

***"The Environmental Audit Committee (EAC) launched a new inquiry into air pollution in 2026. The inquiry aims to investigate the ongoing public health risks and environmental consequences of air pollution in the UK. Prepare a written submission acting as though you were providing evidence to the inquiry by answering: What evidence exists of the extent of air pollution directly or indirectly impacting human health in the UK, are there differential impacts (geographically, and across socioeconomic groups), and are current regulatory mechanisms suitable to address this?"***

Evidence linking air pollution to human health impacts is extensive and well established. Recent research has strengthened understanding of the scale and range of these impacts, with long-term exposure to pollutants such as fine particulate matter (PM<sub>2.5</sub>) and nitrogen dioxide (NO<sub>2</sub>) associated with cardiovascular disease<sup>i</sup>, stroke<sup>ii</sup>, dementia<sup>iii</sup>, adverse birth outcomes<sup>iv</sup> and reduced life expectancy<sup>v</sup>. Unlike many public health risks, air pollution affects large populations through cumulative exposure, meaning its impacts may be gradual and difficult to identify at an individual level. The death of Ella Adoo-Kissi-Debrah, the first person in the UK for whom air pollution was formally recognised as a contributing cause of death, brought attention to the issue and highlighted a burden of disease that is far less visible. Air pollution rarely manifests through single, identifiable events. Instead, its greatest health impacts arise through incremental increases in risk across millions of people, making the overall burden substantial but less immediately apparent.

Evidence demonstrates that reducing air pollution can deliver measurable health benefits; research following the introduction of London's ULEZ found that improvements in air quality helped restore lung growth previously hindered by air pollution, resulting in comparable lung function to that of children in Luton.<sup>vi</sup> Importantly, these findings demonstrate not only that air pollution causes harm, but that interventions can produce meaningful health gains within relatively short spaces of time. Air quality improvement should be viewed not solely as an environmental objective, but as a preventative public health intervention.

The health burden of air pollution is unequally distributed. Geographically, higher concentrations are often found in urban areas, particularly near major roads and other emission sources. However, exposure is also closely linked to socioeconomic factors. More deprived communities are often exposed to higher pollution concentrations whilst experiencing poorer baseline health, making them even more vulnerable to its effects. Communities located near major pollution sources may therefore experience greater exposure despite having limited influence over their own environment. Air pollution can consequently reinforce and worsen existing health and socioeconomic inequalities, creating an important environmental justice issue.

Furthermore, measured pollutant concentrations don't necessarily reflect personal exposure. Exposure is shaped by where people spend time meaning measured concentrations at monitoring sites may not fully capture individual exposure. This is particularly important for more vulnerable groups such as children, elderly and those with pre-existing health conditions. A stronger regulatory approach should therefore combine ambient concentration standards with measures aimed at reducing population exposure, particularly among vulnerable and disadvantaged groups.

The UK's regulatory framework has delivered significant improvements in air quality, with emissions from many traditional sources falling substantially over recent decades. Local Air Quality Management (LAQM), national emissions controls and increasingly ambitious air quality targets have all contributed to this progress. However, there are questions over whether the current framework is fully aligned with the objective of maximising public health protection. Regulatory approaches tend to focus on compliance with legal limits but meeting these doesn't necessarily mean that health risks have been eliminated, particularly as evidence suggests there is no safe exposure limit and that adverse effects can occur below regulatory thresholds<sup>vii</sup>.

Future policy should place greater emphasis on reducing overall population exposure, particularly in areas where vulnerable communities are concentrated. The regulatory framework will also need to adapt to changing sources

of pollution, including non-exhaust emissions from tyre and brake wear, domestic combustion and agricultural emissions that contribute to secondary particulate formation.

Overall, the evidence that air pollution harms human health is compelling, with impacts that are widespread but unequally distributed. Existing regulation remains essential and has achieved substantial improvements, but compliance with legal limits should not be the sole measure of success. Future policy should focus more strongly on reducing population exposure and narrowing inequalities in both exposure and health outcomes across the UK. Ultimately, success should be measured not simply by cleaner air, but by healthier and more equitable outcomes.

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<sup>i</sup> Krismanuel, H. 2025. Air pollution and cardiovascular diseases: mechanisms, evidence, and mitigation strategies, *Journal of Medicine and Life*, 18(5), pp. 411–427.

<sup>ii</sup> Verhoeven, J.I., Allach, Y., Vaartjes, I.C.H., Klijn, C.J.M. and de Leeuw, F.E. 2021. Ambient air pollution and the risk of ischaemic and haemorrhagic stroke, *The Lancet Planetary Health*, 5(8), pp. 542–552.

<sup>iii</sup> Alzheimer's Society. 2026. Air pollution and the risk of dementia. Available at: <https://www.alzheimers.org.uk/about-dementia/managing-the-risk-of-dementia/reduce-your-risk-of-dementia/air-pollution>. Accessed: 6<sup>th</sup> August 2026.

<sup>iv</sup> Nyadanu, S.D., Dunne, J., Tessema, G.A., Mullins, B., Kumi-Boateng, B., Bell, M.L., Duko, B. and Pereira, G. 2022. Prenatal exposure to ambient air pollution and adverse birth outcomes: An umbrella review of 36 systematic reviews and meta-analyses, *Environmental Pollution*, 306, 119465.

<sup>v</sup> State of Global Air. 2026. Impact of air pollution on life expectancy. Available at: <https://www.stateofglobalair.org/health/life-expectancy>. Accessed: 6<sup>th</sup> August 2026.

<sup>vi</sup> Queen Mary University of London. Investigating the impact of London's Ultra Low Emission Zone on children's respiratory health. August 2026.

<sup>vii</sup> Committee on the Medical Effects of Air Pollutants (COMEAP). 2025. COMEAP: shape of the concentration-response curve linking PM<sub>2.5</sub> with all-cause mortality. Available at: <https://www.gov.uk/government/publications/comeap-shape-of-the-concentration-response-curve-linking-pm25-with-all-cause-mortality>. Accessed: 12<sup>th</sup> August 2026.