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Strategies for Health Care Delivery in Rural India Role of Small Scale Community Health Project

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Abstract: *Health care is a fundamental right of every human being. About half of the world's population (An estimated 3.4 billion of the world's 7.6 billion in 2018) lived in rural areas. Individuals in rural areas often have poor access to healthcare because of poor accessibility and availability of standard healthcare systems and socio-cultural factors affecting their perception of health compared to the urban population. Though there is a projected decrease in the absolute percentage of the world's population dwelling in rural areas by 2050, there is also a projected increase projected increase needing of prioritizing rural health. This chapter shall discusses the critical factors that disadvantage the rural population. It also considers the methods used to work out rural healthcare delivery strategies to decrease this disparity in rural areas' health care facilities.*

Keywords: *Health care*

I. INTRODUCTION

Healthcare is a fundamental right of every human being and everyone's respon-sibility [1]. When healthcare is viewed as a right and a responsibility, the state's active role in maintaining its people's health becomes even more pro-active more pro-active. This remedies the often-neglected individual's responsibility toward his/her health. There has always been an inverse distribution of healthcare services in rural when compared to the urban population, which is often referred to as the inverse care law or Pareto's Law. Pareto's law of distribution applied to healthcare (according to the British General practitioner Julian Hart in 1971) hypothesized that those in the greatest need of medical services in healthcare get the lowest quality possible healthcare and at the very end [2].

The term rural population also differs from country to country and is defined by the country's statistical office. In 2019, the world bank estimated that about 3,397,467,990 individuals were residing in rural areas globally. However, the global increase in rural population has been less than 1% per annum [3]. Even though these population growth rates in rural areas are minuscule there is also a projected increase in population. The existing deficiencies in the healthcare delivery system rural areas will only compound the problems with further urbanization and the healthcare policies favoring healthcare privatization [4]. There is also a growing need to create rural communities which are healthy and at par with healthcare facilities in urban areas [5]. Therefore, prioritizing rural health is imperative and will be a dire necessity for the future.

2. Definitions in rural healthcare

Rural healthcare delivery systems are often deficient in human resource, infrastructure structure, equipment, and financial support. These are essential to provide quality clinical and community healthcare services to the population they cater to. Some countries define healthcare services provision in areas (or communi-ties) that are at a distance of more than 80 km or more than one hour by road from a designated healthcare facility (providing round the clock anesthesia, surgical and obstetrical facilities) [5]. This phenomenon, however, is relative to urban healthcare delivery systems and not an absolute absence of healthcare facilities. The services providers in rural areas are mainly the state or the government. The rest of the health care providers in rural regions are primarily indigenous systems of medicine with or without formal training in healthcare provision.

Remote healthcare is a term often used interchangeably with rural healthcare.

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Remote healthcare refers to hard to reach areas geographically. This happens mainly in the rural areas where access via roads are challenging [5, 6]. These areas may benefit from a remote health monitoring system, especially for health conditions and diseases that need long-term healthcare. These regions, however, would be significantly helped by the use of Telemedicine, given information and communica-tion technology widely available. Whenever access to healthcare for an emergency or serious condition is required, these remote areas would need referral-service access to a secondary or a tertiary healthcare facility.

Rural Healthcare access is the ability of rural communities (or individuals resid-ing in such communities) who can be promptly approached for health promotive, preventive, curative, and rehabilitative services. This works on the tenets of avail-ability, utility, acceptability, feasibility, and equitability [7].

3. History of rural healthcare delivery systems

China: An excellent example of a rural healthcare delivery system was the "Barefoot doctors" of China. In 1965 Urban doctors trained young farmers in Shanghai's Chiang Chen Province in primary medical care. These later formed the backbone of China's medical aid services [11, 12]. After a training period of three to six months and regular skill up-gradation with in-service and apprenticeship pro-grams, these part-time healthcare providers. The healthcare provision in these areas enjoyed the local Chinese population's support [12]. They were trained in preven-tive, promotive, and rehabilitative healthcare provision in traditional Chinese and Modern (or Western) Medicine, alongside providing medical care. These part-time healthcare providers, also developed a robust system for referral for complex medi-cal and surgical cases to a secondary or tertiary healthcare facility [4]. The financial support for such healthcare providers was both from a collective and mutual aid

basis. However, in 1978 major health reforms in China heralded a new breed of barefoot doctors to medically more qualified "Village health Doctors" and medically lesser qualified "rural health workers" (through an annual assessment) that led to the downfall of this system [13].

The financial moratorium also changed from a collective and mutual aid basis (through a rural cooperative medical system) to a paid service model. The new system in China rolled back many positive health reforms. These reforms included reduced mortality, improved life expectancy for almost three decades and most importantly widening the already existing urban and rural health disparity [14].

India: The concept of Community Health Worker (C.H.W.) was introduced under the "National Village Health Guide Scheme" much before the idea of primary Healthcare (through the Alma Ata declaration at Kazakhstan in 1978) was proposed [15]. However, lack of affiliation to a formal health system, poorly defined job responsibilities, and poor financial remuneration plagued the Village Health Guide scheme's success.

In India, maternal and child health, especially midwifery and childbirth assis-tance, was mainly through the "Traditional Dai" system. However, lack of formal training in midwifery and safe delivery practices led to significant mortality and morbidity among mothers and infants. Training of these traditional birth attendants in 2006 under the National Rural Health Mission (NRHM) was an essential step toward providing trained birth assistance and improving mothers and newborn health in rural areas.

The paradigm shift in India's healthcare provision was through the National Rural Health Mission effort in health activism through ASHA (Accredited Social Health Activist). Through local community participation, an ASHA worker pro-ficient in various aspects of preventive, promotive, rehabilitative services largely concentrated in maternal and child health through local community participation. The ASHA worker also collaborates with local rural bodies to improve health, sanitation, and nutrition in India's rural communities, a bottom-up approach [16].

The healthcare system in India had stressed the need for primary healthcare right from the pre-independence era (The Joseph Bhore Committee report in 1946) [17]. The Health Survey and Development Committee report (or the Bhore Committee Report) laid down the blueprint for a three-tier system to deliver health-care at centers in India before the first national health policy, in the year 1983. The unique nature of the Indian healthcare sector is the blend of traditional(commonly called the AYUSH system- made up of Ayurveda, Yoga, Unani, Siddha and Homeopathy medicine) and allopathic medicine that is made available through

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a myriad of public and private healthcare providers. However, these healthcare services are also negatively skewed toward the rural areas where more than 60% of the population resides.

The three-tier healthcare system is divided into the primary or first point of con-tact of healthcare through the sub-centers that cater to a population of 3000 to 5000 [17]. The sub-centers are then linked to the Primary Health Centers (P.H.Cs.) estab-lished in the rural and urban areas for a population of 30,000 in plains and 20,000 in hilly and tribal areas. The first point of referral for the Primary health centers in the Community Health Centers (C.H.C.) is set up for every 1,20,000 population in plain areas. Every 80,000 people in hilly, tribal areas form the second tier of the public ealth system in India. The third tier of healthcare providing tertiary healthcare is the First Referral Units (F.R.U.)s that are set up at district or sub-district levels with round- the-clock services for healthcare. These public healthcare centers were plagued with human resource and infrastructural deficiencies. They suffered a vital mechanism for referral of patients and follow-up from higher level healthcare centers, with less than 11.5% seeking healthcare at these centers [18]. However, the privat healthcare sector and the non-governmental healthcare agencies also contribute to addressing the population's healthcare needs. Because of financial and other infra-structural strengths, these healthcare facilities are often beyond the reach of many, especially in rural areas [18]. Under the country's National Health Mission (N.H.M.), through the National Health Policy of 2017, recommended the establishment of "Health and Wellness Centers (H.W.C.)" for delivery of Comprehensive Primary Healthcare (CPHC) by up-gradation of sub-centers and Primary Health Centers as shown in Figure 1. The deficiencies seen in the implementation of rural healthcare seen earlier would now be overcome by improved spending to up to 70% of the budgetary allocation, institutional and governmental mechanisms under the flagship of National Health Mission (N.H.M.) for Primary Health care for Universal Health Coverage (UHC) in India and the Pradhan Mantri Jan Arogya Yojana (PMJAY).

Australia: The Australian Whitlam Labour government in 1972 pioneered set-ting up policies for the rural and remote regions of Australia, especially those resid-ing in Australia's suburban areas. The Hawke Labour government of 1982 renewed its commitment to healthcare services' access and equity in Australia's remote and rural areas. The national conference at Toowoomba to design and set up a policy of initiatives for rural health in the late 1980's paved the way for the National Rural Health Strategy of 1994 that the Australian Health Ministers Council promulgated.

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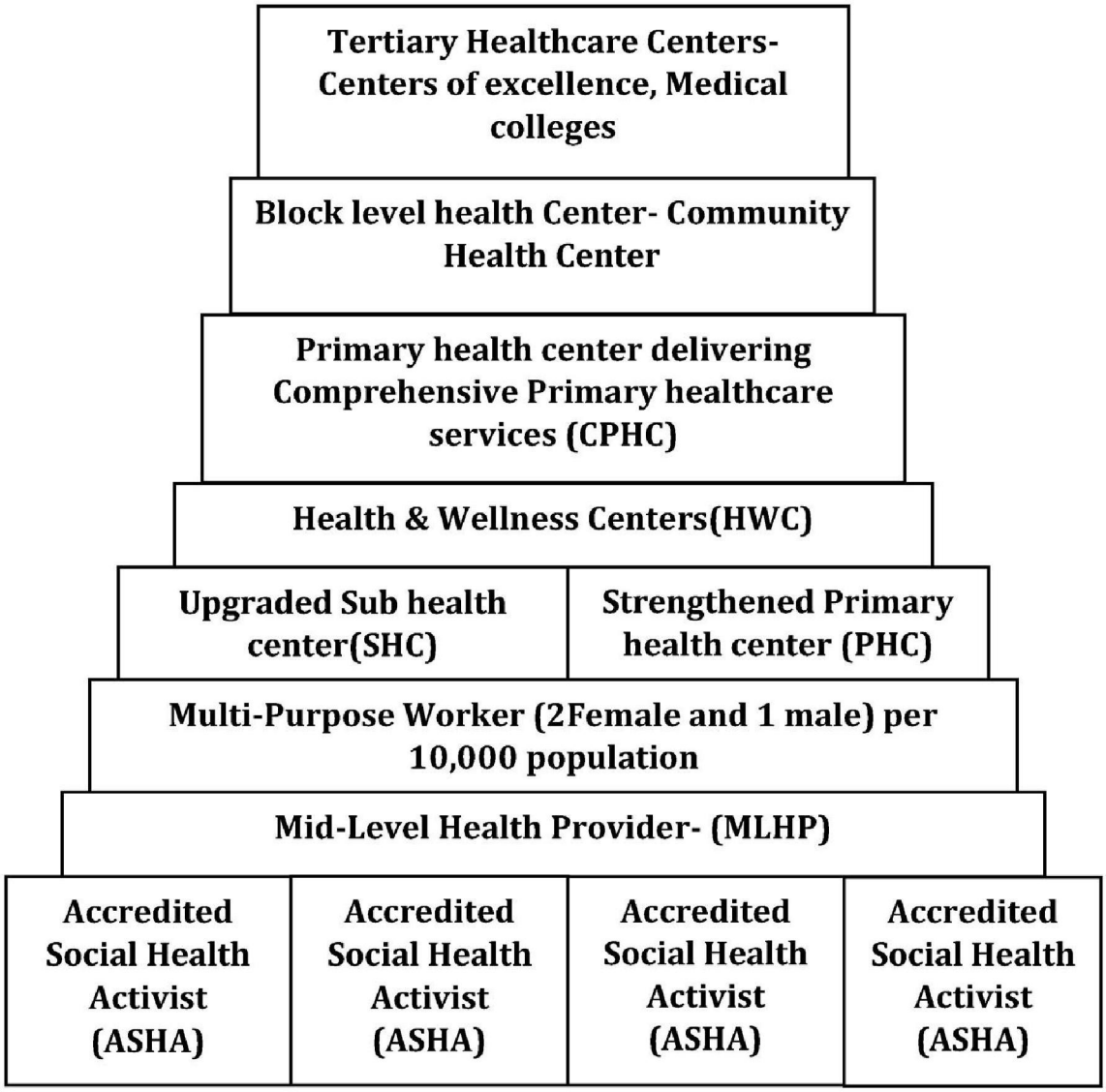

Figure 1.: Re-organization of public healthcare facilities for Rural India under the Ayushman Bharath scheme in India [18].

The National Rural Health Strategy through the RHSET programme, the Rural Incentives Program and the collective efforts of the doctors, nurses, Allied health professionals' associations worked toward healthcare service delivery in the remote and rural areas of Australia along with a Non-governmental rural health body called the National Rural Health Alliance. Although these efforts were primarily focused on incentivizing doctors and other paramedical staff of rural and remote Australia, it was ineffective in satisfying the rural health concept. This was because of issues of financial, infrastructural resource allocation to this programme, as indicated by the performance indicators measuring the remote and rural Australians' health.

The Australian rural and remote health program underwent a radical change through a dedicated policy framework improvement keeping in mind the provision of health services in these areas by 2008 and Healthy Horizons. This programme currently supports the implementation of local programs that are culturally sensi-tive, practical forging partnerships in the community and the health care providers by equipping the physical and social capabilities of rural and remote health care service centers in Australia [5].

United States of America -through rural public health began to rise in the early 1700s, the focus was more on improving and maintaining water supplies and sani-tary conditions. However, in the late 1800s, with the spread of diseases from

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urban to rural communities, the focus shifted to improving rural health facilities from 1908 to the end of World War II. The Hill-Burton Act of 1945 promoted healthcare delivery access in rural areas via rural community hospitals [19].

