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NSDC CONNECT

March 2025 Issue - 18

HEAL IN INDIA, HEAL BY INDIA

SKILLS, LIVELIHOODS AND OPPORTUNITIES IN THE HEALTHCARE SECTOR

CHAMPIONING HEALTH FOR VIKSIT BHARAT

HEALTHCARE SECTOR SKILL COUNCIL

BRIDGING THE GLOBAL HEALTHCARE GAP

INDIAN SKILLED TALENT FOR GLOBAL HEALTH

FUTURE OF INDIA'S PUBLIC HEALTHCARE SYSTEM

SKILLS, JOBS & OPPORTUNITIES

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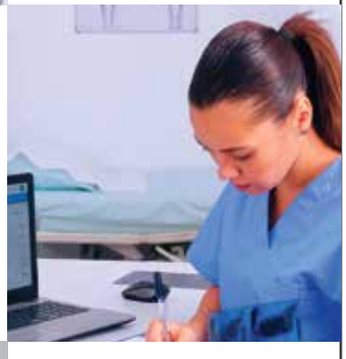


Editor's Note

Welcome you to the eighteenth issue of NSDC Connect!

As the World Health Organization projects a staggering shortage of over eleven million healthcare workers by 2030 across the world, the urgency to find sustainable solutions has never been more apparent. For India, this includes strengthening its domestic healthcare systems as well as utilizing the international mobility landscape in healthcare to create new avenues of growth for the youth.

This edition shines a spotlight on the healthcare sector in India. The recent union budget underscores the importance of investment in healthcare with a ₹99,858.56 crore allocation towards the Ministry of Health and Family Welfare. This increased funding aims to transform the medical infrastructure, education, and service access across the country and beyond. Healthcare is fundamental to India's growth, and this issue seeks to further understand and inform our readers about the healthcare skilling ecosystem in India, its challenges, and the opportunities for future.

Our Spotlight feature examines the critical work of the Healthcare Sector Skill Council, examining how they are adapting training programs to meet international standards and facilitate seamless global mobility for Indian healthcare professionals. This initiative aligns with the National Skill Development Corporation's (NSDC) and the Ministry of Skill Development and Entrepreneurship's (MSDE) broader vision of enhancing healthcare training quality and creating secure migration pathways.

In our Deep Dive sections, we explore the intricate dynamics of international mobility in the healthcare sector. We analyse the specific skill demands in key destination countries and examine the evolving policy frameworks that govern healthcare worker migration. In another article under Deep Dive, we provide an overview of the Indian Public Health Care System, highlighting the strengths and challenges that shape our domestic healthcare landscape and contribute to our global workforce potential.

In this edition we feature a Budget Special that looks at how strategic investments in skills development can address the healthcare workforce gap. We examine the budgetary allocations and policy initiatives that support the skilling and international placement of Indian professionals.

Our Impact Story highlights the transformative power of technology in skilling. We focus on the integration of cobots in training programs, illustrating how innovation can enhance the quality and efficiency. As always, NSDC Highlights and News Bytes section brings the recent initiatives taken by NSDC to empower Indian youth with globally relevant skills.

This edition of NSDC Connect is a call to action. We invite you to join us in exploring the vast potential of India's healthcare workforce and in shaping a healthier, more equitable future for all.

Warm regards,

Jai Hind!

Ved Mani Tiwari - CEO, NSDC

NSDC Connect embodies NSDC's values: Integrity, Innovation, Inclusion, and Impact. We aim to provide trustworthy, innovative, and inclusive content that aims to make a positive impact on education and skill development. Join us in reimagining a better future.

RE IMAGINE FUTURE

SPOTLIGHT

CHAMPIONING HEALTH FOR VIKSIT BHARAT: HEALTHCARE SECTOR SKILL COUNCIL

The spotlight article for this issue focuses on the skills and livelihoods landscape for the healthcare sector in India and the role of the Healthcare Sector Skill Council (HSSC), which is pivotal in transforming India's healthcare workforce by offering training, upskilling, and certification programmes across various healthcare domains. With a focus on workforce development, HSSC addresses challenges like professional shortages and evolving healthcare needs, ensuring that India's healthcare sector remains competitive and future ready.

Ashish Jain, CEO

Healthcare Sector Skill Council

Mr. Jain is a seasoned management professional with over 27 years of experience spanning various sectors and industries. He serves as the CEO of the Healthcare Sector Skill Council (HSSC) & has been instrumental in shaping the skill development landscape in the healthcare sector. In addition to his role as CEO, Mr. Jain also serves as the Joint Apprenticeship Advisor and has established a distinguished career working in collaboration with government bodies, industry stakeholders, academic institutions, global standards organizations, and multilateral entities.

Dr. Smita Saxena, Assistant Manager

Healthcare Sector Skill Council

Dr. Smita Saxena is a healthcare professional working in the capacity of assistant manager at healthcare sector skill council. She is instrumental in defining quality and accreditation standard across verticals of healthcare delivery system.

Introduction

As India strides toward its goal of becoming a developed nation by 2047, the healthcare sector remains a critical pillar of socio-economic development. With a population exceeding 1.4 billion, the nation faces both challenges and opportunities in ensuring equitable access to quality healthcare.

India's healthcare sector has emerged as a formidable economic force, driving substantial contributions to the nation's GDP, employment generation, and foreign exchange earnings. Currently valued at over US$ 638 billion, the sector continues to demonstrate remarkable resilience and potential for expansion. The healthcare sector stands as one of the nation's largest employment generators, providing livelihoods to approximately 7.5 million people across various specializations and skill levels.

The growth trajectory across multiple domains has strengthened India's global healthcare position. The AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy) market is projected to increase exponentially from US$ 43.3 billion to US$ 200 billion by 2030, reflecting both domestic demand and growing international recognition of India's ancient healing traditions.

To meet the growing demands of the healthcare industry and build a strong healthcare system, the Healthcare Sector Skill Council (HSSC) is leading workforce training, upskilling, and competency-based certifications across various healthcare domains. Its efforts play a crucial role in strengthening India's healthcare infrastructure and ensuring the sector remains a vital pillar of the nation's socio-economic development.

Key Highlights

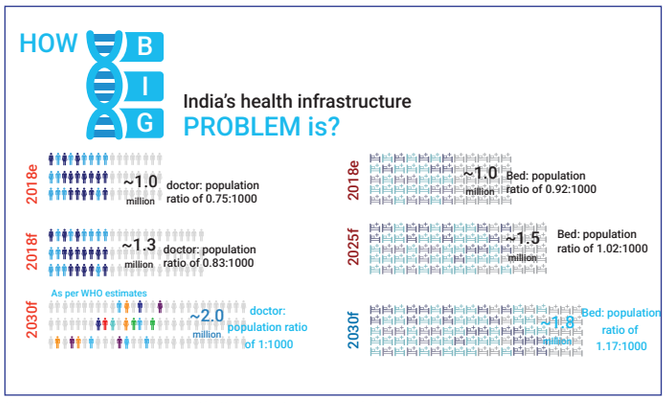
1. Healthcare industry is valued at US$ 638 billion and employs approximately 7.5 million people in India.
2. The demand for Allied Health Professionals (AHPs) is on the rise and is projected to grow to 9.6 million by 2030.
3. Healthcare Sector Skill Council (HSSC) is actively working towards standardizing workforce management practices.
4. HSSC is also focused on futuristic skill development, including AR/VR, simulation, precision medicine, robotic surgery, advanced medical devices, AI-driven diagnostics, clinical decision support tools etc to prepare the workforce for next-generation healthcare.

Demographic Shifts, Challenges, and Opportunities in Healthcare

Despite significant progress, India's healthcare sector faces several challenges. The shortage of healthcare professionals

is a pressing issue, with doctors and nurses per 1,000 people falling short of World Health Organization recommendations. There is also a substantial deficit of Allied and Healthcare Professionals, including technicians, optometrists, and radiographers. Investments in care infrastructure and services, particularly in rural and underserved areas, remain inadequate. Expanding access to affordable and quality care for children and the elderly requires a greater need for highly qualified individuals.

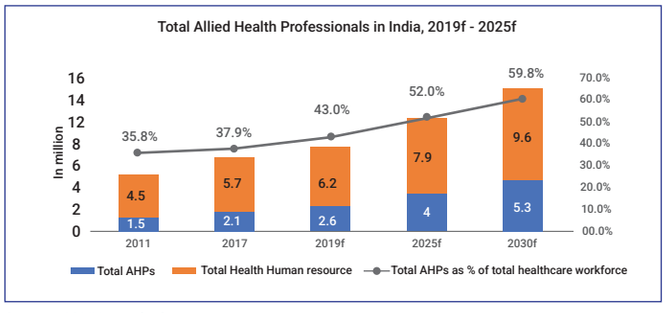
Figure 1: Healthcare continues to be under-served and under-consumed: shortfall of doctors, nurses, and beds likely to continue till 2034



Source: WHO, Global Health Observatory; World Bank; Euromonitor

The study conducted by HSSC highlights the growth of allied health professionals (AHPs) in India, projecting an increase from 4.4 million in 2011 to an estimated 9.6 million by 2030, representing a significant rise in their share of the total healthcare workforce.

Figure 2: Seeing the projected growth of beds in India which is directly proportional to the growth in hospitals and population, we have based the incremental growth of AHPs as per number of beds.



