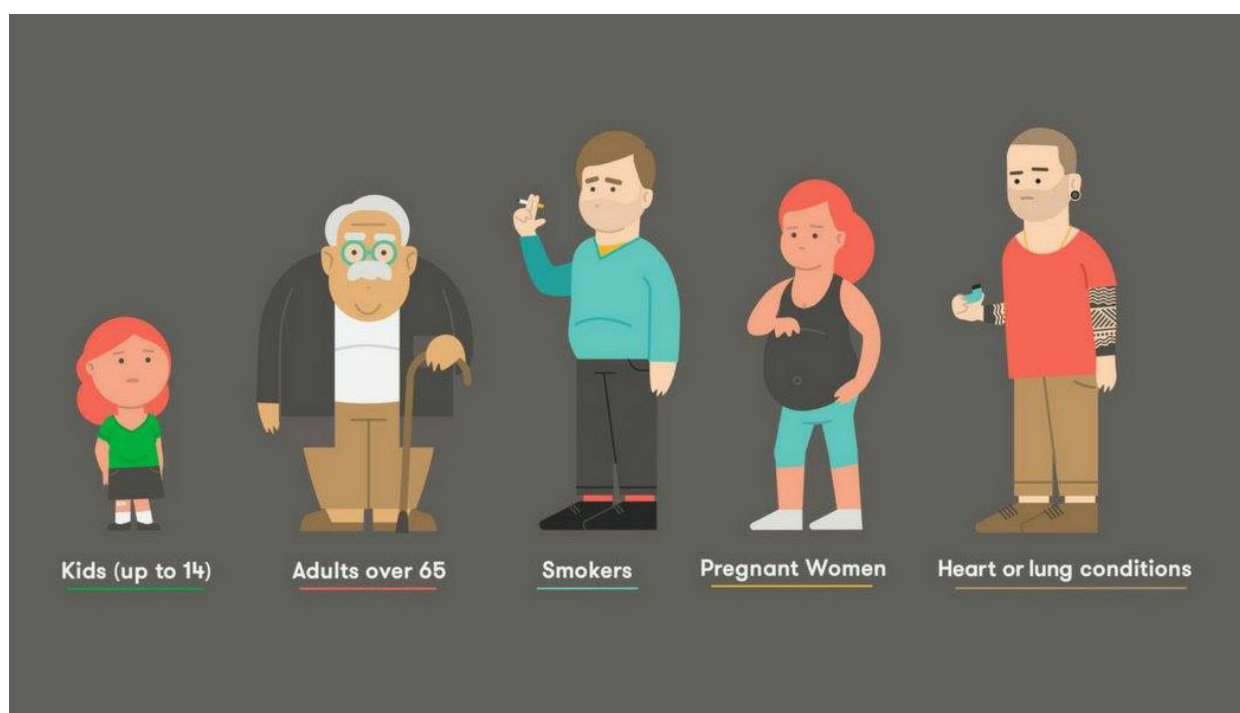


Air pollution

Summary

- Melbourne's air quality is ranked as 'good' by international standards.
- Examples of pollutants include gases, chemicals and airborne particles.
- Around 75 per cent of Melbourne's air pollution is caused by vehicle emissions, comprising gases (such as carbon monoxide, nitrous oxide and ozone) and particulates.
- Victorians spend most of their time indoors, making indoor air pollutants an important risk factor.



Pollutants in the air are caused by natural events (such as bushfires, windstorms and pollen) or human activities (including industrial processes, motor vehicle emissions, use of unpaved roads and wood heaters). Examples of pollutants include gases, chemicals and airborne particles (such as dust and pollen).

Melbourne suffers its worst air pollution on days of light winds and stable conditions. On these days, a wide area can be affected.

Most Melbourne suburbs experience a similar degree of air pollution, although suburbs receiving sea breezes before they have passed over the city will have better air conditions. Low lying areas will have worse air conditions than hilltop areas because pollutants tend to settle in valleys, particularly on calm nights. People living on or within 100 m of major roads will also have reduced air quality.

Outdoor air pollution

Melbourne's air quality has steadily improved since the Environment Protection Authority started monitoring it in 1973, and it is relatively good by international standards.

Melbourne suffers from four major forms of air pollution including:

- summer smog
- winter smog
- wind-blown dust
- smoke.

Smog

Smog on summer days arises due to the effect of sunlight on airborne chemicals, producing 'photochemical oxidants' such as ozone. Winter smog alert days arise when pollutants (particularly particles) build up around the city and are not blown away.

On 'smog alert' days, people with respiratory conditions (such as asthma) and heart disease should avoid strenuous exercise.

Fuel combustion and air pollution

Airborne contaminants vary from country to country, depending on a range of factors, including population, industry, climate and the types of fuels burned. In Melbourne, the main source of air pollution is motor vehicle emissions, caused by petroleum combustion. Combustion (burning) of other fuels (such as gas, wood, and coal) also contributes significantly to the quality of our air.

The main pollutants resulting from fuel combustion include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (minute particles suspended in the air) and sulphur dioxide (SO₂).

