

**A REGIONAL ANALYSIS OF RURAL HEALTHCARE
INFRASTRUCTURE AND MANPOWER AVAILABILITY IN
THE LAST FOUR YEARS: GAPS AND TRENDS ANALYSIS**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment of the award of the degree of

Master of Business Administration (MBA)

in

Development Management

by

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Under the Supervision and Guidance of

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DECLARATION BY STUDENT

I hereby declare that this dissertation title “A regional analysis of rural healthcare infrastructure and manpower availability in the last four years: Gaps and Trends Analysis” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Name of Student

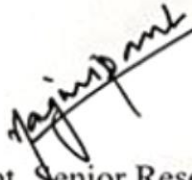
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CERTIFICATE

This is to certify that Vanshika Aggarwal in partial fulfillment of the requirements for the award of the degree of MBA (Development Management) from the IIHMR University, Jaipur has successfully completed her/his internship at Child Rights and You (CRY) during February 20- May 20, 2023.

Place: New Delhi

Date: 29.05.2023


Ragini Pant, Senior Research Manager
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CERTIFICATE

This is to certify that dissertation titled “A regional analysis of rural healthcare infrastructure and manpower availability in the last four years: Gaps and Trends Analysis” is a record of the research work undertaken by (Name of Student) in partial fulfillment of the requirements for the award of the degree of MBA(Development Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

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Acknowledgments

I want to express my sincere gratitude to all of the people who have helped me along the way to finishing this dissertation. Their persistent support, direction, and contributions helped to mold this work into what it is now.

The organization's esteemed manager, *Ms. Ragini Pant, Senior Research Manager, PRAD (Policy, Research, Advocacy and Documentation), Child Rights and You, Delhi*, deserves my sincere gratitude. Your immense knowledge, endurance, and astute criticism have been crucial in determining the course of this research.

I would like to express my profound gratitude to *Dr. Ratna Verma, Assistant Professor, and Dr. Goutam Sadhu, Dean of the School of Development Studies at IIHMR University*. Their commitment to promoting an environment of intellectual growth and to disseminating knowledge has greatly benefited my academic career.

My sincere gratitude is extended to my family and friends for their unflagging support and inspiration during this quest. They were the pillars of strength that kept me going through the highs and lows of this research trip because they had faith in my talents, were patient with me when I was stressed, and offered encouraging words.

I want to show my gratitude to my seniors, graduates, and fellow colleagues since their varied viewpoints and intellectual contributions have helped me to comprehend more and have forced me to think critically, which has pushed me to polish and improve the quality of this work.

I want to express my sincere gratitude to everyone who was mentioned above as well as the several other people who quietly supported me in the background. No matter how minor or large, your input was crucial to the success of this dissertation.

I want to be clear that any mistakes or flaws in this work are all mine. I am hoping that this research will act as a springboard for additional investigation and add to the body of knowledge in this area.

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Abstract

Objective- The purpose of this study is to identify gaps and trends in healthcare availability by conducting a critical assessment of the state of rural healthcare delivery in terms of infrastructure and human resources over the past four years. The purpose of this research is to shed light on issues and tendencies connected to a dearth of funding and manpower in rural health care. The research includes data and statistical analysis for all four regions (North, South, East, and West) in order to provide a thorough overview. The results of this study will help improve healthcare in rural areas by highlighting the most pressing areas for development.

Methodology- This descriptive cross-sectional study focused on four Indian states: Karnataka, Odisha, Rajasthan, and Uttar Pradesh, with the goal of identifying gaps and trends in the healthcare service delivery systems of selected rural health clinics. The study used publicly accessible information such as literature available on open sources, statistics, and reports from the Ministry of Health and Family Welfare, Rural Health Statistics, NRHM and IPHS. These states' rural health facilities served as the study population, but data availability prevented inclusion of any other states. The results can be generalized because probability sampling methods were used to choose the samples. Rural Health Statistics reports and literature studies were combed through for information, which was then entered into a database and analyzed. Data was collected, cleaned, and analyzed in Microsoft Excel using pivot tables and a variety of chart styles for summary, aggregation, and visualization. The ability to identify crucial insights and express them clearly was made possible by this methodical approach.

Results- The analysis of available data for several indicators has depicted the resultant statements. There is a possibility of data analysis varying from the ground reality. From 2019 through 2022, Uttar Pradesh has outperformed Rajasthan, Karnataka, and Odisha in healthcare infrastructure. Uttar Pradesh consistently had the most Primary Health Centers (PHCs) with separate restrooms, operation theaters, and at least four beds. PHCs without electricity decreased over time. Uttar Pradesh had the most Community Health Centers (CHCs) with all four specialists, laboratories, and newborn stabilization facilities. Rajasthan did better in CHCs with separate men's and women's toilets. Uttar Pradesh had better healthcare infrastructure than other states throughout the analyzed time.

