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Review Article

India's healthcare paradox: would the domestic doctor shortage result in failure of journey towards universal health coverage?

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ABSTRACT

Doctor vacancies in rural India, particularly in Primary and Community Health Centres (PHCs & CHCs), represent a critical challenge to the healthcare system and threaten progress toward the Sustainable Development Goals (SDGs), especially SDG 3 (Good Health and Well-being) and SDG 8 (Decent Work and Economic Growth). These centres form the backbone of rural healthcare, serving nearly 64 percent of India's population. However, persistent shortages of medical personnel undermine access to quality care in rural areas. As per 2023, rural CHCs face a shortfall of over 17,551 specialists, including 4,499 physicians. These gaps limit comprehensive service delivery, particularly in emergency care, maternal health, and the management of non-communicable diseases. Contributing factors include underfunding, inadequate infrastructure, poor working conditions, and difficult recruiting and retaining of doctors. This study examines how doctor shortages in rural centres threaten India's progress toward Universal Health Coverage (UHC) and related SDG targets. Using recent workforce data and policy analysis, it explores the scale of vacancies, their impact on healthcare delivery and workforce conditions, and broader economic and equity implications. Inadequate staffing undermines UHC, increases morbidity and mortality among vulnerable populations, and exacerbates rural–urban health disparities, directly impeding SDG 3. From an SDG 8 perspective, these shortages reflect unstable employment and missed decent work opportunities in public health sector, constraining economic productivity. Addressing these vacancies through comprehensive workforce reforms, improved working conditions, and sustained incentives along with proper implementation is essential for strengthening rural healthcare, advancing health equity, and supporting India's broader health and development goals.

Keywords: Health workforce, Vacancies, Primary health centres, Universal health coverage, Sustainable development goal, Ayushman Bharat

INTRODUCTION

A country can achieve its health goals only when its health workforce is adequate in number, fairly distributed, appropriately supported, and capable of delivering high-quality care. The importance of a robust health workforce was globally reaffirmed with the adoption of the Sustainable Development Goals (SDGs) by all 193 United Nations (UN) member states, including India, in 2015.[1] Among these goals, achieving Universal Health Coverage (UHC) stands out as a central health objective. India's progress toward UHC has been marked by incremental advances alongside persistent structural challenges, particularly in rural and underserved regions. The SDGs consist of 17 goals and 169 targets that are ambitious, comprehensive, and universally applicable. While the goals are interconnected, they emphasize specific thematic areas, including health and employment. SDG 3, the health goal, aims to "ensure healthy lives and promote well-being for all at all ages." It is interwoven with nine other goals and underpinned by 13 targets addressing a wide range of health priorities relevant to

both global and Indian contexts, including maternal and child health, communicable and non-communicable diseases (NCDs), mental health, injuries, pollution-related morbidity and mortality, health systems strengthening, and alignment with global health frameworks.[1] SDG 8, in parallel, focuses on promoting inclusive and sustainable economic growth, full and productive employment, and decent work for all, highlighting the critical link between health systems and economic development.[2]

Since Independence, India has developed a tiered public healthcare system to serve its predominantly rural population. This structure includes Sub-Health Centres (SHCs), Primary Health Centres (PHCs), and Community Health Centres (CHCs). SHCs cater to populations of 3,000–5,000 and are staffed by nurses and paramedical personnel. PHCs serve approximately 30,000 people and are staffed by one doctor supported by paramedical staff. CHCs function as referral centres for about 100,000 people and are designed to be equipped with four specialists—a physician, surgeon, gynaecologist, and paediatrician—along with surgical facilities. Patients requiring advanced care are referred onward to taluka or district hospitals, which are expected to manage the majority of medical conditions.[3]

India has made notable progress in expanding health infrastructure. The number of PHCs increased from 725 in 1951 to over 26,636 by 2024, while CHCs grew from 761 in 1984 to 6,155 in 2024.[4] However, this expansion has not kept pace with population growth, which rose from 360 million in 1951 to approximately 1.4 billion in 2024 an increase of about 3.9 times.[5] When adjusted for population norms, India faces a substantial shortfall—an estimated 24,000 PHCs and nearly 12,000 additional CHCs would be required to meet recommended coverage standards. This infrastructure gap is further compounded by severe shortages of doctors and specialists.[3]

Studies have shown that, the Indian Public Health sector only employs at the most 10% of total MOs and also there is a big variation in where the MOs are placed and distributed. These differences not only exist between the states but also within the states.[6]

Target 3.8 under SDG 3 explicitly aims to achieve UHC, encompassing financial risk protection and access to quality essential health services, access to safe, effective, quality and affordable essential medicines, and vaccines. Monitoring progress under this target relies on two indicators: health service coverage (3.8.1) and financial protection against catastrophic health expenditures (3.8.2). Both indicators are closely tied to the availability and distribution of healthcare workers, particularly in rural settings.[7]

