



Air Pollution and Public Health

At a glance

- **25,000**: estimated number of deaths every year attributable to fine particulate matter exposure (PM_{2.5}) in England (PHE)
- **80%**: percentage of UK nitrogen dioxide exceedance due to traffic emissions (Defra)
- **59%**: percentage fall in nitrogen oxides from industrial emissions since 1990 (Defra).
- **PHOF 3.01**: public health indicator for fraction of adult mortality attributable to long-term exposure to human-made particulate air pollution (DH)

Air pollution is now associated with greater public health risk than was understood even a decade ago and more risks are emerging. Air pollution is the fourth largest risk to public health in England.

There is strong evidence associating air pollution with increased mortality and ill health, including exacerbation of asthma, effects on lung function and increases in respiratory and cardiovascular hospital admissions. Older people, children and those with pre-existing illness are more vulnerable to the adverse health effects of air pollution.

The problem

Both long and short-term exposures to air pollution are known to adversely affect health and air pollution is still the largest environmental risk linked to deaths every year. Around 5% of deaths in England are attributable to long-term exposure to human-made particulate air pollution, according to the latest data published in the Public Health Outcomes Framework (PHOF), which equates to roughly 25,000. Air pollution is considered to be a contributory factor rather than the sole cause of death in most cases.

Local road traffic contributes substantially to outdoor air pollution, particularly in busy towns and cities. Defra estimates that 80% of oxides of nitrogen emissions in areas where the UK is exceeding nitrogen dioxide limits are due to transport, with the largest source being emissions from diesel light duty vehicles (cars and vans).

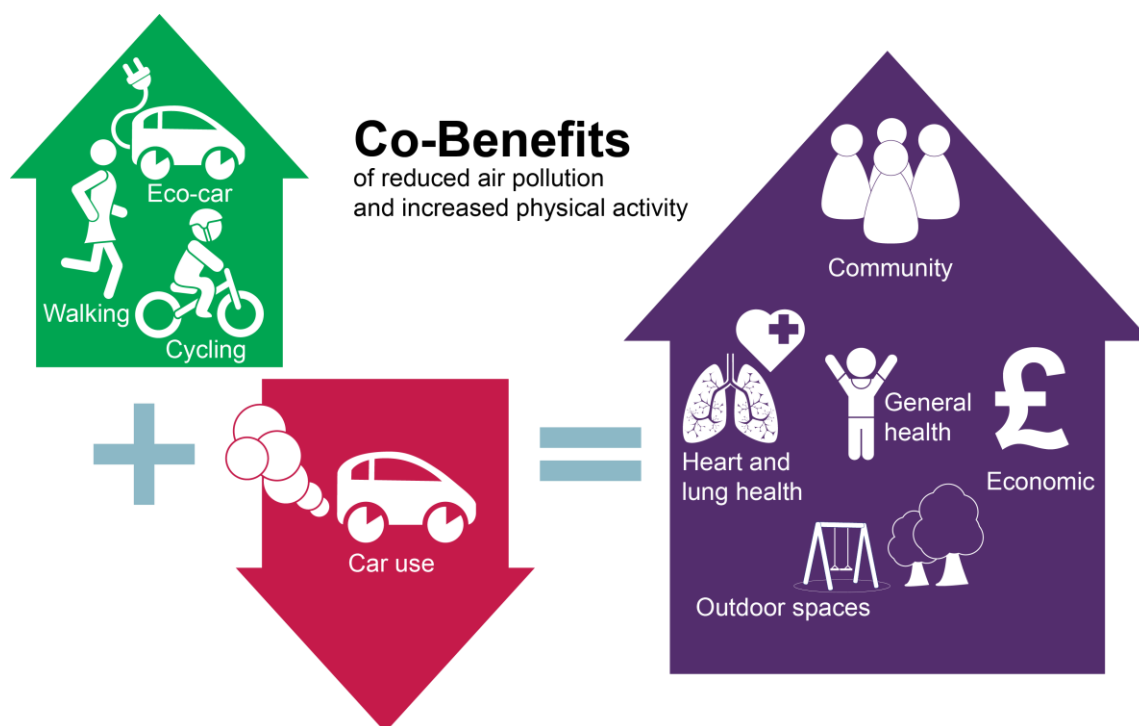
Emissions from industry, agriculture, commercial and domestic sources are also significant contributors. Individuals who spend long periods in urban environments may be more exposed than the general population.

Co-benefits

Tackling air pollution may improve quality of life by:

- reducing health inequalities through addressing air pollution in urban and deprived areas
- promoting physical activity through active travel (walking and cycling)
- improving built environment through actions that improve urban and rural landscapes
- improving road safety through actions that reduce traffic density and speed and provide dedicated space to active travel
- economic benefits through health improvement and increasing investor appeal of urban landscapes

Air pollution is not an issue in isolation. It is often a reflector of and contributor to wider environmental inequalities.



