

AIR POLLUTION IMPACT:

High Public Health Concerns With Increased Pre-Mature Mortality

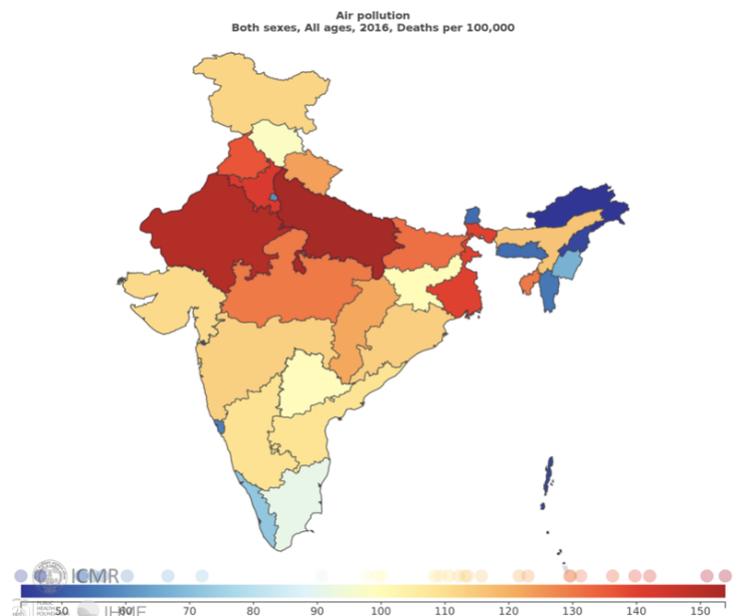
Uttar Pradesh, Bihar and Jharkhand record some of the highest levels of outdoor particulate pollution worldwide (1).

Air pollution is one of the most serious public health risks facing us today, contributing to the earlier deaths of up to 2.5 million people in India in the year 2016 (2). And over the last two decades, much scientific research has demonstrated that particulate matter is the major pollutant of concern from the health perspective. The airborne particulate matter is not a single pollutant, but rather a mixture of many subclasses of pollutants in solid and liquid forms, with each subclass containing many different chemical species.

Although much of the air pollution talk is concentrated in metro cities, the air quality of cities falling in the Indo- Gangetic plain is alarmingly poor. This is particularly true for states like Bihar and Uttar Pradesh which have a large number of cities figured in the top 10 most polluted cities in the global pollution ranking of the World Health Organization (WHO). The topography and meteorology of these states also contribute to the poor air quality of their urban landscape. In cities like Patna, Varanasi, Lucknow, and Gaya, bad air quality is not a seasonal phenomenon but a perennial affair.

A study published by the British journal, The Lancet Commission on Pollution and Health ranks India first in terms of air pollution-related deaths with 1.81 million deaths recorded in the year 2015. The alarming level of PM2.5 caused massive premature deaths in India, with the

maximum number reported in Bihar and Uttar Pradesh. The report has predicted that nearly 153.8 deaths per 100,000 in Uttar Pradesh, 131.3 deaths per 100,000 in Bihar and 100.2 deaths per 100,000 in Jharkhand occurred due to air pollution. Bihar has the highest number of premature deaths after Uttar Pradesh and Rajasthan.



CEED, in partnership with IIT-Delhi, prepared a report 'Know What You Breathe' which highlighted the serious health complications caused due to air pollution in 11 cities of the Indo-Gangetic Plain, including Lucknow, Patna and Ranchi. The study was carried out to evaluate the ambient air pollution (represented in terms of PM2.5) level, the premature mortality burden and the aerosol composition in the important urban centers of Uttar Pradesh

(1) <https://vizhub.healthdata.org/gbd-compare/india>
(2) <https://vizhub.healthdata.org/gbd-compare/india>

(Agra, Allahabad, Kanpur, Lucknow, Meerut, Varanasi and Gorakhpur), Bihar (Patna, Gaya and Muzaffarpur) and Jharkhand (Ranchi).

The report also highlighted the serious health evidence attributed to air pollution. The estimated premature mortality burden from ambient PM2.5 exposure due to COPD, IHD, stroke, lung cancer and ALRI in these cities were alarming and demanded immediate interventions.

The annual premature mortality burden per year from ambient PM2.5 pollution in Ranchi is 1,096 deaths per year while cities like Patna, Muzaffarpur and Gaya noted 2,841, 531 and 710 deaths per year.

The estimated premature deaths in cities of Uttar Pradesh are:

- 4173 deaths/year in Kanpur
- 4127 deaths/year in Lucknow
- 2421 deaths/year in Agra
- 2044 deaths/year in Meerut
- 1581 deaths/year in Varanasi
- 1443 deaths/year in Allahabad
- 914 deaths/year in Gorakhpur

Looking at the estimated health effects and mortality due to air pollution in these cities, they need to immediately intervene to meet their national standards. In order to bring national standards on the annual scale in these cities, the required percentage reduction in PM 2.5 exposures:

- Patna, Gaya and Muzaffarpur should reduce their PM2.5 level to 53.4%, 41.8% and 54.2% respectively.
- The required per cent reduction in PM2.5 exposure to meet the WHO standards at an annual scale in Ranchi is 77.8%.
- Kanpur, Lucknow, Agra, Meerut, Varanasi, Allahabad and Gorakhpur should reduce their PM2.5 concentration by 49.5%, 52.1%, 56.8%, 59.7%, 44.3%, 48.4% and 49.5% respectively.



Bihar has the highest number of premature deaths after Uttar Pradesh.

If the annual PM2.5 exposure comes to the national standard, in the case of earlier mortality, the premature death rate will decrease by 17.5% in Patna, 13.8% in Gaya and 19.9% in Muzaffarpur. The premature death rate in Meerut will reduce by 28.3% in Kanpur 22.3%, 15.3% in Varanasi, 14.2% in Allahabad, 27.7% in Agra, 21.8% in Lucknow and 18.8% in Gorakhpur.

The findings clearly establish the fact that the air pollution problem is very critical in the state. These states cannot afford to ignore the ominous health evidence any more and its necessary to act urgently to reduce the public health risks to children, elderly, poor and all of us. The government should formulate Clean Air action plan with an aim to not only manage air pollutant concentrations/sources but also the population exposures where issuance of a health advisory will be impactful. Some suggestions that immediately should be taken to improve the air quality are:

- Number of pollution monitoring sites in these cities should be increased to capture
- The spatial heterogeneity and the quality of the data should be ensured so that accurate exposure assessment can be carried out.
- Public awareness needs to be strengthened by media coverage and effective communication (in local language) through public displays of pollution levels and their ill effects.
- Source apportionment study needs to be developed. Especially, a detailed inventory for the transportation sector is recommended. This would help in the formulation of a city-specific inter-sectoral air quality management plan.

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- A framework should be established to collate basic health data (daily mortality record and hospital visits) from these cities so that the short-term impacts of air pollution can be quantified rigorously. Such a framework would enable testing the health benefit of any policy intervention in future.
 - Since pollution cannot be restricted within political boundaries, inter-state coordination is required for an effective regional clean air action plan in North India.
 - A comprehensive clean air action plan should also develop.

About CEED

Centre for Environment and Energy Development (CEED), an environment and energy expert group involved in creating a sustainable solution to maintain a healthy, rich and diverse environment. CEED primarily works towards clean energy, clean air, clean water and zero waste solutions by creating an enabling environment and policy framework to scale up investments in low carbon development, climate mitigation and adaptation. CEED engages with government, industries, leaders, think-tanks, stakeholders and public to create environmentally responsible and socially just solutions.

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