

## Effects of particulate matter (PM2.5)

### Why in News?

*A new study reveals the damaging effects of air pollution extend far beyond the lungs and heart, affecting people before they are even born.*

- **Published in** - PLoS Global Public Health.
- **Carried out by** - Researchers from institutions in India, Thailand, Ireland, and the UK.
  - Data collected from the National Family Health Survey (NFHS), along with satellite data.
- **Assessment criteria** - The team assessed the influence of ambient air quality on birth outcomes, specifically ***Preterm births (PTB)*** and low birth weight (LBW).
- The dataset included children ***aged 0 to 5 years***; 52% were female and 48% male.

### Findings of the study

- **Particulate Matter (PM2.5)** - The results suggest that exposure to fine particulate matter (PM2.5) during pregnancy significantly increases the likelihood of these adverse outcomes.

*PM2.5 consists of airborne particles less than 2.5 micrometres in diameter.*

- **Regional disparity** - Specifically, Delhi, Punjab, Haryana, Uttar Pradesh, and Bihar bear the brunt of the consequences of air pollution.
  - **Reasons** - Heavily industrialised with high vehicular emissions and the widespread use of solid fuels for cooking.
- **Pre-Term Births (PTB)** - Prevalent in Himachal Pradesh (39%) and Delhi (17%).
- **Low Birth Weight (LBW)** - Common in Punjab (22%) and Delhi (19%).
- Female children were more likely to be born with LBW compared to males (17%), although both conditions were found to be more frequent among children of illiterate and poorer mothers.
  - **Contributing Factors** - Households that used solid fuel to cook also reported higher rates of both LBW and PTB.
  - Higher levels of PM2.5 during pregnancy significantly increased the likelihood of both LBW and PTB.
- **Higher temperatures** - Linked to maternal dehydration, heat stress, and increased cardiovascular strain, all of which impair placental function and disrupt foetal growth.
- **Excessive Rainfall** - Especially during the monsoon, raises the risk of waterborne infections, which can further hinder foetal growth.
- Flooding and displacement associated with heavy rains can also disrupt healthcare access, leading to delayed medical interventions and increasing the likelihood of pregnancy complications.

## National Air Quality Index (AQI)

- The Air Quality Index (AQI) is a measurement of air pollutant concentrations in ambient air and their associated health risks.
- **Launched in-** 2014.
- **Categories** -There are 6 AQI categories, namely Good, Satisfactory, Moderately Polluted, Poor, Very Poor, and Severe.
- **Included pollutants-** Particulate matter (PM2.5 and PM10), Ozone (O3), Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Sulphur Dioxide (SO2), Lead (Pb) and Ammonia (NH3)

## Reference

[The Hindu| Air pollution and effects of birth](#)