A focus on measures that have co-benefits for air pollution along with other public health priorities such as increased physical activity, health inequalities, climate change mitigation and adaptation, and community cohesion and road safety would be appropriate. The integration of public health functions into local government has encouraged the consideration of broad determinants of health that impact on the local population over the course of a lifetime, including air pollution. In England, the PHOF indicators aid prioritisation of interventions, including PHOF indicator 3.01 which highlights exposure of the population to air pollution.

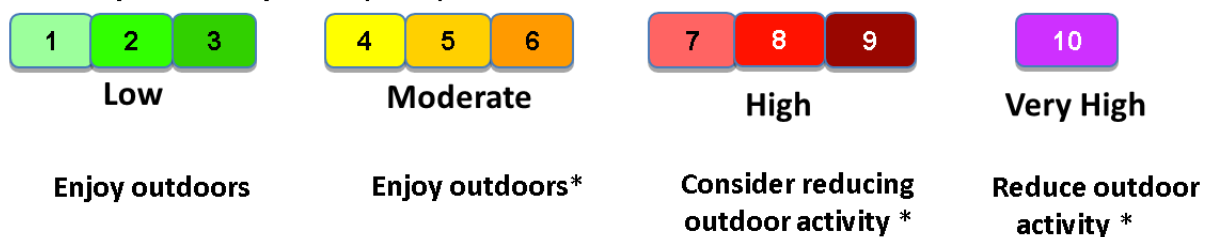
It is clear that actions to improve air quality will benefit other indicators within the PHOF, particularly those related to respiratory and cardiovascular morbidity and mortality (indicators 4.04, 4.05, and 4.07). In addition, active travel can improve physical fitness, thereby benefiting indicators associated with excess weight (indicators 2.06, 2.12) and the proportion of physically active adults (indicator 2.13).

Communication

Health communication can enable the public to reduce their personal exposure by avoiding areas of higher pollution. This is beneficial for the general population and those with existing health conditions.

The Defra Daily Air Quality Index (DAQI) provides current and predicted information on air pollution, rated in bands from low to very high and gives suggestions for action that can be taken, where possible, to minimise exposure in the event of short term air pollution episodes.

The Daily Air Quality Index (DAQI)



*Adults and children with heart or lung problems are at greater risk of symptoms.
People with inhalers may need to use them more often.

Other examples of health communication include air quality alert services such as [airTEXT](#), [airALERT](#) and [Know and Respond](#). These services provide free information about the quality of outdoor air. Communications that raise awareness of the short term and long term health effects of air pollution can empower people to take action to reduce their own exposure as well as to manage existing health conditions.

National and local government interventions often focus on reducing traffic and industrial air pollution. Increasing public awareness of air pollution also complements measures that reduce emissions. For example, evidence suggests that targeted behavioural change initiatives can be effective in encouraging some people to use alternative forms of transport, such as cycling, walking and shared transport. Public Health England is supportive of such measures.

Defra has produced a briefing for directors of public health which includes information on engaging with local decision makers and communicating with the public.

Taking action

Local authority and public health roles are discussed in the Defra leaflet [Air Quality: Public Health Impacts and Local Actions](#) and [Defra Air quality: a briefing for directors of public health](#).

The Action Toolbox in Annex A of the Defra [Local Air Quality Management Technical Guidance \(TG16\)](#) and the Action Matrix referred to in the [London Local Air Quality Management \(PG 16\)](#) provide information on action that can be taken to reduce air pollution and thereby improve the health of the public. These recognise that the suitability and effectiveness of different actions will vary by location and highlight activities that local authorities have taken, such as low emission strategies and promoting active travel.

Maximising health benefits

Public Health England encourages actions that maximise the potential health benefits and associated co-benefits for public health priorities such as increased physical activity; climate change mitigation and adaptation; community cohesion through increased time in outdoor environments and road safety. This may be achieved through actions that reduce emissions, whilst also embracing measures that can be adopted at an individual level, such as promoting active travel and awareness of the effects of air pollution on health.

Public Health England is supportive of action to improve air quality over a wide geographical area, reflecting that negative effects of air pollution may occur at locations other than where the emissions occur – air pollution does not respect boundaries.

There are no thresholds of effect identified for nitrogen dioxide and particulate matter and therefore health benefits can be expected from improving air quality even below concentrations stipulated by air quality standards.

Further information

[Committee on the Medical Effects of Air Pollutants \(COMEAP\)](#)

[Defra UK-AIR Air Information Resource](#)

[Defra Air Pollution in UK](#)

[Defra Local Air Quality Management Support](#)

[Public Health Outcomes Framework](#)

[Public Health England \(PHE\) Public health matters blog](#)

[Royal College of Physicians \(RCP\) Every breath we take: the lifelong impact of air pollution](#)

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