Mexico: The social service year reform of 1930 was sponsored by President Lazaro Cardenas, where medical students had to compulsorily put in 5 months of rural healthcare service as part of their graduation. This helped bridge the health-related gaps in rural areas. Though there was a significant improvement in rural health, a lack of cultural impressionability caused setbacks in the desired outcome as anticipated by the medical graduates. Influenced by the Alma Ata declaration of 1978, the Coplamar system, a Social Protection of Marginal Groups program, was launched, wherein community-based health practitioners were trained in maternal and child health by ensuring community participation in rural communities. However, within years of introduction, the scheme suffered significant losses in funding and the scheme lost

its popularity. The Coplamar system was later re-christened as the Opportunities program, a conditional cash-based transfer system that continues to function in rural Mexico [20].

4. Definition of rural health and its impact on health-seeking behavior

The World Health Organization (WHO) defines health as "The state of complete physical, mental and social wellbeing and not merely the absence of disease or infir-mity". Perception of health was considered "working hard, staying busy, exercising, drinking water and eating well". Being healthy often referred to a more subjective consciousness of self-dependence to carry out their daily living activities in rural areas. A relative inability to carry out Daily activities to maintain a household or to perform farm-related chores was considered ill health. This perception of subjective health and wellbeing is particularly true in rural elderly. Physical, mental, social, and spiritual wellbeing are knitted into a mosaic of the everyday life fabric of rural elderly [21]. There is a distrust, especially in seeking professional help for mental health-related issues. The presence of indigenous systems of healthcare usually handles the burden of preventive and promotive health services. However, they are generally not trained or qualified in managing emergency medical conditions and have an inadequate system for referral for these conditions.

The intuitive feeling of health compounded with a low level of trust in the medical healthcare system, decreased demand for services for the "non-urgent" health issues" by healthcare providers, long waiting periods at hospitals for health-related issues.

These factors often translate to neglect and apathy toward health-seeking at in the health care institutes in rural areas [21]. This perception of health and disease in rural residents goes a long way in planning healthcare service provision in rural areas [21].

5. Situational analysis of rural healthcare delivery system

Disparities exist among urban and rural healthcare delivery systems, but within the healthcare systems, there exist socio-cultural and ethnic differences in the accessibility and utilization of healthcare facilities [22]. The situational analysis will focus on aspects of any healthcare system, i.e., accessibility, utilization, acceptabil-ity, feasibility, and equity.

5.1 Differences in urban and rural healthcare service delivery systems

5.1.1 Accessibility

Healthcare services in rural areas are less accessible than the urban areas, which could be attributed to the topographical differences [5, 23]. Studies from the Indian subcontinent show that the bed population ratio, percentage of trained medical practitioners, and healthcare provision infrastructure are substantially lesser in rural areas compared to urban areas [4]. Even with a sharp increase in the need for emergency services for rural residents when compared to the incremental rise among urban residents in need of emergency services [24], more trained emergency physicians were present in urban areas than rural areas [25]. The number of health-care professionals and availability of medical services in remote areas is sparse [5].

The problems with transport facilities and communication technologies further compound the problem of poor healthcare accessibility [23].

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5.1.2 Utilization

The factors that enabled healthcare service utilization in Africa's urban areas were motivational benefits, the individuals' current health status, and services availability. However, in rural areas, geographical adjacency, free or low-cost healthcare availability, health insurance, ethnicity, and and family income, influ-ence the rural residents' health services utilization [26]. In general, the individuals would preferred to be treated by healthcare personnel of the local areas, though often under-staffed or resource-constrained [23]. The underutilization has also been attributed to the lack of quality-assured healthcare services sensitive to people's health needs in rural areas [27].

5.1.3 Acceptability

The concept of acceptability has frequently been intermingled with availability and affordability of healthcare service provision and patient satisfaction [10]. The concept of trust in the healthcare provider, endorsement of the provider by leaders in the rural community in addition to early community interaction and home visits were found to improve the acceptability of maternal and child healthcare services in rural Uganda [28]. In rural northeast India, facilities for safe and sound quality healthcare services were linked to healthcare service acceptability [29].

5.1.4 Feasibility

The availability of healthcare-related services was substantially lesser in insti-tutes providing rural healthcare vis a vis with their urban counterparts [30].

5.1.5 Equity

Equity in healthcare within rural areas also play an essential role in the rural healthcare delivery system. In the Republic of Suriname, a study conducted showed that equitable resource distribution for primary healthcare services was comparable in rural and urban areas. However, factors like perceived need, female gender, and socioeconomic status contributed to inequity for services related to chronic healthcare-related issues within the Republic of Suriname's rural areas [31].

Provision and upgrading healthcare-related insurance schemes and policies positively contributed to reducing the inequitable distribution of healthcare services [31]. The Development of tailor-made healthcare services addressing these principles to provide timely, socio-culturally appropriate, economically sustainable and equitable services in rural areas is necessary [5, 32].

6. Challenges in healthcare delivery in rural areas

The healthcare facilities in rural and remote areas are often deficient in core or essential health services, especially for support and local outpatient basis treatment [33]. The problem of shortages in trained global healthcare force and support, pro-vision of geriatric and mental health services, infrastructure for timely healthcare services have affected rural healthcare services more than urban services [5]. The lack of healthcare insurance and the treatment costs incurred compounded with the insufficient healthcare expenditure of Gross National Product (G.N.P.) on health has worsened this situation [34]. The rural population of elderly, sick, uninsured and suffering from chronic diseases is significantly higher than its urban counter-part, which need to be addressed [33].

7. Ideal system of rural health service delivery

Planning rural healthcare services need an optimum mix of primary and secondary healthcare services at the community and individual levels. An ideal system delivering rural healthcare services should focus on "core healthcare ser-vices" or basic health-related amenities for maternal, child health, oral health. This must also include primary health care providers and emergency services for stabilizing patients needing urgent medical care with a timely referral system that provides a continuum of care [35]. The health systems should be locally sourced through community-based organizations, depending on the rural community's health care needs through a formal inquiry vide community-healthcare- needs assessment [35]. The aim of delivering healthcare in rural areas should not be limited only to improve the quantum of services provided but also the quality of healthcare services [35]. The Institutes of Medicine (I.O.M.)

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quality in healthcare can be approached through an integrated prioritized public health intervention at individual, family, community levels [29]. There should be provision for a sup-port system for the healthcare service delivery personnel and the communities they serve through appropriate education, financial incentives, human resource, and infrastructural capacity. The feasibility and acceptability of Information and Communication Technology (I.C.T.), especially for diagnostic emergencies like Acute abdomen, Myocardial infarction, Stroke etc., should be explored, especially in remote areas [34]. These systems of I.C.T., if feasible and planned correctly, can be used for monitoring of chronic that arise in Non-communicable and communi-cable diseases [34]. Leveraging the concept of a "healthy village" like the RURBAN initiative in India needs to be looked at while planning services in these areas [27].

A health care team providing these services, which are community-based with sustainable financial sourcing, can ensure healthcare facilities from seemingly simple medical issues to complex health conditions needing sophisticated tertiary care health system interventions, need to be planned too. The rural health care services need to be backed up by community participation with leaders and members of both health and non-health-based organizations in the rural community. The above system would also need to be socio-culturally sensitive and appropriate, catering to the rural commu-nity's health needs. This healthcare provision will depend on the healthcare funding through the nation's allocation of funds for health for rural and urban areas [28, 29].

8. Devising a rural healthcare delivery system

As emphasized by the Alma Ata declaration of 1978 in Kazakhstan, any health-care system's precept should be based on primary healthcare [36]. Scarce resources are allocated in terms of human resources, infrastructure, and money for rural healthcare delivery, equitable healthcare provision can be made possible only by improving accessibility and acceptability of healthcare services among rural com-munities [18]. Sustainable healthcare delivery in rural areas can be possible only if the focus is shifted from providing healthcare service to providing a continuum of care in rural areas [6].

The Continuum healthcare delivery should be planned through a three-tier system of primary, secondary, and tertiary healthcare. This can be coordinated through collaboration and socially accountable healthcare institutes in these areas.

In a consultation forum with Australia, Brazil, South Africa, Nepal, and India on A consultation forum with Australia, Brazil, South Africa, Nepal, and India on delivery of rural-primary healthcare, showed that geographically accessible, socio-culturally acceptable, family-centered healthcare needs to be developed.

Integrating these concepts based on preventive, promotive, and curative, sensitive to the perceived requirements of the rural communities, need to be crafted. Creating a rural healthcare delivery system should begin with community healthcare needs and demands assessment that identifies potential strengths, weaknesses, threats, and opportunities in terms of human resource, infrastructure, and costs in building a sustainable rural healthcare delivery system sensitive to local healthcare needs.

Once the healthcare-related needs are identified, prioritizing these needs based on either a nominal group technique or the Hanlon's basic priority rating system, or an intervention mapping can be employed. Implementing a healthcare system engaging community partners, a community-based organization ensuring the fullest com-munity participation in making healthcare decisions through sustainable healthcare and financial incentivization schemes would be the next challenge to overcome.

When appropriate linkages being forged with referral systems, higher budgetary spending on healthcare by the states, healthcare insurance that improves affordabil-ity to build and empower healthcare teams providing rural healthcare [32]. With a shortage of trained rural healthcare professionals on health emergency and maternal and child health, individuals sourced from the local rural communities like the ASHA workers in India [16], Barefoot doctors in China [6, 12] could be looked at as potential bridges to the healthcare-related gap in rural areas. However, adequate and regular training and accreditation of rural healthcare providers who are sensitive to the family-centered practice of evidence-based medicine are paramount [32].

A concept of extended-community-care team sourced from trained staff of urban social and healthcare professionals who provide their skill and expertise prevalent in Scotland's remote and rural areas [6]. Research models for developing

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such extended healthcare teams in rural and remote with evidence through health impact assessment can ultimately translate to advocacy for policy-orientation prioritizing rural health.

Dissemination of information in rural healthcare delivery systems in research is also paramount for other rural communities to develop or adapt such models to achieve the best healthcare-relatedoutcomes

9. Role of telemedicine in rural healthcare delivery

Telemedicine has leveraged the benefits of advanced telecommunication and computer technologies, which can provide diagnostic and therapeutic support to patients residing in remote and rural areas [6, 37, 38]. Modern technology like Clinical Decision Systems (C.D.S.), Picture Archiving and Communication Systems (P.A.C.S) that capture, store, and disseminate health-related informa-tion from patients in rural and remote areas to healthcare providers on a real-time basis. These systems can help in making immediate and urgent healthcare decisions in these areas [37]. Information and Communication technologies improve accessibility to primary health care needs, maximizes service delivery, transfer and sharing of appropriate technology for instruction, training, con-tinued education of healthcare service providers is also maximized in rural and remote areas [39, 40].

The characteristics of a programme that supports information and communica-tion technology in remote and rural healthcare systems (which helps in return to improve health especially in developing countries are as follows:

1. Use of appropriate technology that is locally applicable to rural and remote health infrastructure
2. Leveraging and strengthening existing systems in the rural and remote communities
3. Demonstrating the benefit of using such health related information and com-munication technologies through showcasing of approaches in I.C.T delivery
4. Capacity building to innovate, develop and demonstrate the effectiveness of Information and Communication Technologies
5. Monitoring and evaluation through Participatory and Rapid Rural Appraisal
6. Designing be7er methods of communication strategies for delivery of health-care in rural and remote areas
7. Continued research and information sharing regarding the strengths and chal-lenges faced in se7ing up such technologies in rural and remote areas [40].

The three-pronged benefits that can be reaped by use of Information and Communication Technology (I.C.T.) would be in

1. Improvement in functioning of health care systems- of order/billing and electronic health record systems development
2. Improvement of delivery of healthcare through use of telemedicine and e-health that help in diagnostic, clinical decision making, quality assurance systems, disease surveillance
3. Improving communication about health in health-related research, health advocacy, patient information retrieval and dissemination [40].

The information and communication technology can also aid in lifelong learning, improvement and retraining in healthcare delivery system's accountability [38]. The establishment of electronic health records using barcoding and other such indexing systems for an individual also helps in maintaining the patients' continuity of care [37]. The WHO e-health strategy envisages, e- health-solutions explora-tion by identifying and addressing needs, innovative methods and research. This provides evidence, information, guidance, best practices and management of such solutions in rural and remote areas [40].

The challenges in implementation of Information and Communication technol-ogy like telemedicine, e-health include:

1. The lack of access to internet and mobile connectivity
2. The ack of credible and culturally sensitive information and communication technologies,
3. Insufficient political commitment toward establishment of a sustainable sys-tem for health information and communication
4. The need of extensive co-operation from stakeholders at the local, regional and national levels,

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Literature and Review

Rural Health Care System – the structure and current scenario

The health care infrastructure in rural areas has been developed as a three tier system (see Chart 1) and is based on the following population norms:

Table 1.

