MAINS iMPACT 2025 **18-07-2025**

IMMUNISATION COVERAGE IN INDIA

SYLLABUS:

GS 2 > Social Justice >> Health

REFERENCE NEWS:

South Asia has achieved its highest-ever immunization coverage for children, with notable progress in India and Nepal, according to new data released by the World Health Organization (WHO) and UNICEF for 2024.

South Asia's record immunisation coverage (WHO & UNICEF, 2024 data):

Key Achievements in 2024

- **Record Immunisation Coverage:** South Asia achieved its **highest-ever child immunisation coverage**.
- **India:** Reduced **zero-dose children** (no vaccine received) by **43%** – from **1.6 million (2023)** to **0.9 million (2024)**.
- **Nepal:** Reduced zero-dose children by **52%**, from **23,000** to **11,000**.
- **Pakistan:** Achieved its **highest-ever DTP3 coverage at 87%**.
- **Afghanistan:** Continued to have the **lowest coverage**, with a **1% decline** compared to 2023.

Coverage Levels

- **DTP vaccine (Diphtheria, Tetanus, Pertussis):**
  - **3rd dose coverage:** 92% (↑2% from 2023)
  - **1st dose coverage:** 95% (↑2% from 2023)
- **Zero-dose children in region:** Fell **27%**, from **2.5 million (2023)** to **1.8 million (2024)**.

Measles Control Progress

- **Measles vaccine coverage:**
  - 1st dose – **93%** (↑3%)
  - 2nd dose – **88%** (↑1%)
- **Measles cases reduced by 39%** – from **90,000 (2023)** to **55,000 (2024)**.
- Still **below the 95% threshold** needed to prevent outbreaks.

HPV Vaccine (Cervical Cancer Prevention)

- Regional coverage rose from **2% (2023)** to **9% (2024)**.
- **Bangladesh:** Vaccinated **7.1 million girls** since 2023.
- **Bhutan, Maldives, Sri Lanka:** Increased coverage by **3, 15 & 17 points** respectively.
- **Nepal:** Launched HPV campaign in Feb 2025, vaccinating **1.4 million girls**.
- **India & Pakistan:** HPV vaccination rollout expected **later in 2025**.

Remaining Gaps & Challenges

- **2.9 million children** in the region remain **unvaccinated or under-vaccinated**.
- Coverage for measles & HPV still **below optimal levels**.
- **14 million infants worldwide** did not receive any routine vaccines in 2024 – up from **12.9 million in 2019** and **4 million above the target** for Immunization Agenda 2030.
- **Nine countries** accounted for over half of the zero-dose children: **Nigeria, India, Sudan, DR Congo, Ethiopia, Indonesia, Yemen, Afghanistan, Angola**.
- **India: 909,000 unvaccinated infants** (~6% of global total).
- Still achieved **96% vaccine coverage** among **22.7 million infants**, showing high absolute numbers despite strong coverage.

Why Vaccines Matter

- Vaccines save **up to 5 million lives annually**.
- Unvaccinated children are at **higher risk of deadly outbreaks**, threatening decades of progress in immunization.

IMMUNISATION IN INDIA:

- **High overall coverage: 96% of India's 22.7 million infants** received at least one routine vaccine. India now ranks among **South Asia's best performers**, surpassing **pre-COVID levels**.
- **Reduction in zero-dose children: 43% drop** in infants who received no vaccines – from **1.6 million (2023)** to **0.9 million (2024)**. India now accounts for **~6% of global zero-dose infants**, despite large population size.
- **DTP (Diphtheria, Tetanus, Pertussis) Vaccine: 92% infants received 3 doses** in 2024 (up from 90% in 2023). **95% received the first dose**, showing improved early immunisation uptake.
- **Measles Vaccine: 93% received 1st dose**, **88% received 2nd dose** in 2024. Measles cases dropped by **39%** – from **90,000 (2023)** to **~55,000 (2024)**.
- **HPV Vaccine (Cervical Cancer Prevention):** India plans **national rollout in 2025**, following Bangladesh, Nepal, and Sri Lanka's success.
- **Universal Immunisation Programme (UIP):** Covers **12 vaccine-preventable diseases** (e.g., BCG, DPT, Polio, Hepatitis-B, Hib).
- **Mission Indradhanush (2014)** & **Intensified Mission Indradhanush (IMI):** Targeted **zero-dose & partially vaccinated children** in hard-to-reach areas.

