Mobile BSL-3 'Laboratory on Wheels

Prelims: Current events of national and international importance

Why in news?

Recently, the Indian Council of Medical Research (ICMR) is expanding its fleet of Mobile Biosafety Level-3 (MBSL-3) laboratories to enhance India's response to disease outbreaks, particularly in remote and inaccessible areas.

- **Mobile BSL-3 laboratory –** Mobile Biosafety Level-3 (MBSL-3) is also known as RAMBAAN (Rapid Action Mobile BSL-3 Laboratory).
- **Field-deployable BSL-3 lab** – It is a fully indigenous, field-deployable laboratory designed for rapid diagnosis and investigation of high-risk pathogens like Nipah virus.
- **First deployed** – September 2023 during the onset of Nipah outbreak, Kozhikode, Kerala
- **Development** – It is developed under the Pradhan Mantri Ayushman Bharat Health Infrastructure Mission.
- Built in collaboration with Klenzaids Contamination Controls Pvt. Ltd., Mumbai.
- It is designed for operation in extreme temperatures and altitudes.

Key Features of Mobile BSL-3 Laboratory

- WHO classified as **Type-IV Rapid Response Mobile Laboratory** under the Global Outbreak Alert and Response Network.

As per WHO, laboratories are categorized into five types in that Type-IV indicates a large-scale, high-capacity deployable diagnostic unit.

- **Negative air pressure environment** – The air is continuously extracted from the room through exhaust systems to contain pathogens.
- **Advanced HVAC system (Heating, Ventilation & Air Conditioning)** – Maintains strict control over temperature, humidity, and air filtration.
- **Double door autoclave** – Safe decontamination of biological waste or lab equipment without breaking the containment barrier.
- **Biological Liquid Effluent Decontamination (BLED)** – Treats and neutralizes liquid waste generated inside the lab before disposal.

Significance

- It enhances on-site diagnostic capacity during outbreaks.
- it allows rapid detection of known and unknown high-risk pathogens.
- It strengthens India's Advanced Augmented Network for outbreak response.
- It is ideal for deployment in remote or inaccessible regions.

- It ensures strict biosafety protocols and protection for healthcare personnel.

Reference

The Hindu| ICMR increasing mobile lab capacity

