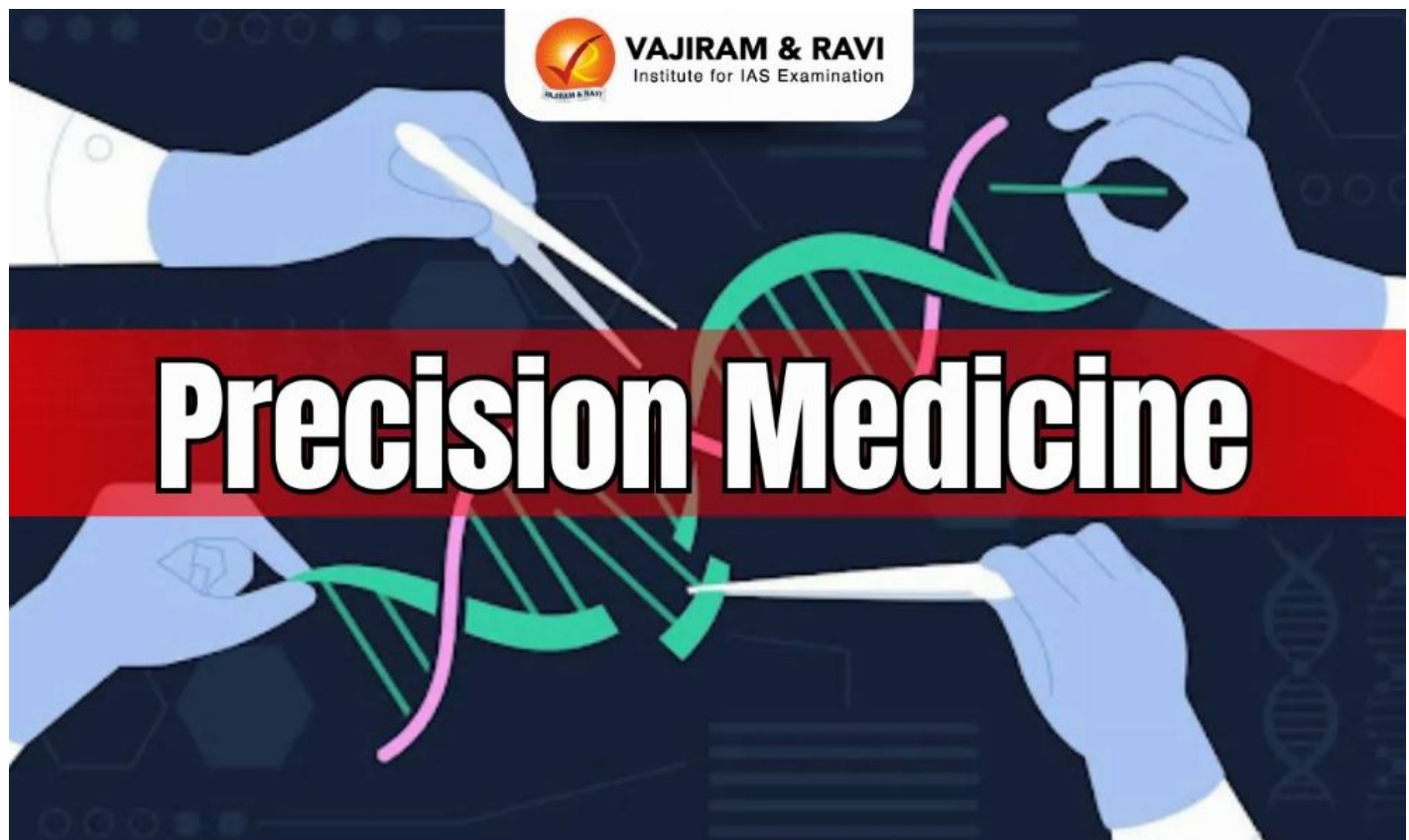


India's Role in Global Precision Medicine Market - Explained

November 17, 2025 • vajiramandravi.com



Precision Medicine Latest News

- The **global precision medicine market** is expanding rapidly, projected to cross \$22 billion by 2027, with India emerging as a key player.

