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Vaccines and Immunisation 2.0

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India firmly established its position as a global leader in vaccine manufacturing and innovation during COVID-19. After addressing the pressing global vaccine demands back then, India continued to strengthen its R&D capabilities and diversify its vaccine development strategies, while expanding immunisation programmes to tackle deadly diseases.



India has emerged as an important innovation hub for vaccine R&D. In the past few years, India has witnessed multiple outbreaks of fatal viruses such as the Nipah virus and has made significant progress in developing home-grown vaccines. In March 2025, Pune-based Genova Biopharmaceuticals received grants worth \$13.38 million to develop self-amplifying mRNA (saRNA) from the Coalition for Epidemic Preparedness Innovations (CEPI). Genova will play a crucial role in validating the potential of the saRNA platform for vaccine development against nipah virus. The vaccine manufacturer aims to set new benchmarks using its saRNA platform. Genova will also collaborate with the Houston Methodist Research Institute (HMRI), and deploy advanced AI technology to accelerate vaccine development research.

In 2025, CEPI, Serum Institute of India and the University of Oxford entered a collaboration to manufacture ChAdOx1 NipahB vaccines for Phase II trials. Funding of \$7.3 million from CEPI will be used by Serum Institute of India for manufacturing of the NipahB vaccine candidate and create an investigational ready reserve of up to 100,000 doses making it the world's largest reserve of nipah virus vaccine. Upon successful completion of clinical trials, ChAdOx1 NipahB vaccine could be the world's first vaccine against nipah virus.

Another notable development is the phase I clinical trials for a fully home-grown vaccine against Kyasanur Forest Disease (KFD), a tick-borne viral infection, which causes 300-500 infections annually among communities in the Western Ghats. Early this year, the Indian Council of Medical Research (ICMR) completed animal studies for the two-dose adjuvanted inactivated vaccine, which has now progressed to clinical trials.

Apart from focusing on developing vaccines for deadly viruses with no commercially available vaccines, India is also investing in developing advanced/ enhanced vaccines to overcome re-emergence of diseases such as TB and Malaria. Researchers at the Indian Institute of Technology (IIT) Bhubaneswar, in collaboration with the Institute of Life Sciences (ILS) Bhubaneswar, are developing India's first indigenous, next-generation subunit vaccine against tuberculosis (TB). Last year, pre-clinical trials were successfully completed for the next-generation TB vaccine Hsp16.3C4. Hsp16.3C4 is a superior vaccine candidate compared to the traditional TB immunisation approaches. Researchers have integrated the use of advanced biotechnology and AI to develop the Hsp16.3C4 vaccine.

Promoting high-performance and sustainable biomanufacturing

In 2024, the government of India approved the BioE3 (Biotechnology for Economy, Environment and Employment) Policy to promote high-performance, scalable and sustainable biomanufacturing. The BioE3 policy will help India achieve its long-term

vision of economic self-reliance, environmental sustainability, and global leadership in science.

The strong vaccine manufacturing infrastructure set up in India over the past decade has led to the scale-up of vaccines for hepatitis A, cholera, meningitis, pneumonia, shingles, and cervical cancer, catering to domestic and global requirements. In September 2025, ICMR granted manufacturing and commercialisation licenses for its indigenous multi-stage malaria vaccine AdFalcivax's to Indian Immunologicals, Techinvention Lifecare, Panacea Biotech, Biological E, and Zydus Lifesciences. This public-private collaboration will boost India's vaccine manufacturing capability to address malaria.

Global pharmaceutical players such as Takeda also see a huge potential to tap into the Indian market demand for vaccines. Takeda aims to launch their dengue vaccine, Qdenga, in India in 2026. Takeda has collaborated with Biological E for its manufacturing capabilities to scale up Qdenga under the Make in India Initiative. This collaboration is expected to produce 50 million doses of QDENGAs per year.

Commitment toward large scale immunisation programmes for public impact:

India's efforts toward immunisation programmes have been commendable, with growing expansion of public coverage. India marked a significant milestone at the start of 2026, with World Health Organization (WHO) granting prequalification (PQ) status to the novel oral polio vaccine type 2 (nOPV2) developed by India's Biological E. The company's new polio vaccine is genetically designed to be more stable compared to traditional polio vaccines. This allows Biological E to become the second full nOPV2 manufacturer to not only eliminate polio risks and lead immunisation programmes in India, but also support global polio eradication programmes. Bharat Biotech, a global leader in manufacturing of oral polio vaccines, and Bilthoven Biologicals B.V., (BBio), a wholly owned subsidiary of Serum Institute of India Private Limited, have collaborated for the production and supply of oral polio vaccines (OPV) within India and globally.

To address immunisation needs at home, India has set up notable immunisation programmes such as the Universal Immunisation Programme (UIP) catering to 30 million pregnant women and 27 million newborns annually. The programme protects a broad range of diseases, such as measles, diphtheria, and polio. India successfully brought down its number of zero-dose children from 1.6 million in 2023 to 0.9 million in 2024 as per WHO and UNICEF reports.

India's efforts in preventing cervical cancer also continue to grow strong. In February 2026, the central government of India launched a programme called the Swastha Nari Mission, a free nationwide HPV vaccination drive aimed at vaccinating girls of 14 years of age.

Under this programme, 1.2 crore adolescent girls turning 14 years every year are expected to be vaccinated. Gardasil (quadrivalent HPV vaccine), protecting against four Human Papilloma Virus (HPV) types (6, 11, 16, 18) is to be administered under the programme. Apart from central government initiatives, state governments are also taking independent initiatives to reduce the incidence of cervical cancer. The Telangana government launched a statewide HPV vaccination programme and procured 4.6 lakh doses of Gardasil to vaccinate adolescent girls.

Digital mapping of the vaccine supply chain and immunisation rollout

India's digital platforms supported by the United Nations Development Programme (UNDP), such as the U-WIN and eVIN (Electronic Vaccine Intelligence Network), have played an important role in strengthening UIP and bringing out commendable immunisation outcomes. Using Electronic Vaccine Intelligence Network (eVIN), which is a smartphone and cloud technology-based app, it has been easy to track information on the vaccine stock and temperatures across the country, enabling a smooth vaccine supply chain and ensuring vaccine availability on time.

U-WIN, an electronic vaccination registry was launched as a pilot programme in 2024 to address gaps in vaccination and aims to strengthen the UIP. Since launch, it has been scaled across the nation and as of February, 2026, 11.12 crore children and 3.78 crore pregnant women have been registered on the U-WIN portal.

An advanced edition of the eVIN has also been launched, enabling an end-to-end supply chain solution for tracking vaccines from manufacturers to vaccination sites. These digital platforms have significantly improved transparency, efficiency, and resilience in the vaccine supply chain and will remain central to ensuring equitable access to all.

India poised to grow in vaccine manufacturing and innovation

India continues to support indigenous vaccine developers, create a collaborative environment for R&D, manufacturing, and commercialisation of next-generation vaccines along with rising deployment of digital tools for vaccine design and optimisation. India's focus on volume and value has resulted in an advantageous position to emerge as both R&D hub as well as a manufacturing leader. Overall, India remains committed to producing high-value vaccines, expanding strategically, and

investing in digital platforms to retain its position as a global leader in vaccine manufacturing.

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