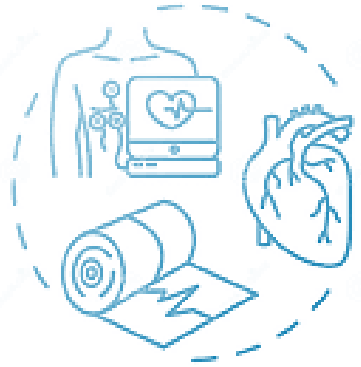
TO STUDY THE CURRENT SCENARIO OF CARDIOVASCULAR MEDICAL DEVICE INDUSTRY IN INDIA



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INTRODUCTION

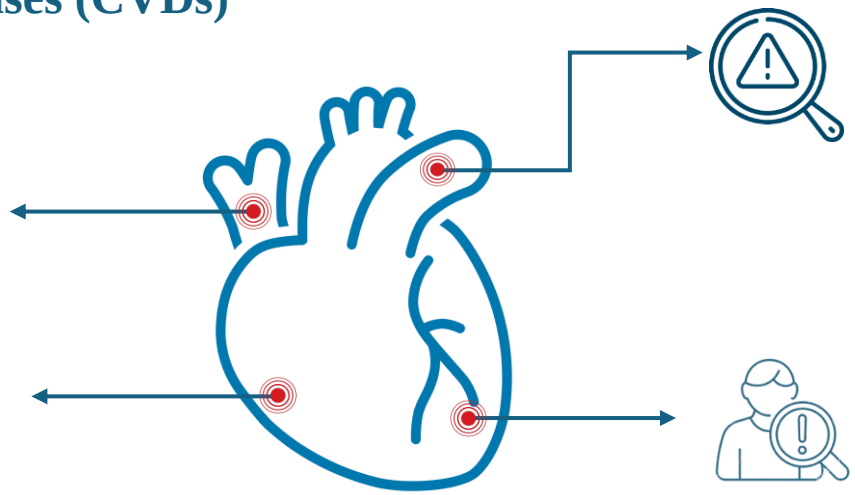
Cardiovascular Diseases (CVDs)

235 per 1,00,000

Global CVD death

India CVD death

272 per 1,00,000



Smoking | Hypertension | Diabetes | Obesity | Genetic Predispositions

Chest Pain | Pain in other parts | Shortness of Breath | Fatigue | Swelling

Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. They include:

- **Coronary heart disease:** Disease of blood vessels supplying the heart.
- **Cerebrovascular disease:** Disease of blood vessels supplying the brain.
- **Peripheral arterial disease:** Disease of blood vessels supplying arms and legs.
- **Rheumatic heart disease:** Heart damage from rheumatic fever caused by streptococcal bacteria.
- **Congenital heart disease:** Birth defects affecting heart structure and function.
- **Deep vein thrombosis and pulmonary embolism:** Blood clots in leg veins that can dislodge to heart and lungs.

Global Impact of CVDs

- CVDs are the world's leading cause of death, accounting for **20.5 million** deaths in 2021, representing one-third of all deaths globally.
- Over **75% of CVD deaths** occur in low- and middle-income countries (LMICs), contributing significantly to premature non-communicable disease (NCD) mortality.
- Ischemic heart disease is a **leading** cause of premature death in many countries.

CVDs Burden in India

- **Leading Cause of Mortality**: CVDs are the leading cause of death in India, with ischemic heart disease (IHD) and stroke being the most prevalent types.
- **Growth Prospects for Cardiovascular Medical Devices:** Promising growth due to expanding healthcare infrastructure and technological advancements and Increased demand for advanced diagnostic tools, therapeutic devices, and surgical interventions.
- **Technological Innovations:** Advancements in AI and minimally invasive procedures are improving treatment outcomes and patient care.
- **Challenges in Reducing Mortality Rates**: Slower declines in age-standardized mortality rates in lower-income segments.
- **Sector Challenges:** Regulatory complexities, quality assurance standards, pricing pressures, and competition from global manufacturer and Ensuring equitable access to advanced medical technologies across diverse socio-economic segments.