Conclusion- This study underscores the need for a complete healthcare system overhaul in India to deliver timely, high-quality medical care for all inhabitants. The Integrated National Health System, which integrates the public and private sectors, can improve health outcomes and accountability. The government should provide curative and preventative healthcare in impoverished and rural areas. Medical specialists and rural healthcare facilities are major obstacles. To overcome these issues, rural healthcare infrastructure, competent healthcare staff, and urban-rural integration are needed. The report underlines the constraints of insufficient resources, discrepancies between urban and rural areas, paucity of medical professionals, inadequate healthcare facilities, training and distribution concerns, governance, and implementation challenges. Establishing a separate body to distribute medical personnel, improving community health workers, providing incentives for healthcare professionals to work in underserved areas, and advocating for medical and nursing schools in those areas are future recommendations. Addressing these obstacles and implementing the Integrated National Health System can improve rural and distant healthcare access and quality, improving health outcomes for all Indians.

Keywords – *Rural health disparities, healthcare access, healthcare manpower, healthcare infrastructure*

Acronyms

ANM – Auxiliary Nursing Midwifery

CHC – Community Health Center

HW – Health Worker

IPHS – Indian Public Health Standards

NRHM – National Rural Health Mission

OT – Operation Theaters

PHC – Primary Health Center

RHS – Rural Health Statistics

SC – Sub-Center

Chapter 1: Introduction

1.1 Background

The health of rural dwellers is perpetually poorer when compared to that of their urban counterparts. People in far-flung and rural communities need special consideration for boosting their health because of the high concentration of poverty, poor health status, and illness load. This is particularly relevant if we are to reverse the urban drift(1). A significant number of people inhabit rural areas in most developing countries. Natural geography affects access to rural and remote communities; for example, mountains, deserts, and jungles make transportation less feasible and are sometimes further hampered by different climatic conditions. Therefore, in some settings perhaps at times, there is no means of transportation, making it impossible to transport critically ill or injured patients(1).

In accordance with World Bank data, the present rural health personnel could have a more significant effect on rural health outcomes if they were more productive and encouraged to stay in rural regions for a longer period of time, as compared to recruitment with numerous incentives(2). Access to healthcare in rural areas depends on accurate estimates of the current demand and the shortage of healthcare providers. Predictive studies are essential because of the extensive amount of time needed to train highly valued healthcare professionals like physicians. They hope that state and federal authorities will use the study's findings to better serve rural areas by improving access to healthcare(3).

If a country wants its citizens to be healthy, it must invest heavily in its healthcare system. The health of the Indian population still suffers from a heavy disease burden, despite India's recent improvements(4). The Government of India established the National Rural Health Mission (NRHM) due to the significance it places on health and development. In 2005, efforts were made to improve health care in rural areas(5). Accessible, cheap, and accountable quality health services in rural areas are the goal of the ambitious NRHM plan. The program plans to implement a "architectural correction" to the public health system(6).

Regardless of these efforts, India's health infrastructure continues to improve in a handful of areas; there are however substantial discrepancies between and within states, and many rural and underdeveloped parts of the country still lack adequate access to medical care(5). In India, the government provides extensive public primary healthcare services. Nevertheless, it tumbles considerably short in both population coverage (particularly in rural areas) and utilization (especially given the poor quality of care available)(4). Significant differences exist between urban and rural areas in terms of human resources for health. For example, the concentration of physicians per capita in metropolitan areas is four times that in rural ones(7).

Enhancing healthcare delivery through the availability of trained and inspired health workers is crucial as India is to realize its goal of providing healthcare to all of its citizens. Effective policies that generate and sustain a responsive manpower require a thorough comprehension of the health-manpower situation(8). Because of the inextricable bond between a society's health and its growth, health professionals play a critical, if indirect, role in fostering long-term social and economic progress. Increases in the healthcare manpower have been made in

response to rising demand. Increases in population size, purchasing power for health care within communities, life expectancy, and the prevalence of non-communicable diseases and other chronic ailments have all worked contrary to these initiatives(8).