SDG 8 reinforces this linkage by emphasizing decent work and full employment. Target 8.5 seeks to ensure productive employment and equal pay for all by 2030.[8] However, India's rural health sector continues to experience persistent doctor shortages, especially at PHCs and CHCs.[9] Nearly 68% of sanctioned specialist posts at CHCs remain vacant, reflecting systemic challenges in recruitment and retention. Factors such as inadequate infrastructure, limited professional growth opportunities, difficult living conditions, and heavy workloads discourage medical professionals from accepting or continuing rural postings.[10,11]

India's health system is currently undergoing a complex health transition. On one hand, the country is emerging as a global hub for medical tourism and tertiary care, while on the other, rural and primary healthcare systems remain understaffed.[12] Often doctors chose private sector as opposed to public because of better exposure of work, recognition, no fear of easy transfers, regular and lucrative salary structure, freedom to prescribe from large medicinal base, opportunities to refine their skills and better living conditions.[3]

The launch of the Ayushman Bharat Programme in 2018 marked a major policy initiative, with Health and Wellness Centres aimed at strengthening primary care and the Pradhan Mantri Jan Arogya Yojana expanding financial protection for secondary and tertiary care. Despite these reforms, gaps in workforce planning—particularly for specialist retention—persist.

State governments have adopted measures such as compulsory service bonds to address shortages, requiring medical graduates and specialists to serve in rural or underserved areas for a fixed duration. While intended to improve availability, these bonds vary widely across states, lack uniform enforcement, and often fail to address underlying issues of job satisfaction and career progression.[13]

The persistence of doctor vacancies reflects deeper systemic weaknesses within India's healthcare framework. Given that a large proportion of the population resides in rural areas, addressing workforce shortages is essential for achieving health equity, strengthening primary care, and improving the quality of life for millions. Educational reforms, targeted incentives, community-based health worker programmes, and comprehensive workforce policies offer promising pathways to ensure that India's progress toward SDG 3 and SDG 8 is both equitable and sustainable.[14]

METHODS

The data for this study was reviewed from the rural health statistics report, health dynamics report, websites of the National Health Authority and Ayushman Arogya Mandir and relevant articles. Additional documented evidence was obtained from official (online) government records, organizational reports. Also, last ten years of publications were searched for at electronic databases such as PubMed and Google Scholar.[15] Chat GPT has been used to enhance the language in the paper.

Key findings

Evolution of primary health centres (PHCS) in India in last two decades

Primary care is the foundation of the healthcare system, serving as the first point of contact between individuals and health services. It plays a critical role in disease prevention, early intervention, and health promotion, thereby improving population health outcomes and reducing the burden on secondary and tertiary care facilities.[16] In 2005, India's public health system was restructured under the National Rural Health Mission (NRHM), with a focus on strengthening rural healthcare delivery. This initiative was later expanded into the National Health Mission (NHM) in 2013, integrating urban health priorities. Key programmes such as Janani Suraksha Yojana and publicly funded insurance schemes like Rashtriya Swasthya Bima Yojana were launched to improve access and financial protection. Aligned with the World Health Organization's Universal Health Coverage framework introduced in 2013, India committed to achieving UHC by 2030. The Twelfth Five-Year Plan further emphasized this goal, outlining strategic measures to address healthcare inequities across the country's population.[15]

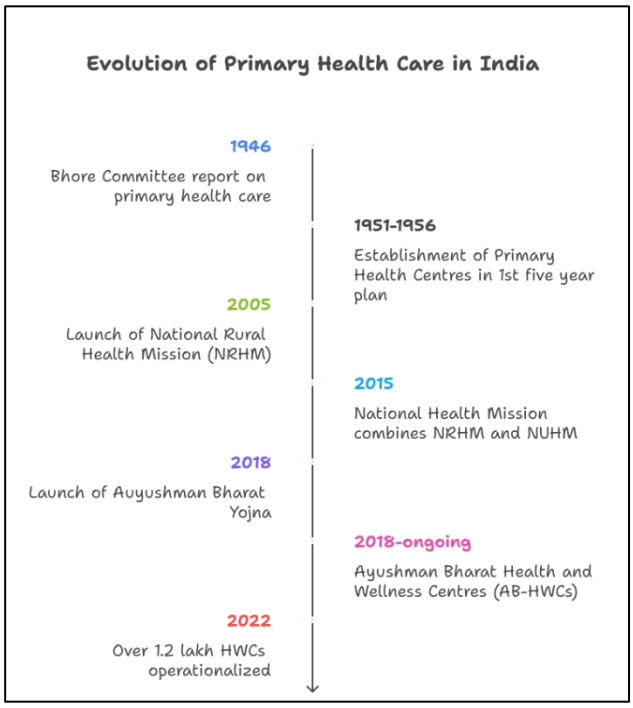

Figure 1: Evolution of primary health care in India.