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LITERATURE REVIEW

Sr. No.	Title of the Study	(Author/s, Year)	Objective/s	Key Findings
1.	An Overview of India's Cardiovascular Medical Device Market	Sharma P., Singh R., and A. Gupta (2023)	To provide a comprehensive analysis of the Indian cardiovascular medical device market, including market dynamics, legislative frameworks, technological developments, and emerging opportunities.	Detailed examination of market size, growth patterns, and key players. Highlights legislative frameworks, technological advancements, and market opportunities, addressing investment strategies and healthcare policy implications.
2.	Innovation and R&D Trends in Indian Cardiovascular Device Industry	Kumar V, Singh A. (2024)	To analyze current R&D developments in India's cardiovascular medical device market, highlighting innovative technologies, research goals, and collaborative projects.	Highlights new areas of innovation and investment. Reveals patterns of innovation dispersion and technology transfer. Discusses implications for knowledge spillovers, industry-academia links, and intellectual property rights.
3.	Challenges in Accessing Cardiovascular Devices in Rural India	Patel R, Desai M. (2023)	To investigate the challenges and barriers to accessing cardiovascular medical devices in rural India, focusing on socioeconomic status, healthcare system, and regulations.	Identifies context-specific obstacles and enablers to healthcare access. Emphasizes the need for inclusive and equitable healthcare delivery. Discusses implications for community engagement, technology adaptation, and health system improvement.

Sr. No.	Title of the Study	(Author/s, Year)	Objective/s	Key Findings
4.	Cost Analysis of Treating Cardiovascular Disorders in a Super-Specialty Hospital	Kumar et al. (2022)	To evaluate the resource utilization in treating cardiovascular disorders in a super-specialty hospital, focusing on common CVDs such as CAD, RHD, cardiomyopathy, congenital heart diseases, and cardiac arrhythmias.	Highlights the importance of economic analyses in healthcare. Provides insights for policymakers on improving healthcare quality and cost-effectiveness. Addresses the need for tailored approaches to optimize resource allocation in cardiovascular treatment.
5.	The Expanding Significance of Artificial Intelligence in Cardiology	Gupta et al. (2022)	To explore the growing role of AI in cardiology, defining AI and its applications, particularly in data analysis and image recognition.	Highlights machine learning types (supervised, unsupervised, reinforcement learning) and deep learning, specifically convolutional neural networks (CNNs) for image recognition. Provides foundational insights into AI's applications in cardiology.
6.	International Collaborations and Partnerships in Indian Cardiovascular Device Sector	Patel S, Singh R, Kumar A. (2024)	To investigate global alliances and partnerships that drive innovation in India's cardiovascular medical device market, focusing on joint ventures, collaborations, and technology transfers.	Highlights successful joint ventures and collaborations. Promotes cross-border partnerships and knowledge exchange. Discusses implications for market access, regulatory convergence, and technological diffusion. Emphasizes the role of international networks in promoting innovation and market expansion.

METHODOLOGY

Research question

- What are the key factors driving the growth and development of the cardiovascular medical device industry in India, and how are they influencing market dynamics?

Study Methodology

Type of study: Secondary Research

Study Design: Descriptive exploratory study

Source of Data: Secondary data was collected from research papers, publications, journals, government websites, news articles etc

Objective

- To analyze the current trends in the cardiovascular medical device industry in India, with a focus on market size, regulatory landscape, technological advancements, and key players.

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RESULTS

MedTech sector growth in India

Market Growth

- India's MedTech market has been growing at a compound annual growth rate (CAGR) of 12%, significantly outpacing the global average of 4.1% per year.