Source: IQVIA analysis

A 2022 UNFPA study highlights that while 25% of India's population (approximately 360 million) comprises children aged 0-14 years, the proportion of elderly individuals (currently 10.5%, or 147 million) is projected to rise to 20.8% (around 347 million) by 2050.This shift demands a well-trained workforce capable of addressing the distinct needs of both age groups such as maternal and newborn care for the young, pain management, mental health support, dementia care, palliative care, end of life care etc.

HSSC is actively supporting this transition through established job roles such as Geriatric Caregivers, Geriatric Care Assistant, and Home Health Aides while being committed to further develop comprehensive skills training initiatives to ensure a qualified workforce capable of providing quality care for India's evolving population.

This growing complexity in healthcare underscores the urgent need for structured workforce management and standardized training protocols. Without a cohesive framework, disparities in care quality will persist, and healthcare professionals may struggle to keep pace with rapid advancements. Establishing standardized skilling pathways will not only enhance efficiency but also ensure that the workforce remains adept at addressing emerging healthcare challenges, from genomics-driven treatments to global biosecurity threats.

Workforce Standardization and Multi-Sector Collaboration

The growth and equity of India's healthcare sector depend on the collective efforts of the government, industry, and academia. Recognizing the evolving needs of this sector, the HSSC has developed over sixty national qualifications which covers diverse spectrum of programmes addressing both direct and non-direct care, curative and preventive healthcare, environmental and occupational health, healthcare management, social work, community health, and AYUSH & complementary medicine practices.

Within the AYUSH sector, HSSC offers specialized job roles such as Panchakarma Technician, Ayurveda Dietician, Cupping Therapy Assistant, Ayurveda Masseur, Yoga Wellness Trainer etc, to support traditional and holistic healthcare practices.

Additionally, HSSC has introduced National Qualification (Micro-Credentials) in lifesaving techniques, including First Aid Care, Basic Cardiopulmonary Life Support, and Advanced Cardiopulmonary Life Support. These initiatives play a crucial role in upskilling healthcare professionals, equipping them with essential skills to manage life-threatening emergencies and improve emergency response capabilities.

A key example of the impact of HSSC's skilling initiatives is evident in the creation of a highly trained healthcare workforce exceeding 6.5 lakh professionals. Over the years, HSSC has established a strong network with more than 1,000 affiliated training partners, approximately 4,500 certified trainers, and 1,200 assessors, reinforcing its dedication to building a future ready.

HSSC continues to make a profound impact on workforce development, transforming lives through skill-based training. This sentiment is echoed by many HSSC-trained professionals who are now making meaningful contributions in healthcare while building fulfilling careers.

A responsive and skilled workforce is essential for a dynamic healthcare ecosystem. HSSC has demonstrated its agility in addressing industry needs through strategic skilling, reskilling, and upskilling initiatives. A notable example was the Customized Crash Course Programme developed for COVID-19 Frontline Workers, launched in 2021 by the Hon'ble Prime Minister Shri Narendra Modi. This initiative successfully trained 150,000 healthcare professionals, significantly strengthening India's pandemic response.

National initiatives like 'Heal in India and Heal by India' position the country as a leading healthcare hub, attracting

international patients and facilitating skilled workforce mobility. In partnership with NSDC International, HSSC is expanding opportunities for Indian healthcare professionals in Japan, the UK, Australia, and Germany.

Domestically, HSSC has played a key role in government initiatives like Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (PM-JAY) by training Arogya Mitras under the National Health Authority (NHA). As India advances through transformative healthcare initiatives such as the Ayushman Bharat Digital Mission and Atmanirbhar Swasth Bharat Yojana (PM-ABHIM), HSSC remains at the forefront, ensuring a future-ready healthcare workforce through targeted skilling programmes, apprenticeships, and industry-academia partnerships. Supported by digital learning platforms, these efforts reinforce India's position as an emerging global leader in healthcare.

Healthcare 2.0: Innovation-Driven Growth in India's Health Sector

India's healthcare sector is led by innovations which are not only improving patient outcomes but also fostering entrepreneurship within the sector. Professionals are now empowered to offer specialized services beyond traditional healthcare services, contributing to the decentralization of health care ecosystem. This progress is enhancing job quality, expanding career opportunities, and increasing wages, making healthcare an attractive and sustainable career path.
For instance, the integration of telemedicine, which gained

significant traction during the pandemic, is fundamentally changing how primary care is delivered. With projections suggesting an upward trend of telehealth consultations, this shift not only addresses the critical shortage of healthcare professionals in rural areas but also enhances access to affordable, quality care for millions.

Medical education and professional training are also undergoing a paradigm shift, with healthcare simulation emerging as a powerful tool. By replicating real-world clinical scenarios in a controlled environment, simulation enhances skills, improves decision-making, and ensures patient safety. Healthcare professionals can practice complex procedures, refine techniques, and build confidence without putting actual patients at risk. A notable example is the Advanced Technology Centre, established by the Healthcare Sector Skill Council, which features a state-of-the-art medical simulation lab. Using AR/VR technology and advanced mannequins, this center provides hands-on training through immersive, lifelike scenarios that foster critical thinking, teamwork, and technical expertise.

In future skills would be needed in the area of cutting-edge technologies like precision medicine and surgery, virtual/augmented reality (VR/AR), robotic procedures, wearable devices, point-of-care solutions, AI-driven diagnostics, Health Data Analysis, machine learning, clinical decision support tools etc that will revolutionize the healthcare landscape. Additionally, advancements inayurveda,nutritional science, andpreventive careare shifting the focus toward holistic and proactive health management.

These innovations necessitate continuousskilling and upskillingto ensure healthcare professionals remain competitive in a rapidly evolving, technology-driven ecosystem. HSSC is proactively seeking to develop programme around the acquisition of new skill sets in response to this growing demand thereby empowering healthcare workers to deliver specialized services beyond traditional clinical environments.

Conclusion

Looking ahead, the Healthcare Sector Skill Council (HSSC) remains committed to transforming India's healthcare workforce through proactive skill development, continuous skills gap analysis, specialized training programmes and industry-driven training initiatives. By anticipating emerging healthcare needs, forging strategic collaborations, and upholding rigorous quality standards, HSSC aims to build a highly competent workforce prepared for future challenges.

As India embarks on its journey into *Amrit Kaal*, the healthcare sector stands at the forefront of its vision for inclusive growth and sustainable development. HSSC remains dedicated to shaping a skilled workforce, contributing to global healthcare standards, and enhancing India's position as a global capital of skilled healthcare professional.

References

1. WHO India | World Health Organization
2. Business Opportunities in India: Investment Ideas & Industry Insights | IBEF
3. Home | Ministry of Health and Family Welfare | GOI
4. World Bank Group - International Development, Poverty and Sustainability
5. Home | NITI Aayog
6. UNFPA India
7. Skill Gap Study by HSSC in collaboration with IQVIA

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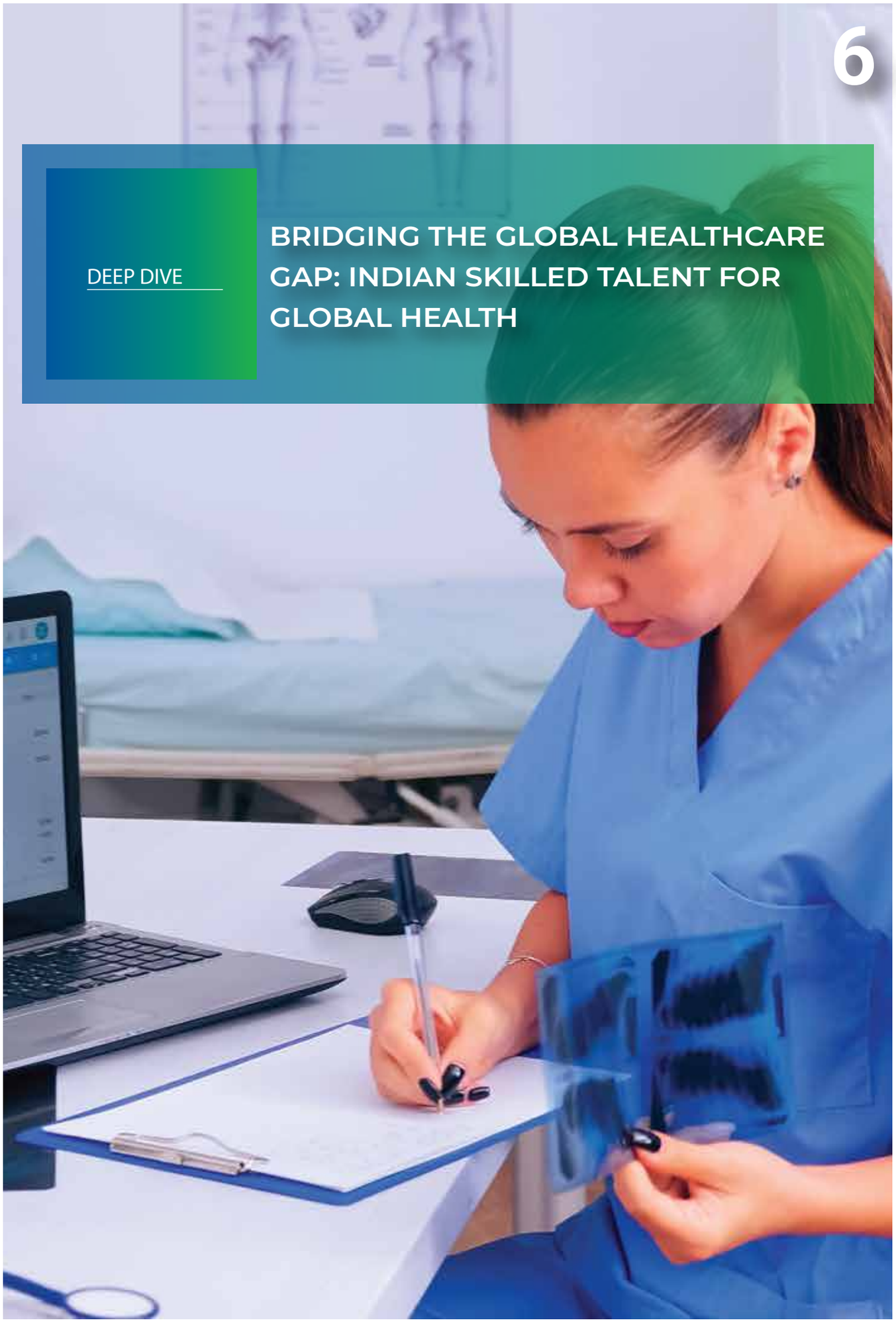
DEEP DIVE