The health effects associated with breathing in these contaminants include:

- **carbon monoxide** – reduces the ability of the blood to carry oxygen
- **nitrogen dioxide** – may trigger asthma attacks and other respiratory disorders
- **ozone** – may trigger asthma attacks and other respiratory disorders
- **particulates** – the effects depend on the chemical composition of the particles
- **sulphur dioxide** – may trigger asthma attacks and other respiratory disorders.

Lead was phased out of petrol in 2003. Victoria does not have any major lead-based industries.

Ozone depletion due to air pollution

The ozone layer sits around 10 to 50 kilometres above the surface of our planet. Its principle function is to moderate the amount of ultraviolet radiation from the sun that penetrates the earth's atmosphere and reaches the earth's surface. Ozone is produced by the action of sunlight on oxygen and is naturally destroyed by a range of rising gases.

The production and destruction of ozone in nature is in balance, but human activity is depleting ozone faster than nature produces it. Gases including chlorofluorocarbons (CFCs) and halons (compounds containing bromine) are creating 'holes' in the ozone layer, which allow greater amounts of ultraviolet radiation to reach the earth's surface.

Health risks from depletion of the ozone layer include greater incidence of eye problems, such as cataracts and pterygia (growths on the eye), and greater incidence of skin cancer.

Air pollution and the greenhouse effect

The earth insulates itself with greenhouse gases, which help to hold the warmth from the sun. Since the industrial revolution two centuries ago, human activity has increased the amount of greenhouse gases in the earth's atmosphere (such as carbon dioxide, methane, nitrous oxide, CFCs and halons).

The generation of greenhouse gases has risen spectacularly in the last 50 years, mainly due to combustion of fossil fuels. An increase in greenhouse gases makes the earth warmer, and causes changes to weather and climate worldwide.

Climate change projections for Australia developed by CSIRO suggest that annual average temperatures will increase between:

- 0.4 C and 2 C by 2030
- 1 C and 6 C by 2070.

These changes may affect agriculture and cause a greater incidence of health problems, including heat stress, mosquito-borne diseases and asthma.

Indoor air pollution

Research indicates that Victorians spend most of their time indoors, making indoor air pollutants an important risk factor for people's health. Significant indoor pollutants include:

- cigarette smoke
- heaters and stoves without flues
- faulty or unserviced gas heaters and fuel-burning appliances (can lead to carbon monoxide poisoning)
- chemical odours from freshly applied paint, glues, cleaners or solvents
- animal fur or dander
- moulds
- dust.

Other home environment air pollution

Apart from general indoor pollutants, the outdoor environment at home can be polluted with fumes, particulates and odours. These can be a nuisance that may or may not affect you or your neighbours. The main contributors are:

- wood heaters and open fires
- lawn mowers.

Dust storms and air pollution

Dust storms reduce air quality and visibility, and may affect people's health, particularly those who already have breathing-related problems such as asthma and emphysema.

The most common symptoms experienced during a dust storm are irritation to the eyes and upper airways. Coarse dust particles generally only reach as far as the inside of the nose, mouth or throat. However, some people with pre-existing breathing-related problems may experience difficulties when fine particles reach deeper into the sensitive regions of the respiratory tract and lungs. This can trigger allergic reactions and asthma attacks, and cause serious breathing-related problems.

Long-term exposure to airborne dust can lead to chronic breathing and lung problems, and possibly heart disease.

Hazardous substances and air pollution

Hazardous substances that can become airborne include:

- **arsenic** – a substance that is found naturally in rock. It has been used to preserve timber and as an ingredient in chemicals such as pesticides and weed-killers. Small amounts of arsenic are normally taken into the body from low levels that are naturally present in soil, water, air and food. Swallowing a large amount of arsenic can cause severe health effects or even death.
- **asbestos** – a silicate mineral made up of tiny fibres that form a dust when disturbed. Fibres breathed into the lungs can cause a range of health problems, including lung cancer and mesothelioma. Asbestos used to be a common building material because of its fire-resistant and insulating properties, but now that we are aware of the health risks, it is no longer mined in Australia and its use has been phased out.
- **cadmium** – a mineral bound with elements such as oxygen, sulphur and chlorine. It is found naturally in low levels in most foods and is one of the ingredients of cigarette smoke. Smelting other metals, such as zinc and copper, produces cadmium. High exposure to cadmium by either breathing or eating it can cause a range of ill effects, including lung damage and kidney disease.
- **lead** – a metal that can be found in paints in many homes and in contaminated soil. The natural concentration of lead in the air is very low (less than 0.1 microgram per cubic metre). Lead gets into the air naturally through soil erosion, volcanic eruptions, sea spray and bushfires. It can also enter the air as a byproduct of lead smelting, mining operations and waste incineration. In the home, lead air pollution is a risk when renovating a

house painted with lead-based paint. Children are particularly sensitive to the effects of lead exposure. Acute poisoning is rare, but it can occur if a young child breathes in high levels of airborne particulate lead, or swallows lead paint dust or lead paint chips off old houses.

Where to get help

- Your doctor
- Your local council – domestic pollution causing health concerns, such as illegal use of incinerators, should be reported to your local council's environmental health department
- Environment Protection Authority – for general enquiries or to report pollution (24 hours) Tel. 1300 372 842
- Department of Health – for information relating to air quality and health – Environmental Health Unit, Tel. 1300 761 874

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