A breath of fresh air: responding to the health challenges of modern air pollution | parliamentary briefing on the Royal College of Physicians' 2025 air quality report

This briefing summarises the key evidence and recommendations from the Royal College of Physicians' 2025 report *'A breath of fresh air: responding to the health challenges of modern air pollution'*. The RCP's report:

- highlights new evidence from the last decade showing that air pollution affects almost every organ in the body, with significant new knowledge about its impacts on foetal development, cancer, heart disease, stroke, mental health and dementia.
- estimates that air pollution could still be linked to around 30,000 UK deaths in 2025
- estimates that costs for healthcare, productivity losses and reduced quality of life due to air pollution cost the UK upwards of £27 billion – and may be as much as £50 billion when wider impacts, such as dementia, are accounted for.
- calls for air pollution to be recognised as a public health issue, rather than a solely environmental one, with 19 recommendations for a range of government departments and other stakeholders to clean up our air.

Summary

In 2016, the RCP, alongside the Royal College of Paediatrics and Child Health (RCPCH) published *Every breath we take: the lifelong impact of air pollution*, highlighting the dangerous short- and long-term impact of air pollution on health. **Over the past decade, we have gained new evidence about the harmful health impacts of air pollution that occur even at low air pollution concentrations.** The RCP's new report highlights this evidence and calls for ambitious action on air pollution to reduce avoidable deaths and improve population health.

The air pollutants with the greatest effect on the health of the UK population are particulate matter, nitrogen dioxide (NO_2) and ozone. The greatest effects are attributable to particulate matter, measured in the UK's atmosphere as $PM_{2.5}$.

Air pollution emissions have reduced significantly over the years – but advances in exposure assessment, modelling and health studies show that even lower levels of air pollution still continue to affect our health. There is no safe level of air pollution.

Estimates of the mortality burden of air pollution in the UK in 2019 for $PM_{2.5}$ and NO_2 range between 29,000 and 43,000 deaths per year. **The RCP report projects that air pollution could still be linked to around 30,000 deaths in 2025.** While a welcome reduction from the 40,000 estimated deaths from the 2016 RCP report, air pollution clearly still has a significant impact on population health. 30,000 deaths attributable to air pollution is 30,000 too many. **The government must recognise air pollution as a preventable threat to public health and take increasingly ambitious action to reduce avoidable deaths and improve the health of our population.**

Air pollution is a preventable threat to public health

Air pollution has historically been framed as an environmental issue in the UK, but there is now overwhelming health evidence showing that health and health impacts are at the centre of the consequences of air pollution.

Air pollution is the largest environmental health risk causing loss of healthy years of life and premature death. **In 2021, there were 8.1 million preventable deaths linked to outdoor and indoor pollution worldwide, 90% being attributable to noncommunicable diseases. At an individual level, exposure to air pollution shortens the average**

person's lifespan by 1.8 years, an impact that ranks just behind some of the leading causes of death and disease worldwide - cancer 2.5, tobacco smoking 2.1, malaria 0.3 and inadequate water/sanitation/hygiene 0.6 years, respectively.

In addition to the mortality impacts, air pollution also worsens people's health. Estimates on the morbidity impacts of air pollution have found that in 2019 there were 3,010 new cases of lung cancer in adults and 9,750 new cases of asthma in children attributable to air pollution.

People can be exposed to air pollution where they live, play, study or work, and this exposure is distributed unevenly in the UK. Urban areas tend to have higher concentrations of traffic-related air pollution and higher population density, while rural locations often experience air pollution linked to specific activities, such as solid fuel or wood burning, agriculture, road transport, and forest and heathland fires.

Indoor air is also a growing concern, with people spending the majority of their time indoors in the UK. Poor ventilation, damp and mould, and emissions from domestic heating, gas cooking and household products all contribute to exposure.