Centre	Population Norms	
	Plain Area	Hilly/Tribal/Difficult Area
Sub-Centre	5000	3000
Primary Health Centre	30,000	20,000
Community Health Centre	1,20,000	80,000

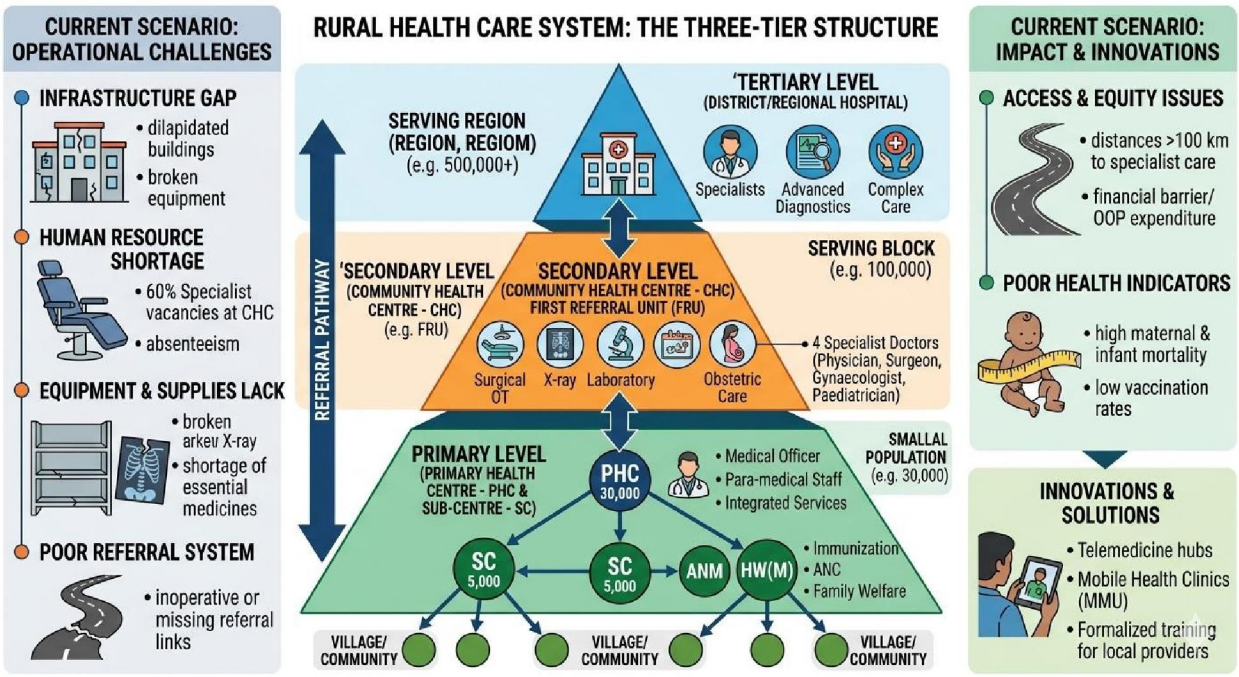
Sub-Centres (SCs)

As on March, 2011, there are 148124 Sub Centres, 23887 Primary Health Centres (PHCs) and 4809 Community Health Centres (CHCs) functioning in the country

1.2. The Sub-Centre is the most peripheral and first contact point between the primary health care system and the community. Each Sub-Centre is required to be manned by at least one Auxiliary Nurse Midwife (ANM) / Female Health Worker and one Male Health Worker (for details of staffing

pattern, see Box 1 and for recommended staffing structure under Indian Public Health Standards (IPHS) see Annexure I). Under NRHM, there is a provision for one additional second ANM on contract basis. One Lady Health Visitor (LHV) is entrusted with the task of supervision of six Sub-Centres. Sub-Centres are assigned tasks relating to interpersonal communication in order to bring.

Rural Health Care System – the structure and current scenario



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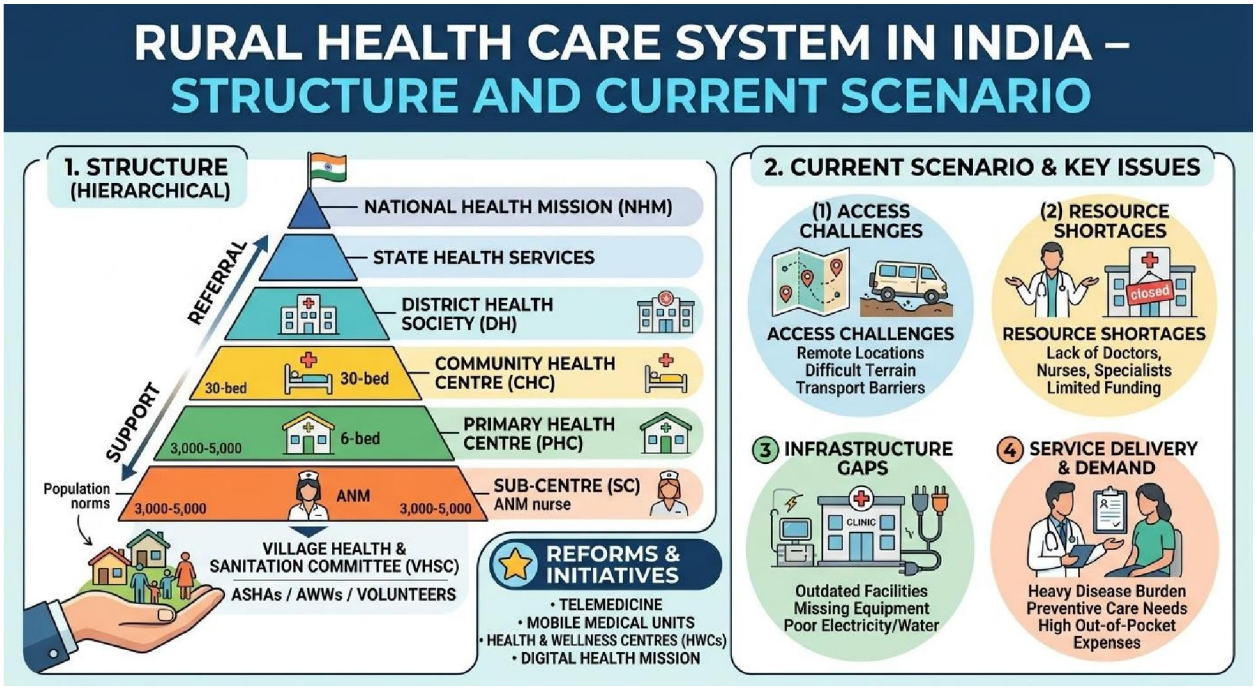

relation to maternal and child health,
family welfare, nutrition, immunization, diarrhoea control and control of communicable diseases programmes. The Sub-Centres are provided with basic drugs for minor ailments needed for taking care of essential health needs of men, women and children. The Ministry of Health & Family Welfare is providing 100% Central assistance to all the Sub-Centres in the country since April 2002 in the form of salary of ANMs and LHVs, rent at the rate of Rs. 3000/- per annum and contingency at the rate of Rs. 3200/- per annum, in addition to drugs and equipment kits. The salary of the Male Health Worker is borne by the State Governments (Also see para 2.4 for NRHM additionalities). Under the Swap Scheme, the Government of India has taken over an additional 39,554 Sub Centres from State Governments / Union Territories since April, 2002 in lieu of 5,434 Rural Family Welfare Centres transferred to the State Governments / Union Territories. There are 1,48,124 Sub Centres functioning in the country as on March 2011.
Number of Sub Centres existing as on March 2011 increased from 146026 in 2005 to 148124 in 2011. There is significant increase in the number of Sub Centres in the States of Chhattisgarh, Haryana, Jammu & Kashmir, Karnataka, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura and Uttarakhand.

Primary Health Centres (PHCs)
At the national level, there is an increase of 651 PHCs in 2011 as compared to that existed in 2005. Significant increase is observed in the number of PHCs in the States of Andhra Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Jammu & Kashmir, Karnataka, Maharashtra, Nagaland, Uttarakhand andUttar Pradesh
1.3. PHC is the first contact point between village community and the Medical Officer.
The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care. The PHCs are established and maintained by the State Governments under the Minimum Needs Programme (MNP)/ Basic Minimum Services (BMS)
Programme. As per minimum requirement (Box-1), a PHC is to be manned by a Medical Officer supported by 14 paramedical and other staff (See Annexure-I for IPHS norms). Under NRHM, there is a provision for two additional Staff Nurses at PHCs on contract basis. It acts as a referral unit for 6 Sub Centres and has 4 - 6 beds for patients. The activities of PHC involve curative, preventive, promotive and Family Welfare Services. (Also see para 2.4 for NRHM additionalities). There were 23,887 PHCs functioning in the country as on March 2011.

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Community Health Centres (CHCs)

At the national level there is an increase of 1463 CHCs in 2011 as compared to that existed in 2005. Significant increase is observed in the number of CHCs in the States of Arunachal Pradesh, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Punjab, Odisha, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal

1.4. CHCs are being established and maintained by the State Government under MNP/BMS programme. As per minimum norms (Box-1), a CHC is required to be manned by

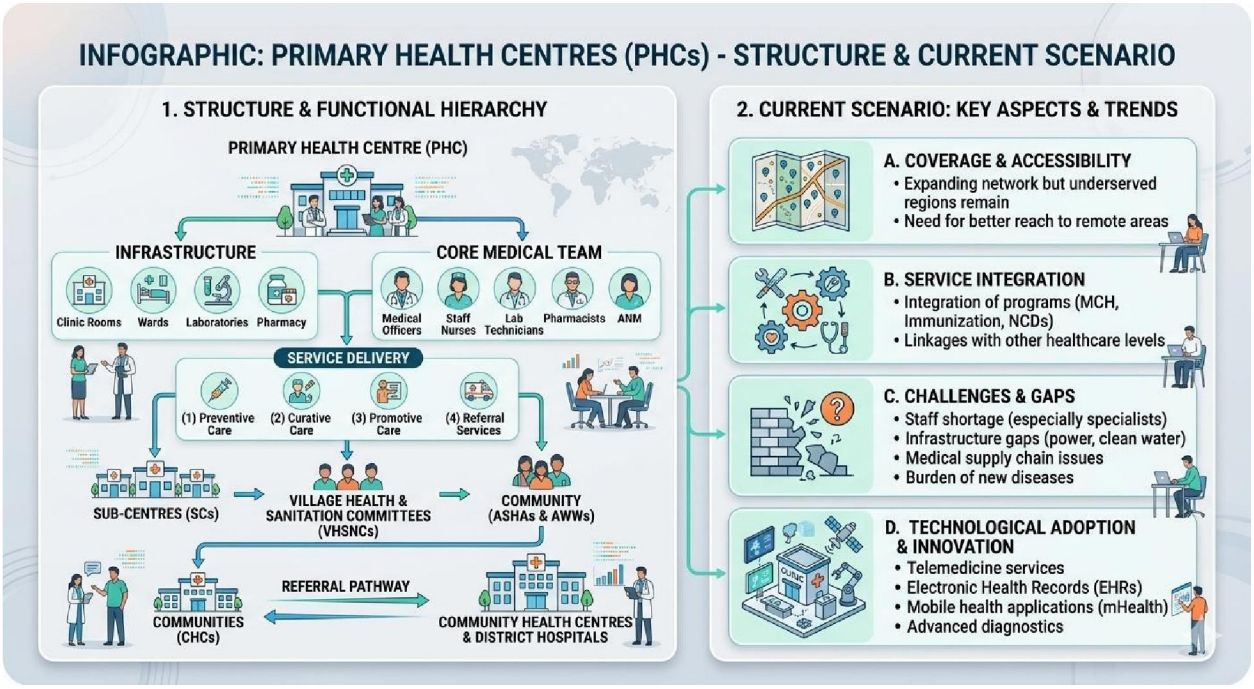
four Medical Specialists i.e. Surgeon, Physician, Gynecologist and Pediatrician supported by 21 paramedical and other staff (See Annexure-D for IPHS norms). It has 30 in-door beds with one OT, X-ray, Labour Room and Laboratory facilities. It serves as a referral centre for 4 PHCs and also provides facilities for obstetric care and specialist consultations (Also see para 2.4 for NRHM additionalities). As on March, 2011, there are 4,809 CHCs functioning in the country.

1.5. The details of the population norms for each level of rural health infrastructure and current status against these norms are given in Box 2.

First Referral Units (FRUs)

1.6. An existing facility (district hospital, sub-divisional hospital, community health centre etc.) can be declared a fully operational First Referral Unit (FRU) only if it is equipped to provide round-the-clock services for Emergency Obstetric and New Born Care, in addition to all emergencies that any hospital is required to provide. It should be noted that there are three critical determinants of a facility being declared as a FRU: i) Emergency Obstetric Care including surgical interventions like Caesarean Sections; ii) New-born Care; and iii) Blood Storage Facility on a 24-hour basis.

Primary Health Centres (PHCs)



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Community Health Centres (CHCs)

