Environmental Contaminants in Mother's Milk

Prelims: *Current events of national and international importance | Health*

Why in News?

Recent studies in parts of rural India have detected traces of environmental contaminants, raising concerns about early-life exposure to pollutants.

- **Breast Milk –** It is a unique bioactive fluid produced by mammalian mothers.
- **Composition –** Contains all the nutrients that an infant needs in the first 6 months of life, including fat, carbohydrates, proteins, vitamins, minerals and water

  The World Health Organisation (WHO) recommend exclusive breastfeeding for the first 6 months of life, followed by continued breastfeeding alongside complementary foods up to 2 years of age or beyond.

- **Importance – First food and first vaccine –** Breast milk provides complete nutrition and immune protection for infants.
- Recommended by WHO as the safest nourishment for infants.
- It provides macronutrients, micronutrients, bioactive molecules and stem cells that support infant growth.
- **Benefits –**
  - Strengthening immune defences.
  - Supporting brain and neurodevelopment.
  - Shaping the gut microbiome.
  - Reducing inflammation and infections.
  - Lowering risk of allergies, autoimmune disorders, obesity and respiratory diseases.

Key findings of the study

- **Long-term Benefits –** Study found that longer breastfeeding duration is associated with
  - Higher intelligence in adulthood
  - More years of schooling
  - Higher earnings.
- **Concern of Contaminants –** Detection of traces of pesticides, heavy metals and uranium in breast milk in parts of rural India.

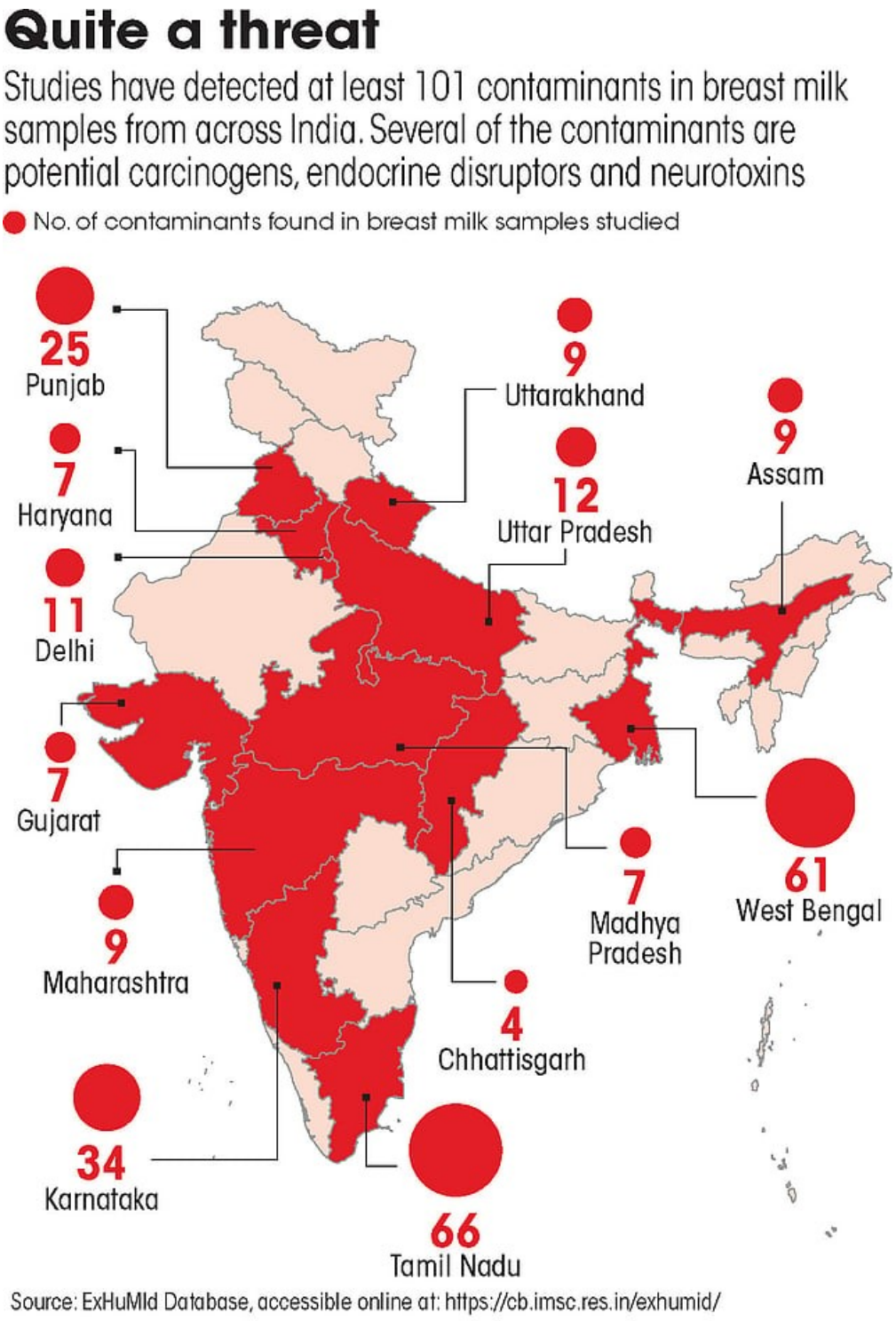
Studies have detected at least 101 contaminants in breast milk samples across India.

- **Nature –** Detected substances fall into categories such as:
  - Carcinogens (cancer-causing agents)
  - Endocrine disruptors (chemicals that interfere with hormonal systems)
  - Neurotoxins (harmful to brain development)
  - Nephrotoxicity (kidney damage)
- **Early-life Exposure –** Indicates exposure to pollutants may begin in infancy rather than later in life.
- Infants are particularly vulnerable because their organs and immune systems are still developing and have lower body weight, increasing relative exposure.
- **Uranium in Groundwater –** Uranium-238 (U-238) is a naturally occurring radioactive element that can contaminate groundwater.
- 151 districts across 18 states had groundwater uranium levels above the WHO guideline of 30 µg/l.

In Bihar, about 1.7% of groundwater sources are affected. Uranium contamination has been reported to have the highest level (5.25 µg/L) recorded in the Katihar district.

States with High contamination levels –

  - Punjab – 24.2% wells above limit
  - Haryana – 19.6%
  - Telangana – 10.1%
  - Delhi – 11.7%
  - Rajasthan – 7.2%



- Smaller proportions were found in Karnataka, Madhya Pradesh, Tamil Nadu, Jharkhand, Chhattisgarh, Gujarat, Himachal Pradesh, Maharashtra, Odisha, West Bengal and Bihar.
- **Significance –** Highlights the link between environmental pollution and early-life health exposure.
- Emphasises the need for groundwater quality monitoring and pollution control.

References

1. Down to Earth | Environmental Contaminants in Mother’s Milk
2. Nature | Contaminants in Mother’s Milk

