# Poor air quality could cause over half a million premature deaths in Europe by 2050, study warns



A study conducted by researchers at the University of Leeds has projected that poor air quality could lead to the premature deaths of over half a million Europeans each year by 2050 if current trends in greenhouse gas emissions continue. The research highlights the connection between greenhouse gases emitted from vehicles, power plants, and industrial sources and the resultant air pollution that causes significant health risks across Europe.

The findings suggest that up to 250,000 deaths annually in central and western Europe could be averted if stringent measures are implemented to reduce these emissions. Connor Clayton, a PhD student involved in the research, stated, “Europe has quite a high air quality mortality rate because of the density and large degree of urbanisation.” He emphasised the importance of showcasing the benefits of climate change mitigation to policymakers, indicating that proactive measures could yield local health benefits.

The study specifically examined two harmful pollutants: fine particulate matter (PM2.5) and surface-level ozone (O3). PM2.5 is often generated by coal-burning power plants and industrial activities, while ozone forms when sunlight interacts with greenhouse gases, creating a smog that exacerbates respiratory and cardiovascular issues. Breathing in these pollutants has been linked to severe health conditions, including lung cancer, cardiovascular diseases, and can adversely affect reproductive health.

Current statistics indicate that pollution from PM2.5 leads to 444,000 deaths per year in Europe, along with 23,000 fatalities attributed to ozone. The researchers modelled potential future scenarios to illustrate the impact of varying levels of emissions. In a low emissions scenario, deaths from PM2.5 could decline to 199,000, with ozone-related deaths dropping to 17,000. However, if emissions continue unmitigated, the total could exceed 500,000 by 2050.

Dr. Clayton noted, “Only high mitigation reduces the absolute number of projected air quality deaths in Europe,” suggesting that without significant reductions in emissions, the health risks associated with air quality will persist or worsen. Areas in Europe that are economically deprived currently experience higher rates of pollution-related deaths, though the research indicates that equitable reductions in emissions could contribute to narrowing this gap.

The study, appearing in the journal Earth’s Future, underscores the dual nature of greenhouse gases and their health impacts. Leading researcher Dr. Jim McQuaid emphasized that the findings provide crucial evidence for transitioning towards a low carbon economy not only to combat climate change but also to protect public health.

Experts urge a coordinated response to both climate change and air pollution, as the actions taken today could significantly alter the health landscape in Europe in the years to come. With continued urbanisation and industrial activity, the emphasis on reducing greenhouse gas emissions remains critical for safeguarding both environmental and public health in the continent.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://time.com/7283174/cutting-emissions-prevent-deaths-polluted-air-europe/> - This article discusses a study published in Earth's Future on May 6, 2025, by researchers from the University of Leeds, emphasizing that reducing greenhouse gas emissions could significantly lower pollution-related deaths in Europe. Specifically, up to 250,000 premature deaths in central and western Europe could be avoided by 2050 with aggressive emissions cuts.
2. <https://www.ft.com/content/3503bae3-3cbb-40e5-9497-39ec23599ea5> - This study by the World Heart Federation found a significant decline in cardiovascular disease deaths in Europe linked to air pollution, as emissions have been reduced. Between 2010 and 2019, deaths related to heart disease due to pollution fell by 19.2%, while stroke deaths dropped by 25.3%.
3. <https://www.reuters.com/business/environment/eu-parliament-adopts-new-rules-improve-air-quality-by-2030-2024-04-24/> - On April 24, 2024, the European Parliament approved new, stricter limits on air pollution to be met by 2030, in response to the World Health Organization's tightened air quality guidelines. These measures aim to reduce the 300,000 annual premature deaths in Europe due to air pollution by 70% over the next decade.
4. <https://www.eea.europa.eu/publications/air-quality-in-europe-2022/health-impacts-of-air-pollution/> - In 2020, air pollution led to a significant number of premature deaths in the 27 EU Member States (EU-27). Exposure to concentrations of fine particulate matter above the 2021 World Health Organization guideline level resulted in 238,000 premature deaths; exposure to nitrogen dioxide above the respective guideline level led to 49,000 premature deaths. Acute exposure to ozone caused 24,000 premature deaths.
5. <https://www.eea.europa.eu/en/analysis/publications/harm-to-human-health-from-air-pollution-2024> - In 2022, European citizens remained exposed to air pollutant concentrations that were considerably above the levels recommended by the World Health Organization (WHO). Reducing air pollution to these WHO guideline levels would prevent a significant number of annual deaths in EU Member States (EU-27): 239,000 from exposure to fine particulate matter (PM2.5); 70,000 from exposure to ozone (O3) and 48,000 from exposure to nitrogen dioxide (NO2).
6. <https://www.eea.europa.eu/en/newsroom/news/health-and-environment-impacts-of-air-pollution> - Just under 240,000 deaths per year in the European Union can be attributed to exposure to fine particulate matter, a key air pollutant, according to the latest European Environment Agency (EEA) air quality health impact assessment published today as the new EU rules enter into force. The latest data also confirm, yet again, that Europeans remain exposed to air pollutant concentrations considerably above recommended World Health Organization (WHO) levels.
7. <https://www.dailymail.co.uk/sciencetech/article-14683085/Scientists-deaths-prevented-2050-greenhouse-gas.html?ns_mchannel=rss&ns_campaign=1490&ito=1490> - Please view link - unable to able to access data