The Indian Public Health Standards (IPHS), which suggest a three-tier health center structure according to underlying population densities and fixed area of coverage, serve as the basis for manpower for Health sanctioning within NRHM.(6) These standards also serve as the benchmarks for the delivery of needed and ideally-desired health services(7).When it comes to providing standardized public health care services and general principles for infrastructure planning and up-grading of health facilities according to the population of the States and UTs, the Indian Public Health Standards (IPHS) for Sub-Centers, Primary Health Centers, Community Health Centers, Sub-District and District Hospitals is referred(9).

Rural Health Infrastructure and Manpower

- **Sub-Centers** - One Sub Health Centre is set up for every 5,000 people in plain regions and for every 3,000 people in hilly/tribal/desert areas in rural areas with a HWC-SHC. Through a method of population enumeration, regular home, and community encounters, and boosting people's engagement, they hope to provide individuals with a healthy response that is person-centered, holistic, equity-sensitive, and of high quality(9).

Table 1: Sanctioned Staffs at Sub-Centre

Staff - Sub Centre	No. of Posts
Female Health Worker /ANM	1
Male Health Worker	1
Voluntary Worker	1
Total	3

- **Primary Health Centers(PHC)** - For every 20,000 people who live in hilly or tribal areas, or 30,000 people who live in the plains, a primary healthcare center (PHC) should be built. Integration and connectivity with citizen-centric services will be more successful if they are built associated with Panchayats (population-based). Reproductive, sexual, and child health services, as well as part of the National Disease Control Programs, are all that ought to be expected from an efficiently-run primary health center(10).

Table 2: Sanctioned Staffs at Primary Health Centre (PHC)

Staff- PHC	No. of Posts
Medical Officer	1
Pharmacist	1
Nurse Mid-wife (Staff Nurse)	1
Health Worker (Female)/ANM	1
Health Educator	1
Health Assistant (Male)	1

Health Assistant (Female)/LHV	1
Upper Division Clerk	1
Lower Division Clerk	1
Laboratory Technician	1
Driver (Subject to availability of Vehicle)	1
Class IV	4
Total	15

- **Community Health Centers (CHC)** - The essential services provided by non-FRU CHCs include but are not limited to prevention, promotion, treatment, palliation, and rehabilitation. Normal childbirth, the stabilization of common emergencies, etc., fall within the category of curative services. Additionally, there will be 30 fully functional beds available at rural non-FRU CHCs. Maternal and child health services (including normal delivery), infectious diseases, nutritional problems (such as iron-deficiency anemia), mental health disorders, non-communicable diseases, eye, oral, and ear care are also expected to be provided by non-FRU CHCs. The only approach to alleviate illness burden in a population is by early diagnosis and treatment, in addition to community-level prevention, promotion, and risk reduction(11).

Table 3: Sanctioned Staffs at Community Health Centre (CHC)

Staff – CHC	No. of Posts
Medical Officer	4
Nurse Mid– Wife(staff Nurse)	7
Dresser	1
Pharmacist/Compounder	1
Laboratory Technician	1
Radiographer	1
Ward Boys	2
Dhobi	1
Sweepers	3
Mali	1
Chowkidar	1
Aya	1
Peon	1
Total:	25

Different Indian states are at varying stages of health in the process of transformation, and this variation is obscured by national standards. Orissa, West Bengal, Bihar, Rajasthan, Madhya Pradesh, and Uttar Pradesh (northeast and central) are states with a high population that are still in the early stages of the health transformation progression, while Kerala, Maharashtra, and Tamil Nadu(South) are much further advanced(4).

1.2 Research Objective

The intent of this research is to critically assess the state of rural healthcare delivery over the previous four years in terms of both infrastructure and human resources in order to more effectively communicate recommendations for enhancing healthcare in rural areas.

Research Question - What gaps and trends does a regional analysis of rural healthcare infrastructure and manpower availability highlight, in the last four years?

Objectives –

- The goal is to bring attention to the problems and trends in the rural healthcare system's lack of resources and personnel.
- To present the study regionally, i.e., demonstrating data and statistical analysis for all four regions (North, South, East, and West).

1.3 Significance of the Study

The study's primary objective is to evaluate the existing facilities and services in rural Karnataka, Odisha, Rajasthan, and Uttar Pradesh. Hospitals, clinics, primary care centers, and diagnostic centers, among others, are just some of the types of healthcare facilities that can be analyzed with this data. This research is useful for spotting blind spots in infrastructure and illuminating problem spots that could want some more funding or attention.

