India’s Tuberculosis Challenge

Mains: *GS II | Governance*

Why in News?

More than a century after the introduction of the Bacillus Calmette-Guérin (BCG) vaccine, Tuberculosis (TB) remains one of the world's deadliest infectious diseases, disproportionately impacting Low- and Middle-Income Countries (LMICs).

What is Tuberculosis (TB)?

- Tuberculosis (TB) is a ***contagious airborne bacterial infection*** primarily affecting the lungs, though it can impact any part of the body.
- **Caused by** - Mycobacterium tuberculosis.
- **Spread -** The disease spreads when bacteria-carrying droplets are inhaled from an infected person's coughs, sneezes, or speech.
- **Symptoms -** Symptoms depend on whether the infection is active or latent.
- **Latent TB -** The bacteria live in the body but are inactive and asymptomatic, are not contagious, and may only test positive on a skin or blood test.
- **Active TB (Disease) -** The bacteria multiply, make sick and contagious.
- **Pulmonary TB -** Is active TB that involves the lungs. When a Person contract it by breathing in air exhaled by someone who has TB. The germs can remain in the air for several hours.
- **Common signs -** A persistent bad cough lasting more than 3 weeks Coughing up blood or mucus Chest pain or pain while breathing/coughing Unexplained fatigue and weight loss Drenching night sweats and fever
- **Treatment & Prevention** - Though preventable and highly curable, active TB is fatal if left untreated.

India accounts for approximately 27% of global TB cases.

24th March is observed as World Tuberculosis Day. ***(Click the link***

to Know More about TB)

What is India's Need for a Layered Approach?

- With TB incidence between 200–300 per 100,000 population, India faces one of the world's highest burdens.
- Reducing this to 10–20 per 100,000, the elimination threshold demands systemic reform.
- India's strategy must move beyond the pursuit of a perfect vaccine and adopt a layered approach
    - **Early Detection** – Strengthen diagnostics, including tools for subclinical TB.
    - **Preventive Therapy** – Treat latent infections before they progress.
    - **Vaccination** – Integrate new vaccines into national programs.

How does the PreVenTB Trial makes a Turning Point?

- Recent findings from the ICMR-led PreVenTB trial, mark a milestone.
- Conducted across 18 sites with over 12,700 participants, it evaluated 2 indigenous vaccines — **VPM1002** (SIIPL) and **Immuvac** (Cadila).
- **VPM1002 -** 50.4% efficacy against EPTB; 64.6% efficacy in children ***aged 6–14 years.***
- **Immuvac -** Over 60% efficacy against EPTB in children aged ***6–10 years*** and latent infection progression.
- These findings are significant, especially since no other global trial has evaluated efficacy against EPTB.

What are the Public Health and Ethical Dimensions?

- **Ethical Imperative of Action -** Waiting for a perfect vaccine risk perpetuating preventable deaths.
- Ethically, India must act on ***available evidence*** to protect vulnerable populations rather than delay intervention.
- **Equity and Nutrition -** Reduced efficacy among individuals with low BMI highlights the ethical link between nutrition and vaccine performance.
- Public health ethics demand that vaccination be coupled with nutritional support to ensure equitable outcomes.
- **Indigenous Innovation -** VPM1002's single-dose, BCG-based design offers logistical simplicity and scalability — vital for India's vast population.
- Ethically, prioritizing indigenous solutions aligns with self-reliance and

equitable global health.

How to move towards a Smarter TB Strategy?

- TB is a slow-moving pandemic requiring sustained urgency.
- India’s elimination goal must integrate:
  - Targeted vaccination for school-age children and household contacts.
  - Alignment with nutrition and preventive therapy programs.
  - Continued investment in diagnostics and case-based management. A combination of moderately effective vaccines across age groups may deliver immediate, tangible benefits.

What is the way forward?

- The PreVenTB trial offers a light at the end of the tunnel for TB vaccine development.
- India’s ethical and strategic challenge is to act decisively deploying tools that reduce severe disease today rather than waiting indefinitely for perfection.
- A pragmatic, layered approach combining early detection, preventive therapy, vaccination, and nutrition can transform India’s TB control framework and bring the nation closer to its elimination goal.

Reference

The Hindu | India Needs Innovative strategies to eliminate TB