Here's a concise timeline outlining this transformation

2005–2015: strengthening PHCS under NRHM[16]

2005 marked the launch of the National Rural Health Mission (NRHM), aiming to revitalize rural health infrastructure. Several improvements were done under NRHM:

PHC up-gradation happened through Indian Public Health Standards (IPHS) norms, hiring of contractual staff like AYUSH doctors and additional nurses, introduction of Untied Funds for local health planning, encouraged institutional deliveries via schemes like Janani Suraksha Yojana (JSY).

A policy shift happened between 2015 to 2018, and the intent behind this was comprehensive primary care. The main changes were:

In 2015, NRHM was merged into the National Health Mission (NHM) (which includes urban health via NUHM), recognition grew that PHCs focused mostly on reproductive and child health, with little for NCDs or mental health.

Pilot models and innovations done

Some states began pilot models for expanded primary care (e.g., Tamil Nadu's UPHCs and Odisha's NCD clinics). Discussions on universal health coverage (UHC) picked up at national forums.[17]

2018–2025: launch of ayushman bharat health and wellness centres (AB-HWCS).[18]

In February 2018, the Government of India launched the Ayushman Bharat Programme to advance Universal Health Coverage through two components: Health and Wellness Centres (HWCs) and the Pradhan Mantri Jan Arogya Yojana (PM-JAY). The initiative aimed to establish 150,000 HWCs by 2022 to deliver comprehensive primary healthcare and provide health insurance coverage for secondary and tertiary care to the bottom 40% of the population.

Transformation of PHCS to AB-HWC PHCS

The primary difference between a PHC and an AB-HWC PHC lies in service scope. While PHCs provide basic care, AB-HWC PHCs offer expanded comprehensive, preventive, and wellness services. In November 2023, HWCs were renamed Ayushman Arogya Mandir (AAM).[19] By 2022, over 1.2 lakh HWCs were operationalized (including SC-HWCs and PHC-HWCs).

PHCS became AB-HWC PHCS, with

Expanded services to cover 12 health packages, including non-communicable diseases (NCDs), mental health, oral health, elderly care, palliative care, and emergency care, use of Mid-Level Health Providers (MLHPs) – Community Health Officers (CHOs), introduction of IT systems (e.g., AB-HWC portal, tele-consultation via e-Sanjeevani), continuous supply of essential medicines and diagnostics, wellness activities: yoga, counselling,

lifestyle modification. As of 9 February 2026, there are 1,83,911 Ayushman Arogya Mandirs Operational across India, of which 24,422 are rural PHCs.[20]

Pradhan mantri swasthya suraksha yojana (PMSSY):

The PMSSY is based on ensuring the three E's of Expand-Equity-Excellence. The scheme aims at correcting regional imbalances in the availability of affordable and reliable tertiary healthcare services and augmenting facilities for quality medical education in the under-served States. Before we go into further analysis of vacancies in PHCs and CHCs, let us understand how the workforce positions are sanctioned in the health sector.

How are health workforce positions sanctioned?

The health workforce, a critical pillar of the health system is essential for achieving equitable healthcare coverage, especially in the post-pandemic context. India's commitment to universal healthcare depends on the availability and equitable distribution of healthcare professionals across all levels of care.

Process of sanctioning health workforce positions:[17,6]

State Health Departments initiate proposals based on population size, health indicators, facility utilization, and requirements for establishing new or upgrading existing PHCs and CHCs. Directorate of Health Services (DHS) reviews proposals against Indian Public Health Standards (IPHS), current staffing patterns, vacancy levels, and projected retirements.

Financial and administrative approvals are obtained from the State Finance Department, and from the Union Ministry when central assistance (e.g., NHM posts) is involved. Recruitment and notification are carried out through State Public Service Commissions, Medical Recruitment Boards, or under National Health Mission contracts. Some states have dedicated medical recruitment boards. Sanctioned posts may remain unfilled due to vacancies or lack of applicants. The analysis here compares trends in PHC numbers and doctor availability at PHCs and CHCs, including changes in requirements, in-position staff, vacancies, and shortfalls over time.