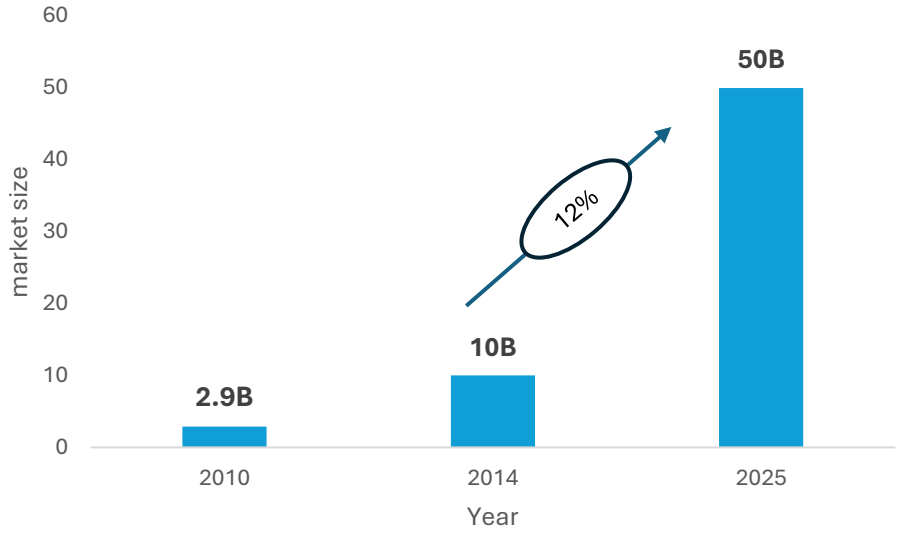
Projected Size

- The Indian MedTech market is projected to reach USD 50 billion by 2025, driven by factors such as an aging population, increasing private sector investments, rising income levels, and government support.

Global Ranking

- India is ranked among the top 20 MedTech markets globally and stands fourth in Asia, following South Korea, Japan, and China, highlighting its strategic importance in the region.

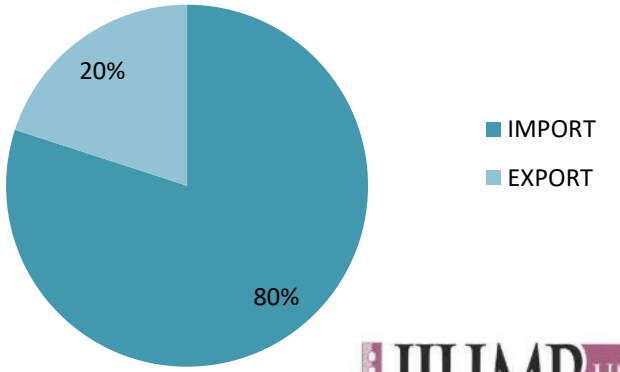
MedTech sector growth in India



Export & Import of Medical devices in India

- The demand and supply of services in India's healthcare sector are significantly out of balance
- India has an overall 80% imports of medical devices. In 2022-23, India exported medical devices worth US$ 3.39 billion and imported medical devices valued at US$ 7.49 billion.

Export & Import of Medical devices in India



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Medical device clusters in India

- **Geographical Concentration:** Chennai, Bengaluru, Mumbai, and Pune serve as prominent centers for manufacturing medical devices and equipment.
- **Cluster Distribution:** 21 medical device clusters across India spawning Medical Device Park.
- **Geographical region wise finding :** There are 10 medical devices clusters in North region, while 6 clusters are in West region and 5 clusters are in South region.
- **Government Initiatives:** States like Madhya Pradesh, Uttar Pradesh, Himachal Pradesh, and Tamil Nadu are actively establishing Medical Device Parks to the country's medical device manufacturing sector, aligning with the government's "Make in India" initiative which prioritizes the medical devices industry.

Safety of Cardiovascular Devices: The Materiovigilance Programme of India (MvPI)

Purpose of MvPI

Established to ensure the security of medical equipment, with a particular focus on cardiovascular devices

National Coordination Centre

Since 2018, the Indian Pharmacopoeia Commission (IPC), part of the Ministry of Health and Family Welfare (MHFW), has served as the National Coordination Centre (NCC) for the MvPI.

Data Collection and Analysis

The MvPI aims to gather, compile & analyze voluntarily reported adverse events associated with medical devices, especially cardiovascular devices, to ensure their safe use.

Evidence-Based Information

Support the safe use of cardiovascular medical devices.

