

# Air Pollution and Health: Information for Professionals

## What is Air Pollution?

Air pollution is a complex mix of particles and gases emitted from a range of man-made and natural sources. The key air pollutants which adversely impact health are Particulate Matter (PM) and Nitrogen Dioxide (NO<sub>2</sub>). The main sources of man-made PM are fuel combustion and physical tyre and brake wear of vehicles. NO<sub>2</sub> is a gas that is produced by combustion processes. It is estimated that 80% of NO<sub>2</sub> emissions in areas where levels exceed the UK limits are due to transport, with the largest source being emissions from diesel cars and vans.

## Why is Air Pollution a problem?

Air pollution is the largest environmental risk to public health in the UK and is contributing to up to 40,000 early deaths in the UK each year<sup>1</sup>. There is an extensive body of evidence that long-term exposure to PM increases mortality and morbidity<sup>2</sup>, and PM has been classified by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (a Group 1 carcinogen) and causing lung cancer. Studies have also shown associations between NO<sub>2</sub> and adverse health effects including reduced life expectancy. In 2010, the Environment Audit Committee considered that the annual cost of health impacts of air pollution was likely to exceed estimates of £8 to 20 billion<sup>3</sup>.

## What are the health effects of air pollution?

### Long-term exposure (over years or lifetimes)<sup>1,2,4</sup>

- Suppresses growth of children's lungs
- Increases risk of asthma and infections like pneumonia in children
- Increases the risk of cerebrovascular disease including stroke
- Accelerates decline of lung function
- Reduces life expectancy, mainly due to cardiovascular disease, respiratory diseases and lung cancer
- Associations with dementia, type 2 diabetes, adverse effects on foetal development and premature birth

### Short-term exposure (over hours or days)<sup>1,2</sup>

- Acute bronchospasm, cough, wheezing and shortness of breath
- Exacerbations of asthma and COPD
- Increased respiratory and cardiovascular hospital admissions
- Increased mortality

## Who are the Vulnerable Groups of patients?

- Children
- Pregnant women
- Elderly (> 65 years old)
- Developing babies in the womb
- Adults with pre-existing health conditions, especially respiratory and cardiovascular conditions such as asthma, COPD, bronchiectasis and coronary artery disease, or those with risk factors for such diseases
- People from low-income communities, who are more likely to have existing medical conditions and live in areas with poorer air quality (eg. close to busy roads or industry)

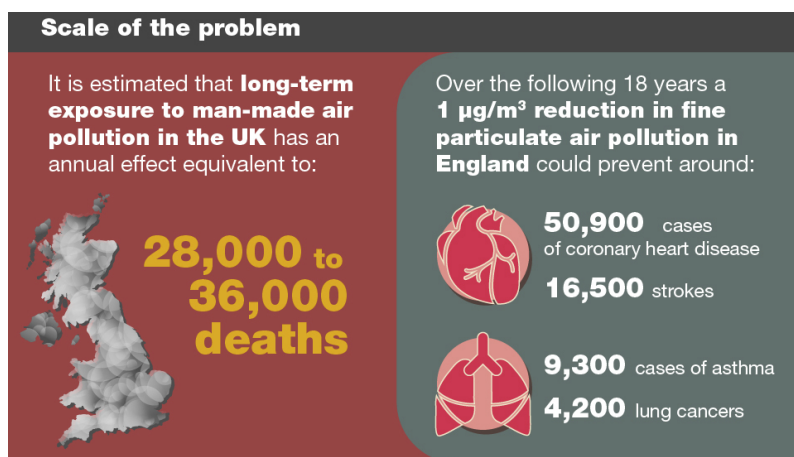


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## What kind of advice should I be giving to my patients?

According to NICE, healthcare professionals have an important role to play in:

- 1. Awareness Raising.** Helping the public to understand the health effects of air pollution – especially the vulnerable groups of patients.
- 2. Giving Advice.** Offering patients advice on actions they can take to reduce their day-to-day and lifetime exposure to air pollution, whether this is through travel choices or other changes to their lives.