Precision Biotherapeutics

- **Precision biotherapeutics** refers to medical interventions optimised for a patient's **specific genetic or molecular profile**, rather than relying on generalised population-level data.
- This approach allows for **early diagnosis, personalised treatment, and fewer adverse effects**.
- Key technologies shaping this field include:
 - **Genomic and Proteomic Analysis:** Decoding individual genetic and protein signatures to identify disease-causing mutations.

- **Gene Editing Therapies:** Tools like **CRISPR-Cas9** modify defective genes to correct underlying causes of disorders such as **thalassemia** and **sickle-cell anaemia**.
- **mRNA and Nucleic Acid Therapeutics:** These therapies, popularised during the COVID-19 pandemic, use RNA molecules to instruct cells to produce or suppress specific proteins.
- **Monoclonal Antibodies and Biologics:** Laboratory-engineered molecules that precisely target disease-related proteins, used in treatments for **cancer, rheumatoid arthritis, and autoimmune diseases**.
- **AI-Driven Drug Discovery:** Machine learning models analyse vast datasets to predict molecule interactions, accelerating the discovery of new drugs.
- Together, these technologies represent a shift from **symptom management** to **disease correction at the molecular level**, offering transformative potential for chronic and genetic illnesses.

The Global Precision Medicine Landscape

- The precision medicine industry has seen exponential growth over the past decade.
- According to **Precedence Research**, the global market, valued at approximately **\$12 billion in 2023**, is expected to surpass **\$22 billion by 2027**.
- **Key drivers of this growth include:**
 - Advances in **next-generation sequencing (NGS)** and **gene editing technologies**.
 - Rising prevalence of **non-communicable diseases (NCDs)** like cancer, diabetes, and cardiovascular disorders.
 - Integration of **AI and big data analytics** in clinical decision-making.
 - Increased investment from pharmaceutical and biotech companies in personalised drug development.
- The United States, Europe, and China currently lead global innovation in precision medicine.
- However, developing economies like **India** and **Brazil** are fast emerging as competitive hubs due to their **cost advantage, skilled workforce, and growing genomic research infrastructure**.

India's Position in the Precision Medicine Ecosystem

- India contributes nearly **65% of deaths** from **non-communicable diseases**, underscoring the need for advanced diagnostic and therapeutic approaches.
- The country's **diverse genetic landscape**, one of the most complex in the world, makes it an ideal testing ground for precision biotherapeutics.
- **Research and Institutional Strength**
 - The **Department of Biotechnology (DBT)** has identified **precision biotherapeutics** as one of six focus areas under its **Biotechnology for Economy, Environment, and Employment (BioE3)** policy.
- **Genomic Initiatives and Localisation**
 - Projects like **GenomeIndia** and **IndiGen** are building reference genomic databases representing India's vast population diversity.
 - Such datasets enable **customisation of global drug molecules** to Indian genetic profiles, addressing the common issue where **foreign-developed drugs** show **reduced efficacy** among

Indian patients.

- **Challenges Hindering India's Precision Medicine Growth**

- **Regulatory Gaps:** There is no unified framework governing gene and cell therapies. Current regulations are fragmented and unclear on therapeutic use.
- **High Cost and Limited Access:** Advanced biotherapeutics remain **affordable only to urban elite**, with costs running into lakhs per treatment.
- **Manufacturing Bottlenecks:** India lacks large-scale facilities for biologics and cell-based therapies, forcing dependence on imports.
- **Ethical and Data Privacy Concerns:** Genomic data, if not protected by robust **data protection laws and consent frameworks**, risks misuse and discrimination.
- Addressing these gaps is crucial for India to emerge as a trusted global leader in **affordable precision healthcare**.

Opportunities for Growth

- India's advantages lie in its **cost-effective research environment, data analytics capabilities**, and **biotechnology talent pool**.
- By fostering **public-private partnerships**, strengthening **biomanufacturing infrastructure**, and creating **ethical genomic data-sharing frameworks**, India can:
 - Localise global therapies at lower costs.
 - Expand precision medicine access to rural populations.
 - Attract international investment in **R&D and clinical trials**.
- Collaborations with global institutions, coupled with government support under **'Make in India' for Biotech**, could position India as a **global hub for precision therapeutics** in the next decade.

Source : **TH**

Source: <https://vajiramandravi.com/current-affairs/global-precision-medicine/>

© Vajiram & Ravi. For personal use only.