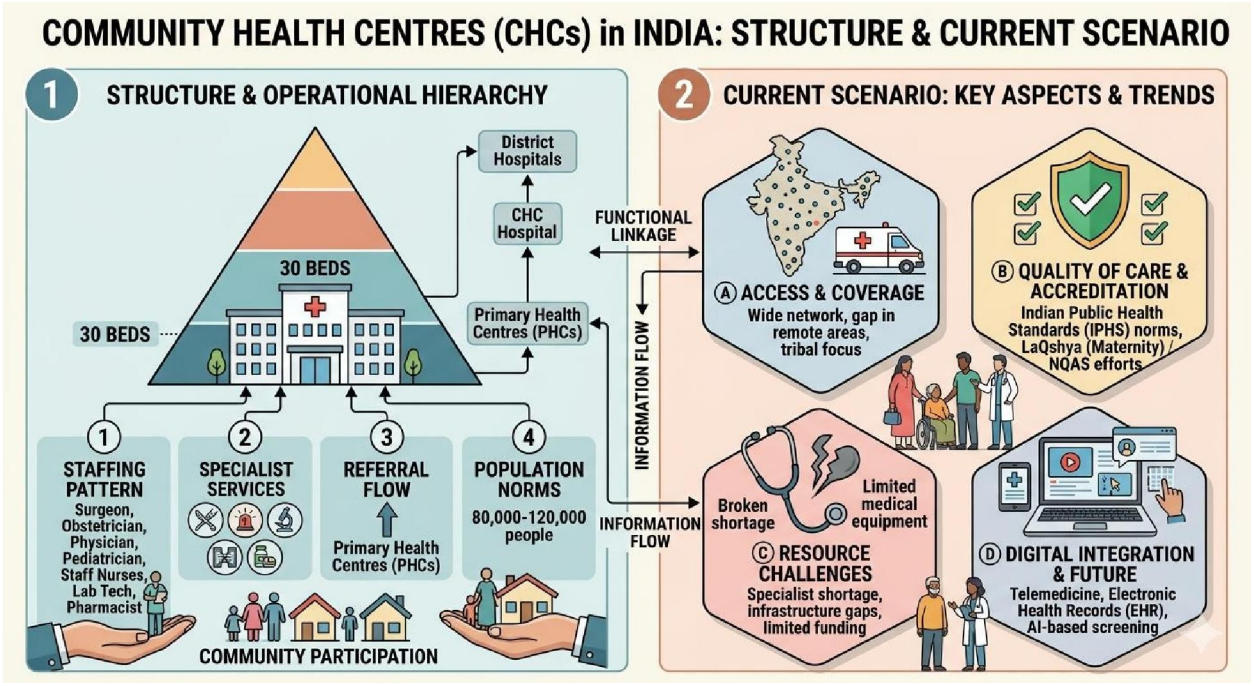
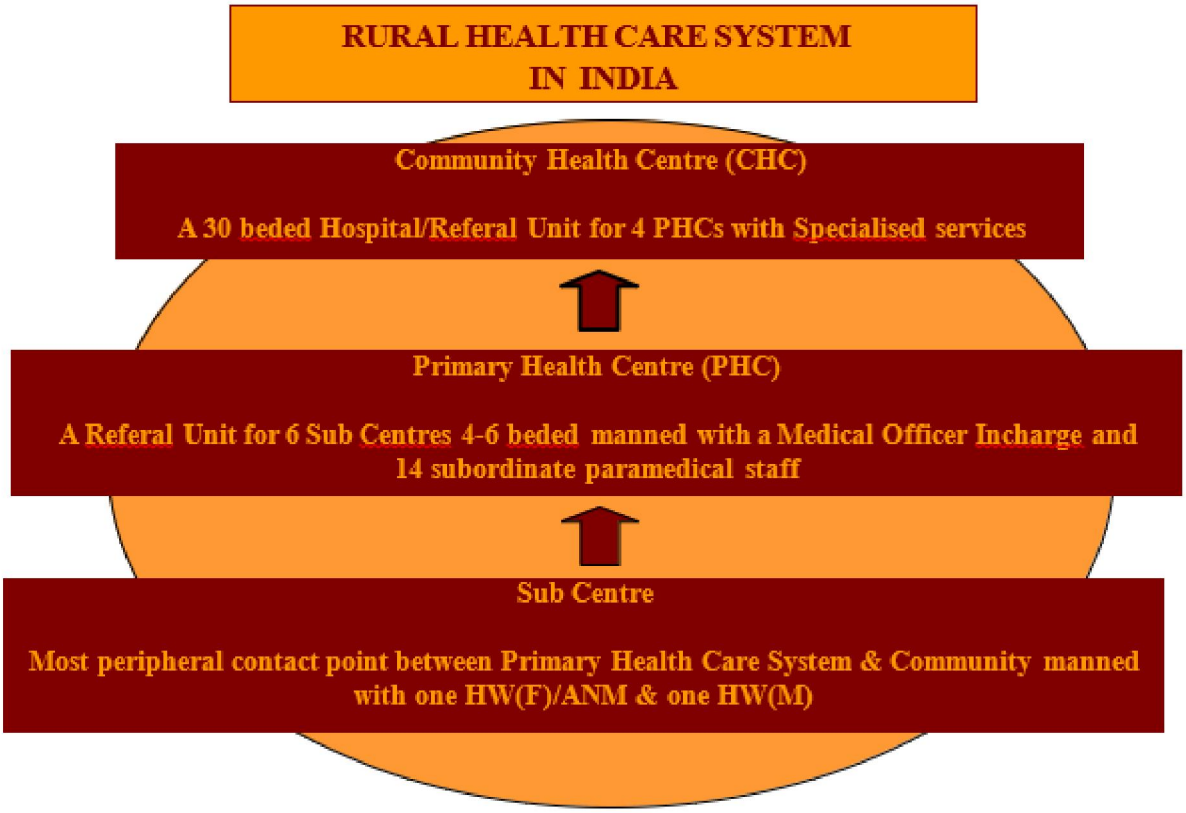


Chart 1.



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2. Strengthening of Rural Health Infrastructure Under National Rural Health Mission

2.1. The National Rural Health Mission (2005-12) seeks to provide effective healthcare to rural population throughout the country with special focus on 18 states, which have weak public health indicators and/or weak infrastructure. These 18 States are Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Jammu & Kashmir, Manipur, Mizoram, Meghalaya, Madhya Pradesh, Nagaland, Orissa, Rajasthan, Sikkim, Tripura, Uttarakhand and Uttar Pradesh. The Mission is an articulation of the commitment of the Government to raise public spending on Health from 0.9% of GDP to 2-3% of GDP.

2.2. NRHM aims to undertake architectural correction of the health system to enable it to effectively handle increased allocations as promised under the National Common Minimum Programme and promote policies that strengthen public health management and service delivery in the country. It has as its key components provision of a female health activist in each village; a village health plan prepared through a local team headed by the Health & Sanitation Committee of the Panchayat; strengthening of the rural hospital for effective curative care and made measurable and accountable to the community through Indian Public Health Standards (IPHS); integration of vertical Health & Family Welfare Programmes, optimal utilization of funds & infrastructure, and strengthening delivery of primary healthcare. It seeks to revitalize local health traditions and mainstream AYUSH into the Box 1.

RURAL HEALTH INFRASTRUCTURE - NORMS AND LEVEL OF ACHIEVEMENTS (ALL INDIA)

S.No.	Indicator	National Norms		Present Average Coverage
1	Rural Population (2011) (Provisional) covered by a:	General	Tribal/Hilly/Desert	
	Sub Centre	5000	3000	5624
	Primary Health Centre (PHC)	30000	20000	34876
	Community Health Centre (CHC)	120000	80000	173235
2	Number of Sub Centres per PHC	6		6
3	Number of PHCs per CHC	4		5
4	Rural Population (2011) (Provisional) covered by a:			
	HW (F) (at Sub Centres and PHCs)	5000	3000	4008
	HW (M) (At Sub Centres)	5000	3000	15955

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ISSN: 2581-9429 Volume 6, Issue 3, June 2026 Impact Factor: 8.2

5	Ratio of HA (M) at PHCs to HW (M) at Sub Centres	1:6	1:3
6	Ratio of HA (F) at PHCs to HW (F) at Sub Centres and PHCs	1:6	1:13
7	Average Rural Area (Sq. Km) covered by a:		
	Sub Centre	--	21.05
	PHC	--	130.54
	CHC	--	648.43
8	Average Radial Distance (Kms) covered by a:		
	Sub Centre	--	2.59
	PHC	--	6.44
	CHC	--	14.36
9	Average Number of Villages covered by a:		
	Sub Centre	--	4
	PHC	--	27
	CHC	--	133

2.3. Following are the core and supplementary strategies of NRHM:

2.3.1. Core Strategies:

Train and enhance capacity of Panchayati Raj Institutions (PRIs) to own, control and manage public health services.

Promote access to improved healthcare at household level through the female health activist (ASHA).

Health Plan for each village through Village Health Committee of the Panchayat.

Strengthening sub-centre through an untied fund to enable local planning and action and more Multi Purpose Workers (MPWs).

Strengthening existing PHCs and CHCs, and provision of 30-50 bedded CHC per lakh population for improved curative care to a normative standard (Indian Public Health Standards defining personnel, equipment and management standards).

Preparation and Implementation of an inter-sectoral District Health Plan prepared by the District Health Mission, including drinking water, sanitation & hygiene and nutrition.

Integrating vertical Health and Family Welfare programmes at National, State, District, and Block levels.

Technical Support to National, State and District Health Missions, for Public Health Management.

Strengthening capacities for data collection, assessment and review for evidence based planning, monitoring and supervision.

Formulation of transparent policies for deployment and career development of Human Resources for health.

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Impact Factor: 8.2

Developing capacities for preventive health care at all levels for promoting healthy life styles, reduction in consumption of tobacco and alcohol etc. promoting non-profit sector particularly in under served areas.

2.3.2 Supplementary Strategies:
Regulation of Private Sector including the informal rural practitioners to ensure availability of quality service to citizens at reasonable cost. Promotion of Public Private Partnerships for achieving public health goals. Mainstreaming AYUSH - revitalizing local health traditions.
Reorienting medical education to support rural health issues including regulation of Medical care and Medical Ethics.

2.4. NRHM Plan of Action relating to Infrastructure and Manpower Strengthening
2.4.1 Component (A): Accredited Social Health Activists
 Every village/large habitation will have a female Accredited Social Health Activist (ASHA) - chosen by and accountable to the panchayat- to act as the interface between the community and the public health system. States to choose State specific models.
 ASHA would act as a bridge between the ANM and the village and be accountable to the Panchayat.
 She will be an honorary volunteer, receiving performance-based compensation for promoting universal immunization, referral and escort services for RCH, construction of household toilets, and other healthcare delivery programmes.
 She will be trained on a pedagogy of public health developed and mentored through a Standing Mentoring Group at National level incorporating best practices and implemented through active involvement of community health resource organizations.
 She will facilitate preparation and implementation of the Village Health Plan along with Anganwadi Worker, ANM, functionaries of other Departments, and Self Help Group members, under the leadership of the Village Health Committee of Panchayat.
 She will be promoted all over the country, with special emphasis on the 18 high focus States. The Government of India will bear the cost of training, incentives and medical kits. The remaining components will be funded under Financial Envelope given to the States under the programme.
 She will be given a Drug Kit containing generic AYUSH and allopathic formulations for common ailments. The drug kit would be replenished from time to time.
 Induction training of ASHA to be of 23 days in all, spread over 12 months. On the job training would continue throughout the year.
 Prototype training material to be developed at National level, subject to State level modifications.
 Cascade model of training proposed through Training of Trainers including contract plus distance learning model
 Training would require partnership with NGOs/ICDS Training Centres and State Health Institutes.

2.4.2 Component (B): Strengthening Sub-Centres (SC)
Each sub-centre will have an Untied Fund for local action @ Rs.10,000 per annum. This Fund will be deposited in a joint Bank Account of the ANM & Sarpanch and operated by the
 Supply of essential drugs, both allopathic and AYUSH, to the Sub-centres.
 In case of additional Outlays, Multipurpose Workers (Male)/ Additional ANMs wherever needed, sanction of new Sub-centres as per 2001 population norm, and upgrading existing Sub-centres, including buildings for Sub-centres functioning in rented premises will be considered.
.
2.4.3 Component (C): Strengthening Primary Health Centres (PHCs)
Mission aims at strengthening PHCs for quality preventive, promotive, curative, supervisory and outreach services, through:
 Adequate and regular supply of essential quality drugs and equipment (including Supply of Auto Disabled Syringes for immunisation) to PHCs

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 Provision of 24 hour service in at least 50% PHCs by addressing shortage of doctors, especially in high focus States, through mainstreaming AYUSH manpower.
 Observance of Standard treatment guidelines & protocols.
 In case of additional Outlays, intensification of ongoing communicable disease control programmes, new programmes for control of non-communicable diseases, upgradation of 100% PHCs for 24 hours referral service, and provision of 2nd doctor at PHC level (1 male, 1 female) would be undertaken on the basis of felt need.

2.4.4 Component (D): Strengthening Community Health Centres (CHCs) for First Referral Care
A key strategy of the Mission is:
 Operationalising existing Community Health Centres (30-50 beds) as 24 hour First Referral Units, including posting of anaesthetists.
 Codification of new Indian Public Health Standards" setting norms for infrastructure, staff, equipment, management etc. for CHCs.
 Promotion of Stakeholder Committees (Rogi Kalyan Samitis) for hospital management.
 Developing standards of services and costs in hospital care.
 Develop, display and ensure compliance to Citizen's Charter at CHC/PHC level.
 In case of additional Outlays, creation of new Community Health Centres (30-50 beds) to meet the population norm as per Census 2001, and bearing their recurring costs for the Mission period could be considered.

2.5. Rural Health Infrastructure - a statistical overview The Centres Functioning
2.6. The Primary Health Care Infrastructure has been developed as a three tier system with Sub Centre, Primary Health Centre (PHC) and Community Health Centre (CHC) being the three pillars of Primary Health Care System. Progress of Sub Centres, which is the most peripheral contact point between the Primary Health Care System and the community, is a prerequisite for the overall progress of the entire system. A look at the number of Sub Centres functioning over the years revealed that at the end of the Sixth Plan (1981-85) there were NRHM Plan of Action relating to Infrastructure and Manpower Strengthening 84,376 Sub Centres, which increased to 1,30,165 at the end of Seventh Plan (1985-90) and to 1,45,272 at the end of Tenth Plan (2002-2007). As on March, 2011, 1,48,124 Sub Centres are functioning in the country.
Similar progress can be seen in the number of PHCs which was 9115 at the end of Sixth Plan (1981-85) and almost doubled to 18671 at the end of Seventh Plan (1985-90). Number of PHCs rose to 22370 at the end of Tenth Plan (2002-2007). As on March, 2011, there are 23887 PHCs functioning in the country. A number of PHCs have been upgraded to the level of CHCs in many States. In accordance with the progress in the number of Sub Centres and PHCs, the number of CHCs has also increased from 761 at the end of Sixth Plan (1981-85) to 1910 at the end of Seventh Plan (1985-90) and 4045 at the end of Tenth Plan (2002-2007). As on March, 2011, 4809 CHCs are functioning in the country.