The study's consideration of the accessibility of human resources in rural healthcare is also essential. It looks into the availability and distribution of healthcare workers such as doctors, nurses, EMTs, and administrators. This research analyzes the current manpower and determines whether or not it is sufficient to meet the healthcare needs of the rural population, thereby shedding light on the difficulties of addressing personnel shortages and the potential solutions to these difficulties.

By doing a regional study, healthcare gaps and inequities in the four states can be identified. The analysis can highlight inequities in resource allocation and pinpoint locations with the most opportunity for improvement by comparing healthcare facilities and the availability of employees across different regions. Policymakers and healthcare authorities can use this data to implement targeted initiatives to close gaps and minimize inequities.

Analysis of changes over the past four years in rural healthcare facilities and personnel offers a valuable longitudinal viewpoint. It's helpful for learning about the evolution of various states across time. The success of earlier programs, areas of development, and persistent difficulties that need attention can all be assessed by looking at the patterns.

For policymakers and government officials engaged in healthcare planning and resource allocation, the study's findings and recommendations are a significant resource. State and regional policymaking, strategic planning, and decision-making can all benefit from the analysis's findings. It aids in setting priorities, focusing efforts where they will have the most impact, and making the most of limited healthcare resources.

The study's findings have important implications for improving healthcare access and equity in disadvantaged areas since they highlight the importance of investing in healthcare infrastructure and human resources in rural areas. Understanding the gaps and difficulties that rural communities have in getting quality healthcare will allow policymakers to devise targeted initiatives to improve healthcare delivery, expand coverage, and eliminate geographic disparities. Possible benefits include increased access to care and better health outcomes.

The value of the study resides in its ability to analyze rural healthcare facilities and staff availability, identify gaps and inequities, track trends, and provide input into policy decisions. The research team hopes that by focusing on these fundamental points, they may help enhance rural healthcare systems in Karnataka, Odisha, Rajasthan, and Uttar Pradesh and increase people's access to medical treatment.

Chapter 2: Literature Review

2.1 Rural Healthcare Infrastructure: Importance and Components

Access is the most significant problem in rural health care around the globe, in spite of the vast disparities that exist between developing countries and developed nations. Even in nations where the bulk of the people live in rural areas, the majority of the resources are located in urban centers. Every nation struggles with issues relating to transportation and communication, and they are all forced to contend with the problem of shortages of medical experts in areas that are primarily rural or geographically isolated. On account of inadequate funding and other resource restrictions, the delivery of health services in rural and distant locations is greatly hindered. In developing countries, there is both a significant amount of poverty and a limited availability of facilities and resources for health care. In many affluent countries, there has been a general tendency toward cutting financing and infrastructural support for health care in rural and distant regions. This is especially true in developing countries. All of these challenges are exacerbated by the fact that rural and distant locations sometimes have severe shortages of medical professionals, including doctors, nurses, and other healthcare professionals. The provision of rural health services necessitates an adequate number of physicians and other health care personnel who are with the relevant knowledge and experience to do their jobs in an efficient and satisfying manner in these locations. The continuation of these services is contingent on there being appropriate health service infrastructure and help from specialists being made available. It is apparent that the creation and delivery of health care in rural regions must be specific to the rural environment and different from that in the metropolis when considering the various characteristics of rural morbidity and mortality patterns and the rural context(1).

A certain definition of infrastructure puts it as the basic services or the social capital of a country, or part of it, which are the factors that make it possible for a country to engage in economic and social activities. Its components may either directly preserve the health of the individuals, such as public sanitation systems, or they may indirectly support actions that protect and promote the health of a population. Examples of both types of protection include clean public water systems. As a result, the formal and tangible structures that underpin the health system are considered to be the physical health infrastructures. Given that the enjoyment of good health is a basic, universal, and intrinsic right, it is critical that sufficient quantities of high-quality healthcare resources be made available to all people(12).

Government involvement in health care delivery is particularly important in developing countries because the main intermediary problem is more severe there due to higher transaction costs associated with inconsistencies in information and larger negative externalities of infectious and communicable disease burdens. If health equality and social justice are on the global policy anvil, as they appear to be now, then reform aimed at universal coverage and locally responsive service delivery at the primary healthcare level should be a priority within national public health systems(6).

