

Air Pollution and Mortality in Indian Cities

Source: IE

Why in News?

Recently, Lancet has published a **first multi-city study** examining the relationship between short-term **air pollution (PM2.5) exposure** and **mortality** in 10 major cities of India between 2008 and 2019.

What are the Key findings of the Study?

- Air Pollution Causing Death: The study revealed that over 33,000 deaths (approximately 7.2% of total mortalities) could be attributed to air pollution annually across the 10 investigated cities.
- Highest Mortality Burden: Delhi, exhibited the most severe air pollution, with a staggering 11.5% (12,000 deaths) of annual deaths linked to air pollution.
- Shimla Lowest Mortality: Shimla emerged as the city with the lowest mortality burden attributable to air pollution, with only 59 deaths (constituting 3.7% of total deaths) annually.
- Chronic Exceedance of Safe Air Quality Standards: There has been a persistent violation of established air quality standards. PM2.5 concentrations consistently exceeded the <u>World Health</u> <u>Organization's (WHO)</u> safe limit (15 μg/m³) on an alarming 99.8% of the days analyzed.
- Deteriorating Health with Increasing Pollution Levels: Every 10 μg/m³ increase in PM2.5 concentration demonstrably resulted in a 1.42% rise in mortality across the ten cities.
 - Cities with comparatively lower pollution levels, such as Bengaluru and Shimla, exhibited a heightened susceptibility to mortality increases with even incremental rises in PM2.5 concentrations.
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Air Pollutants

Sulphur Dioxide (SO₂)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Nitrogen Dioxide (NO₂)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

Ammonia (NH₃)

Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Ozone (O₃)

Secondary pollutant formed from other pollutants (NOx and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Carbon Monoxide (CO)





It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)



PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.
 PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.
 Source: Emitted from construction sites, unpaved roads, fields, fires.
 Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



Read More: Advancing Air Pollution Control in India, World Air Quality Report 2023

UPSC Civil Services Examination Previous Year Question (PYQ)

<u>Prelims</u>

Q. In the cities of our country, which among the following atmospheric gases are normally considered in calculating the value of Air Quality Index? (2016)

- 1. Carbon dioxide
- 2. Carbon monoxide
- 3. Nitrogen dioxide
- 4. Sulfur dioxide
- 5. Methane

Select the correct answer using the code given below:

(a) 1, 2 and 3 only
(b) 2, 3 and 4 only
(c) 1, 4 and 5 only
(d) 1, 2, 3, 4 and 5

Ans: (b)

Mains

Q. Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve revised standards? **(2021)**

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