# Air pollution-linked cancers rise as UK regions face deadly PM2.5 hotspots



# The Global Air Pollution Crisis: A Dire Health Warning

The escalating air pollution crisis across the globe was starkly illustrated in a recent interactive map that highlights alarming levels of toxic fumes in numerous regions, including parts of the UK. The World Health Organisation (WHO) has long been at the forefront of efforts urging nations to bolster their responses to this public health emergency, which is estimated to claim approximately seven million lives each year worldwide.

US researchers, in a comprehensive study encompassing over 13,000 urban areas, employed satellite data alongside advanced computer models to quantify harmful carbon dioxide emissions in the atmosphere. This study also assessed the average levels of three critical pollutants over a 14-year period: fine particulate matter (PM2.5), nitrogen dioxide (NO2), and ozone (O3). Exposure to these pollutants has been linked to an increased risk of several severe health conditions, including lung and colon cancer, heart disease, and dementia.

PM2.5 particles, which are less than 2.5 micrometers in diameter, can penetrate deep into the lungs and enter the bloodstream. As they are often produced by vehicle exhaust and domestic wood-burning stoves, their presence is insidious, often going unnoticed until severe health complications arise. In the UK, the East of England emerged as the most affected region, with Ipswich recording a worrying rate of 15.88 parts per billion (ppb) for PM2.5, followed closely by Basildon and Southend. In contrast, Londonderry in Northern Ireland and Greenock in Scotland exhibited significantly lower levels, at 6.36 and 7.33 ppb, respectively.

Research has increasingly highlighted the relationship between PM2.5 exposure and cancer development. A 2022 study from University College London revealed that around 300,000 lung cancer deaths globally were linked to PM2.5 exposure in 2019. Furthermore, findings presented at an oncology conference established a direct mechanism by which air pollution contributes to lung cancer in non-smokers, underscoring the urgent need for greater awareness and stricter regulations.

Notably, a comprehensive meta-analysis emphasised the correlation between exposure to major air pollutants and cancer rates, reinforcing the critical health risks associated with air pollution. The results not only elucidated the dangers of PM2.5 but also highlighted the mortality risks linked to nitrogen dioxide and ozone exposure. NO2, commonly sourced from vehicular emissions, has been associated with increased rates of respiratory problems, leading to higher hospital admissions for conditions such as asthma.

The interactive map developed by MailOnline allows users to discern the pollution levels in their respective areas, illustrating a significant disparity across different regions. In terms of ozone levels, Hereford and Folkestone reported the highest rates in the country at 37.96 and 37.94 ppb, while York registered the lowest at 24.08. The WHO guidelines stipulate that ozone levels should not exceed approximately 47 ppb over an eight-hour period, highlighting the urgent need for action in areas exceeding these limits.

Alarmingly, despite the efforts to monitor and mitigate air pollution, the global data indicates that ozone levels increased by six per cent from 2005 to 2019, while PM2.5 and NO2 levels showed little improvement. The highest PM2.5 concentrations were recorded in India, with some cities reporting pollutant levels more than double the global average. Moreover, cities in South Asia and China consistently exhibited the highest concentrations of both PM2.5 and ozone, emphasizing the critical need for renewed focus on air quality in these regions.

Professor Susan Anenberg from George Washington University, who co-authored the study, remarked on the varying air quality across urban environments, stating, “This study provides a powerful snapshot of how urban environments are evolving across the globe.” However, she also noted the limitations of the research, acknowledging potential inaccuracies in measurements and data collection methods. The need for reliable data is crucial for shaping effective policy and intervention strategies.

As the evidence mounts regarding the adverse health impacts of air pollution, the call for comprehensive air quality management to safeguard public health has never been more pressing. The detrimental effects of pollutants extend beyond immediate respiratory issues; they pose a significant threat to overall public health, particularly concerning cancer development and other chronic conditions. The fight against air pollution is a shared responsibility, demanding urgent actions from governments, industries, and individuals alike to ensure cleaner air for all.