2.1.1 Infrastructure Components: Facilities, Equipment, and Technology

Health care is an intricate topic for both developed and developing nations. Aspiring to provide healthcare for a large population is difficult for developing countries like India due to the high price tag of hiring qualified medical professionals and providing them with the resources they need to do their duties effectively. It is difficult to bring together patients, facilities, and practitioners who reside out across a large geographic area without a solid operating model. Facilities are concentrated in places that cater to the wealthy, leaving others from lower socioeconomic classes to make do with underfunded and under stocked alternatives. This leads to the emergence of highly concentrated and specialized socioeconomic zones, where the poor are left to fend for themselves because they lack the resources to get better medical care. India's rural population has been forced to rely on traditional medicine or make do with inadequate healthcare because of the country's rapid urbanization and inadequate planning for the rural areas left behind. Many people who may have been saved from potentially fatal illnesses lose their lives as a direct result of these harmful practices(13).

2.1.2 Challenges and Barriers in Infrastructure Development

India faces several challenges in its health infrastructure, which impact the accessibility and quality of healthcare services across the country. Government expenditure on healthcare has increased little over the past few years, but it still ranks near the bottom compared to other emerging countries. However, even these meager sums are frequently misused or wasted by a number of states. A lack of public health and managerial knowledge is largely to blame for state healthcare systems' low absorption capability. Prior to the National Rural Health Mission, states lacked the autonomy that variable funding now affords them. There is a major disconnect between planning and implementation because the nation's government has the authority and resources to initiate national health programs, but the states have primary responsibility for implementing these programs and providing a variety of other health-care services. In numerous regions, the absence of a connection has been most obviously manifested in the form of insufficient and prohibitively expensive primary health care for rural residents and economically disadvantaged urban dwellers(14).

2.2 Manpower Availability in Rural Healthcare

The term "health manpower" is used to describe those who have received education and training to improve public health, combat disease, and care for those who are ill. The purpose of manpower planning is to make available the correct kind of individuals in the right number with appropriate abilities at the right place at the right time doing the right work. Manpower is the most important asset in health planning delivery. Manpower planning is a method used to balance economic demands and supplies of workers. Planning for a country's manpower involves more than just making sure that everyone has the jobs they need. It also involves making sure that the country's human resources are being developed and used to their full potential. Manpower utilization is the practice of assigning tasks to people based on their individual skill sets. Therefore, it is a holistic strategy that must be taken into account as a whole(15).

The lack of available medical personnel remains a persistent problem in India. It has fewer physicians and nurses per capita than the estimated global average of 1 physician and 3 nurses per 1,000 people, as reported by the World Health Organization (WHO). This dearth of medical personnel suggests that capacity building should be accelerated in order to meet the basic health care requirements of the Indian people. It's difficult because doctors and nurses aren't evenly dispersed across the country. Attempts to subsidize rural health care jobs and mandate rural postings in the past have met with modest success(16).

Healthcare professionals have also been in short supply, especially in rural areas. These problems have been aggravated by a lack of investment in training, unequal distribution, and the departure of key personnel to other nations. As a result of the health care system being centered on doctors, public health workers, nurses, and community health workers have been overlooked, marginalized, and underutilized. Health care expenses and health care disparities have both risen as a result of a focus on high-tech, specialist-delivered, hospital-based medical treatment at the expense of primary health care and evidence-based practices(14).

2.2.1 Healthcare Manpower: Doctors, Nurses, and Allied Health Professionals

Increased funding, vertical health, and family welfare program integration, female accredited social health activist employment in every village, decentralized health planning, community involvement in health services, rural hospital strengthening, untied funds to health facilities, and the incorporation of traditional medical practices are all part of the National Rural Health Mission's plan to revitalize the public health sector. The entire country is covered, with extra attention paid to 18 states with less-than-stellar infrastructure and population characteristics(14).

A competent and trained manpower is the foundation of an efficient health system. Doctors [allopathic and Ayurveda, Yoga and naturopathy, Unani, Siddha, and Homeopathy (Ayush)], nurses, pharmacists, lab technicians, radiographer health assistants (male and female), health workers (male), auxiliary nurse midwife (ANM), accredited social health activists (ASHAs), anganwadi workers, trained dais, and others (health inspectors, health educators, occupational therapy assistant, dieticians, etc.)(15).

Chapter 3: Methodology

3.1 Study Design

Descriptive cross-sectional study, for measuring the prospective factors to assess one data set at a point in time, to study and depict the pattern in gaps and trends.

3.2 Study Procedure

Study Setting– Since this is a secondary study, it relies on the publicly available information (such as online articles and the statistics data found on the Ministry of Health and Family Welfare's website) and readings assigned by the mentor at Child Rights and You (CRY), based in New Delhi. Thus, the research environment was virtual.