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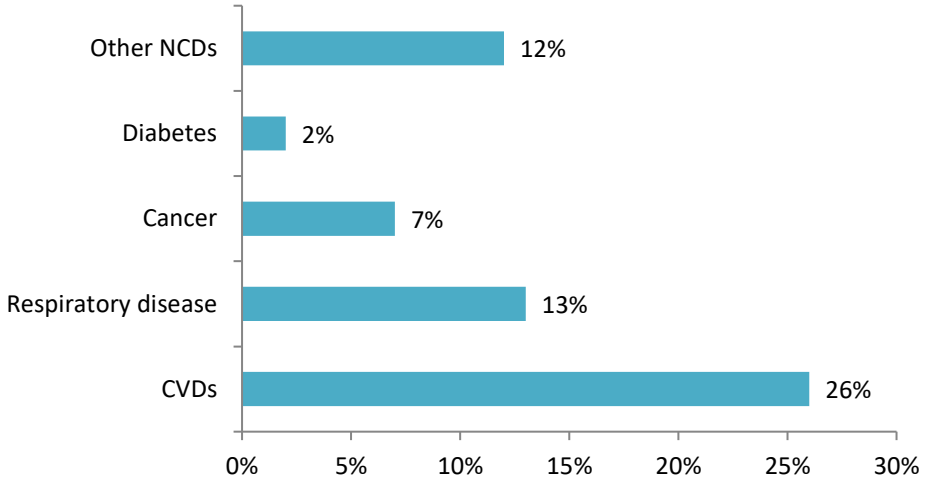
CVDs burden in India

- **Prevalence :** CVDs account for nearly 26% of all deaths in India.
- **Leading Causes:** Over 80% of CVD deaths are due to ischemic heart disease and stroke.
- **Stroke and Chronic Heart Disease:** 2.7% of older adults have a stroke diagnosis; 5.2% have chronic heart disease.
- **Age Group 25-69 Years:** CVDs account for more than 57% of all deaths in this age group
- **Early Onset:** The average age of the first myocardial infarction in India is 53 years, about ten years younger than in wealthier countries.

Annual death in India due to NCDs



Risk factors associated with CVDs in India

Smoking: Contributes 15-20% to the incidence of CVD.

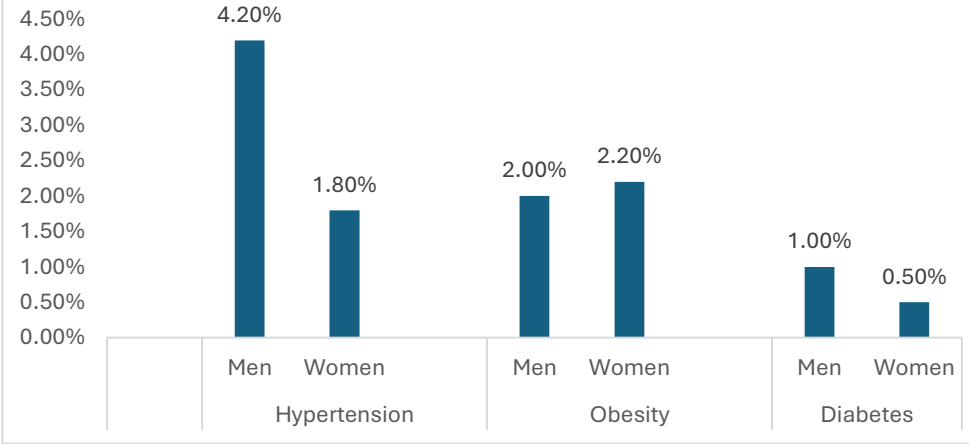
Lifestyle Risk Factors: Physical inactivity, poor dietary habits, stress, and excessive alcohol consumption.

Genetic Predispositions: Contributes 5-20% to the total CVD burden.

Obesity: Higher incidence in women leading to CVDs.

Diabetes and Hypertension: Higher incidence in men.

Gender specific annual Incidence of Obesity, Hypertension, and Diabetes



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Affordability of Cardiac Care in India

- **Cost per Patient in India:** Average total cost for treating CVD per patient is INR 2,47,822.
- **Most Expensive Treatments:** Rheumatoid Heart Disease is the most expensive, followed by Cardiomyopathy
- **Cost Comparison:** The cost of managing CVDs in India is significantly lower compared to affluent nations due to variations in healthcare infrastructure, resource availability, and economic factors.

Category	Cost (INR)
Per bed per day	
Cardiac care unit	28,144
Adult cardiology ward	22,210
Pediatric cardiology ward	18,774
Composition of inpatient cost	
Equipment	1,73,475 (50%)
Human resource	69,198 (28%)
Total per patient cost for CVD treatment	**2,47,822**

Affordability of Cardiovascular Medical Devices

Rural households with low income makes devices like pacemakers unaffordable.