BRIDGING THE GLOBAL HEALTHCARE GAP: INDIAN SKILLED TALENT FOR GLOBAL HEALTH



Ragini Thakur
Manager, Research & Impact, NSDC

Ragini leads the content, editing, and publication process for NSDC Connect. She is an Education, Skilling Sector, and Policy professional with over 8 years of experience in diverse fields such as policy research, content development, project management, and policy writing. She has a postgraduate degree in International Relations from Jawaharlal Nehru University and a passion for inclusive and accessible education.

Introduction

The global healthcare landscape is at a critical juncture today with WHO estimating a shortage of over 11 million healthcare workers by 2030, particularly in lower and middle-income countries.[1] There are many causes for this shortfall including population ageing in developed countries like Japan and United Kingdom, inadequate investments in healthcare skilling in lower income countries, and budgetary constraints in the public health systems.

This has resulted in a growing demand for foreign healthcare workforce in many countries. At a time when more and more countries are closing their borders and there is a negative sentiment around migration, healthcare stands as an exception. The experience of COVID 19 has also revealed the interconnectedness of global health systems and India's pivotal role in supplying healthcare workers to the world. For example, during the pandemic, countries like Maldives[2] and UAE with a heavy dependency on healthcare workers from India, faced a severe shortage nurses and doctors due to travel restrictions. In case of UAE, special travel approvals were given to allow for the movement of healthcare professionals from India.[3] This has led to a growing focus on creating resilient healthcare systems by many countries. It also presents an opportunity for countries like India to capitalize on its young population and export its skilled healthcare workforce to meet the global demand.

India's healthcare, education, and training systems have also taken cognizance of this opportunity and introduced significant reform in the recent years. The National Skill Development Corporation (NSDC) and the Ministry of Skill Development and Entrepreneurship (MSDE) have made strides in enhancing the quality of healthcare training programs and facilitating secure migration pathways. These initiatives are designed to align with international standards, ensuring that India's healthcare professionals are well-prepared to work and live abroad.

As India continues to invest in skilling its workforce and aligning healthcare training programs with global needs, it is poised to play an increasingly vital role in addressing the global healthcare workforce gap. This article delves into India's skilling ecosystem to support international mobility in the healthcare sector. Healthcare sector can emerge as a massive source of employment for Indian youth and investing in quality training, international recognition of skills and certifications, and healthcare infrastructure can yield outsized returns, and help address the issue of unemployment in the country.

Global Demand for Healthcare Workers

Good Health and Wellbeing (SDG 3) is globally adopted as one of 17 Sustainable Development Goals and is closely linked to many other SDGs including Zero Hunger (SDG 2), Climate Action (SGD 13), and Gender Equality (SDG 5)[4]. With increasingly ageing populations, growing costs of healthcare in economically advanced countries, and the

recent experience of Covid 19 pandemic coupled with rising threat of infectious diseases, the need for training, hiring, and retaining skilled Human Resources for Health (HRH) has become more crucial.

Figure 1: Sustainable Development Goals

Source: United Nations Sustainable Development Goals website

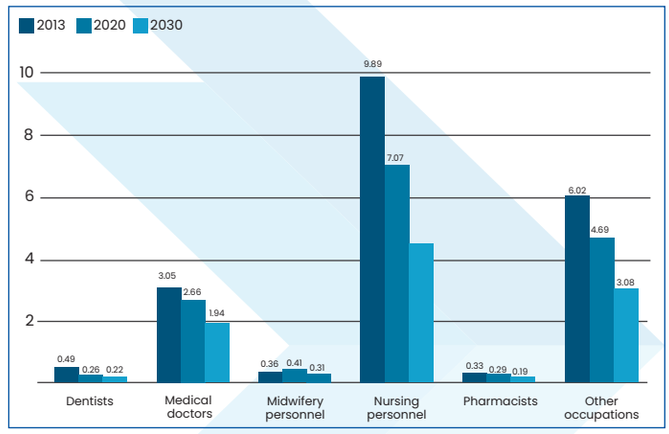
The global healthcare sector is grappling with a significant demand for skilled professionals. According to the World Health Organization (WHO), by 2030, there will be an estimated 11 million healthcare worker shortage worldwide, particularly in low- and middle-income countries. This shortage is driven by factors such as aging populations, the increasing burden of chronic diseases, increasing costs of healthcare, and the long-lasting effects of the COVID-19 pandemic. Consequently, countries with well-established healthcare systems are turning increasingly to international mobility to address workforce gaps[5]. In high-income countries, where healthcare systems are expanding to meet the needs of aging populations and growing healthcare demands, the demand for foreign-trained healthcare professionals is particularly high.

The United States for example experiencing a critical shortage of over 100,000 healthcare workers by 2028, particularly in nursing and allied healthcare profession. Allied health professionals such as physical therapists and laboratory technicians are also in short supply as medical technology evolves, creating additional demand for trained professionals[6]. Similarly, Japan is estimated to face a shortage of over a million medical and welfare service workers[7], while in the Middle East countries like Saudi Arabia faces a shortage of over 175,000 healthcare workers by 2030[8].

The most critical roles in demand globally include nurses, physicians, and allied health professionals. Nurses, who represent nearly half of the global healthcare workforce, are particularly sought after in countries such as the United States, the United Kingdom, Canada, and the Middle East. The WHO notes that nurses' expertise is vital in meeting the needs of aging populations and addressing the growing burden of chronic diseases worldwide.

Despite the increasing demand for healthcare professionals, international mobility faces several challenges. One of the most significant hurdles is the recognition of qualifications. Many countries struggle with

Figure 2: Estimation of Global Health Workforce Shortage by occupation



Source: Market.us[9]

recognizing foreign certifications, which can slow down the migration process and prevent healthcare workers from fully contributing to the workforce. The WHO has advocated for mutual recognition of qualifications to ease these barriers.

Quality standards also pose a challenge. Ensuring that healthcare workers meet the high standards of their host countries is crucial for patient safety and quality care. Therefore, maintaining stringent accreditation and certification processes is vital to ensure that foreign-trained professionals meet the expectations of the healthcare systems they join.

Additionally, there are ethical concerns around migration terms. Healthcare workers from low-income countries often face difficult working conditions abroad, including low wages, limited benefits, and few opportunities for career progression. Addressing these issues is essential to creating fairer, more sustainable migration pathways.

The India Advantage

India's youthful population, with over 600 million people under the age of 25 (World Bank, 2022), offers a critical advantage in meeting global healthcare needs. As developed countries, particularly those in the West, face challenges due to aging populations and shrinking domestic workforces, the demand for foreign-trained healthcare workers has risen sharply. This demand is particularly strong in fields like nursing, medical technology, and geriatrics, where shortages are most pronounced. In response to this, India's large and expanding pool of healthcare professionals is well-positioned to fill these gaps.

India has long been a significant source of healthcare professionals globally, with a substantial number of doctors, nurses, and allied health workers migrating to various countries to meet international healthcare demands. This trend is driven by India's robust medical education system, producing a large pool of qualified professionals, and the increasing global need for healthcare workers, particularly in developed nations facing aging populations and workforce shortages.