Study Population

- Inclusion criteria – Rural health centers of states – Karnataka (South), Odisha(East), Rajasthan(West), Uttar Pradesh(North)
- Exclusion criteria – Other than the above-mentioned four states, no others will be included in the study because the information provided (Rural health statistics and other open sources) about each selected state's infrastructure and manpower is sufficient to describe the condition of the healthcare service delivery system in each region.

Study tools – Rural health statistics report for the year 2019 to 2022 available on open sources such as the internet, literature reviews, and newspaper articles.

Sampling technique - Probability Sampling: This method include simple random sampling, stratified sampling, and cluster sampling. These techniques help ensure that the sample is representative of the population and can allow for generalization of the findings.

3.4 Data Analysis

The data analysis for the described research methodology includes scrutinizing and interpreting the data gathered to gain observations into the trends, gaps, and changes in the selected states' healthcare service delivery systems. First, the data collected from the Rural Health Statistics reports, literature evaluations was organized and tabulated for each state and year to produce a comprehensive dataset, according to the set standards of IPHS for each health institution.

Microsoft Excel was used extensively throughout the process of collecting, cleaning, and evaluating the data. In order to efficiently investigate patterns and trends, pivot tables were extensively used to summarize and aggregate the data. For the purpose of presenting the results and facilitating a thorough understanding of the data, several different types of charts were developed, including bar charts, line graphs, and others. This method provided a systematic and structured framework for data analysis, which aided in the discovery of important insights and the clear presentation of those findings.

3.5 Ethical Considerations

Informed consent might not be applicable to the study population because this is a secondary study implementing information that is already available to the public. It is vital to check that the data sources used are open to the public and do not break any confidentiality or privacy laws, nevertheless.