In 2005, India had a total of 23,236 PHCs, in 2012 the total increased to 24,049 PHCs, an increase of 813 PHCs or approximately +3.50% from 2005. In 2017 the total PHCs further rose to 25,308, an increase of 1,259 PHCs or approximately +5.24% from 2012. In 2020 the total reached 30,813 PHCs, marking a significant increase of 5,505 PHCs or approximately +21.75% from 2017. (Figure 2). Overall, from 2005 to 2020, there was an increase of 7,577 PHCs, or approximately +32.61%. Noteworthy shift happened between 2020 and 2021, where a sharp decrease was reported between 2020 and 2021. The total number of PHCs in 2020 was 30,813, in 2021 this total dropped to 25,140. This represents a decrease of 5,673 PHCs, or approximately -18.41%. As discussed, this substantial reduction could indicate a reclassification of health facilities in Health and Wellness Centers (HWCs) after the launch of Ayushman Bharat. Other reasons could be changes in data collection methodology, or revisions to the definition of what constitutes a PHC in the reporting framework, rather than a physical dismantling of centres.[21]

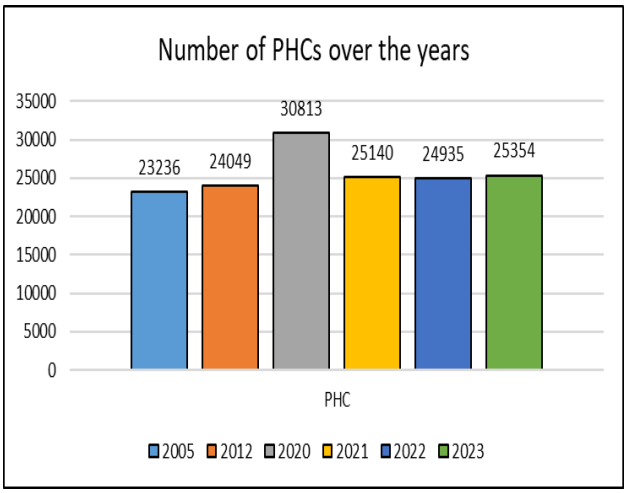

Figure 2: Number of PHCS over the years.

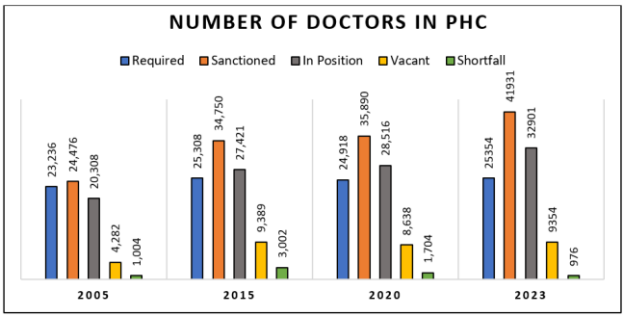

Figure 3: Number of doctors in PHCS.

Trend between 2021 and 2023 shows that following the 2020-2021 shift, the total PHC numbers remained relatively stable with minor fluctuations. Overall, from 2005 to 2023, the total number of PHCs increased from 23,236 to 25,354, representing a net increase of 2,118 PHCs, or approximately +9.11%. 22. As of 2024, a total of 1,73,274 AB-HWCs have been operationalized throughout the nation. Of these, 1,27,468 are SHC-HWCs, 23,870 are PHC-HWCs, 5,086 are UPHC-HWCs, 11,770 are AYUSH-HWCs and 5,080 are UHWC. 15Since the number of required doctors is completely dependent on the number of functioning PHCs in the state, with the variation in this reflects variations in position of doctors. There has been an over 62 percent rise in the number of doctors in primary health centres since the launch of the National Rural Health Mission in 2005. In 2005, the shortage of doctors (which is dependent upon number of required doctors) was 4.32 percent, whereas vacancies were 17.5 percent, the

numbers in 2023 did not change much, with shortfall being 4 percent and vacancies being 22.3 percent as shown in Figure 3. At the primary level, there were nearly 17.5 % vacancies reported for sanctioned medical officer positions in rural PHCs as of 2005, 27 % in 2015, and 24% vacancies.

Table 1: State-wise doctors.

	2005					2023				
State/union territory	Required	Sanctioned	In position	Vacant	Shortfall	Required	Sanctioned	In position	Vacant	Shortfall
Chhattisgarh	517	1,034	628	406	*	773	1011	585	426	188
Gujarat	1,070	1,070	848	222	222	1483	1893	1558	335	*
Karnataka	1681	2237	2041	196	*	2132	2392	2052	340	80
Madhya Pradesh	1,192	1,278	839	439	353	1440	1946	1404	542	36
Odisha	1,282	1,353	1,353	0	*	1277	1321	916	405	361
Punjab	484	646	373	273	111	397	586	411	175	*
Rajasthan	1,713	1,517	1,506	11	207	2179	2622	2236	386	*
Uttarakhand	225	272	182	90	43	532	619	486	133	46
Uttar Pradesh	3,660	-	-	-	-	3055	4448	2827	1621	228
All India	23,236	24,476	20,308	4,282	1,004	25354	41931	32901	9354	976

Table 2: State-wise specialists.