- **Electronic Vaccine Intelligence Network (eVIN):** Real-time vaccine stock monitoring for better cold-chain management.
- **Community Engagement: ASHA workers** conducting door-to-door campaigns. **Jan Andolan** approach increased awareness in rural & tribal belts.
- **Digital Tools: U-WIN Platform (2023)**: Digital tracking of child & maternal vaccination history. **CoWIN experience (COVID-19)** leveraged for routine immunisation.
- **Hard-to-reach areas:** Focused immunisation in **tribal districts**, **urban slums**, and **conflict zones (J&K, Northeast)**.
- **Community-Specific Projects:** Revival of **Namda craft women in J&K** linked with maternal immunisation. **Bru-tribe youth** in Tripura mobilised for vaccine awareness.
- Nearly **45% of vaccinated children are girls**, reducing gender disparities.
- **Mission Indradhanush Impact:** Increased **full immunisation coverage from 62% (NFHS-4, 2015-16) to 76% (NFHS-5, 2019-21)**.
- **COVID-era catch-up:** Under **IMI 4.0 (2022)**, **~3 crore children & 72 lakh pregnant women** vaccinated after pandemic disruptions.
- **South India Model:** Kerala, Tamil Nadu & Telangana consistently maintain **>95% DTP3 & measles coverage**.

SIGNIFICANCE OF IMMUNISATION IN INDIA:

Public Health Significance

- **Reduces Child Mortality:** Vaccines prevent **life-threatening diseases** like measles, polio, diphtheria, and hepatitis-B. WHO estimates **vaccines save 5 million lives globally each year**.
  - India was declared **polio-free in 2014** after decades of immunisation drives.
- **Prevents Disease Outbreaks:** High vaccine coverage creates **herd immunity**, reducing community transmission.
  - **Measles cases fell by 39% in 2024** (from 90,000 to 55,000) due to improved measles vaccine uptake.
- **Protects Maternal & Neonatal Health:** Maternal immunisation (e.g., **TT vaccine for pregnant women**) prevents **neonatal tetanus**.

Economic Significance

- **Cost-effective Healthcare:** Immunisation **reduces healthcare expenditure** by preventing expensive hospitalisation for preventable diseases.

    - Every **₹1 invested in immunisation saves ₹16 in treatment costs** (UNICEF India).
- **Boosts Workforce Productivity:** Healthy children grow into **healthy adults**, enhancing **human capital** and economic productivity.
    - Post-polio eradication, India saved **~₹3,000 crore annually** in healthcare & rehabilitation costs.
- **Protects Economy from Epidemic Shocks:** Avoids economic disruptions like seen in **COVID-19 pandemic**.

Social Significance

- **Promotes Social Equity:** Immunisation benefits the **poorest and most vulnerable**, reducing health inequalities. Mission Indradhanush targeted **urban slums, tribal belts, and conflict areas**, bridging rural–urban gaps.
- **Enhances Gender Equity:** Encouraging **HPV vaccine rollout for adolescent girls** prevents cervical cancer, a leading cause of female mortality in India.
- **Community Trust in Governance:** Successful vaccine campaigns like **Pulse Polio** improve **citizen confidence** in public health systems.

Demographic & Human Capital Significance

- **Reduces Infant & Child Mortality Rate:** India's **IMR dropped from 80 (1990) to 27 per 1,000 live births (2023)** due to better maternal & child immunisation.
- **Supports Demographic Dividend:** Healthy children → better education outcomes → skilled future workforce.
    - **NFHS-5** showed full immunisation coverage increased to **76% (2019-21)** from **62% (2015-16)**, directly linked to better child survival rates.

Global Health & Diplomatic Significance

- **Strengthens Global Health Commitments:** Aligns with **Sustainable Development Goal (SDG) 3** – Good Health & Well-being.
    - India contributes to **Immunization Agenda 2030** by reducing **zero-dose children by 43% in 2024**.
- **Vaccine Diplomacy & Leadership:** India is a **major vaccine manufacturer**, supplying **~60% of global vaccines** (Serum Institute of India).
    - **Vaccine Maitri initiative (COVID-19)** boosted India's global goodwill.

