

Air Pollution and Health

What is air pollution?

There are two main types of air pollution – ambient (outdoor) pollution and indoor air pollution. An air pollutant refers to anything in the air which can cause damage to health.

Common pollutants include:

- Particulate matter - very small particles of dust and dirt in the air
- Carbon monoxide
- Nitrogen dioxide, sulphur dioxide and ozone

The World Health Organisation (WHO) recognises that air pollution is the largest environmental health risk, as it can cause the development and worsening of many chronic conditions, amongst other potential negative health effects including lower life expectancy.

The WHO recommends that particulate matter level should not exceed $10 \mu\text{g}/\text{m}^3$. However, legal limits in the UK are double this amount. In Sheffield, most areas do not exceed this limit, but some come very close to it and the level increases above the limit near some very busy roads. Although the WHO have recommended an upper limit guideline, there is no safe level of pollution and even lower levels could affect your health.

What are the health effects of air pollution?

Air pollution has many negative effects on our health and can even shorten life expectancy. In 2016, it was estimated that outdoor air pollution caused 4.2 million premature deaths worldwide each year. Furthermore, the Environmental Audit Committee estimated that air pollution results in health costs between £8.5 billion and £20.2 billion per year. NHS England estimates that in UK adults over 30 years old, 1 in 20 deaths is related to air pollution, based on figures from 2010-2017.

Short term effects of air pollution include exacerbation of pre-existing lung disease such as asthma or COPD, and heart disease which results in higher hospital admissions amongst people with these conditions.

The main 3 long term health effects of prolonged air pollution exposure include the development of lung disease, heart disease and lung cancers. However, emerging evidence suggests air pollution can have many more consequences including:

- Low birth weight, premature birth, miscarriages and stillbirths
- Developmental problems in children
- Stroke
- Type 2 diabetes
- Dementia
- Obesity

In many cases, the damage of air pollution is gradual and may not be apparent for years.

Public Health England predict that over the next 18 years, a small reduction in particulate matter of $1 \mu\text{g}/\text{m}^3$ in England could prevent around 50,900 cases of heart disease, 16,500 strokes, 9,300 cases of asthma and 4,200 lung cancers.

Where does air pollution come from?

Some common sources of outdoor air pollution include:

- Cars and other vehicles, particularly diesel vehicles
- Power generation
- Farming
- Bonfires and firework displays
- Sources of smoke
- Natural causes e.g. dust blown from the Sahara desert.

Although pollution does tend to be higher near these sources, it can travel a long way and so there may be air pollution even far away from where it was formed. The level of pollution can also be affected by the weather and season. On a windy day, it is easier for air pollution to disperse, whereas on a sunny day with not much wind, the pollution will build up in the same place and cause a high pollution episode.

Common sources of indoor air pollution include:

- Cigarette smoke
- Other sources of smoke including candles, incense and open fires.
- Heating and cooking
- Chemicals used to clean or decorate – these can irritate the lungs
- Asbestos (found in some older buildings).

Follow this link to find out more about sources of air pollution in our own homes:

<https://www.blf.org.uk/support-for-you/indoor-air-pollution/causes-and-effects>

Am I at risk?

Everybody is at risk of air pollution to some extent but some people can be more vulnerable to the health issues caused by air pollution. These groups include:

- Older people (ages 65 and older)
- Children (they breathe faster, and their bodies are still developing)
- People with respiratory or cardiovascular disease
- Pregnant women
- People living in areas of higher pollution.

What can I do?

1. Mode of transport

An experiment in Sheffield looked at who breathed in the most air pollution on their school run – those who walk, cycle or go by car.

It was found that cycling was the best mode of transport with the least exposure to air pollution, walking came in second best and travelling by car led to the highest exposure to air pollution. Being inside a car does not protect you from pollution. Air comes into the car from outside, and this will contain exhaust fumes from all the cars on the road.

Watch the video here: <https://www.bbc.co.uk/news/av/uk-england-south-yorkshire-49960950>

Next time you make a short journey, consider if you can cycle or walk instead of driving, and try to walk or cycle on smaller roads, away from busy traffic. Walking or cycling will not only reduce your own exposure to air pollution, but it will also create less pollution for everyone. The less we

all drive, the cleaner our air will be which will be better for everyone's health in the long term. If cycling or walking is not possible for your journey, consider using public transport, or car sharing with a friend so there are fewer cars on the road.

2. Reducing air pollution inside your house

Indoor air pollution is important to consider as we spend around 90% of our time indoors. Here are some tips to reduce indoor air pollution:

- Open your windows to allow good air flow throughout the house.
- Avoid cleaning products with lots of chemicals, especially if you can feel they affect your breathing. Look for "allergy friendly" or eco-friendly products which often have fewer chemicals.
- If you or anyone in your house smokes, ask them to smoke outside. Better still, support them to quit!
- Avoid burning incense – they emit 100 times the number of fine particles as a candle. Burning candles occasionally is unlikely to pose much of a health risk but be aware of them if you notice your asthma symptoms worsening.
- Get a carbon monoxide alarm – carbon monoxide is a dangerous poisonous gas with no smell or taste that can arise from cooking and heating. It is important to have an alarm to alert you if the level gets too high. Making sure your cooking and heating appliances are serviced regularly will also reduce the risk of carbon monoxide.
- If you find asbestos in your home, then leave it undisturbed. If it is damaged, then get it removed by professionals.
- Avoid using open fires or wood burning stoves

3. Help make the air we breathe cleaner and safer

The best way to reduce your risk from air pollution long term is to create less of it. Although we need help from Governments to achieve this for everyone, we can still take steps as individuals to contribute less to air pollution such as:

- Walk or cycle instead of driving where possible.
- Take a bus or carpool so there are fewer vehicles on the road
- When buying a new car, consider an electric car, or look for a car with better fuel efficiency
- Insulate your home so that you use less fuel – this also saves you money
- Turn off lights and electric appliances when you are not using them
- Buy energy efficient light bulbs

Clean air is important for your own health and everybody else's health. There are many campaigns you can get involved in to ask the government to act in response to the rising air pollution.

Here are some petitions and other resources available for you to get involved in campaigning for cleaner air:

- The British Lung Foundation has started a petition for cleaner air. You can sign it here: https://hello.blf.org.uk/page/75175/petition/1?ea.tracking.id=clean_air_hub&_ga=2.269082737.1403094433.1613131079-2019186167.1599472528
- Asthma UK petition: <https://www.asthma.org.uk/support-us/campaigns/our-policy-work/clean-air-campaign/>

- Global Action Plan provide many Clean Air Day resources, including a template of a letter you can send to your local councillor expressing concerns about air quality. Find their resources here: <https://www.cleanairday.org.uk/free-resources/individuals>

Share what you have learned about air pollution with friends and family.

4. Plan ahead

The Defra Air Pollution Forecast can be useful to best prepare for each day. The forecast is based on the main pollutants known to impact our health - ozone, nitrogen dioxide, sulphur dioxide and particulate matter. You can search your local area to see the forecast where you live for the following 5 days.

Steps 1 and 2 above can be useful all the time, but it is particularly important to take these tips into account on the higher pollution days.

Find the forecast at this web address: <https://uk-air.defra.gov.uk/forecasting/> or search for “Defra Air Pollution Forecast”.

Useful Resources

- <https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>
- British Lung Foundation (www.blf.co.uk) and (www.blf.org.uk/taskforce/data-tracker/air-quality/pm25)
- Clean Air Day (www.cleanairday.org.uk)
- If you are affected by asthma you can request our other leaflet regarding the effects of air pollution on asthma and how best to protect yourself and stay well.