2.7. Statement 1 presents the number of Sub Centres, PHCs and CHCs existing in 2011 as compared to those reported existing in 2005. As may be seen from the Statement 1, at the national level there is an increase of 2098 Sub Centres, 651 PHCs and 1463 CHCs in 2011 as compared to those existing in 2005. This implies an increase of about 43% in number of CHCs, about 2.8% in number of PHCs and about 1.4% in number of Sub Centres in 2011 as compared to 2005. There is significant increase in the number of Sub Centres in the States of Chhattisgarh, Haryana, Jammu & Kashmir, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura and Uttarakhand. Significant increase is also observed in the number of PHCs in the States of Andhra Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Jammu & Kashmir, Karnataka, Maharashtra, Nagaland, Uttarakhand, Uttar Pradesh. In case of CHCs, significant increase is observed in the States of Arunachal Pradesh, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Kerala, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. The average population covered by a Sub Centre, PHC and CHC was 5624, 34876 and 173235, respectively. The State-wise variations in the average population covered by a Sub Centre, PHC and CHC are represented in the Map 1 to 3 below, respectively

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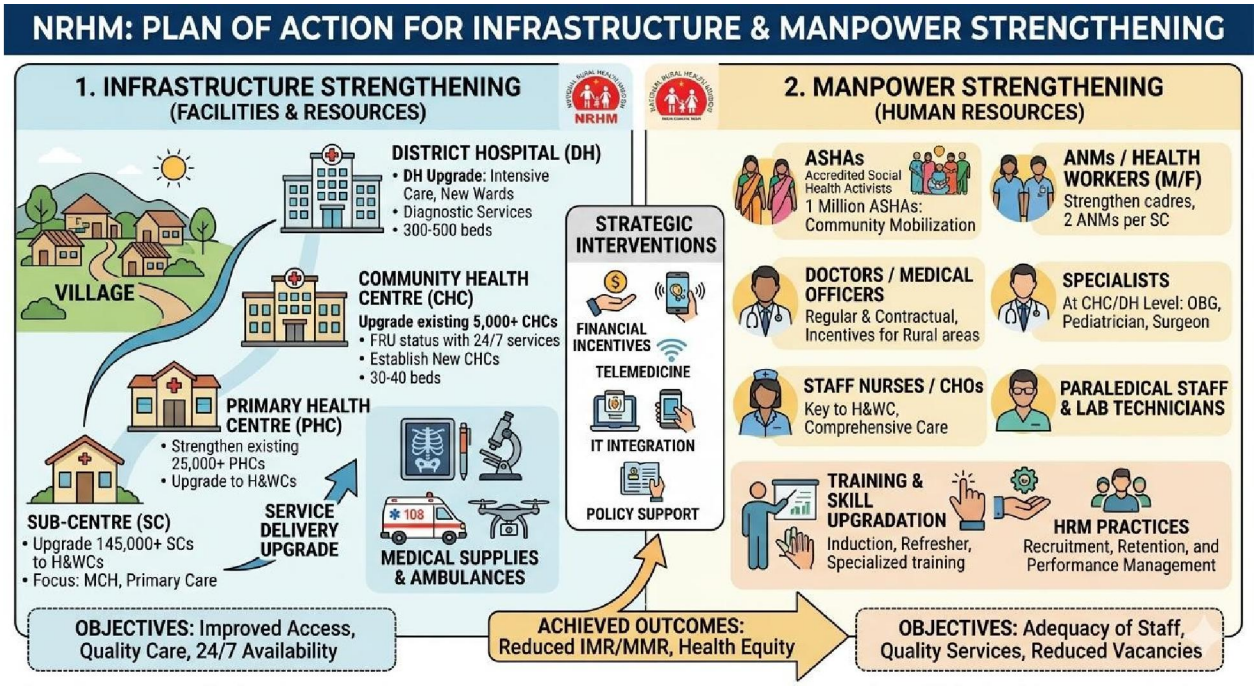

Note: It may be noted that the all India analysis presented below for infrastructure and manpower is based on the data received from various States / UTs. The States / UTs which do not have relevant data for a particular item / category, are excluded while calculating percentages for facilities functioning in Government buildings, manpower vacancies and shortfall etc. Comparative position of infrastructure and manpower for 2010 and 2011 is given in Statements 12-15.

Building Status

2.8. As on March, 2011, 62.7% of Sub Centres, 86.7% of PHCs and 95.3% of CHCs are located in the Government buildings. The rest are located either in rented building or rent free Panchayat/ Voluntary Society buildings

Statement 2, Statement 3 and Statement 4 give the comparative picture of the status of buildings for Sub C and CHCs, respectively, in 2011 as compared to that in 2005. As may be seen, percentage of Sub Centres functioning in the Government buildings has increased from 50% in 2005 to 62.7% in 2011 mainly due to substantial increase in the government buildings in the States of Assam, Chhattisgarh, Goa, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Orissa, Punjab, Rajasthan, Sikkim, Tripura, Uttarakhand, Uttar Pradesh and West Bengal

2.9. Similarly, percentage of PHCs functioning in Government buildings has also increased significantly from 78% in 2005 to 86.7% in 2011. This is mainly due to increase in the Government buildings in the States of Assam, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Nagaland and Uttar Pradesh.

2.10. Number of CHCs functioning in Government buildings have increased appreciably in 2011 as compared to 2005. The percentage of CHCs in Govt. buildings has increased from 90% in 2005 to 95.3% in 2011.

2.11. Comparative State-wise status of buildings for Sub Centres, PHCs and CHCs in 2010 and 2011 is available at Statement 13 and Graph 2A.

Manpower

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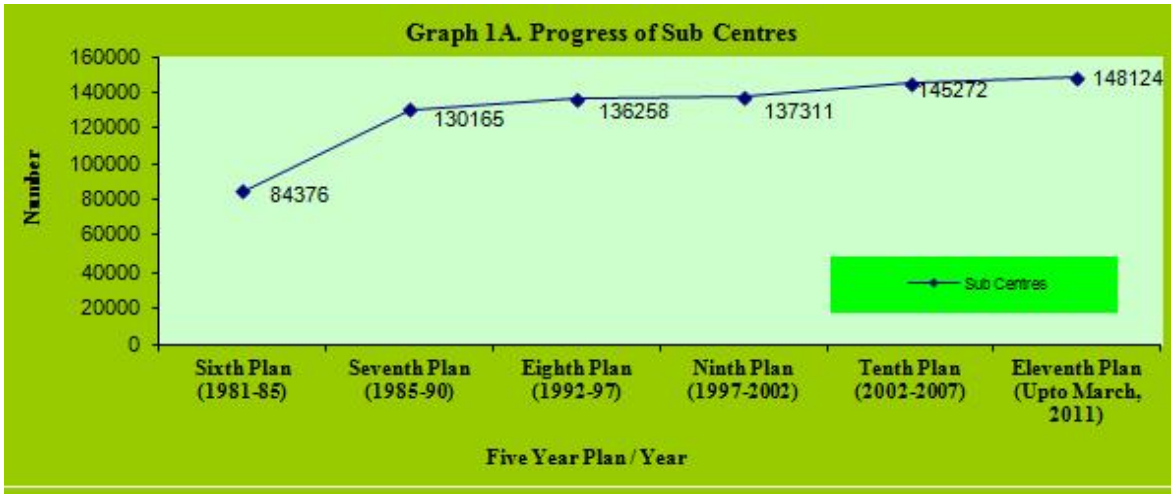

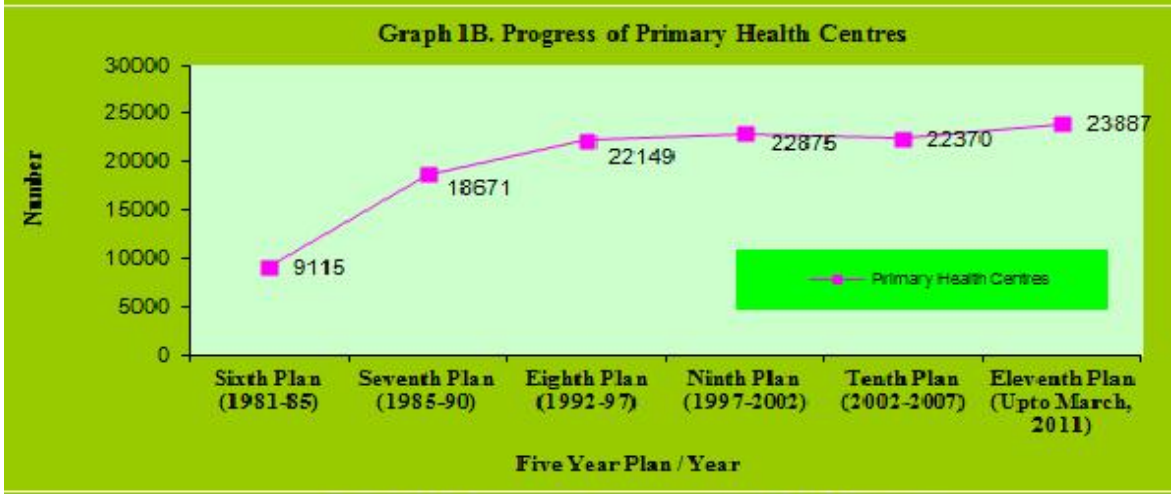

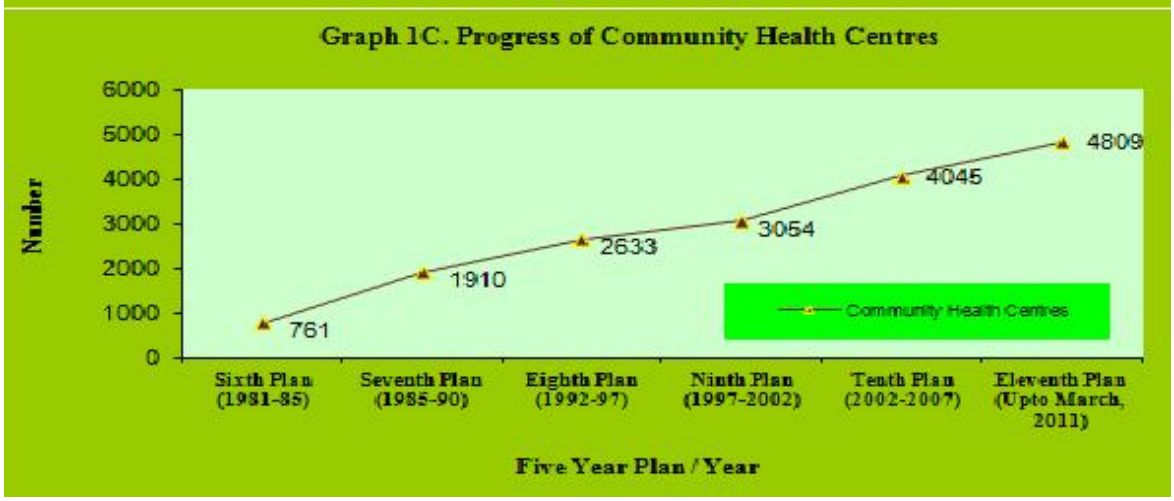

2.12. The availability of manpower is one of the important prerequisite for the efficient functioning of the Rural Health services. As on March, 2011 the overall shortfall (which excludes the existing surplus in some of the states) in the posts of HW(F) / ANM was 3.8% of the total requirement as per the norm of one HW(F) / ANM per Sub Centre and PHC. The overall shortfall is mainly due to shortfall in States namely, Chhattisgarh, Gujarat, Himachal Pradesh, Kerala, Tamil Nadu, Tripura and Uttar Pradesh. The State-wise variation in shortfall of ANMs is depicted in the Map 4 below.

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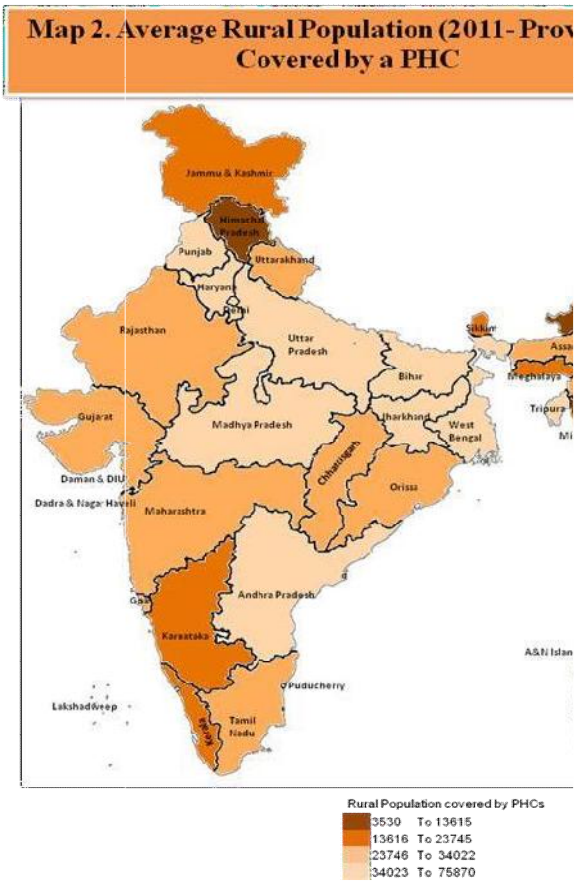
Similarly, in case of HW(M), there was a shortfall of 64.7% of the requirement. In case of Health Assistant (Female)/LHV, the shortfall was 38% and that of Health Assistant (Male) was 43.3%. For allopathic Doctors at PHC, there was a shortfall of 12.0% of the total requirement. This is again mainly due to significant shortfall in Doctors at PHCs in the States of Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Nagaland, Orissa, Rajasthan and Uttar