In the United States, Indian-trained doctors have a prominent presence. According to recent data, Indian nationals constitute a significant portion of the immigrant healthcare workforce in the U.S., with their numbers reflecting their crucial role in the healthcare system.[10]

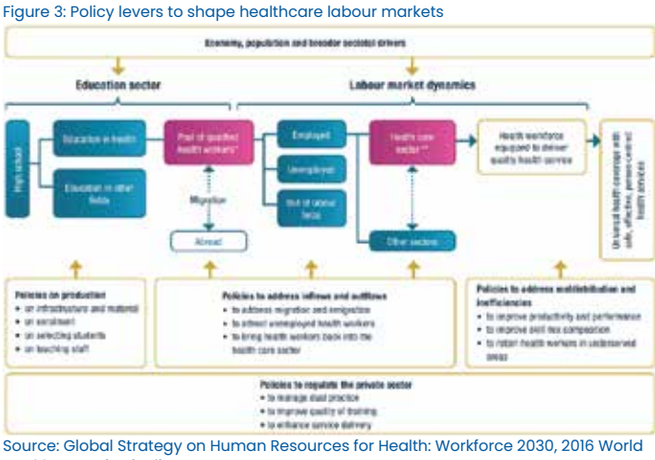
Similarly, in the United Kingdom, Indian healthcare professionals play a vital role in the National Health Service (NHS). A substantial number of nurses and doctors in the UK are of Indian origin, contributing significantly to patient care and the overall functioning of the healthcare system.[11] The Middle East, particularly countries like Saudi Arabia, the United Arab Emirates, and Qatar, has also been a significant destination for Indian healthcare workers. The demand for healthcare professionals in these regions has led to a substantial migration of Indian medical staff, who are attracted by competitive salaries and opportunities to work in advanced healthcare facilities.[12]

Supporting International Mobility in Healthcare

India's healthcare workforce is increasingly recognized for its high level of skill, especially in fields such as nursing and medical technology. The global demand for these skilled professionals, particularly in the Middle East, the United States, and the United Kingdom, has become a vital aspect of India's healthcare export strategy.

To support international mobility of healthcare workers, the policy ecosystem needs to increase the focus and investment on training, infrastructure, assessments, skill-recognition, and migration pathways (inflows as well as outflows).

Figure 3: Policy levers to shape healthcare labour markets



Source: Global Strategy on Human Resources for Health: Workforce 2030, 2016 World Health Organization[13]

In this scenario, India launched the Heal in India, Heal by India initiative on August 15, 2022, with the goal of establishing India as a global leader in healthcare services.[14] Managed by the Ministry of Health and Family Welfare, this initiative focuses on boosting medical tourism, expanding the country's healthcare infrastructure, and promoting the export of skilled healthcare professionals abroad. It aims to attract international patients for high-quality medical care at competitive prices and enhance India's reputation as a hub for healthcare innovation and excellence. The government has allocated significant resources to this initiative, with the 2025 Union Budget providing ₹99,858.56 crore to the Ministry of Health and Family Welfare, marking an increase in funding to strengthen healthcare services and infrastructure across the country.[15] This substantial investment supports the expansion of the healthcare sector, including the promotion of Indian healthcare workers internationally and the improvement of healthcare facilities to meet global standards. Through Heal in India, India seeks to increase its share of the global medical tourism market while simultaneously improving the professional skills and global reach of Indian healthcare workers, positioning them as key players in the international healthcare system.

NSDC Leading the Way

The National Skill Development Corporation (NSDC) and its subsidiary, NSDC International, have been instrumental in supporting the international mobility of healthcare professionals from India. NSDC has designed several targeted programs to improve the skills of healthcare workers, ensuring they meet international standards. One such program is the International Mobility Skill Bridge Program (IMSB), which focuses on preparing healthcare professionals for employment opportunities abroad by providing sector-specific training and orientation[16]. This program helps professionals acquire the necessary skills for overseas healthcare settings, especially in high-demand countries like the UAE, the UK, and the USA.

NSDC, under the aegis of MSDE also runs the Skill India Digital Hub (SIDH), which is crucial for integrating digital technologies into healthcare training. Through SIDH, healthcare professionals are trained in digital health systems like Hospital Management Information Systems (HMIS) and Electronic Medical Records (EMR), aligning Indian professionals with international digital health standards. These skills make Indian workers more adaptable to the advanced digital healthcare environments in many countries.

To further support international mobility, NSDC International provides language training in English, Arabic, and other languages critical for effective communication in healthcare settings worldwide. This includes medical terminology and culturally competent communication, ensuring that Indian healthcare professionals can engage effectively with diverse patient populations. Additionally, NSDC International offers cultural orientation programs that help workers adapt to different healthcare practices in various countries.

Furthermore, NSDC collaborates with global certification bodies to ensure that Indian healthcare workers' qualifications are recognized and valued internationally. This collaboration ensures the seamless transition of Indian healthcare professionals into foreign healthcare systems, helping them contribute to global healthcare needs. Through these comprehensive programs, NSDC and NSDC International are enhancing the global mobility of Indian healthcare professionals while preparing them to meet the challenges of international healthcare markets.

Conclusion

The demand for healthcare workers is growing globally due to aging populations, increasing chronic disease burdens, and the evolving landscape of medical care. India is poised to meet this demand by providing a significant supply of skilled healthcare professionals. However, challenges related to recognition of qualifications, quality standards, and migration terms must be addressed to ensure that international mobility benefits both healthcare workers and the populations they serve. With strategic investments in training and ethical recruitment practices, the global healthcare workforce gap can be effectively bridged.

References

1. World Health Organization. "Health Workforce." Accessed March 4, 2025. *https://www.who.int/health-topics/health-workforce.*
2. Khan, Sanjida. "Maldives Turns to Indian Nurses as Its Health System Struggles with COVID-19." The New York Times, June 18, 2021. Accessed March 4, *https://www.nytimes.com/2021/06/18/world/asia/maldives-covid-nurses.html.*
3. COVID-19: Doctors, Nurses from India Permitted to Fly to UAE with Special Approval." Gulf News, May 4, 2021. Accessed March 4, *https://gulfnews.com/uae/covid-19-doctors-nurses-from-india-permitted-to-fly-to-uae-with-special-approval-1.80514572.*
4. United Nations. "Sustainable Development Goals Communications Material." United Nations, n.d. Accessed March 4, 2025 *https://www.un.org/sustainabledevelopment/news/communications-material/.*
5. World Health Organization (WHO). "Health Workforce." Accessed March 4, 2025. *https://www.who.int/news-room/fact-sheets/detail/health-workforce*
6. Mercer. Future of the U.S. Healthcare Industry. Mercer, n.d. Accessed March 5, 2025. *https://www.mercer.com/en-us/insights/talent-and-transformation/attracting-and-retaining-talent/future-of-the-us-healthcare-industry/.*
7. Asahi Shimbun. "Japan Set to Face Shortage of Healthcare Workers." The Asahi Shimbun, September 16, 2021. Accessed March 4, 2025. *https://www.asahi.com/ajw/articles/14735557#:~:text=Japan%20is%20set%20to%20face%20a%20shortage%20of,presented%20to%20a%20Cabinet%20meeting%20on%20Sept.%2016.*
8. Al Arabiya. "Saudi Arabia Needs an Extra 175,000 Healthcare Workers by 2030: Report." Al Arabiya English, June 13, 2023. Accessed March 4, 2025. *https://english.alarabiya.net/News/saudi-arabia/2023/06/13/Saudi-Arabia-needs-an-extra-175-000-healthcare-workers-by-2030-Report.*
9. Market.us. "Healthcare Staffing Statistics." Market.us, n.d. Accessed March 4, 2025. *https://media.market.us/healthcare-staffing-statistics/.*
10. Lubna Kably, "India Becomes the Biggest Source Country for Doctors in the US," The Economic Times, June 15, 2024, *https://economictimes.indiatimes.com/nri/work/india-becomes-the-biggest-source-country-for-doctors-in-the-us/articleshow/111013832.cms.*
11. "One NHS Nurse in Four Was Recruited from Abroad," The Times, December 10, 2024, *https://www.thetimes.co.uk/article/nhs-nurses-abroad-foreign-hospital-staff-j26jsvphq.*
12. "Kerala Emerges as Leader in Healthcare Talent Migration to MENA Countries," The Economic Times, March 5, 2024, *https://economictimes.indiatimes.com/nri/work/kerala-emerges-as-leader-in-healthcare-talent-migration-to-mena-countries/articleshow/107968048.cms.*
13. World Health Organization. Global Strategy on Human Resources for Health: Workforce 2030. Geneva: World Health Organization, 2016. Accessed March 4, 2025 *https://iris.who.int/bitstream/handle/10665/250368/9789241511131-eng.pdf.*
14. India Launches Heal in India and Heal by India Initiative," PIB, August 15, 2022, accessed March 5, 2025, *https://pib.gov.in*.
15. Union Budget 2025-26: Health Sector Allocation Rises to ₹99,858 Crore," Zee Business, February 2025, accessed March 5, 2025, *https://www.zeebiz.com*
16. INLEAD, "International Mobility Skill Bridge Program," accessed March 5, 2025, *https://www.inlead.in/international-mobility-skill-bridge-program.php.*

11

DEEP DIVE

BUILDING A GLOBALLY COMPETITIVE HEALTHCARE WORKFORCE: STRENGTHENING THE PUBLIC HEALTHCARE SYSTEM

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Introduction

The World Health Organization (2018) refers[1] to public health as, "all organized measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases." Control of communicable diseases, provisioning medical care, drinking water, and public health sanitation facilities are some of the examples of these organized efforts.

The COVID-19 pandemic brought along unprecedented disruptions across the world and highlighted how a public healthcare sector in any country is a critical pillar of national development, playing an instrumental role in ensuring not only public well-being, but economic growth and social stability. With the ongoing geopolitical conflicts, the climate and energy crises, varying demographic compositions and care needs have made it even more significant that the public health care system of a country is made resilient and well equipped with a state-of-the-art infrastructure and a highly skilled workforce.