Price Caps: National Pharmaceutical Pricing Authority (NPPA) with low pricing strategy.

Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY) provides up to INR 5,00,000 per family for surgeries.

Make in India Program: Boosts domestic production, reducing dependency on imports and lowering costs.

CVDs	Cost (INR)	Interventions
Pacemakers	50,000-2,50,000	Costly for rural households with incomes often less than INR 10,000 per month.
Imported stents	25,000-2,00,000	More expensive due to import fees, taxes, and distribution expenses.
Locally Made Stents	7,500 - 40,000	Affordable compared to imported stents.
Drug-Eluting Stents	Price capped at 30,000	Price cap imposed by the National Pharmaceutical Pricing Authority (NPPA).
Bioresorbable Stents	Price capped at 27,000	Price cap imposed by the National Pharmaceutical Pricing Authority (NPPA).

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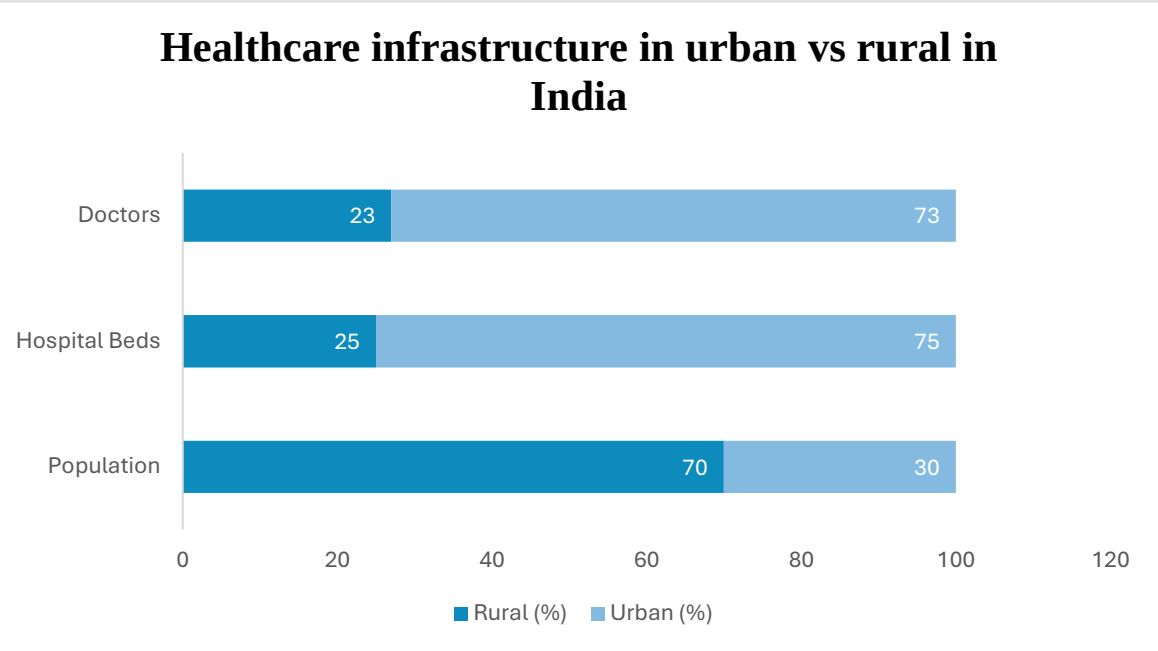
Healthcare challenges in India

- **Shortage of Healthcare Professionals:**
  - India has 0.7 physicians per 1000 people, half the world average of 1.5.
  - Significantly lower doctor density than China (1.9) and Brazil (1.9).

- **Insufficient Healthcare Infrastructure:**
  - Government healthcare funding is only 1% of GDP.
  - India has 0.7 hospital beds per 1000 people.



- **Urban vs. Rural Healthcare Disparity:**
  - 70% of Indians live in rural areas, but most healthcare resources are in cities.
  - Rural areas face inadequate infrastructure and a shortage of qualified medical personnel.
  - Urban areas have better access to advanced medical technology and private healthcare.

