

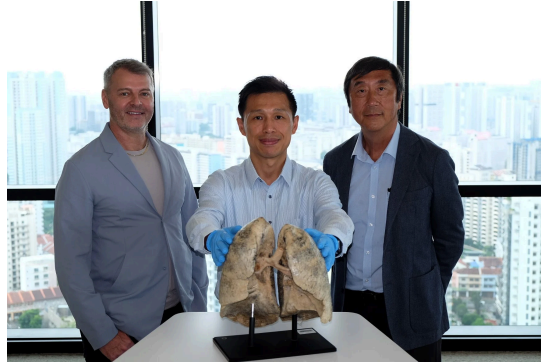


Science

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Research Links Millions of Deaths to Fine Particle Pollution



A study led by researchers from NTU Singapore revealed that fine particulate matter from 1980 to 2020 was associated with approximately 135 million premature deaths globally.

In the study, premature deaths refer to fatalities that occur earlier than expected based on average life expectancy, resulting from preventable or treatable causes such as diseases or environmental factors.

Led by Asian School of the Environment (ASE) and Lee Kong Chian School of Medicine (LKCmedicine) Associate Professor Steve Yim, who is also Principal Investigator at NTU's Earth Observatory of Singapore (EOS), the study found that the impact of pollution from fine particulate matter was worsened by climate variability phenomena such as the El Niño-Southern Oscillation, the Indian Ocean Dipole, and the North Atlantic Oscillation, and led to a 14 per cent rise in premature deaths.

The researchers, which include co-authors EOS Director Professor Benjamin Horton and Distinguished University Professor Joseph Sung, NTU's Senior Vice President (Health and Life Sciences) explain that during such weather events, the increased temperature, changes in wind patterns, and reduced precipitation can lead to stagnant air conditions and the accumulation of pollutants in the atmosphere. These result in higher concentrations of PM_{2.5} particles that are particularly harmful to human health when inhaled.

Fine particulate matter, or PM_{2.5}, refers to particulate matter 2.5 micrometres in diameter or smaller. These tiny particles come from vehicle emissions, industrial processes, and natural sources such as wildfires and dust storms.

The study estimated that a third of the premature deaths from 1980 to 2020 were associated with stroke (33.3 per cent); another third with ischemic heart disease (32.7 per cent), while chronic obstructive pulmonary disease, lower respiratory infections, and lung cancer made up the rest of premature deaths.

To understand how PM_{2.5} pollution affects mortality rates, the researchers studied satellite data from NASA on the levels of fine particulate matter in the Earth's atmosphere. They also analysed statistics on the incidence and mortality of diseases linked to pollution from the Institute for Health Metrics and Evaluation, based in the US. Additionally, they considered information on climate patterns from the National Oceanic and Atmospheric Administration.

While previous studies have explored aspects of air quality and climate, this study had a global scope and analysed over 40 years of data. By examining how specific climate patterns affect air pollution in different regions, it offers fresh insights into the complex relationship between climate and air quality.

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