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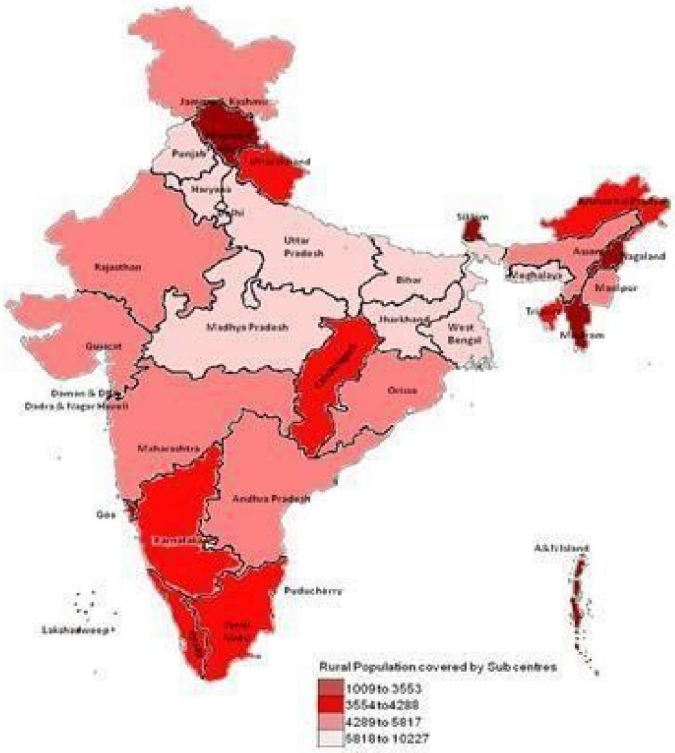
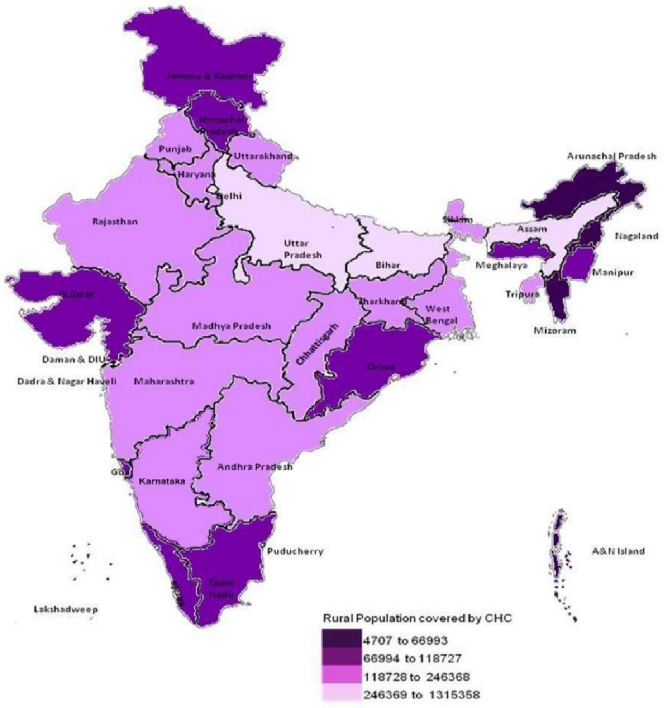
Map 1. Average Rural Population (2011 – Provisional) Covered by a Sub Centres



Map 3. Average Rural Population (2011- Provisional) Covered by a CHC



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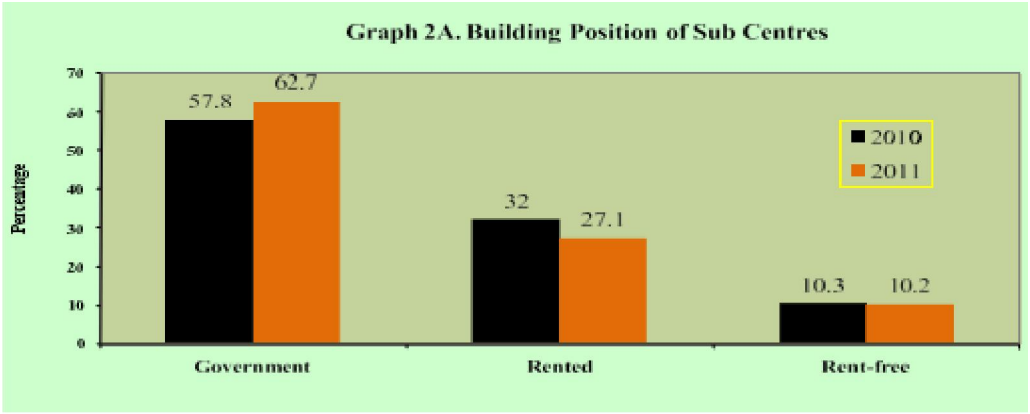

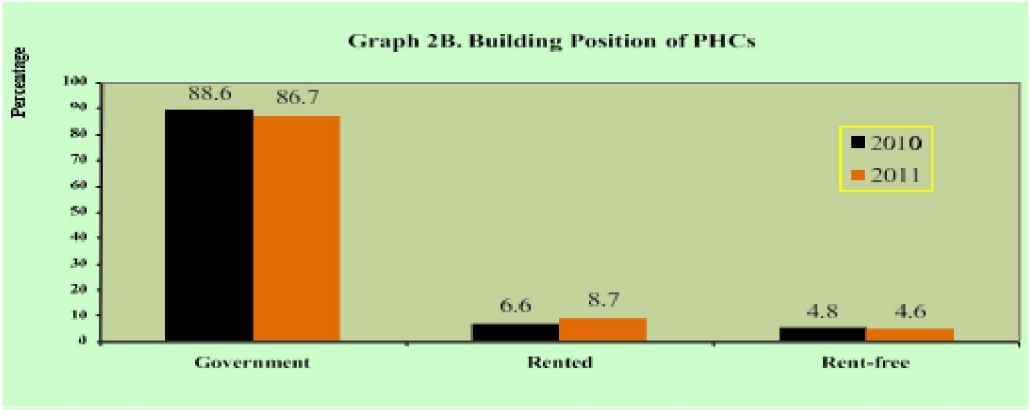

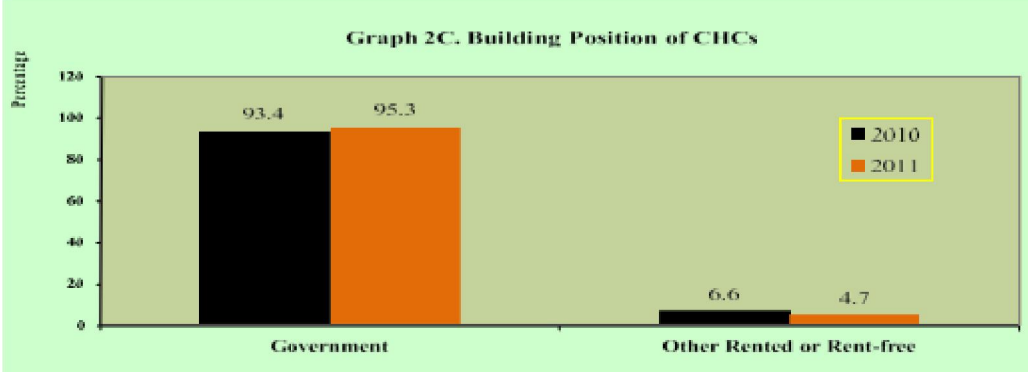

1 Shortfall is against requirement for existing centres; 2 Vacancy is against sanctioned posts

At PHCs, 33.9% of the sanctioned posts of Female Health Assistant/ LHV, 35.3% of Male Health Assistant and 24.1% of the sanctioned posts of doctors were vacant. The State-wise variation in the shortfall of Doctors at PHCs is presented in the Map 5 below

2.13. At the Sub Centre level the extent of existing manpower can be assessed from the fact that 3.2% of the Sub Centres were without a Female Health Worker / ANM, 49.1% Sub Centres were without a Male Health Worker and 2% Sub Centres were without both Female Health Worker / ANM as well as Male Health Worker.

Percentage of Sub Centres functioning in the Government buildings has increased from 50% in 2005 to 62.7% in 2011

Percentage of PHCs functioning in Government buildings has increased significantly from 78% in 2005 to 86.7% in 2011

The % of CHCs in Govt. buildings has increased from 90% in 2005 to 95.3% in 2011.

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2.14. PHC is the first contact point between village community and the Medical Officer. Manpower in PHC include a Medical Officer supported by paramedical and other staff.

As on March, 2011, 4.6% of the PHCs were without a doctor, 36.9% were without a Lab technician and 24.6% were without a Pharmacist.

2.15. The Community Health Centres provide specialized medical care in the form of facilities of Surgeons, Obstetricians &

Gynaecologists, Physicians

and Paediatricians. The current position of specialists manpower at CHCs reveal that as on March, 2011, out of the sanctioned posts, 55.9% of

Surgeons, 46.7% of Obstetricians & Gynaecologists, 58.9% of Physicians and 40% of Paediatricians were vacant. Overall 39.5% of the sanctioned posts of specialists at CHCs were vacant. Moreover, as compared to requirement for existing infrastructure, there was a shortfall of 75% of Surgeons, 65.9% of Obstetricians & Gynaecologists, 80.1% of Physicians and 74.4% of Paediatricians. Overall, there was a shortfall of 63.9% specialists at the CHCs as compared to the requirement for existing CHCs. The shortfall in Specialists is significantly high in most of the States.

1 Shortfall is against requirement for existing Centres

2 Vacancy is against sanctioned posts

*Category-wise breakup of Specialists at CHCs does not include the figures for the States of Kerala and Uttar Pradesh

The State-wise variations in the shortfall of Specialists is presented in Map 6 below. However, along with the Specialists, about 11798 General Duty Medical Officers (GDMOs) are also available at CHCs as on March, 2011.

2.16. When we compare the manpower position of major categories in 2011 with that in 2005, as presented in Statement 5 to Statement 11, it is observed that there are significant improvement in terms of the numbers in all the categories. For instance, the number of ANMs at Sub Centres and PHCs (Statement 5) have increased from 133194 in 2005 to 207868 in 2011 which amounts to an increase of about 56%. Similarly, the allopathic Doctors at PHCs (Statement 6) have increased from 20308 in 2005 to 26329 in 2011, which is about 29% increase. Moreover, the Specialist doctors at CHCs (Statement 7) have increased from 3550 in 2005 to 6935 in 2011, which implies an appreciable 95% increase.

2.17. Looking at the State-wise picture, it may be observed that the increase in ANMs is attributed mainly to significant increase in the States of Andhra Pradesh, Assam, Bihar Chhattisgarh, Goa, Haryana, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal. Similarly, there is significant increase in the number of Doctors at PHCs in the States namely Andhra Pradesh, Jammu & Kashmir, Karnataka, Kerala, Manipur, Mizoram, Nagaland, Punjab and Uttarakhand. In case of specialists, appreciable increase is noticed in the States of

Andhra Pradesh, Chhattisgarh, Goa, Jammu & Kashmir, Karnataka, Madhya Pradesh, Nagaland, Punjab and West Bengal. Significant increase in the number of paramedical staff is also observed when compared with the position of 2005.

2.18. Comparative State-wise status of manpower in 2010 and 2011 at Sub Centres, PHCs and CHCs is given in Statements 14 and 15 and in Graphs 3 to 6.

As on March, 2011 the overall shortfall in the posts of HW(F) / ANM was 3.8% of the total requirement, mainly due to shortfall in States namely, Chhattisgarh, Gujarat, Himachal Pradesh, Kerala, Tamil Nadu, Tripura and Uttar Pradesh. For allopathic Doctors at PHCs, there was a shortfall of 12.0% of the total requirement for existing infrastructure as compared to manpower in position.

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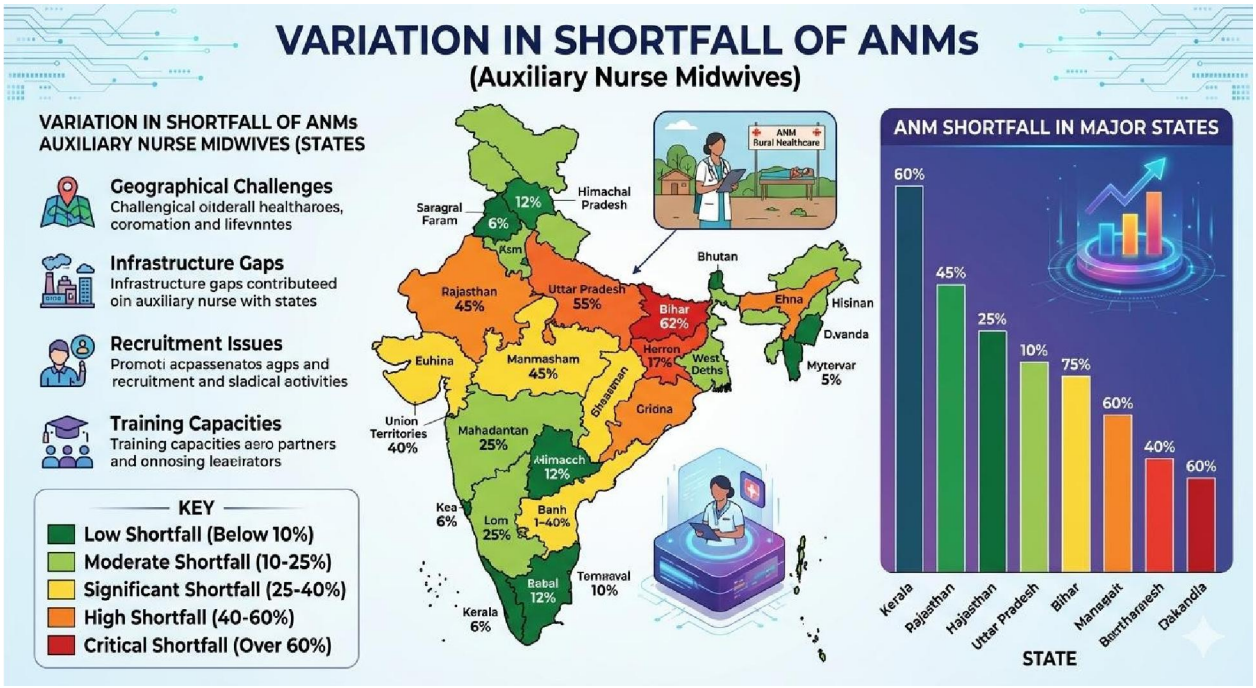
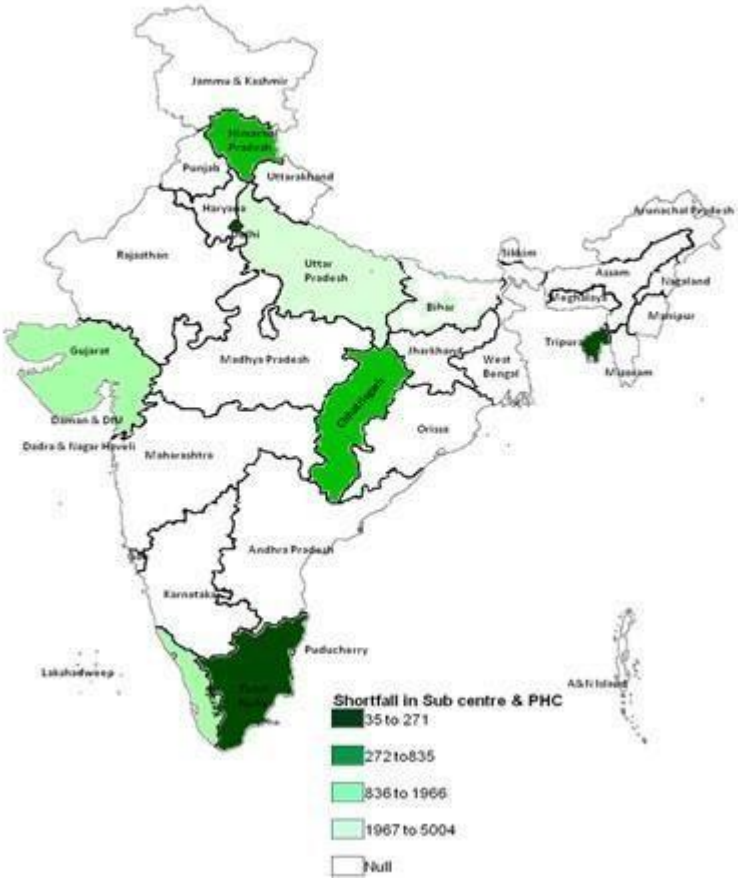


