

## Worsening air quality major cause of premature deaths, study finds

Left gasping: Breathable air is at a premium these days | Photo Credit: [Arunangsu Roy Chowdhury](#)

Worsening air quality in the last two decades has emerged as one of the major reasons for high numbers of premature deaths, says a new study conducted in 11 north Indian cities.

The findings titled 'Know what you breathe', released here on Tuesday, were researched by Indian Institute of Technology (IIT)-Delhi in collaboration with environmental NGO Centre for Environment and Energy Development (CEED). The report found annual mortality linked to air pollution to be in the range of 150-300 persons per 1 lakh population.

The study was conducted in seven cities of Uttar Pradesh (Allahabad, Kanpur, Lucknow, Meerut, Varanasi and Gorakhpur), three cities of Bihar (Patna, Gaya and Muzaffarpur), and the capital of Jharkhand, Ranchi.

Kanpur recorded the highest number of premature deaths per year (4,173) due to chronic exposure to air pollution, followed by Lucknow (4,127), Agra (2,421), Meerut (2,044), Varanasi (1,581), Allahabad (1,443) and Gorakhpur (914).

The study calculated the annual "mortality burden" through averages of recorded deaths caused due to Chronic Obstructive Pulmonary Disease (COPD), Acute Lower Respiratory Infection (ALRI), coronary disease, stroke, and lung cancer, in these cities. COPD was the largest cause of the deaths (at 29.7%) and lung cancer the lowest (0.6%).

The largest share in total burden was attributed to ALRI in Agra and Meerut, and to COPD in Allahabad, Gaya, Kanpur, Gorakhpur, Lucknow, Patna, Muzaffarpur and Varanasi.

The estimates should not be perceived as instant deaths, said the report, clarifying that they represent premature (earlier than the expected lifetime of the Indian population) deaths due to chronic exposure from pollution. However, "it isn't possible to validate these estimates, as cause-specific mortality data do not exist in India," said the report authored by Dr. Sagnik Dey, Associate Professor, Centre for Atmospheric Sciences, IIT-Delhi.

Premature mortality burden would reduce by 14%-28% annually with the achievement of Indian air quality standards in these cities, the report said.

Using satellite-based high-resolution PM2.5 database to generate particulate matter statistics for the past 17 years, the report concludes that the mean annual ambient fine particulate matter concentration was 75-120% higher than the Indian annual air quality standard in the 10 of the 11 cities. In Ranchi, the mean annual ambient PM2.5 exposure was 12.5% higher than the Indian standard.

The report found levels of PM2.5 exposure moving downward from west to east of the Indo-Gangetic plain with the highest proliferation in Varanasi and the lowest in Ranchi. The report has indicated an increase of 28.5 microgram / m<sup>3</sup> in PM 2.5 in the last 17 years in Varanasi.

The annual particular matter exposure was the highest in Meerut, with an "alarming" figure of 99.2 ug/M<sup>3</sup> (microgram per cubic metre), followed by Agra (91) and Lucknow (83.5).

The study has attributed residential (cooking, heating and lighting) sources as the largest

contributors to annual ambient PM2.5 concentration (73.8%) followed by industry (11.7%), transport (9.8%) and energy sectors (4.6%).

Ankita Jyoti, senior programme officer at CEED said, “the analysis of aerosol composition in our study indicates a higher percentage of sulphates, organic carbons and black carbon, which are emitted primarily from anthropogenic sources.”

A high rate of unplanned urbanisation is the main anthropogenic source of rapid increase in the pollution levels, she added.

The study said that a “very high exposure” to air pollution was recorded during post-monsoon (October-November) and winter (December-February) seasons.

Abhishek Pratap, programme director of CEED, said, “We are witnessing a public health emergency in our cities as polluting air is choking our lungs.”

The States and the Union government need to take note of this alarming situation and create a national clean air action plan which is ambitious, effective and focuses on time-bound implementation, he added.

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