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Innovations in the cardiac care and cardiovascular medical device sector in India

Sr.No	Company / Institution	Innovations	Key Points
1.	GE Healthcare	AI-powered Cath lab products	Enhances procedural speed, diagnostic accuracy, and patient outcomes using AI in angiography.
2.	Sahajanand Medical Technologies	Drug-eluting stents (DES) tailored for Indian anatomy and diseases	Exclusive distributor for Penumbra's thrombectomy technologies in India.
3.	SS Innovations	SSI Mantra - Made-in-India surgical robots	Advanced robotic system for cardiac and major surgeries, including recent international installations.
4.	Opto Circuits (India) Ltd.	Defibrillators, cardiac catheters, monitoring systems	AI-driven analytics and remote monitoring for optimized cardiac care.
5.	Medtronic India	Cardiac resynchronization devices, defibrillators, pacemakers	Cutting-edge technologies addressing complex cardiac conditions.
6.	SCTIMST	Domestic cardiac implants and devices (biodegradable stents, heart valves)	Aim to reduce dependency on foreign medical equipment.
7.	IIT Guwahati	Recombinant Protein Toolbox for cardiomyocyte transformation	Potential applications in regenerative medicine and customized cardiac therapy.
8.	Tricog Health	AI-driven tools for STEMI Program	Improves emergency cardiac care through prompt detection and treatment.
9.	Portea, AliveCor, NanoHealth	Heart Smart Initiative - Smart device-based cardiac care services	Offers comprehensive cardiac care at home with personalized health management tools.
10.	Cardiac Design Labs	MIRCaM - Mobile Intelligent Remote Cardiac Monitor	Real-time ambulatory monitoring and diagnosis of heart conditions, enhancing rural healthcare access.

CONCLUSION

Opportunities

- **Aging Population**: Increasing demand for cardiac care products due to a growing elderly population.
- **Rising Prevalence of CVDs**: Higher incidence of cardiovascular diseases necessitates advanced medical devices.
- **Expanding Market Base**: Investment opportunities in technologies that improve longevity and quality of life.
- **Growing Healthcare Needs**: Demand for devices that address age-related cardiovascular illnesses.

Challenges

- **Limited Awareness**: Significant knowledge gaps about cardiovascular health, especially in rural areas.
- **Healthcare Workforce Shortages**: Lack of cardiologists, nurses, and technical staff impacts patient care.
- **Inadequate Infrastructure**: Low hospital bed-to-population ratio and overcrowded medical facilities.
- **Affordability Issues**: High cost of cardiovascular devices and procedures limit access for economically disadvantaged populations.

Innovations

- **AI-Driven Diagnostics**: Enhanced patient monitoring and diagnosis through artificial intelligence.
- **Wearable Technology**: Advanced gadgets for continuous health tracking and monitoring.
- **Telemedicine** : Remote healthcare delivery and consultation, especially for rural areas.
- **Minimally Invasive Surgery**: Improved surgical methods with reduced recovery time and risk.
- **Next-Generation Devices** : Development of advanced medical devices tailored to India's healthcare needs.

Government Initiatives

- **Make in India Campaign**: Emphasis on local manufacturing and innovation in the medical device sector.
- **National Medical Devices Policy, 2023**: Regulatory simplification and support for indigenous production.
- **Production Linked Incentives (PLI):** Fiscal policies to encourage manufacturing and research.
- **Public-Private Partnerships** : Collaboration between sectors to boost technological advancements.

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RECOMMENDATION

Raise Public Knowledge

Extensive health education programs on cardiovascular diseases and preventive strategies.

Expand Healthcare Infrastructure

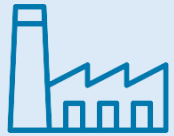
Invest in building and renovating healthcare facilities, including clinics and hospitals.

Increase the hospital bed-to-population ratio, especially in underserved areas.

Boost Medical Education and Training

Enhance training programs for cardiology and critical care specialties.

Offer financial incentives and professional development opportunities to attract healthcare workers to rural and remote areas.



Promote Local Manufacturing and Innovation

Support initiatives under the "Make in India" campaign and National Medical Devices Policy, 2023.

Provide fiscal incentives, research grants, and technological infrastructure to encourage local production of medical devices.

Leverage Technological Advancements

Embrace telemedicine platforms, digital health technologies, AI-driven diagnostics, and remote monitoring solutions.

Promote the adoption of digital health technologies to improve patient outcomes and healthcare delivery efficiency.

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Thankyou

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