The Public Healthcare System in India

The Indian public healthcare system is a vast and intricate network[2] that serves the need of over 1.4 billion people through a multi-tier structure comprising of Sub-Centres (SCs), Primary Health Centres (PHCs), Community Health Centres (CHCs), Sub-District Hospitals, District Hospitals, Directorates and Medical research and training colleges. The sub-centres are the first point of contact for a patient, usually catering to a population of 3,000-5,000, succeeded by a PHC, which is required to look after the daily needs of 20,000-30,000 people and CHCs provide referrals and access to specialists, catering to 80,000-120,000 people. Similarly, there are urban PHCs and CHCs – catering to a population of 50,000 -75,000 and 0.25 – 0.5 million, respectively. This network is parallelly accompanied by a mix of public and private institutions and organizations providing health services. Despite this extensive framework, the Indian public health care system continues to face challenges of significant workforce shortages and need for capacity-building.

Workforce Needs in India's public Healthcare System

India is home to many medical colleges. The government has announced new policies and increased funding to establish 157 new medical colleges and about 50 new nursing schools to keep up with the requirement to help the vast population of India[3]. The deficit will presumably be filled by the additional 22,500 doctors and 2,000 nurses that these institutions are expected to generate annually. Nonetheless, a news report[4] suggest about 30% of physicians and 50% of nurses with sufficient training were

not engaged in the health sector, either because they are unemployed or do not want to work.

As per another report[5] (FICCI- KPMG 2022) India has a density of 33.5 health workers per 10,000 population as compared to the WHO recommended threshold of 44.5 skilled health workers per 10,000 people, which is necessary to meet the Sustainable Development Goals and Universal Health Coverage ambitions.

Rural India faces acute shortages, with Community Health Centers (CHCs) having an 83.2% shortfall of surgeons, 74.2% of obstetricians and gynecologists, 79.1% of physicians, and 81.6% of pediatricians (Rural Health Statistics 2021-2022, MoHFW). Urban centers, while having more trained professionals, are overburdened, leading to inefficiencies in service delivery.

Additionally, India's healthcare workforce lacks exposure to global best practices, digital healthcare tools, and advanced medical technologies, reducing their competitiveness in international job markets. Addressing these gaps requires a comprehensive strategy focusing on skilling, reskilling, and upskilling healthcare workers.

Demand for Skilled Healthcare Workers

The demand for skilled healthcare professionals in India is driven by multiple factors, including:

- **Population Growth:** With over 1.4 billion people, India requires a well-trained healthcare workforce to cater to the increasing healthcare needs
- **Epidemiological Transition:** A rise[6] in non-communicable diseases (NCDs) like diabetes, cardiovascular conditions, and cancer has increased the need for specialized healthcare professionals
- **Universal Health Coverage (UHC):** Initiatives like Ayushman Bharat require[7] a significant expansion of skilled manpower to strengthen primary and secondary healthcare services
- **Rural-Urban Divide:** There is a critical shortage[8] of healthcare professionals in rural India, necessitating focused skilling programs to ensure equitable access to healthcare services.
- **Global Demand for Indian Healthcare Workers:** With an aging population and increasing healthcare needs, countries such as Germany, Japan, Canada, and the Gulf nations face acute shortages of healthcare workers. The World Bank estimated[9] that by 2030, the global shortfall of healthcare workers will reach 10 million, creating significant opportunities for skilled professionals from India.

Opportunity for Growth and Livelihoods

Skill development in the healthcare sector not only enhances service delivery but also generates employment and livelihood opportunities. Key skilling areas include nursing and midwifery, where India faces a significant shortage of trained nurses, creating opportunities for skill-based employment[10]. Allied health professionals, such as radiology technicians, medical laboratory technicians, and physiotherapists, are in high demand due to the increasing complexity of medical diagnostics and treatments. Community Health Workers (CHWs), including Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs), form the backbone of rural healthcare and require continuous upskilling to meet evolving healthcare needs[11]. Additionally, the growing aging population has increased demand for skilled caregivers in geriatric and palliative care. Moreover, the digitization of healthcare records has created job opportunities in medical coding, health informatics, and medical transcription.

In addition to domestic skilling initiatives, capacity-building efforts should align healthcare training with global standards to enhance employment opportunities for Indian healthcare professionals both within the country and abroad. This includes adopting global certification programs such as the WHO's International Health Regulations (IHR) training and ISO healthcare standards. Collaborations with international medical councils can help align Indian curricula with global best practices, while Recognition of Prior Learning (RPL) programs can certify existing healthcare workers with internationally recognized credentials[12] (PMC). Expanding medical and paramedical education through new medical colleges, nursing schools, and skill-based training institutes, particularly in underserved areas, is necessary. The Ministry of Skill Development and Entrepreneurship (MSDE) and the National Skill Development Corporation (NSDC) can play a

pivotal role in structuring vocational training programs (Health ET). E-learning modules via the Skill India Digital Hub (SIDH) can facilitate continuous professional development, while simulation-based medical training using AR/VR technology can improve practical exposure. Encouraging healthcare employment in underserved areas requires financial incentives, scholarships, and student loan forgiveness programs for professionals willing to serve in rural and urban low-income communities. Structured career pathways and leadership development programs can also improve retention. Strengthening public-private partnerships (PPP) for workforce development can also play a significant role, with collaborations involving private hospitals, NGOs, and corporate social responsibility (CSR) initiatives enhancing skill training.

Conclusion

Addressing skill gaps and building capacity in India's healthcare sector is not just about improving domestic health outcomes but also about positioning the country as a global leader in healthcare workforce development. By integrating skilling initiatives, leveraging technology, and fostering international collaborations, India can create a sustainable pipeline of highly trained healthcare professionals ready to tackle challenges both at home and abroad. Investing in skill development today will define the future of India's healthcare workforce, ensuring better accessibility, quality, and global competitiveness.

References

1. World Health Organization (2018). "Essential Public Health Functions, Health Systems, And Health Security." Accessed at https://iris.who.int/bitstream/handle/10665/272597/9789241514088-eng.pdf

2. Chokshi, M., Patil, B., Khanna, R., Neogi, S. B., Sharma, J., Paul, V. K., & Zodpey, S. (2016). Health systems in India. Journal of perinatology: official journal of the California Perinatal Association, 36(s3), S9–S12. https://doi.org/10.1038/jp.2016.184

3. PIB Release: Update on opening of new medical colleges in the country accessed at https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1982756

4. Hindustan Times (2021). The real deficit in India's health care system. Accessed at https://www.hindustantimes.com/editorials/the-real-deficit-in-india-s-health-care-system-101632231013386.html

5. FICCI-KPMG (2022). "Strengthening healthcare workforce in India: the 2047 agenda." Accessed at https://assets.kpmg.com/content/dam/kpmg/in/pdf/2022/10/Strengthening-healthcare-workforce-in-India.pdf

6. The Hindu (2025). India's challenge: stemming the rising tide of non-communicable diseases. Accessed at https://www.thehindu.com/sci-tech/health/indias-challenge-stemming-the-rising-tide-of-non-communicable-diseases/article69284577.ece

7. Grewal, H., Sharma, P., Dhillon, G., Munjal, R. S., Verma, R. K., & Kashyap, R. (2023). Universal Health Care System in India: An In-Depth Examination of the Ayushman Bharat Initiative.Cureus,15(6), e40733. https://doi.org/10.7759/cureus.40733

8. ETGovernment (2024). Fixing the last-mile delivery problem in rural healthcare: Policies, infrastructure & skills. Accessed at https://government.economictimes.indiatimes.com/blog/fixing-the-last-mile-delivery-problem-in-rural-healthcare-policies-infrastructure-skills/112275303

9. Mathieu Boniol, Teena Kunjumen, Tapas Sadasivan Nair, Amani Siyam, James Campbell, Khassoum Diallo - The global health workforce stock and distribution in 2020 and 2030: a threat to equity and 'universal' health coverage? BMJ Global Health 2022;7: e009316.

10. Priyadarshi, M., Mishra, S. S., Singh, A., Singhal, A., Hashmi, M., & Neogi, S. B. (2023). Assessment of needs and gaps in public health cadre in India - a situational analysis. BMC health services research, 23(1), 1162. https://doi.org/10.1186/s12913-023-10132-3

11. Mehta, V., Ajmera, P., Kalra, S., Miraj, M., Gallani, R., Shaik, R. A., Serhan, H. A., & Sah, R. (2024). Human resource shortage in India's health sector: a scoping review of the current landscape. BMC public health, 24(1), 1368 https://doi.org/10.1186/s12889-024-18850-x

12. Joshi, A., Bhatt, A., Gupta, M., Grover, A., Saggu, S. R., & Malik, I. V. (2022). The current state of public health education in India: A scoping review. Frontiers in public health, 10, 970617. https://doi.org/10.3389/fpubh.2022.970617

IMAPCT STORY

SKILLING WITH CO-ROBOTS: INDIA'S LEAP INTO THE 5TH INDUSTRIAL REVOLUTION

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Introduction

As India strides towards its vision of Industry 5.0, a paradigm shift is underway, emphasizing human-robot collaboration and personalized production. However, this evolution brings forth a critical challenge: a widening skill gap. To effectively harness the potential of this new era, India needs innovative solutions that empower its workforce. Enter collaborative robots, or cobots – a transformative technology poised to bridge this divide. Designed to work alongside humans, cobots offer not just automation, but a unique opportunity for upskilling and reskilling, paving a practical pathway for India to navigate the complexities of its 5th Industrial Revolution. Therefore, the integration of cobots in traditional factories, particularly Indian MSMEs, enables them to demonstrate excellent smart manufacturing setups.