Air quality impacts across the life course

For a long time, it was thought that air pollution health impact in adults was mainly through respiratory health. However, in recent years scientists have found **links between air pollution and almost every organ system in the body and the major diseases that affect them. These include the lungs, cardiovascular systems, metabolism, renal, liver, gastrointestinal, bone, skin and cancers.**

The volume of evidence on the impact of air pollution on health is rapidly growing. New cohort studies - published since 2016 - have follow-ups of over 25 years, showing how exposure from decades ago influences morbidity and mortality throughout life. Most significant has been the new knowledge about the impacts of air pollution in the earliest period of life and on our brain health, including child and adult mental health and dementia.

We now know that air pollution negatively affects health at all stages of life, beginning before conception and continuing throughout pregnancy. Exposure during pregnancy can affect birth outcomes; **globally around 2.7 million low birth weight babies and around 5.8 million preterm babies each year have been linked to ambient and household PM2.5 exposure.**

Health inequalities

Air pollution is harmful to everyone, but it disproportionately affects the most vulnerable groups in society. Some people are more susceptible to harm from air pollution because they are more likely to be living in poor health. Vulnerabilities are most evident amongst those living in the most deprived communities in the UK who are already at risk of health inequity. **In 2023, individuals living in the 20% most deprived areas in England experienced 8% higher than average $PM_{2.5}$ concentrations than those in the 20% least deprived.** In addition, research has shown that in the UK, non-White populations typically experience a greater burden of air pollution compared with White populations - NO_2 and $PM_{2.5}$ concentrations are, on average, 83% and 27% higher, respectively.

Those from more deprived or vulnerable backgrounds are more likely to experience the effects of indoor air pollution too; an estimated 904,000 homes in England have damp problems and associated mould and are more likely to be occupied by older people, lone parents, children, families on low-incomes and people from minority ethnic groups, thereby contributing to health inequalities. **We must recognise air pollution as a driver for poor health among deprived and vulnerable communities.**

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The economic burden of air pollution

Air pollution has negative influences on the population's health and the environment, impacting the economy. The economic impact of air pollution is linked to health care costs, productivity losses and lost utility - the benefits of being well and not suffering ill health. **Looking at the core effects of air pollution, costs for healthcare, productivity losses and reduced quality of life due to air pollution cost the UK upwards of £27 billion in 2019.** When wider impacts such as dementia are accounted for, the cost may be as much as £50 billion.

Pollutant exposures are projected to fall in coming years under current government policies targeted at reducing air pollution, including Net Zero policies. Taking those current policies into consideration, the 2019 figure declines to £19 billion in 2040. But when we include the secondary and sensitivity effects of air pollution, we estimate that annual costs could still be up to £30 billion per year in 2040.

RCP's recommendations

We have compelling new evidence on the detrimental impact of toxic air on brain health across the life course. Policy for the future needs to respond to new and emerging evidence, especially for vulnerable populations. Recommendations for government include:

1. **Taking greater action to tackle all sources of air pollution, increasing action where progress is being made and tackling areas that have been overlooked or lightly regulated, such as agriculture, indoor and domestic emissions.**

2. **Working with stakeholders and citizens to identify robust pathways towards the delivery of the World Health Organization's 2021 global air quality guidelines.**

3. **Regularly reviewing the effectiveness of the air quality limit values and population exposure reduction targets, assessing which tools and approaches are most effective at continuously driving down air pollution.**

4. **Funding and delivering a coordinated, UK-wide public health clean air campaign to provide accurate and trusted information about the health impacts of air pollution exposure**

5. **Targeted support to protect the most vulnerable and affected communities, who are often the groups and people least responsible for the problem**

6. **Developing a cross-departmental indoor air quality strategy to address the health harms from exposures to air pollution, such as from wood-burning stoves or from damp and mould in homes, workplaces, transport, healthcare settings, and indoor public and retail spaces – and set standards for healthy indoor air quality.**

7. **Integrating air quality into Net Zero policy development to ensure that the substantial air pollution benefits of decarbonisation can be realised.**

8. **Introducing a statutory duty to require the integration of health in all environment and planning policies, including the proposed large increase in providing new homes across the UK.**

Led by the RCP's special adviser on air quality, Professor Stephen Holgate CBE, the RCP's new report was developed with the help of 30 clinical and academic experts and approved by RCP Council prior to publication.

The full RCP report and summary for policy makers are available on the RCP website.

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