	2005					2023				
State/union territory	Required	Sanctioned	In position	Vacant (C-D)	Shortfall (B-D)	Required	Sanctioned	In position	Vacant (H-I)	Shortfall (G-I)
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
Andhra Pradesh	656	406	224	182	432	552	599	503	96	49
Bihar	404	-	-	-	-	1096	1046	209	837	887
Chhattisgarh	464	464	18	446	446	664	617	82	535	582
Gujarat	1,088	321	92	229	996	1400	459	166	293	1234
Jharkhand	188	-	-	-	-	684	752	207	545	545
Madhya Pradesh	916	253	49	204	867	1180	1328	67	1261	1261
Odisha	924	496	-	-	-	1508	1315	253	1062	1067
Rajasthan	1,304	811	581	230	723	2356	1702	510	1192	2090
Tamil Nadu	140	48	48	0	92	1540	329	227	102	1313
Uttar Pradesh	1,544	-	-	-	-	3012	3018	976	2042	2780
All India	13,384	7,582	3,550	3,538	6,110	21964	13232	4413	8967	17551

In 2005 the problem states with highest number or vacancies and shortfall of doctors were Chhattisgarh, Gujarat, Madhya Pradesh, Punjab, and Rajasthan. In 2023, the states with highest number or vacancies and shortfall of doctors were Chhattisgarh, Odisha and Uttar Pradesh. In Punjab and Rajasthan though there were vacancies, however, the shortfall was not there (Table 1).

Across India, medical officers, doctors and specialists play a crucial role in PHCs and CHCs, serving as the first point of contact for rural patients. There was a 46 percent shortfall of specialists (Figure 4) in rural India's CHCs in 2005, which rose to 80 percent in 2023 23 and the vacancies rose to 68 percent from 47 percent reflecting the growing crisis in rural healthcare access across the country. Andhra Pradesh is the only state with only 9% shortage of specialists, where most states in the country have more than 70% to 80% shortage of specialists in CHCs. The situation is particularly bleak in large states such as Madhya Pradesh, Bihar, Uttar Pradesh, Rajasthan, Gujarat, and Tamil Nadu which have a shortage of 94 percent, 80.9 percent, 74.4 percent, 80.3 percent, 88.1 percent, and 85.2 percent, respectively.

Rise of medical colleges increased in last few years and their fees

There were only 387 medical colleges in 2014. The enactment of the National Medical Commission Act, 2019 leading to constitution of the National Medical Commission, as the apex regulatory body for medical education in the country was the first but essential step in reforming the governance architecture. In 2023, the medical colleges in India were 660, 360 government and 300 private. Since 2014, a total of 273 medical colleges were added, leading to a 70 % increase in the establishment of medical colleges with a whopping 98% increase in the number of Government medical colleges (GMC) alone and a 45% increase in the private sector,

since till 2023. The medical colleges in India rose to 780, in March 2025, of which 427 are government and 352 private, further 10.3% increase in government colleges and 17% increase in private colleges.[24] The number of medical colleges were increased from 387 in 2014 to 766 in 2024.[15] So also the number of seats from these colleges, a 96 percent increase in number of UG seats and 109 percent increase in PG seats in 2023.[24]

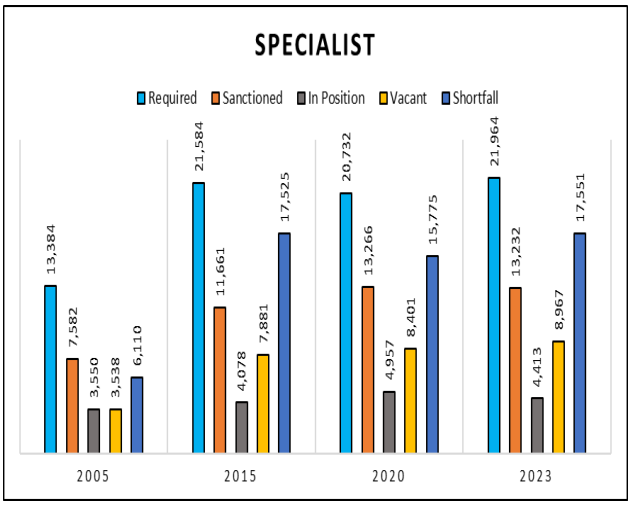

Figure 4: Specialist doctors in CHCS.