This information is summarised in the accompanying [Patient Information leaflet on Air Pollution](#) which can be printed and given to patients.

### Messages that health professionals can communicate to their patients include:

- Air pollution affects everyone, and can particularly affect some individuals who are more vulnerable to harm - including those with heart and lung disease, children, and the elderly
- Particulates are now known to contribute to heart disease and lung cancer
- Many years of life are lost each year in the UK, as a result of air pollution
- People's behaviour can reduce their contribution to local air pollution
- People's behaviour can reduce their exposure to air pollution

## Where can I find information on local air quality?

Pollution Map of Bristol: <http://www.claircity.eu/bristol/city-shockers/air-pollution-map-of-bristol/>

Defra's [Pollution forecast](https://uk-air.defra.gov.uk/forecasting/) - <https://uk-air.defra.gov.uk/forecasting/>

Defra updates on [social media](https://twitter.com/DefraUKAir). - <https://twitter.com/DefraUKAir>

Defra's [Daily Air Quality Index \(DAQI\)](https://uk-air.defra.gov.uk/air-pollution/daq) provides recommended actions and health advice for both the general population and for at-risk individuals – <https://uk-air.defra.gov.uk/air-pollution/daq?view=more-info>

### References:

1. Every breath we take: the lifelong impact of air pollution. The Royal College of Physicians, February 2016. (<https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>)
2. Walton, H. et al. Understanding the Health Impacts of Air Pollution in London – King's College London. Report For: Transport for London and the Greater London Authority, July 2015. (<https://www.kcl.ac.uk/lsm/research/divisions/aes/research/ERG/research-projects/HIAinLondonKingsReport14072015final.pdf>)
3. House of Commons Environmental Audit Committee report. "Air Quality". Fifth Report of Session 2009–10. March 2010.
4. Grigg J. Suppression of lung growth by environmental toxins. *Thorax* 2016; 71:99– 100
5. Public Health England (2018). Guidance: Health matters: Air pollution. Available at <https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution>

## **Appendix A – NICE Guidance**

A summary of the NICE guidance relevant to clinical practice, taken directly from the National Institute for Clinical Excellence website and available at: <https://www.nice.org.uk/guidance/ng70>

### **NICE Guidance**

#### **Awareness Raising**

1.7.2 Ensure healthcare professionals are aware that information on air quality is available, what it means for patients and what actions are recommended.

1.7.3 Consider providing information on air quality (using the Department for Environment, Food and Rural Affairs' [Daily Air Quality Index](#) with weather forecasts and the pollen index. This could be provided through local, national and social media.

1.7.4 Consider providing information on:

- How health is affected by exposure to air pollutants in the long term as well as during specific periods of poor air quality.
- The impact of local pollution on air quality inside, as well as outside, a vehicle (levels of pollution are not always lower inside).
- How to reduce air pollutants and people's exposure, including the need to:
  - Reduce the number of motor vehicle journeys, if possible.
  - Drive in a style that minimises emissions by: avoiding rapid accelerations and decelerations, restricting the time spent with an engine 'idling' and ensuring the vehicle is correctly maintained
- Change routes to avoid highly polluted areas and adding to traffic congestion.

#### **Vulnerable Groups**

1.7.7 Healthcare professionals should be aware of vulnerable groups who are particularly affected by poor outdoor air quality. When notified of poor outdoor air quality, during any contact with vulnerable groups healthcare professionals should give general advice on how to avoid contributing to levels of air pollution and raise awareness of how to minimise exposure.

This could include advice to:

- Avoid or reduce strenuous activity outside, especially in highly polluted locations such as busy streets, and particularly if experiencing symptoms such as sore eyes, a cough or sore throat.
- Use an asthma reliever inhaler more often, as necessary.
- Close external doors and windows facing a busy street at times when traffic is heavy or congested to help stop highly polluted air getting in.