The ability of cobots lends itself to a broad spectrum of industries crucial to economic growth in India. From the assembly lines of automotive manufacturing and electronics, where precision and consistency are non-negotiable, to the agile environments of logistics and warehousing, cobots can streamline operations and enhance productivity. In the healthcare sector, cobots can assist patient, perform diagnostics through automated labs, and even support surgical procedures, freeing up medical professionals for more customized tasks. Moreover, within India's vast agricultural landscape, cobots can be deployed for tasks like precision planting, harvesting, and quality control, addressing labour shortages and improving efficiency. The food and beverage industry can also leverage cobots for packaging, processing, and quality assurance, ensuring hygiene and consistency. These diverse applications highlight the transformative potential of cobots in revolutionizing India's key sectors, fostering a more efficient and technologically advanced workforce.

Emerging Applications of Cobots in Industries

Smart Factories

The future lies in e-smart factories, which encompass disruptive cyber-physical system technologies. These include human-machine interface technologies like cobots, integrated with machine vision, pick-and-place systems, blockchain, and the Industrial Internet of Things (IIoT). The entire manufacturing process is coupled with an intelligent supply chain.

Cobots in MSME

Indian MSMEs are experiencing significant transformations in successfully implementing digital manufacturing technologies like cobots. By deploying cobots, MSMEs have seen enhanced productivity, reduced carbon footprints, and a high return on investment. Notably, cobots are installed within the existing layouts of Indian manufacturing setups. Bajaj auto has 50% of women workforce working on smart manufacturing

especially using cobots.

Image 1: Cobot in an Indian MSME

Picture Credit:SMEW Textile Machinery/bajaj Automotive/Universal Robots/CC BY 4.0

Skill Development for Cobots Integration

India is strategically building its Cobot expertise through dedicated skill development centers, fostering a new generation of robotic talent. Leading institutions are establishing smart factories and innovation hubs, providing firsthand training and cutting-edge research opportunities. These initiatives are crucial for bridging the skill gap and accelerating India's adoption of collaborative robotics in its industrial landscape.

a. **Smart factory at Indian Institute of Science (IISc) Bengaluru:** The Smart Factory at the Indian Institute of Science (IISc) in Bengaluru is a standardized production facility that serves as a research and development platform. IISc also offers an Advanced Certification Programme in Digital Manufacturing and Smart Factories.

b. **Innovation Hub for Cobotics at IIT Delhi:** The innovation hub is supported by Department of Science & Technology, Ministry of Science & Technology, Govt. of India under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS).

c. **Foundation for Smart manufacturing, IIT Delhi:** The centre of excellence was established under Smart Advanced Manufacturing and Rapid Transformation Hub (SAMARTH) supported by Ministry of Heavy Industry & Public Enterprises, Government of India. The centre has Mobile Collaborative Robots (MCR) for material handling and machine tending.

Image 2: iFactory at Institute for Auto Parts & Hand Tools Technology

Picture Credit:C4i4 Labs/ Ministry of Heavy Industry & Public Enterprises, Government of India /Institute for Auto Parts & Hand Tools Technology/CC BY 4.0

d. **Centre of Excellence at National Productivity Council (NPC):** In June 2017, the NPC, in association with the Asian Productivity Organization (APO), Japan, established the Centre of Excellence on IT for Industry 4.0 (CoE: IT for I4.0). The NPC has also introduced an ambitious nationwide "Udyami Bharat 4.0 (UB4.0)" programme. UB4.0 can be used to assess manufacturing industry readiness. It can also be utilized by Indian MSMEs.

e. **The Factor (I4.0)** at the Institute for Auto Parts & Hand Tools Technology, a center of excellence supported by C4i4 Labs under SAMARTH (supported by the Ministry of Heavy Industry & Public Enterprises, Government of India), offers hands-on training for various stakeholders, including MSME industries. This center features a complete smart manufacturing supply chain, showcasing a model smart manufacturing facility.

f. **Universal Robots (UR) India:** UR has opened a cutting-edge technology center in Bengaluru to address the needs of cobot training, digital readiness assessment, remote performance evaluation, and performance optimization. UR has also developed an online platform to provide hands-on learning on cobots and their potential applications, enabling users to earn certifications.

g. **Tamil Nadu Smart and Advanced Manufacturing Centre (TANSAM):** TANSAM is a joint initiative of the

Government of Tamil Nadu and Siemens Industry Software India Pvt. Ltd. (SISW). The center features in-house capabilities for Product Innovation, Predictive Engineering Analytics, Smart Factory Research, Asset Performance Management (IoT) research, Product Lifecycle Management research, Innovative Manufacturing, and AR/VR/MR Research and Skill Training.

h. **Cobots in Academic institutions:** Educational institutions in India such as Maulana Azad National Institute of Technology, Bhopal, PSG College of Technology, Coimbatore are improving their hands-on learning teaching methodologies by installing cobots within their laboratories. This allows for student training on cobots through the Robot Operating System (ROS).

Image 3: Smart factory at TANSAM, Chennai

Picture Credit: Tamil Nadu Industrial Development Corporation (TIDCO), Government of Tamil Nadu, and Centre powered by SIEMENS/ CC by 4.0

Image 4: Cobots in Educational Institution

Picture Credit: PSG College of Technology, Coimbatore, Tamil Nadu

Science and Technology Clusters

Science and Technology Clusters (S&T Clusters), a flagship initiative of the Office of the Principal Scientific Adviser (PSA) to the Government of India (GoI), were established after the recommendation of the Prime Minister's Science, Technology, and Innovation Advisory Council (PMSTIAC). These clusters are pivotal for facilitating collaborative research to solve local and global challenges and realize the vision of 'Atmanirbhar Bharat'. The clusters in Bengaluru, Pune, Jodhpur and AMTZ in India are working on Industry 4.0 technologies especially implementing the 6-36 Framework and Lab to Market concept. India has successful case studies on implementation of Industry 4.0 through IEEE Smart village which is community-based concept by IEEE Foundation/Philanthropy. India is the industrial powerhouse for AI integrated technologies like telepresence robots, automated guided vehicles in smart factories like Bajaj silent factory, Havells Llyod factory.

Conclusion

Collaborative robots present a powerful and practical solution for bridging India's 5th Industrial Revolution skill gap. By fostering human-robot collaboration, cobots not only enhance productivity across diverse sectors but also create opportunities for upskilling and reskilling the workforce. Investing in cobot-focused training programmes, like those being established at leading Indian institutions, is essential for maximizing their potential. As India embraces Industry 5.0, cobots will be instrumental in creating a skilled and adaptable workforce, ensuring a seamless transition into a technologically advanced and human-centric industrial landscape.

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NEWS BYTES 19

PM Modi hails India as the 'World Force' in Global Manufacturing

Prime Minister Shri Narendra Modi highlighted India's growing global influence, stating that the "Vocal for Local" campaign is yielding results as Indian products gain global recognition. Speaking at the NXT conclave, he emphasized India's transition from a back-office hub to a manufacturing powerhouse, producing semiconductors, aircraft carriers, and automobiles while increasing defence exports. Modi also noted the global popularity of Indian superfoods, Ayurveda, and yoga. He urged for India's true story to be shared globally, reflecting its rise as a leader in key global initiatives, including AI and the G20 presidency.

Empowering Women Entrepreneurs & Future Skills: Govt's Bold Initiatives

Union Minister Shri Jayant Chaudhary emphasized India's forward-looking National Education Policy, promoting AI integration in education. At the launch of the Swavalambini programme, aimed at equipping women in UP and Telangana with entrepreneurial skills, he stressed shifting from women beneficiaries to women-led development. The programme, involving six hundred students across four universities, will provide training, mentorship, and funding support to establish thirty women-led enterprises. Additionally, NSDC signed MoUs to set up Centres of Future Skills in Meerut, integrating AI, ML, and IoT training. A sports manufacturing-cum-training facility for six hundred women SHG members was also announced.

Skilling India's Woodcraft: MSDE & IWST Forge Stronger Ties

Shri Atul Kumar Tiwari, Secretary, MSDE, visited the Institute of Wood Science and Technology (IWST), Bengaluru, to strengthen collaborations in skill development for the wood and forestry sector. Discussions focused on onboarding IWST as an Awarding Body under NCVET, approving NSQF-aligned short-term courses, and integrating IWST into the PM Vishwakarma Scheme for artisan support. Plans include upgrading 450+ ITIs with modern woodworking technologies and using IWST for WorldSkills pre-training. Integration with Skill India Digital Hub (SIDH) will enhance accessibility. Strengthening partnerships with Sector Skill Councils, MSMEs, and industry clusters will build a future-ready, sustainable skilling ecosystem.

