interviewed were cautiously optimistic and felt that community members had an increased ability to make their voices heard on issues that concerned them, including the transition away from coal, overcoming division and disadvantage, and improving service provision.

Where to now?

The wide-ranging 10-year research program of the Hazelwood Health Study (2014-2024) has now concluded. Detailed descriptions of research activities and findings, including a comprehensive multi-volume report and lay language summaries, can be found at www.hazelwoodhealthstudy.org.au/study-findings

While the Study itself has officially concluded, the research team remains keen to: collaborate with the community; continue some research areas which have separate funding; and seek future opportunities to contribute to health in the region. There are a number of organisations which continue to monitor and support local health. The Latrobe Health Assembly is a community-led organisation that seeks to facilitate new ways of working to improve health and wellness (www.healthassembly.org.au). The Gippsland Region Public Health Unit led by Latrobe Regional Health (www.lrh.com.au/gippsland-region-public-health-unit/) monitors the health and wellbeing of the population, and uses this information to inform public health priorities and programs. The Gippsland Primary Health Network (www.gphn.org.au/) supports general practice, health planning, health system integration and commissioning across the region.

Individuals who have any health concerns should consult their doctor or local healthcare provider in the first instance.

Hazelwood HEALTH STUDY