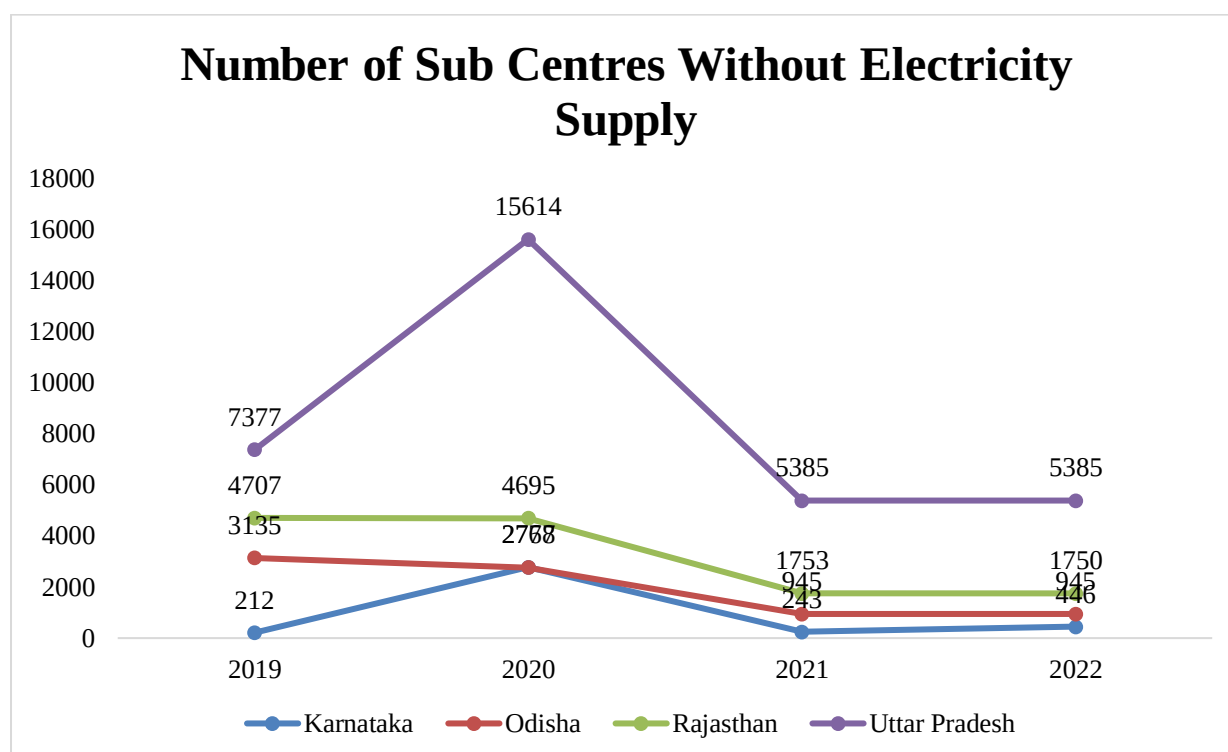
Chapter 4: Results

4.1 Regional Analysis of Rural Healthcare

4.1.1 Infrastructure Availability

Sub Centers

Figure 1: Number of Sub Centres Without Electricity Supply



- Sub-centers in Karnataka without access to power expanded dramatically from 212 in 2019 to 2777 in 2020. However, this number would fall to 243 by 2022 and 446 by 2021.
- There were 3135 sub-centers in Odisha without electricity in 2019, and that number is expected to drop to 2768 by 2020. There were still 945 unpowered sub-centers in 2022, the same amount as in 2021.
- There were 4707 sub-centers in Rajasthan without electricity in 2019, and while that number is expected to fall to 4695 in 2020, it is expected to remain constant overall. The number of sub-centers dropped to 1753 in 2021 and 1750 in 2022.
- There were 7377 unpowered sub-centers in Uttar Pradesh in 2019, and that number is expected to skyrocket to 15614 by 2020. However, the total number of unpowered sub-centers did not change from 5 385 in 2020 to 5 385 in 2021 or 2022.

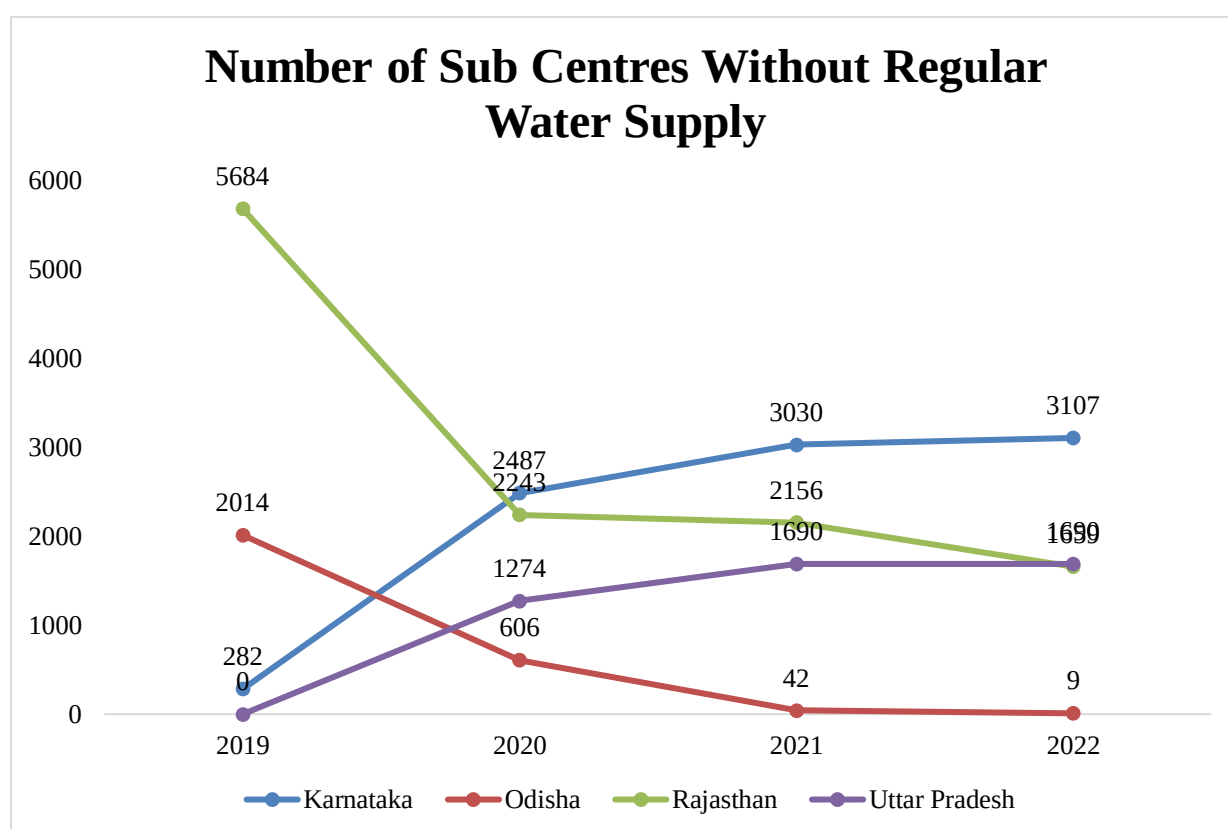
Percentage change –

- The percentage of Karnataka's sub-centers without access to electricity rose dramatically, by 110.38 percent between 2019 and 2022. The percentage of sub-centers without access to electricity dropped by 83.94 percent between 2020 and

