

## Pollution - air

Pollutants in the air are caused by natural events (like bushfires and windstorms) or human activities (including industrial processes or driving motor vehicles). Examples of pollutants include gases, chemicals and airborne particles (such as dust and pollen).

Melbourne's air quality has steadily improved over the past 15 years and is relatively good by international standards. Occasionally, Melbourne experiences 'smog alert' days. People with respiratory conditions such as asthma and heart disease should avoid strenuous exercise on these days.

### Fuel combustion

Our air is mainly polluted by combusting fuel (such as gas, wood, petroleum or coal). Airborne contaminants vary from country to country, depending on a range of factors including population, industry, climate and the types of fuels burned. In Australia, motor vehicle emissions are the main cause of outdoor air pollution, accounting for around 75 per cent.

In Melbourne, the most air-polluted regions are those with heavy traffic, in the inner suburbs where people burn fuels in fire places or in areas where there are wood heaters. The main pollutants include carbon monoxide, nitrogen dioxide, ozone, particulates (minute particles suspended in the air) and sulphur dioxide. Lead was phased out of petrol in 2003. Victoria does not have any major lead-based industries. 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** - effects depend on the particle's chemical composition. Studies of populations in the United States (the '20 cities study') and in Europe have shown that the level of particulates in the air is associated with the risk of death. Some of these deaths affect people with a serious pre-existing conditions but evidence also suggests air pollution can have a long-term effect on health.
- **Sulphur dioxide** - may trigger asthma attacks and other respiratory disorders.

### Ozone depletion

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. 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 is a balancing act, but human activity is depleting ozone faster than nature can make it. Gases including chlorofluorocarbons (CFCs) and halons (compounds containing bromine and once used in fire extinguishers) are creating 'holes' in the ozone layer, which allow greater amounts of ultraviolet radiation to reach the earth's surface. Health risks of ozone depletion include:

- Greater incidence of eye problems, including cataracts and pterygia (growths on the eye)
- Greater incidence of skin cancer.

### 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 (such as carbon dioxide, methane, nitrous oxide, CFCs and halons). The generation of these greenhouse gases has risen spectacularly in the last 50 years, mainly due to fossil fuels and vehicle exhaust. 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:

- 0.4C to 2.0C by 2030
- 1C to 6C 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
- Chemical odours from freshly applied paint, glues or solvents
- Animal fur or dander
- Moulds
- Dust.

## Other home environment 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

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. This can trigger allergic reactions and asthma attacks and cause serious breathing-related problems.

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. Smaller or fine particles can reach deeper into the sensitive regions of the respiratory tract and lungs. These smaller dust particles have a greater potential to cause serious harm to your health.

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

## Hazardous substances

Hazardous substances that can become airborne include:

- **Arsenic** - a substance that is found naturally in rock. It has been used to preserve timber and was 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, like 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 lead-based paints in many homes and contaminated soil. Children are particularly sensitive to the effects of lead exposure. Acute poisoning is rare but can occur if a young child eats 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** - report pollution from motor vehicles or industrial pollution to Pollution Watch Line Tel. (03) 9695 2777
- EPA air quality information Tel. (03) 9695 2722
- **Department of Human Services** - for information relating to air quality and health - Environmental Health Unit, Tel. (03) 9637 4156

## Things to remember

- 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.

**This page has been produced in consultation with, and approved by:**

Department of Health - Environmental Health Unit

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