## Reference Map:

* Paragraph 1 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490)
* Paragraph 2 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490), [[3]](https://ascopubs.org/doi/10.1200/GO.23.00427)
* Paragraph 3 – [[2]](https://www.axios.com/2022/09/12/scientists-air-pollution-link-lung-cancer), [[5]](https://www.eea.europa.eu/publications/air-quality-in-europe-2022/health-impacts-of-air-pollution)
* Paragraph 4 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490), [[3]](https://ascopubs.org/doi/10.1200/GO.23.00427)
* Paragraph 5 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490), [[6]](https://ehp.niehs.nih.gov/doi/10.1289/EHP124)
* Paragraph 6 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490), [[4]](https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-024-03596-5)
* Paragraph 7 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490), [[5]](https://www.eea.europa.eu/publications/air-quality-in-europe-2022/health-impacts-of-air-pollution)
* Paragraph 8 – [[1]](https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490), [[2]](https://www.axios.com/2022/09/12/scientists-air-pollution-link-lung-cancer)

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## Bibliography

1. <https://www.dailymail.co.uk/health/article-14686893/Map-polluted-cities-world-fumes-lung-colon-cancer.html?ns_mchannel=rss&ns_campaign=1490&ito=1490> - Please view link - unable to able to access data
2. <https://www.axios.com/2022/09/12/scientists-air-pollution-link-lung-cancer> - A 2022 study presented at an oncology conference identified a mechanism by which air pollution can trigger lung cancer in non-smokers. The research found that particles from fossil fuel combustion not only contribute to climate change but also directly impact human health by causing cancer in lung cells. In 2019, poor air quality was linked to over 250,000 lung cancer deaths globally. ([axios.com](https://www.axios.com/2022/09/12/scientists-air-pollution-link-lung-cancer?utm_source=openai))
3. <https://ascopubs.org/doi/10.1200/GO.23.00427> - A comprehensive meta-analysis published in JCO Global Oncology examined the association between exposure to major ambient air pollutants and the incidence and mortality of lung and non-lung cancers. The study found significant relationships between exposure to pollutants such as PM2.5 and NO2 and lung cancer incidence and mortality. The findings underscore the global health impact of air pollution on cancer outcomes. ([ascopubs.org](https://ascopubs.org/doi/10.1200/GO.23.00427?utm_source=openai))
4. <https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-024-03596-5> - A study published in BMC Medicine investigated the association between long-term exposure to multiple air pollutants and various health conditions in Southwest China. The research found that exposure to pollutants like PM2.5, NO2, and O3 was significantly associated with increased risks of conditions such as cardiovascular diseases, respiratory diseases, and certain cancers, including liver and colorectal cancers. The study highlights the extensive health impacts of air pollution. ([bmcmedicine.biomedcentral.com](https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-024-03596-5?utm_source=openai))
5. <https://www.eea.europa.eu/publications/air-quality-in-europe-2022/health-impacts-of-air-pollution> - The European Environment Agency's 2022 report on air quality in Europe highlighted the significant health impacts of air pollution. In 2020, exposure to fine particulate matter (PM2.5) above the World Health Organization's guideline level resulted in 238,000 premature deaths in the EU-27. Additionally, exposure to nitrogen dioxide (NO2) above the guideline level led to 49,000 premature deaths, and acute exposure to ozone (O3) caused 24,000 premature deaths. The report underscores the urgent need for effective air quality management to protect public health. ([eea.europa.eu](https://www.eea.europa.eu/publications/air-quality-in-europe-2022/health-impacts-of-air-pollution/?utm_source=openai))
6. <https://ehp.niehs.nih.gov/doi/10.1289/EHP124> - A study published in Environmental Health Perspectives investigated the association between ambient fine particulate air pollution (PM2.5) and lung cancer incidence. The research found that each 10 μg/m³ increment of ambient PM2.5 was associated with increased estimates of incident lung cancer, even in areas with relatively low concentrations of ambient PM2.5. The study supports the classification of outdoor air pollution and PM as carcinogenic and has important public health implications, especially for non-smokers. ([ehp.niehs.nih.gov](https://ehp.niehs.nih.gov/doi/10.1289/EHP124?utm_source=openai))
7. <https://pubmed.ncbi.nlm.nih.gov/38311022/> - A study published in PubMed assessed the global burden of lung cancer attributable to household fine particulate matter (PM2.5) pollution from 1990 to 2019. The study found that in 2019, household PM2.5 was responsible for 0.08 million deaths and 1.94 million disability-adjusted life-years (DALYs) due to lung cancer. The burden of lung cancer attributable to household PM2.5 decreased over the study period, with the middle sociodemographic index region having the highest number of lung cancer deaths and DALYs attributable to household PM2.5. The study highlights the significant impact of household air pollution on lung cancer burden globally. ([pubmed.ncbi.nlm.nih.gov](https://pubmed.ncbi.nlm.nih.gov/38311022/?utm_source=openai))