



World Air Quality Report 2024

[Source: DTE](#)

Why in News?

The **World Air Quality Report 2024**, released by Swiss company IQAir, ranked **India as the 5th most polluted country** globally.

What are the Key Findings of the World Air Quality Report?

- **India:** India is the **5th most polluted country in 2024**, improving slightly from 3rd place in 2023.
 - **Polluted Cities:** Delhi remains the **most polluted capital** globally with a Particulate matter (PM) 2.5 concentration of **91.6 $\mu\text{g}/\text{m}^3$** (micrograms per cubic metre).
 - 6 of the world's 10 most polluted cities and 13 of the top 20 are in India, with **Byrnihat** (Assam-Meghalaya border) topping the list at a **PM2.5 concentration of 128.2 $\mu\text{g}/\text{m}^3$** .
 - Other polluted cities include **Mullanpur** (Punjab), Gurugram, **Faridabad**, Bhiwadi, and **Noida**.
 - **PM2.5 Reduction:** India saw a **7% decrease** in PM2.5 levels, averaging **50.6 $\mu\text{g}/\text{m}^3$** in 2024, down from **54.4 $\mu\text{g}/\text{m}^3$** in 2023.
 - However, this is still **10 times higher** than the [World Health Organization \(WHO's\)](#) recommended safe limit of **5 $\mu\text{g}/\text{m}^3$** . **35% of Indian cities** reported PM2.5 levels exceeding this limit.
 - **Pollution Sources:** Major contributors include **vehicle emissions, industrial pollution, and the burning of biomass**.
 - **Northern India faced extreme pollution levels** with crop stubble-burning contributing to **60% of PM2.5 levels**.
- **Global:** The most polluted countries by annual average PM2.5 levels are Chad (91.8 $\mu\text{g}/\text{m}^3$), Bangladesh (78 $\mu\text{g}/\text{m}^3$), Pakistan (73.7 $\mu\text{g}/\text{m}^3$), and Congo (58.2 $\mu\text{g}/\text{m}^3$).
 - The report highlights that **most of the global population** is breathing polluted air, with **only 12 countries, regions, or territories** reporting PM2.5 concentrations below the **WHO's recommended limit**.

Air Pollution

- Air pollution is the contamination of air by **chemical, physical, or biological agents that alter its natural composition**.
 - Major sources include combustion, vehicles, industries, and fires. Pollutants like PM, CO, O₃, NO₂, and SO₂ cause respiratory diseases and high mortality.
- WHO reports that **99% of the global population breathes polluted air, with low- and middle-income countries most affected**.
 - Prolonged PM2.5 exposure **cuts life expectancy by 5.2 years in India**, linked to **1.5 million annual deaths between 2009-2019**, as per *the Lancet Planetary Health Study*.
- [WHO Air Quality Guidelines \(AOG\)](#) aim to help governments reduce air pollution and improve public health.

// Recommended 2021 AQG levels compared to 2005 air quality guidelines

Pollutant	Averaging Time	2005 AQGs	2021 AQGs
PM _{2.5} , µg/m ³	Annual	10	5
	24-hour ^a	25	15
PM ₁₀ , µg/m ³	Annual	20	15
	24-hour ^a	50	45
O ₃ , µg/m ³	Peak season ^b	-	60
	8-hour ^a	100	100
NO ₂ , µg/m ³	Annual	40	10
	24-hour ^a	-	25
SO ₂ , µg/m ³	24-hour ^a	20	40
CO, mg/m ³	24-hour ^a	-	4



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.

Ozone (O₃)



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

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

Nitrogen Dioxide (NO₂)



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

Impact: Chronic lung disease.

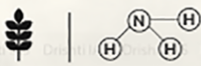
Carbon Monoxide (CO)



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.

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.

Lead (Pb)



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.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

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

1. Carbon dioxide
2. Carbon monoxide
3. Nitrogen dioxide
4. Sulphur 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

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)