Cultural & Behavioural Significance

- **Combats Myths & Misinformation:** Successful immunisation campaigns foster **scientific temper** in communities.
  - Intensive campaigns in UP & Bihar countered polio vaccine hesitancy in early 2000s.
- **Community Engagement:** Frontline workers (ASHA) build trust, leading to better health-seeking behaviour beyond immunisation.

CHALLENGES TO IMMUNISATION IN INDIA:

High Absolute Number of Zero-Dose Children

- Even with **96% coverage**, **909,000 Indian infants remained unvaccinated in 2024**, due to India's **large birth cohort (22.7 million infants annually)**.
- India still accounts for **6% of the global zero-dose children**, highlighting the difficulty of reaching **every last child**.

Geographical & Regional Disparities

- **Hard-to-reach areas** like **tribal belts, hilly terrains (NE states), flood-prone regions (Bihar, Assam)**, and **conflict-affected districts (J&K, Chhattisgarh)** have lower coverage.
- NFHS-5 shows **immunisation coverage varies from >90% in Kerala to <60% in Nagaland & Arunachal Pradesh.**

Urban–Rural & Migrant Gaps

- **Urban slums & migrant populations** often miss routine immunisation due to **lack of documentation & mobility**. In Delhi's slum clusters, studies show **zero-dose children are 2–3 times higher** than in rural areas.

Vaccine Hesitancy & Misinformation

- Religious & cultural myths, social media rumours, and post-COVID distrust fuel hesitancy.
  - During **polio campaigns in UP & Bihar**, rumours about infertility delayed acceptance.
  - Recent HPV vaccine hesitancy due to **lack of awareness about cervical cancer**.

Supply Chain & Infrastructure Gaps

- **Cold-chain challenges** in remote areas affect vaccine potency. India has **29,000 cold chain points**, but only **~11% are fully automated with real-time monitoring (eVIN data)**.
- Shortage of trained vaccinators in underserved regions.

Inadequate Awareness & Behavioural Barriers

- Many families still lack awareness of **vaccination schedules** & benefits. NFHS-5 reports **~20% mothers in rural UP & Bihar unaware of full immunisation schedules.**

Conflict & Instability

- Areas affected by **insurgency or political unrest** face disrupted health services. **Manipur's ethnic violence (2023)** led to delayed immunisation campaigns.

WAY FORWARD:

Target Zero-Dose & Under-Vaccinated Children

- **Adopt micro-planning** at district & sub-district levels to identify last-mile pockets.
- Expand **Intensified Mission Indradhanush (IMI)** with focus on: **Urban slums, migrant camps, tribal belts & conflict areas**. Use **GIS-based mapping** like in **Bangladesh's Measles-Rubella campaign**, which achieved >95% coverage.

Leverage Digital Tools & Data Systems

- Fully implement **U-WIN platform** (childhood immunisation equivalent of CoWIN) for real-time tracking.
- Integrate **Aadhaar-based unique child health IDs** for portability across states (helpful for migrants).
- Use **AI predictive analytics** like Singapore's **HealthHub** for demand forecasting & outbreak prediction.

Combat Vaccine Hesitancy with Behavioural Interventions

- **Community engagement models**: involve **local influencers, ASHA workers, school teachers, religious leaders**.
- Run **myth-busting campaigns** on social media & local radio.
- Follow **Philippines' "Vaccine Champions" model** to counter misinformation.

Improve Supply Chain & Cold Chain Management

- Upgrade **cold-chain infrastructure** in remote districts; automate temperature monitoring.
- Use **solar-powered cold storage & drones** for hard-to-reach areas (replicate Rwanda & Ghana's **drone delivery model**).

- Strengthen **last-mile delivery using mobile vans** like Kerala's **Immunisation-on-Wheels**.

Integrate Immunisation with Primary Healthcare & NEP 2020

- Link immunisation with **maternal care & nutrition programs (ICDS, Poshan Abhiyaan)**.
- Use **schools as vaccination hubs** for **adolescent vaccines (HPV, Rubella)** like **UK's school-based HPV programme**.