India to Supply 100,000 Care Workers Annually to Global Market

India will supply 100,000 care workers annually for the next two years to meet global demand, said NSDC CEO Shri Ved Mani Tiwari. In 2023, 20,000 Indian workers went to Israel, including 5,000 care workers. India is mapping skill requirements in forty-three countries, identifying demand in healthcare, IT, and manufacturing. A recent agreement with Germany will increase visas for skilled workers to 90,000 per year. NSDC has trained forty million people and plans to open 50,000 skilling centers by 2025. Skilling initiatives have improved wages by 20% and employability by 15%, with a focus on Tier-II and Tier-III towns.

World Bank: Green Skills Key to India's Sustainable Future

As economies shift toward clean energy and sustainability, the World Bank emphasizes the need to integrate green skills development into education systems, from primary schooling to mid-career upskilling. India is addressing this challenge through the Skill Council for Green Jobs (SCGJ), established in 2015 under the National Skill Development Mission. SCGJ has developed seventy-seven nationally approved qualifications in areas like renewable energy, waste management, ecotourism, and sustainability, training over 560,000 candidates through nine hundred institutions. With growing global demand for green jobs, India is positioning its workforce to compete in the evolving green economy.

Tamil Nadu Introduces Online Skill Courses for School Students

The Tamil Nadu School Education Department has launched online skill development courses for students of classes 9 to 12 under the Nan Mudhalvan scheme. Provided through the Tamil Nadu Skill Development Corporation (TNSDC), these courses feature 10-15 lessons per category across various career-oriented topics. Students can access them via hi-tech labs after school hours using their EMIS ID. Career guidance teachers will oversee the initiative, ensuring students make informed decisions about higher education. Chief Educational Officers have been instructed to encourage maximum participation among students and teachers.

Tripura Accelerates Industrial Growth with 'Skill-Uday Tangnai'

Chief Minister Dr. Manik Saha inaugurated the 'Skill-Uday Tangnai' program, emphasizing industrial growth and drone technology in key sectors. He credited PM Modi's Act East Policy for transforming the North-East into a hub of peace and prosperity. Tripura is leveraging rubber, tea, and agarwood industries, with investment discussions underway. Infrastructure expansion, including highways, rail, and the Maitree Bridge, is boosting connectivity. With Tripura ranking second in GSDP and per capita income, the state is emerging as a gateway to South-East Asia, reinforcing its commitment to skilling, industrialization, and economic growth. "

Government Restructures Skill India Programme with ₹8,800 Crore Outlay to Boost Workforce Readiness

The Union Cabinet has approved the continuation and restructuring of the Skill India Programme till 2026, with an ₹8,800 crore outlay. The initiative integrates PMKVY 4.0 (₹6,000 crore), PM-NAPS (₹1,942 crore), and JSS (₹858 crore) under a single scheme. PMKVY 4.0 introduces on-the-job training and 400+ courses in AI, 5G, and green hydrogen. PM-NAPS provides apprentices ₹1,500/month via DBT, and JSS focuses on flexible, low-cost vocational training for marginalized groups. The initiative aims to create a future-ready workforce through industry-aligned, technology-driven, and inclusive skilling programs benefiting 2.27+ crore individuals to date.

Oracle's Project Vidya to Train 500,000 Indian Youth in AI, Cybersecurity, and Cloud by 2028

Oracle has launched Project Vidya, an initiative to train 500,000 young Indians in AI, cybersecurity, Cloud computing, and data science by 2028. Delivered by Oracle University, the program includes collaboration with NSDC to train 100,000 individuals from diverse backgrounds. Tamil Nadu's Naan Mudhalvan initiative has already certified 80,000 students under this program. With foundational and professional-level training, Project Vidya aims to equip India's youth with future-ready skills, aligning with national workforce development goals. Oracle, with a 52,000-strong workforce in India, continues its commitment to digital skill-building.

Government, Intel Launch 'AI for Entrepreneurship' to Skill 1 Lakh Youth

The Ministry of Skill Development & Entrepreneurship and Intel have introduced the 'AI for Entrepreneurship' micro-learning module to equip one lakh young innovators with AI skills. In collaboration with NSDC, this initiative aims to demystify AI and promote entrepreneurial thinking across India. Skill Development Minister Shri Jayant Chaudhary emphasized AI's potential in job creation and self-reliance, while Intel India President Gokul Subramaniam highlighted the program's broad reach. This partnership underscores India's commitment to leveraging AI for economic growth and workforce development, ensuring young entrepreneurs are equipped to shape the industries of the future.

APSSDC Partners with SkillBee to Train Nursing Students in German for Overseas Jobs

The Andhra Pradesh State Skill Development Corporation (APSSDC) has signed an MoU with SkillBee India Pvt Ltd to train over 4,000 nursing students in German, enhancing their employment prospects in Europe. Minister Nara Lokesh emphasized Germany's need for three lakh nurses, particularly in elderly care. The initiative is expected to facilitate around 1,000 nursing job placements from Andhra Pradesh annually. SkillBee has already helped 10,000 individuals secure international jobs. APSSDC aims to position Andhra Pradesh as a 'Skill Capital' by equipping students with specialized language training for global career opportunities.

IHCL and Goa Govt to Establish India's Largest Hospitality Skilling Centre

Indian Hotels Company (IHCL) has signed an MoU with the Ministry of Skill Development & Entrepreneurship, GoI, to set up the country's largest hospitality skilling centre. The initiative aims to boost employment opportunities for Goan youth and support the state's thriving tourism industry. The centre will offer industry-aligned training in front office management, housekeeping, food production, and service, along with internships for hands-on experience. IHCL, with 47 skilling centres under its ESG+ framework, continues to invest in talent development, bridging the gap between education and employment in the hospitality sector.

BUDGET SPECIAL

EMPOWERING INDIA'S FUTURE: A SKILLS-FOCUSED BUDGET

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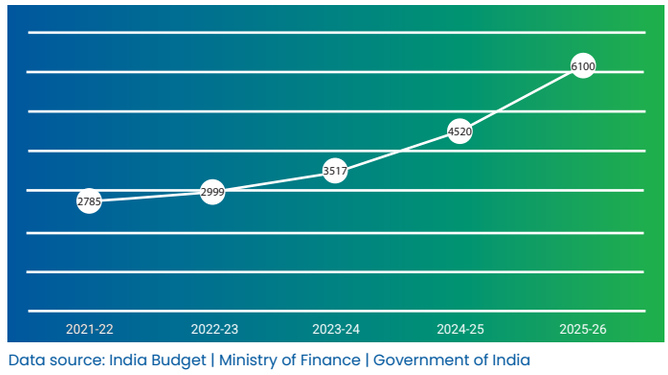
Introduction

India's journey toward becoming a global economic powerhouse hinges not only on its robust policies but also on its ability to harness the potential of its young and dynamic workforce. The Union Budget 2025-26, presented by Hon'ble Minister of Finance Smt. Nirmala Sitharaman, reaffirms this vision with a substantial push towards skill development, marking a pivotal step in achieving the 'Viksit Bharat' (Developed India) dream.

Over the past five years, the government has steadily increased its investment in skill development related initiatives, demonstrating a clear and consistent commitment to building a future-ready workforce. From ₹2,785 crore in 2021-22 to a remarkable ₹6,100 crore in 2025-26, this 119% increase underscores a strategic focus on equipping India's youth with industry-relevant skills, promoting entrepreneurship, and aligning education with emerging market demands.

Figure 1: 5-Year Budget Trend for the Ministry of Skill Development and Entrepreneurship



Data source: India Budget | Ministry of Finance | Government of India

A closer look at this upward trajectory reveals more than just numbers; it tells the story of India's evolving priorities in a rapidly changing global economy. The budget builds upon past skilling initiatives with a more structured, market-driven, and outcome-oriented approach. The focus is clear: digital skilling, green jobs, global workforce mobility, and direct employment linkages.
The emphasis is on integrating artificial intelligence (AI), enhancing vocational training and promoting international collaborations. The key is not only to response to current market demands but a forward-thinking strategy to future proof India's labour force.

> *"India's growth story will be powered by its people. Our priority is to ensure that every Indian has access to skills that are relevant, employable, and future-ready."*
>
> **Hon'ble Union Minister of Finance, Smt. Nirmala Sitharaman**

The Skill India Mission 2015 laid the groundwork, but structural gaps like low employability, outdated training methods, and limited industry collaboration remained. In recent years, the government has introduced targeted interventions like:

- **PM Vishwakarma Yojana (2023):** A ₹13,000 crore

initiative to upskill traditional artisans with digital and financial literacy

- **Skill India Digital Hub (SIDH) (2023):** A tech-driven skilling platform offering AI-powered career guidance and job matching
- **National Apprenticeship Training Scheme (NATS) (2024):** ₹3,500 crore allocated to ensure 25 lakh youth gain hands-on industry exposure

This year's budget does not treat skilling as a standalone intervention but integrates it with industry demands, technological trends and global employment opportunities.

Digital Skilling and AI Workforce Development

As AI and automation reshape industries, digital skilling is no longer optional but foundational. Budget 2025 expands investments in AI-driven skilling initiatives, ensuring that India's workforce is prepared for the future. A sum of ₹5,000 crore is being invested in upgrading 5,000 ITIs (Industrial Training Institutes) with AI labs. Approximately 1.5 crore youth will be trained in data science, cybersecurity, and cloud computing through Skill India Digital Hub (SIDH). Further, an AI Workforce Programme has been launched to train 10 lakh professionals in advanced AI applications, blockchain, and automation.