The addition of 120 colleges in just two years from 2023 to 2025 (~18%) reflects ongoing, robust expansion. By 2023, there were a total of about 1,18,148 MBBS seats across all medical colleges in India. This expansion aligns with national objectives to improve the doctor-population ratio, enhance healthcare access, and meet rising medical education demand.[25]

This picture holds a background of a lot of input that budding doctors have to put in, in terms of monetary resources. On an average a MBBS degree in a private college cost around 50 lakhs to 1.2 crore rupees. After spending this much money on their education, almost every doctor hopes for a good return through their practice and hence often choose private sector for working. Many specialists also believe in establishing their own practice hence avoid rural sector altogether.[26]

DISCUSSION

The situational analysis of human resources across Indian states indicates persistent shortages of doctors, specialists, and paramedical staff, with little improvement since 2005. India's current doctor–population ratio is approximately 1:811, with 13.86 lakh registered allopathic l doctors and 7.15 lakh AYUSH practitioners.[27] The healthcare workforce also includes around 36.14 lakh nursing personnel and 13 lakh allied health professionals.[28] However, this workforce is unevenly distributed, resulting in significantly better healthcare access in urban areas compared to rural regions.

National data show an urban-to-rural doctor density ratio of 3.8:1. In rural India, the doctor-to-patient ratio is roughly 1:11,082, far below recommended standards, even when both allopathic and AYUSH practitioners are included. Consequently, rural healthcare facilities—particularly Primary Health Centres (PHCs) and Community Health Centres (CHCs)—face critical shortages of medical personnel.[29]

Despite an increase in the number of medical colleges and MBBS graduates, many postgraduate specialists (MD/MS) are reluctant to serve in rural government facilities.[18] Specialists working in CHCs report poor living and working conditions, including inadequate housing, unreliable electricity and water supply, and lack of security. These constraints contribute significantly to low recruitment and retention in rural areas and create professional dissatisfaction and uncertainty regarding career progression.[30,31]

Further compounding the problem is the gap between reported staffing figures and ground realities. Reports indicate widespread absenteeism at PHCs, with doctors often attending only to fulfil minimum requirements rather than provide continuous care—an issue not adequately captured in official Rural Health Statistics. In many instances, PHCs are staffed solely by AYUSH practitioners, even though AYUSH and allopathic roles are not interchangeable.[32]

Additionally, meeting the healthcare needs of a population of 100,000 requires expertise across nearly 20 specialised domains. Deploying and sustaining such a wide range of specialists at CHCs or sub-district hospitals is both logistically and financially challenging, and limited caseloads may further hinder specialists from maintaining and refining their clinical skills.[12]

Impact of doctor vacancies

Rising specialist vacancies in rural India have seriously affected healthcare delivery at Community and Primary Health Centres. This trend reflects persistent failures in recruiting and retaining specialists, leading to compromised healthcare quality for rural populations.[33]

Work Pressure and Quality of Care: Specialist shortages have increased workload for existing staff, forcing general physicians to work beyond their expertise. Poor working conditions and heavy workloads reduce provider and patient satisfaction, pushing patients toward higher-level facilities and further burdening the system.[30,11] Consequences for Specialists: High vacancy rates cause frustration and distress among specialists, affecting their well-being and job satisfaction. Administrative conflicts, strained patient interactions, deskilling, and limited professional growth drive many to leave rural services for better opportunities in the private sector.[30]

Broader implications for rural health

Persistent rural–urban disparities in healthcare stem from poor infrastructure, unequal distribution of doctors, and limited access to specialized services, restricting rural populations' access to quality care and underscoring the need for urgent workforce reforms. Lack of doctors and specialists in public hospitals often force rural poor to seek medical facilitates from a higher-level facility or a private hospital, resulting in overcrowding, long queues, delays in treatment, untimely death and often a huge financial burden.

Doctor shortages also hinder progress toward SDG 8 by reducing healthcare access, lowering worker productivity, increasing healthcare costs, and disproportionately affecting vulnerable groups, thereby constraining inclusive and sustainable economic growth. Some doctors also suggest that there is no use of upgrading PHCs into CHCs since the vacancies are simply increasing and if a CHC does not have specialists then they do not serve their purpose.[35]

CONCLUSION

Why qualified medical professionals avoid rural India

Retaining doctors in rural India remains difficult, and flagship initiatives like Ayushman Bharat have had limited impact. A 2011 World Bank–funded study found that 39% of medical providers in PHCs across 19 states were absent.[31] A 2017 Public Health Foundation of India study identified poor living and working conditions, weak infrastructure, irregular drug supply, professional isolation, and heavy administrative burdens as major deterrents to rural service. In response, states have introduced mandatory rural service requirements of one to five years during or after postgraduate training, while projections suggest India will need 15,000 additional family medicine seats by 2030 to strengthen rural healthcare delivery.[7,32]