Enhance Domestic Vaccine Financing & Production

- **Increase state budgets** for immunisation; reduce overdependence on donor agencies like GAVI.
- Support **local vaccine R&D & manufacturing** (Serum Institute, Bharat Biotech) to ensure affordable supply.
- Encourage **CSR funding** for outreach & awareness campaigns.

Invest in Frontline Health Workforce

- Train & incentivise **ASHA, ANMs & Anganwadi workers** for outreach in difficult terrains.
- Recruit **mobile vaccinators** for nomadic & migrant populations.
- Follow **Rwanda's community health worker model**, where each village has dedicated volunteers for vaccination follow-up.

Strengthen Surveillance & Rapid Response

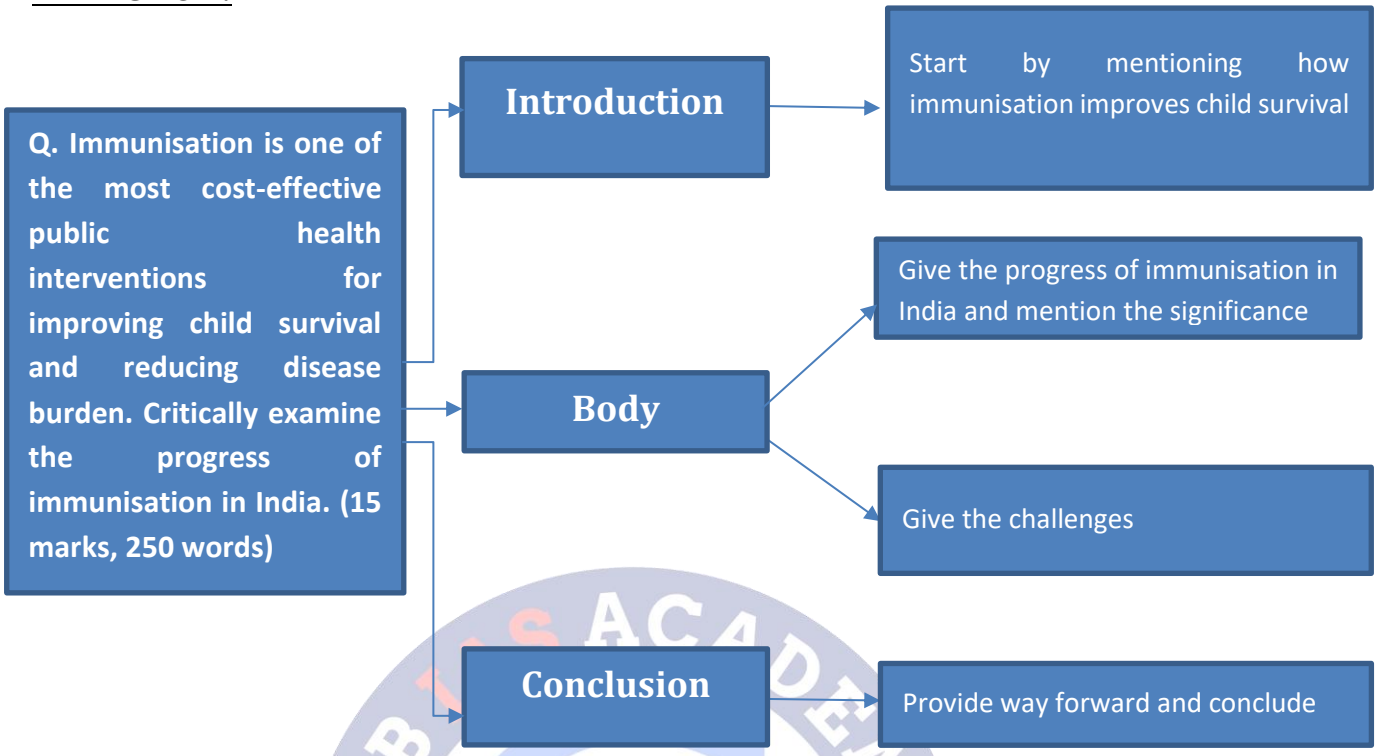
- Expand **Integrated Disease Surveillance Programme (IDSP)** for real-time monitoring of vaccine-preventable diseases.
- Conduct **periodic sero-surveys** to identify immunity gaps (similar to CDC's model in the US).