"AI will not replace jobs - it will transform them. India must lead this transition, not just adapt it."

Hon'ble Prime Minister Shri Narendra Modi

Atal Tinkering Labs (ATLs): Expansion to 50,000 government schools, promoting hands-on STEM education and fostering innovation among school students. The initiative supports digital education and reduces the digital divide through broadband connectivity in schools.

National Centres of Excellence for Skilling (NCoES): Demand-Driven Learning: ₹500 crore for a Centre of Excellence in Artificial Intelligence (AI) for Education to bridge the skills gap in high-growth sectors, the government will establish five National Centres of Excellence for Skilling in partnership with industry leaders. These will focus on:

- Artificial Intelligence and Automation
- Green Energy and Electric Mobility
- Semiconductors and Electronics
- Aerospace and Advanced Manufacturing
- Fintech and Digital Banking

"India's skilling ecosystem needs a demand-driven model, where training is not just supply-side driven but guided by market forces."

Hon'ble Union Minister of Education, Shri Dharmendra Pradhan

Empowering Women Entrepreneurs

A new scheme is being launched for 5 lakh women, Scheduled Castes and Scheduled, and Tribes first-time entrepreneurs. This will provide term loans up to 2 crore during the next 5 years. The scheme will incorporate lessons from the successful Stand-Up India scheme. Online capacity building for entrepreneurship and managerial skills will also be extended.

Recognizing the pivotal role of women in economic development, the government has launched the Swavalambini Women Entrepreneurship Programme in the northeastern states of Assam, Meghalaya and Mizoram. This initiative aims to empower female students in higher education institutions by providing them with the necessary entrepreneurial mindset, resources, and mentorship.

"The Swavalambini Women Entrepreneurship Programme is a commitment to empower, enable and elevate young women as job creators and leaders of tomorrow."

– Hon'ble Minister of State (I/C), Ministry of Skill Development and Entrepreneurship, Shri Jayant Chaudhary .

Conclusion

As India strives to become a $5 trillion economy, the emphasis is on human capital development through targeted skilling initiatives, and they will be pivotal in driving inclusive growth, reducing inequality and positioning India as a global talent powerhouse. Ultimately, this budget is not just an investment in skills, but an investment in India's future. These initiatives reflect a comprehensive approach to skill development, aiming to prepare India's workforce for future challenges and opportunities.

References

1. Budget Speech 2025-26, retrieved from *www.indiabudget.gov.in*
2. Swavalambini, a women entrepreneurship programme launch, retrieved from Press Release: Press Information Bureau

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Shri Jayant Chaudhary inaugurates NSDC International Academy at Greater Noida

Shri Jayant Chaudhary, Hon'ble Minister of State (I/C), Ministry of Skill Development and Entrepreneurship (MSDE) and Minister of State, Ministry of Education inaugurated the NSDC International Academy, a state-of-the-art facility designed to provide world-class skill development and training programmes. The NSDC International Academy is a landmark initiative designed to bridge the gap between Indian youth and global employment opportunities. It will serve as a centre of excellence, offering specialized training programs aligned with the skill demands of countries like Germany, Japan, and Israel. Shri Chaudhary flagged off the departure of 11 candidates headed to Germany and toured the NSDC International Academy, engaging with students enrolled in its programs and experienced the AI and VR facilities, advanced labs present at the centre, interacted with students about their life journeys, and offered them motivation.

Honourable Chief Minister of Maharashtra Shri Devendra Fadanvis unveiled Skill India Digital Hub (SIDH) in Marathi

In a significant move to strengthen Maharashtra's skilling ecosystem, Hon'ble CM Shri Devendra Fadnavis along with Deputy CMs, Shri Eknath Shinde and Shri Ajit Pawar, unveiled the Marathi version of the Skill India Digital Hub (SIDH) at the Vishwa Maratha Sammelan 2025 in Pune. In the event, Shri Ved Mani Tiwari, CEO NSDC, was felicitated by the Hon'ble Minister of Marathi Language of Maharashtra, Shri Uday Samant, for his instrumental role in shaping SIDH into a pioneering initiative that is transforming knowledge accessibility. The platform offers over 7,000 skill courses, including those on AI, ML, and drone technology, enabling professionals, students, and jobseekers to explore learning resources in their native language. Maharashtra is among the top five states in SIDH registrations, contributing 30% of the national user traffic. By enabling millions to upskill in their own language, SIDH is opening doors to new opportunities, strengthening India's digital economy and workforce.

NSDC to set up 50 new Future Skill Centres and 10 International Academies

National Skill Development Corporation (NSDC) announced a significant expansion in its skilling footprint across India with plans to set up 50 new Future Skills Centres and 10 NSDC International Academies to advance skill development and training programs. During his address at NSDC's first Annual Press Conference, Shri Ved Mani Tiwari, CEO, NSDC and MD, NSDC International, shared his roadmap to skill and upskill the Indian youth for domestic and global job markets. The industry aligned programs aim to bridge the gap between theoretical knowledge and practical skills by aligning education with emerging technologies and industry needs. So far, 33 global corporations have partnered, and 21 Future Skills Centres have been established in Higher Education Institutions (HEIs). Over 200 industry-aligned programs have been assessed and certified by corporations, covering 9 major emerging technologies. More than 27,000 candidates have been trained, with over 1.20 lakh square feet of training space developed.

Summit organized by NSDC International deliberates on Skilling of Workforce in the Care Sector

National Skill Development Corporation International (NSDCI) organized a summit in Chandigarh with Member (Health), NITI Aayog, Dr. V.K. Paul gracing the occasion as Chief Guest. The summit witnessed participation of Vice Chancellors of 50 institutions and around dozen AIIMS chiefs, working towards a stronger healthcare ecosystem.

Addressing the summit, Member (Health), NITI Aayog, Dr. V.K. Paul emphasized the need to expand skilling initiatives beyond traditional medical education, balancing quality with quantity. He highlighted the importance of evolving curricula, strengthening regulatory frameworks, and scaling up skill-based training programs to address workforce shortages, including in specialized areas such as geriatric care. He spoke about the important role to be played by the private sector and said that private sector collaboration is essential to bridge the skill gap. CEO, NSDC International, Shri Alok Kumar said that India has the potential to bridge the supply-demand gap for care professionals.

NSDC partners with Get Set Learn to Empower 1M Students and Transform K-12 Education for the Future of Work

National Skill Development Corporation and Get Set Learn, a future skills focused learning startup backed by the Arvind Mafatlal Group, have partnered to launch the Skills for New Bharat initiative, with the goal of empowering 1 million students in K12 over the next five years. This collaboration will equip school students with essential future skills like AI, robotics, entrepreneurship, critical thinking, creativity, and more… preparing them to thrive in a rapidly evolving digital world. The collaboration focuses on three key pillars: the development of a Future Skills Report to identify in-demand competencies, the establishment of Future Skills Tinkering Labs across schools in India and Get Set Learn's Industry challenges platform SOLVEIT integrated with NSDC Digital. This will provide students with hands-on experience through real-world industry challenges, encouraging them to apply their knowledge and gain recognition for problem-solving efforts. This partnership is a significant step in shaping the future of learning and empowering the next generation of entrepreneurs and innovators.

NSDC Academy Launches Advanced Certification Program in IC Packaging & Manufacturing, Powered by Siemens in Association with Daksh Gurukul-IIT Guwahati

As India advances toward its Viksit Bharat 2047 vision—aspiring to be a global leader in technology and innovation—the semiconductor industry plays a crucial role in achieving self-reliance and driving economic growth. A highly skilled workforce is essential for IC packaging, fabrication, and semiconductor manufacturing.

To support this national mission, NSDC Academy, in collaboration with Siemens experts, Daksh Gurukul - IIT Guwahati (IITG), has launched an Advanced Certification Program in IC Packaging & Manufacturing. This program is designed to equip engineers with world-class skills, address critical skill gaps, and strengthen India's semiconductor ecosystem.

A joint initiative by IIT Guwahati and NSDC, the program is powered by Siemens EDA and Maven Silicon. Aligned with the India Semiconductor Mission, it integrates cutting-edge technology, hands-on training, and real-world applications to create industry-ready semiconductor professionals. This initiative directly supports India's Make in India and Atma Nirbhar Bharat missions, fostering a highly skilled workforce in IC packaging and manufacturing and positioning India at the forefront of semiconductor technology.

NSDC collaborated with National Institute of Design (NID), Jorhat and Skillinabox to launch a course in Fashion and Apparel Designing

The collaboration between National Skill Development Corporation Academy, Skillinabox and the National Institute of Design (NID), Jorhat, brings high-quality design education to aspiring designers, with a special focus on empowering housewives. This 6-month program breaks down traditional barriers, offering accessible. NID-quality education without entrance exams, age restrictions, or financial burdens. Designed to be budget-friendly, the program provides professional-grade kits and hands-on training in stitching, patternmaking, fabric selection, and creative design, all delivered by industry experts.

Skillinabox has been committed to skilling women aged 35-45, and through this collaboration, housewives now have the opportunity to gain the skills needed for a successful career in fashion design. By making NID's renowned education available to all, regardless of background, Skillinabox and NID aim to open doors for personal and professional growth, financial independence, and entrepreneurship. This partnership offers housewives a chance to transform their lives and pursue sustainable careers in the fashion industry.


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