The implications of healthcare vacancies are far-reaching. The global agenda for investment in health, including the health workforce, is articulated by the High-Level Commission on Health Employment and Economic Growth, established by the United Nations Secretary-General in 2016. The Commission recognizes that health workers and health employment are central to the Sustainable Development Goals (SDGs). An expanded, transformed, and sustainable health workforce is essential to improving health outcomes, wellbeing, equity, and social cohesion, while also fostering inclusive economic growth.[37] Under SDG 3, persistent staffing gaps limit access to care and contribute to higher morbidity and mortality among vulnerable populations.[38,39] Under SDG 8, inadequate staffing undermines decent work conditions and constrains economic productivity. These vacancies also signal deeper systemic challenges in health workforce planning, underscoring the need for comprehensive recruitment and retention reforms. Although Rural Health Statistics from the MoHFW provide vacancy data for rural areas, no consolidated public-sector workforce data exist for urban areas.[37] Workforce projections further indicate that, at current growth rates, the density of skilled health professionals is unlikely to improve by 2030.[37]

Government initiatives

Overview of strategies

To address persistent doctor vacancies in rural India, particularly in PHCs and CHCs, the government has recognized the need for comprehensive reforms that go beyond recruitment. Effective strategies must strengthen support systems to ensure equitable distribution and long-term retention of healthcare professionals in underserved areas. Achieving this requires coordinated, interdepartmental action involving not only the health ministry but also finance and general administration departments to reform policy frameworks and ensure effective implementation.[40-42]

Policy development and implementation

The government has introduced several policy measures to improve the recruitment and retention of healthcare workers in rural areas. Evidence suggests that rural posting policies are most effective when supported by complementary investments, such as staff housing and access to quality education for workers' children, which help create a conducive working environment. Improved digital connectivity and user-friendly applications at health centres can further enhance service delivery and professional satisfaction.[10]

To address doctor shortages at PHCs, initiatives under Ayushman Bharat–Health and Wellness Centres include deploying Mid-Level Healthcare Providers (MLHP) trained through a six-month course to manage common conditions, along with recruiting contractual providers to ensure service continuity in underserved areas.

Additional efforts include granting states flexibility in setting salaries under the National Health Mission to enable timely recruitment, institutionalising training for Mid-Level Healthcare Providers (MLHPs), and exploring the creation of an All-India cadre of specialist and public health doctors. The government is also piloting incentive-based human resource strategies to strengthen recruitment and long-term retention, particularly in underserved regions.[43] Although the state government has invited retired specialists to re-join the system this year to provide their services.[9]

National plans

In addition to above measures, under National Health Mission, Ministry of Health and Family Welfare provides

both financial and technical support to States/UTs to strengthen their healthcare systems. This support includes assistance for recruitment of doctors based on the requirements outlined in their Programme Implementation Plans (PIPs), subject to their overall resource envelope available to each state.[44]

Under NHM, following types of incentives and honorarium are provided for encouraging doctors to practice in rural and remote areas of the country:

Hard area allowance to specialist doctors for serving in rural and remote areas and for their residential quarters so that they find it attractive to serve in public health facilities in such areas. To this could also be added the effort for co-locating multiple teaching institutions such as medicine, nursing, dentistry etc.[37]

Honorarium to Gynaecologists/Emergency Obstetric Care (EmoC) trained, Paediatricians and Anaesthetist/Life Saving Anaesthesia Skills (LSAS) trained doctors is also provided to increase availability of specialists for conducting Caesarean Sections in rural and remote area.

Performance linked special incentives for doctors, for auxiliary nurse midwives (ANMs) for ensuring timely ANC check-ups and recording, incentives for conducting Adolescent Reproductive and Sexual Health activities.

Flexible salary structures

States are permitted to offer negotiable salaries for specialists, including strategies such as "You Quote, We Pay," to attract talent to underserved areas. Non-Monetary incentives such as preferential admission in post graduate courses for staff serving in difficult areas and improved accommodation arrangement in rural areas have also been introduced under NHM. Multi-skilling of doctors is supported under NHM to overcome the shortage of specialists. Skill up-gradation of existing HR is another major strategy under NRHM for achieving improvement in health outcomes.Under Section 51 of the National Medical Commission Act, 2019, doctors receive up to a 10% incentive in NEET (PG) marks for each year of service in rural, remote, or difficult areas, maximum up to 30%, and 50% of medical diploma seats are reserved for in-service medical doctors who have served in such areas. In addition, national strategies promote the involvement of civil society organizations to support community-based interventions and strengthen healthcare delivery in rural settings.[45,46]