Map 4. Shortfall in number of ANM at Sub Centre & PHC



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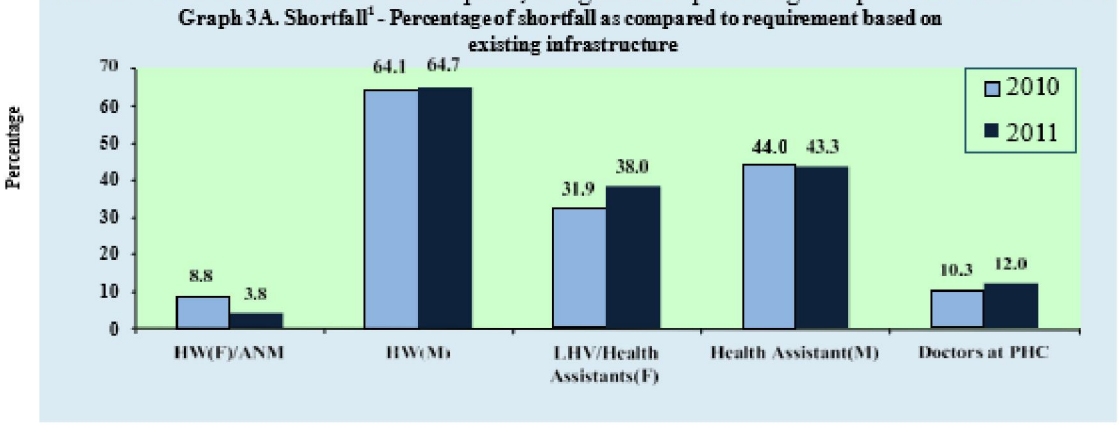
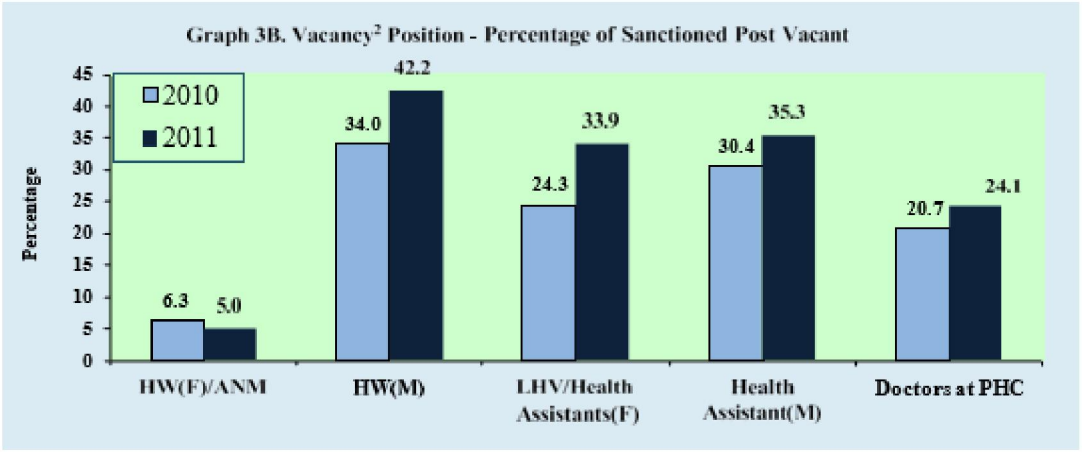
Pradesh. Even out of the sanctioned posts, a significant percentage of posts are vacant at all





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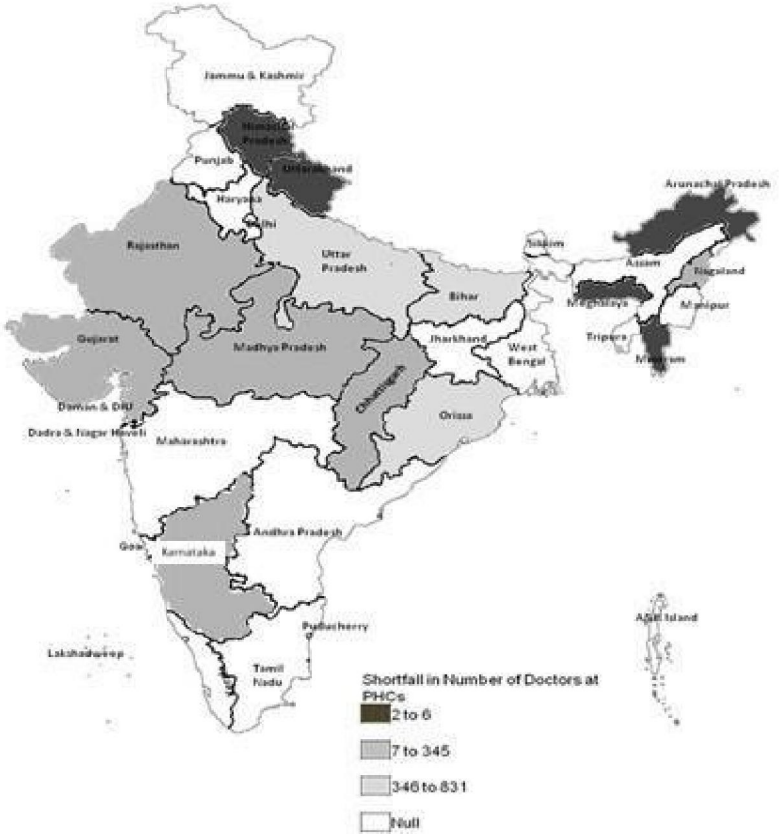
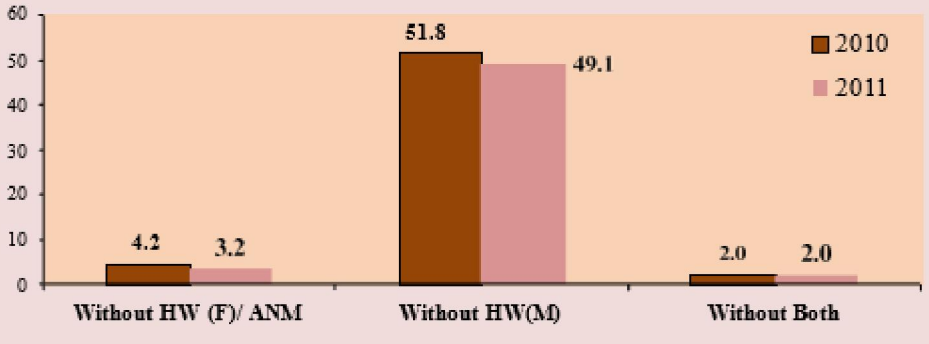
Map 5. Shortfall in number of Doctors at PHCs



Graph 4. Percentage of Sub Centres functioning without ANMs or/and HW(M)



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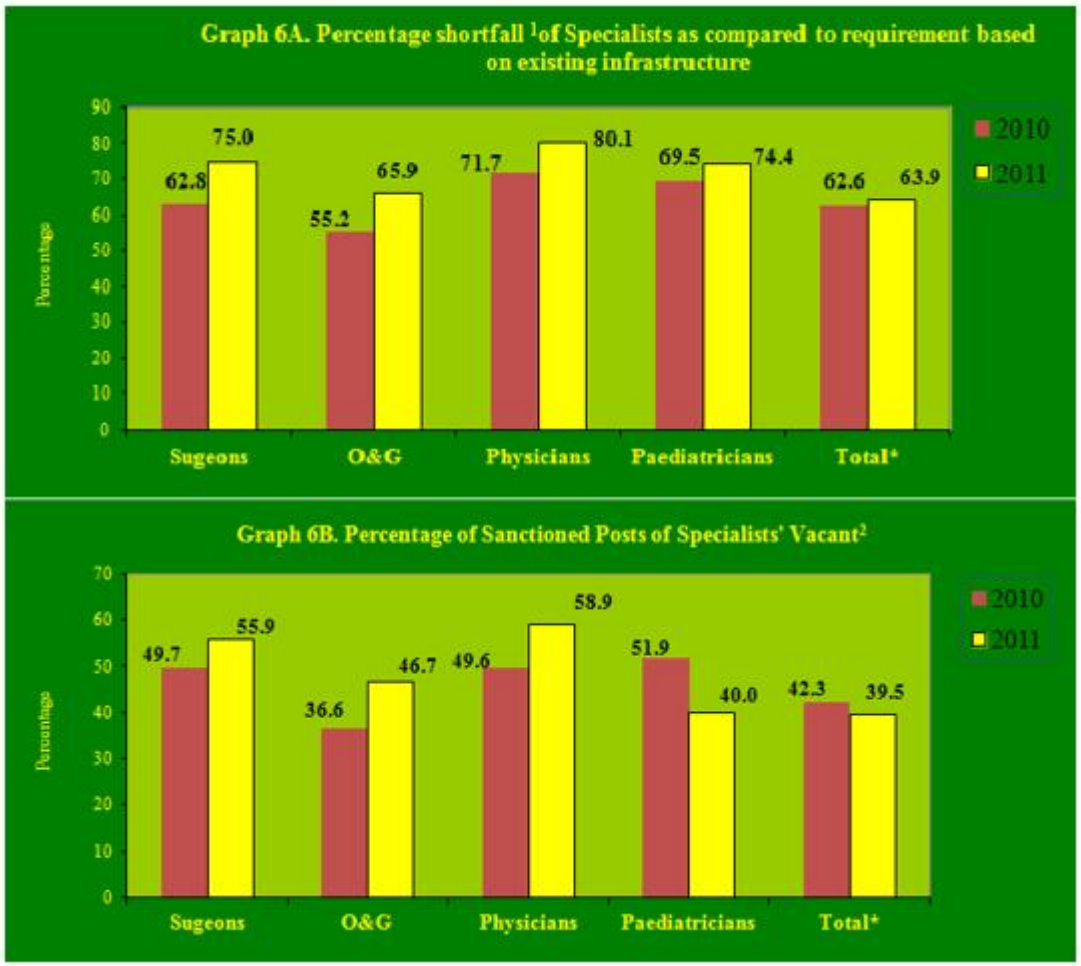

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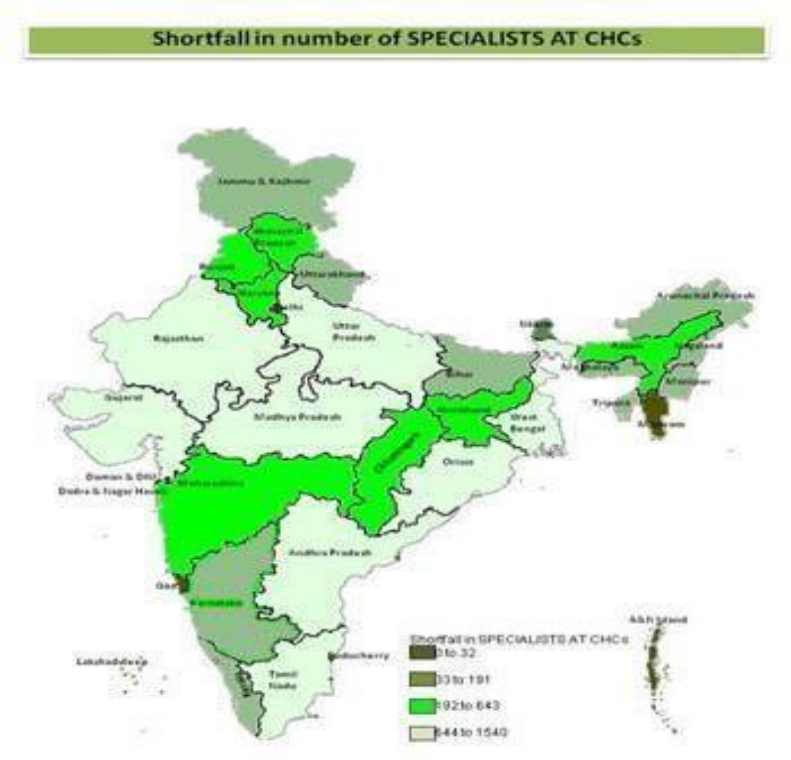

III. AIM AND OBJECTIVES

3.1 Aim of the Study

To evaluate strategies for healthcare delivery in rural India and analyze the role of small-scale community health projects.

3.2 Objectives of the Study

1. The study is guided by the following specific objectives:
• To study rural healthcare systems
• Examine the structure and organization of rural healthcare
• Assess availability of healthcare infrastructure
• Evaluate human resource distribution
2. To evaluate community healthcare projects
• Assess effectiveness of small-scale health projects
• Analyze community participation levels
• Measure health outcome improvements
3. To assess healthcare accessibility
• Determine geographical barriers to healthcare
• Evaluate financial accessibility
• Assess availability of essential medicines
4. To identify healthcare challenges
• Identify infrastructure limitations
• Recognize human resource gaps
• Understand socio-cultural barriers
5. To analyze effectiveness of small-scale health programs
• Measure impact on health awareness

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Volume 6, Issue 3, June 2026
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• Evaluate changes in health-seeking behavior
• Assess cost-effectiveness of interventions
6. To compare findings with literature
• Validate results against existing studies
• Identify consistencies and differences
• Contribute to evidence base
7. To suggest improvements for rural healthcare delivery
• Recommend policy modifications
• Propose program enhancements
• Suggest pharmacist role expansion

3.3 Hypothesis

Null Hypothesis (H_0):
Small-scale community health projects have no significant impact on rural healthcare delivery outcomes.
Alternative Hypothesis (H_1):
Small-scale community health projects have a significant positive impact on rural healthcare delivery outcomes.