A **multi-pronged approach—digital innovation, community engagement, cold-chain upgrades, domestic financing, and new vaccine rollouts—** will help India meet **Immunization Agenda 2030 targets**, save millions of lives, and strengthen its **global health leadership**.

PRACTICE QUESTION:

Q. Immunisation is one of the most cost-effective public health interventions for improving child survival and reducing disease burden. Critically examine the progress of immunisation in India. (15 marks, 250 words)

APPROACH:



MODEL ANSWER:

Recent WHO-UNICEF data (2024) shows India achieving **96% immunisation coverage**, reducing **zero-dose children by 43%** within a year, marking significant progress towards **Immunization Agenda 2030 goals**.

Progress of Immunisation in India

- **Record Coverage:**
  - 96% of India's **22.7 million infants** received at least one vaccine in 2024.
  - **Zero-dose children reduced** from **1.6 million (2023)** to **0.9 million (2024)**.
- **Specific Vaccine Success:**
  - **DTP vaccine:** 92% received 3 doses (↑2%).
  - **Measles vaccine:** 93% received 1st dose; measles cases fell **39% (90,000→55,000)**.
- **Policy Interventions:**
  - **Mission Indradhanush & IMI** increased full immunisation coverage from **62% (NFHS-4)** to **76% (NFHS-5)**.

  - **eVIN (Electronic Vaccine Intelligence Network):** Reduced stock-outs by 80%.
  - **Digital Platforms:** U-WIN (2023) integrates child & maternal vaccination history.

- **Community Engagement:**
  - ASHA workers, tribal outreach (Bru-tribe, Namda craft revival in J&K) ensured inclusivity.

- **Public Health:** Reduced IMR to **27 per 1,000 live births (2023)**; India declared **polio-free (2014)**.
- **Economic:** Every ₹1 spent saves ₹16 in treatment costs; post-polio eradication saved ₹3,000 crore/year.
- **Social:** Promotes equity in tribal & slum areas; HPV vaccine rollout will reduce cervical cancer burden.
- **Global:** Supports **SDG 3 (Health)** and strengthens **India's vaccine diplomacy** (Vaccine Maitri).

Challenges Persisting

- **High absolute numbers:** 909,000 infants remain unvaccinated despite high % coverage.
- **Regional disparities:** Coverage >90% in Kerala but <60% in Nagaland & Arunachal Pradesh.
- **Urban slum & migrant gaps:** Zero-dose children 2–3× higher in Delhi slums vs. rural areas.
- **Vaccine hesitancy & misinformation:** Myths delay uptake (e.g., polio in UP, HPV awareness gaps).
- **Cold-chain & workforce gaps:** Only **11% cold-chain points fully automated**; shortage of vaccinators.
- **Conflict zones:** Violence in Manipur & LWE areas disrupted campaigns.

Way Forward

- **Target zero-dose children** with micro-planning & GIS mapping (Bangladesh's MR campaign model).

- **Leverage digital tools:** Full rollout of **U-WIN**, AI-based demand prediction (like Singapore HealthHub).
- **Combat hesitancy:** Use *"Vaccine Champions"* model (Philippines), local influencers & myth-busting campaigns.
- **Upgrade cold-chain & logistics:** Solar-powered storage & **drone delivery** (Rwanda model).
- **Integrate with schools & ICDS:** HPV vaccination via school-based approach (UK model).
- **Strengthen frontline workforce:** Incentivise ASHAs, mobile vaccinators for migrants & nomadic tribes.
- **Increase domestic financing:** Reduce donor dependency, boost R&D (Serum Institute, Bharat Biotech).
- **Enhance disease surveillance:** Real-time tracking via **Integrated Disease Surveillance Programme (IDSP)**.

India's immunisation journey showcases **remarkable progress**, reducing zero-dose children by **43% in one year**, but **migrant exclusion, regional disparities, and vaccine hesitancy** persist. A **multi-pronged approach—digital innovation, community engagement, cold-chain upgrades, domestic financing, and global best practices—** is vital for achieving **Immunization Agenda 2030 goals**, safeguarding child health, and enhancing India's global health leadership.