Financial support and training

Financial incentives play crucial role in the government's strategy to improve healthcare access and quality. Cash transfers for outpatient care and insurance coverage for inpatient services aim to empower economically disadvantaged populations by expanding choice between public and private providers, thereby encouraging improvements in public health facilities. In parallel, the government has prioritised training programmes aligned with national health policies to strengthen the skills of paramedics and other allied health professionals.[47]

Recruitment and retention strategies

Recruitment and retention strategies must be designed for long-term sustainability. Community-based approaches in countries such as the United States and Scotland demonstrate that combining education, financial incentives, and effective management can successfully strengthen the rural healthcare workforce.[42] Central to these models is aligning institutional missions with the personal and professional goals of healthcare providers, fostering supportive environments that reduce turnover and encourage long-term commitment.[48]

Doctors are fighting many demons in their head, including peer pressure (from doctors working in cities) to lack of support from seniors.[30] Not many of these plans have worked in retaining doctors to rural sector. For service bonds there is no uniformity in bond duration, after completion of post-graduation. Also students prefer studying in states with no bonds.[10] Usually a combination of the above example, job with higher education training opportunities, good connectivity, good salary, facilities for family, housing etc is necessary to retain doctors in a rural facility.[31]

Solutions and recommendations

Recruitment and retention strategies

A multifaceted approach is required to attract and retain doctors in rural areas. While financial incentives such as higher salaries and honoraria for rural postings have been adopted by several states, these measures alone are insufficient.[49] Improving infrastructure and living conditions is equally critical. Additionally, empowering rural doctors with leadership roles and strengthening coordination with community stakeholders can enhance service delivery while fostering ownership and long-term professional commitment.[50]

A scoping review identified strategies for attracting and retaining healthcare professionals in rural areas, broadly grouped into recruitment, development, and retention, with educational, policy, and financial incentives as key components. India, for instance, has implemented monetary incentive schemes in eighteen states. However, the effectiveness of these strategies varies widely due to differences in local contexts, infrastructure, and definitions of "rural," making cross-region comparisons challenging.[10,51]

Training and development

Investing in the training of local healthcare providers is vital for strengthening rural health systems. Telemedicine

has emerged as an effective tool to connect rural facilities with urban specialists, reducing costs while enhancing training and professional development. Through real-time consultations and remote learning, telemedicine supports continuous medical education for rural doctors and extends specialist care to underserved areas.[17,31]

Policy and infrastructure improvement

Policymakers should bundle interventions—such as compulsory rural postings—with more positively received measures to reduce resistance. Adequate allocation and maintenance of infrastructure are essential to support medical staff, while addressing funding mismanagement and facility neglect is key to creating a conducive rural working environment.[10]

Addressing workload and burnout

Managing workloads is key to sustaining healthcare professionals' motivation and job satisfaction, as excessive workloads can lead to burnout. Establishing manageable hours and providing adequate support helps healthcare workers feel valued and encourages long-term service in rural and underserved areas.[18]

Role of telemedicine AI in healthcare

Across the world, the healthcare system is adopting virtual healthcare as a solution to deal with shortages of doctors. We saw how online consultations increased during the COVID pandemic. AI is of course revolutionising the healthcare.A few things need to be taken care of while adapting telemedicine like offering optimization for low bandwidth environment, ability to offer offline services to account for network issues in rural areas and data security and privacy.[52,53]

Role of civil society in rural healthcare

NGOs have often filled the gaps in healthcare provision over the years by focusing on marginalized and vulnerable populations. Civil society organizations can help fulfil gaps in the public healthcare sector and act as data messenger with the help of community connections. They can also refer people to appropriate health facilities minimizing out-of-pocket expenditure on health. NGOs can assist doctors in PHCs and also place their doctors in absence of government doctors. Beyond these, NGOs can perform vast range of functions if properly engaged.[54]

Implications for future research

Further research is necessary to evaluate the effectiveness of these strategies not just within the Indian context but globally. By analysing successful implementations in different countries, policymakers can adapt and apply effective strategies that consider local geographical and cultural factors, thus enhancing the rural healthcare workforce worldwide.

Addressing the issue

Addressing doctor shortages is crucial for achieving Sustainable Development Goals 3 and 8. This requires a multifaceted approach, beginning with investments in healthcare infrastructure to expand and strengthen facilities, particularly in underserved areas. Equally important is enhancing training and education programs to increase the number of qualified doctors. Incentivizing healthcare professionals through competitive salaries, benefits, and improved working conditions can help attract and retain doctors, especially in rural and remote regions. Promoting the use of digital health technologies further supports this effort by improving access to healthcare services and potentially reducing the burden on existing doctors. By effectively tackling doctor vacancies, countries can strengthen their healthcare systems, ensure a healthier and more productive workforce, and advance sustainable economic growth in line with SDG 8.

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