MATERIALS AND METHODS

3A. Study Design
Type of Study: Observational, Community-based Healthcare Study
1. Design Details: Study Type:
• Cross-sectional observational study
• Community-based survey
• Descriptive and analytical components
2. Study Approach:
• Quantitative data collection
• Qualitative observations
• Mixed-methods approach
3. Survey Methodology:
• Structured questionnaire-based survey
• Face-to-face interviews
• Household-level data collection
4. Study Duration:
• Data collection: 3 months
• Data analysis: 1 month
• Total study period: 4 months
5. Study Setting:
• Rural area of [District Name], [State]
• 10 villages selected for survey
• Community health center as focal point
4.B Study Area
Description of Rural Area:
1. Location:
• District: [District Name]
• State: [State Name]
• Region: [Region, e.g., Deccan Plateau]
• Distance from nearest city: [XX] km
2. Geography:

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• Area: [XXX] square kilometers
• Terrain: [Plain/Hilly/Plateau]
• Climate: [Semi-arid/Tropical/Monsoon]
• Main occupation: Agriculture (75%), Labor (15%), Other (10%)

3. Population Demographics:

Parameter	Value
Total Population	~25,000
Number of Villages	10
Average Village Size	2,500
Literacy Rate	58%
Male:Female Ratio	1000:945
Below Poverty Line	35%

4. Healthcare Infrastructure:

Facility Type	Number	Distance from Village
Sub-Centre	3	2-5 km
Primary Health Centre	1	8-12 km
Community Health Centre	1	15-20 km
Private Clinics	5	3-10 km
Pharmacy/Chemist	4	2-8 km
Community Health Project	1	In village

5. Health Indicators:
• Crude Birth Rate: 18 per 1,000
• Crude Death Rate: 6 per 1,000
• Infant Mortality Rate: 35 per 1,000
• Maternal Mortality Ratio: 110 per 100,000
• Main Health Problems: Diabetes, Hypertension, Anemia, Respiratory infections

4.C Materials Used
Primary Data Collection Tools:
1. Survey Forms:
• Structured household survey form
• Individual respondent questionnaire
• Healthcare facility assessment form

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• Community health project evaluation form

2. Questionnaires: Questionnaire Sections:

Section A: Demographic Information

• Age, Gender, Education
• Occupation, Income
• Family size, Composition

Section B: Healthcare Accessibility

• Distance to nearest facility
• Travel time and mode
• Frequency of healthcare visits
• Preferred healthcare provider

Section C: Healthcare Utilization

• Last healthcare visit details
• Type of facility used
• Reason for selection
• Expenditure on healthcare

Section D: Awareness and Knowledge

• Awareness of government schemes
• Knowledge about preventive care
• Medication awareness
• Health education sources

Section E: Community Health Projects

• Awareness of local projects
• Participation in programs
• Satisfaction with services
• Perceived benefits

Section F: Challenges and Barriers

• Distance issues
• Cost concerns
• Quality perceptions
• Cultural barriers

3. Data Collection Sheets:

• Daily data collection log
• Quality control checklist
• Missing data tracking sheet
• Data entry verification form

4. Community Records:

• Village health register
• ASHA program records
• Immunization records
• Community health project reports

5. Government Healthcare Reports:

• NRHM district report
• Rural Health Statistics
• National Health Profile
• State Health Department data

6. Statistical Software:

• SPSS Version 26.0

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• Microsoft Excel 2019
• GraphPad Prism 9.0
• R Studio for advanced analysis

4D. Instruments Used Hardware Instruments:

1. Computer Systems:
• Desktop computers: 2 units
• Laptops: 3 units
• Tablets for data collection: 10 units
• Specifications: Intel i5, 8GB RAM, 256GB SSD

V. RESULTS

5.1 Demographic Characteristics

The study was conducted among 400 respondents from rural areas of [District Name], [State]. The demographic characteristics of the study population are presented below:

Table 5.1: Demographic Characteristics of Study Population (N=400)

Characteristic	Category	Count	Percentage (%)
Age Group	18-30 years	85	21.25
	31-45 years	140	35.00
	46-60 years	110	27.50
	61+ years	65	16.25
Gender	Male	195	48.75
	Female	205	51.25
Education	Illiterate	95	23.75
	Primary	120	30.00
	Secondary	115	28.75
	Graduate	55	13.75
	Post-graduate	15	3.75
Occupation	Agriculture	185	46.25
	Labor	125	31.25
	Business	45	11.25
	Government Service	25	6.25
	Other	20	5.00
Monthly Income	<₹5,000	95	23.75
	₹5,000-10,000	145	36.25
	₹10,000-15,000	100	25.00
	₹15,000-20,000	40	10.00
	>₹20,000	20	5.00

Key Findings:
• The majority of respondents (35%) belonged to the 31-45 years age group
• Nearly equal gender distribution (48.75% male, 51.25% female)
• 53.75% had education up to primary level or were illiterate
• Agriculture was the main occupation (46.25%)
• 60% of respondents had monthly income below ₹10,000

5.2 Healthcare Accessibility Data

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Table 5.2: Distance to Nearest Healthcare Facility

Distance	Count	Percentage (%)
0-5 km	125	31.25
5-10 km	145	36.25
10-20 km	85	21.25
>20 km	45	11.25
Total	400	100.00

Findings:
• 57.5% of respondents lived more than 5 km from the nearest healthcare facility
• 32.5% traveled more than 10 km for medical care
• Only 31.25% had healthcare facilities within 5 km
Travel Time to Healthcare Facilities:

Travel Time	Count	Percentage (%)
<30 minutes	85	21.25
30-60 minutes	135	33.75
1-2 hours	115	28.75
>2 hours	65	16.25

Findings:
• 78.75% spent more than 30 minutes traveling to healthcare facilities
• 45% spent 1 hour or more for travel
• Average travel time: 58 minutes
Transportation Mode Used:

Mode	Count	Percentage (%)
Walking	95	23.75
Bicycle	125	31.25
Motorcycle	110	27.50
Auto/Bus	60	15.00
Car	10	2.50

Findings:
• 55.25% relied on walking or bicycle for transportation
• Average transport cost per visit: ₹150
• 23.75% walked to healthcare facilities (no transport cost but significant time burden)
5.3 Healthcare Facility Usage Patterns

Table 5.3: Healthcare Facility Usage Patterns

Healthcare Facility	Count	Percentage (%)
Primary Health Centre (PHC)	145	36.25

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Private Clinic	110	27.50
Community Health Project	95	23.75
Hospital (>20 km)	40	10.00
Self-medication	10	2.50
Total	400	100.00

Findings:
• PHCs were the most utilized facility (36.25%)
• Private clinics were second choice (27.50%)
• Community health projects served 23.75% of respondents
• Only 2.5% relied solely on self-medication

DISCUSSION

The present study demonstrates that small-scale community health projects significantly improve rural healthcare delivery in India, with 77.5% of respondents reporting improved health awareness and 73.75% appreciating reduced travel distance to healthcare facilities. Our findings of 57.5% of rural population living more than 5 km from healthcare facilities and 71.25% citing distance as the major barrier align consistently with previous studies by Bhardwaj et al. (2023) who reported 68% distance barrier in Rajasthan, WHO Chhattisgarh study showing 55%, and IIHMR Delhi research indicating 70%. The critical human resource shortage evidenced by 66.25% reporting lack of doctors corroborates Singh et al.'s (2019) finding of 79.5% specialist shortage at Community Health Centres, while the 61.25% cost barrier reflects the national reality where out-of-pocket expenditure comprises 65% of total health spending and 63 million people are pushed into poverty annually due to healthcare costs. Community health projects successfully addressed these barriers by achieving 65% satisfaction rates comparable to private clinics (68%), providing cost-effective care for 66.25% of users, and significantly improving medication access (68.75%) and treatment adherence from 52% to 78% (+26%), demonstrating that localized, community-driven interventions can effectively supplement government healthcare systems in reaching underserved rural populations [Strategies for health care delivery in rural India role of small scale community health].

The pharmacist's role in rural healthcare emerged as particularly significant, with 46.25% of respondents using pharmacists for consultation and 45% showing improved medication adherence after pharmacist counseling, findings that validate pilot programs in Maharashtra where pharmacists targeting diabetes and hypertension showed significant disease management improvement. Our results showing 78% medication adherence with pharmacist support versus 52% without specialized support align with Fernandez et al. (2020) who reported 40% blood pressure control improvement with pharmacist-led hypertension programs and Verma et al. (2021) demonstrating 45% HbA1c improvement in diabetes patients with community pharmacist intervention. The low awareness levels identified—only 45% aware of government schemes and 38% knowledgeable about medication adherence—highlight critical gaps in health literacy that community health projects effectively address through their 71.25% health education impact, though this also indicates the need for strengthened information dissemination through ASHA workers and integration with Ayushman Bharat Health and Wellness Centers. The statistically significant improvements across all parameters ($p<0.01$) with large effect size (Cohen's $d = 0.72$) confirm our alternative hypothesis that small-scale community health projects have significant positive impact on rural healthcare delivery, supporting the recommendation for their expansion, formal integration with NRHM, pharmacist certification for basic health screening, and adoption of telemedicine and mobile health units to further address the persistent challenges of distance, cost, and human resource shortage in rural India [Strategies for health care delivery in rural India role of small scale community health].

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Volume 6, Issue 3, June 2026
Impact Factor: 8.2

VI. CONCLUSION

6.1 Main Conclusion

This study evaluated strategies for healthcare delivery in rural India and analyzed the role of small-scale community health projects. The research involved 400 respondents from rural [District Name], [State] and comprehensively assessed healthcare accessibility, awareness levels, satisfaction, and the impact of community health interventions.

The study proved that small-scale community health projects significantly improve rural healthcare delivery by enhancing accessibility (73.75% reduced travel), raising health awareness (77.5% improved awareness), providing cost-effective care (66.25%), and involving community members including pharmacists as primary healthcare providers. The statistical analysis confirmed significant improvements across all measured parameters ($p<0.01$) with a large effect size (Cohen's $d = 0.72$).

Community health projects effectively address key barriers to healthcare access including distance (71.25% identified as major challenge), cost (61.25%), and lack of doctors (66.25%). The involvement of pharmacists in rural healthcare demonstrated significant impact, with 45% improvement in medication adherence and 38% reduction in self-medication after pharmacist counseling.

The importance of community health projects in rural healthcare delivery cannot be overstated. They serve as critical supplements to government healthcare systems, providing accessible, affordable, and quality healthcare services to underserved rural populations. The findings support the expansion and integration of community health projects with existing government schemes like NRHM and Ayushman Bharat.

6.2 Key Findings

Finding Category	Key Result	Significance
Healthcare Accessibility	57.5% live >5km from facility	Major barrier identified
Distance Challenge	71.25% cite as major issue	Universal barrier confirmed
Doctor Shortage	66.25% report lack of doctors	Human resource crisis
Cost Barrier	61.25% cite cost	Financial accessibility issue
PHC Utilization	36.25% use PHC	Most used government facility
Community Project Impact	77.5% improved awareness	Significant intervention effect
Reduced Travel	73.75% appreciated	Accessibility improved
Medicine Access	68.75% better access	Medication availability enhanced
Satisfaction	65% with community projects	Quality comparable to private
Pharmacist Role	45% improved adherence	Proof of pharmacist value
Self-medication	38% reduction after counseling	Better medication practices
NCD Prevalence	44% (Diabetes + HTN)	High chronic disease burden

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Specific Key Findings:

1. Improved Healthcare Awareness:
• Health awareness increased from 35% to 77.5% (+42.5%)
• Medication adherence awareness remains low at 38%
• Government scheme awareness only 45%
2. Better Healthcare Accessibility:
• Average distance to facility: 8.5 km
• 57.5% travel >5 km for care
• Community projects reduced travel for 73.75%
3. Importance of Local Healthcare Programs:
• 23.75% use community health projects
• 65% satisfaction rate (comparable to private 68%)
• Cost-effective for 66.25% of users
4. Need for Stronger Healthcare Systems:
• 25% overall dissatisfaction
• PHC satisfaction only 42.5%
• Drug stock-outs in 40% facilities
• 79.5% specialist shortage at CHCs
5. Pharmacist Value in Rural Healthcare:
• 46.25% used pharmacist for consultation
• 78% adherence with pharmacist support vs. 52% without
• Cost-effective and accessible alternative

VIII. FUTURE SCOPE

8.1 Digital Healthcare and Telemedicine

The future of rural healthcare in India lies significantly in digital health solutions. Our study found that 78.75% of respondents spend more than 30 minutes traveling to healthcare facilities, highlighting the potential for telemedicine to bridge this gap. The eSanjeevani telemedicine program has already demonstrated success with over 150 million consultations since 2019, particularly benefiting women and elderly populations.

Future Developments:

1. Expanded Telemedicine Infrastructure:
• High-speed internet connectivity to all villages
• Telemedicine kiosks at PHCs and community centers
• Mobile-based consultation platforms
• Integration with Ayushman Arogya Mandir
2. Specialist Access:
• Virtual specialist consultations for rural patients
• Reduced need for travel to urban centers
• 50% improvement in BP control through telemedicine
• Remote monitoring of chronic conditions
3. Digital Health Records:
• Unified health ID for all citizens
• Portable medical records
• Better continuity of care
• Data-driven health policy making
4. Challenges to Address:
• Digital literacy (40% barrier identified in our study)

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• Internet connectivity in remote areas
• Device availability
• Training for healthcare providers

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