2022. The percentage of sub-centers without access to electricity rose sharply from 2021 to 2022, by 83.54%.

- The percentage of Odisha's sub-centers without access to electricity dropped by 69.86% between 2019 and 2022. From 2020 to 2022, the percentage of sub-centers without access to electricity dropped by 65.86%. The percentage of sub-centers without access to electricity did not change from 2021 to 2022.
- The percentage of Rajasthan sub-centers without access to electricity fell by 62.82 percent between 2019 and 2022. Sub-centers without access to power saw a dramatic decline (62.73%) between 2020 and 2022. There was a little drop (0.17%) in the percentage of sub-centers without access to electricity between 2021 and 2022.
- There was a moderate drop of 27.00% in the number of Uttar Pradesh sub-centers without access to electricity between 2019 and 2022. The percentage of sub-centers without access to electricity dropped by 65.51 percent between 2020 and 2022. The percentage of sub-centers without access to electricity did not change from 2021 to 2022.

Figure 2: Number of Sub Centres without Regular Water Supply



- Karnataka has 282 sub-centers in 2019 without regular water Supply. In 2020, there were 2,487 of them; by 2021, there were 3,030; and by 2022, there were 3,107.
- There were 2,014 Odisha sub-centers without regular water Supply in 2019. In 2020, however, that number dropped dramatically to 606. In 2021, it dropped to 42, and in 2022, it dropped to a mere 9.
- In 2019, 5,684 of Rajasthan's sub-centers without regular water Supply. By 2022, there would be just 1,659 of them, down from 1,659 in 2021 and 2,156 in 2020.

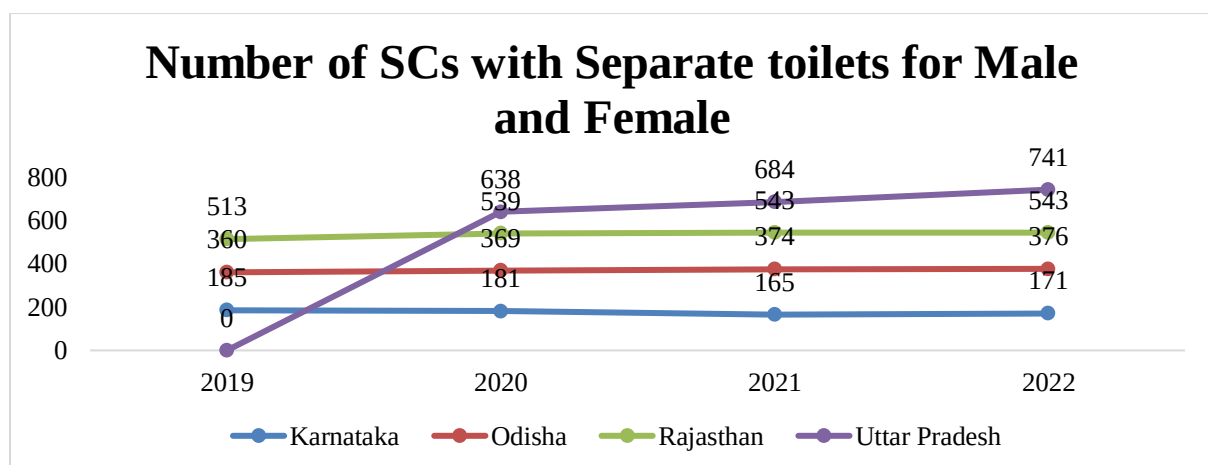
- There are no more rural areas in Uttar Pradesh without regular water Supply in 2019. However, in 2020 there were 1,274, in 2021 there were 1,690, and in 2022 there were 1,690 again.

These figures show that sub-centers in these states have not had a reliable water supply for quite some time. This problem must be fixed so that hospitals and the communities they serve always have access to safe, clean water.

Percentage change –

- The percentage of Karnataka's sub-centers without regular water supply increased by 1017.17% between 2019 and 2022. The percentage of Sub Centers without Regular Water Supply decreased by 24.93% between 2020 and 2022. The percentage of sub-centers without reliable access to water rose by 2.54 percentage points between 2021 and 2022.
- The percentage of Odisha's sub-centers without regular water supply dropped by 99.55 percent between 2019 and 2022. Sub-centers without a consistent supply of water decreased by 98.51 percent between 2020 and 2022. The percentage of census tracts without permanent access to piped-in water dropped by 78.57 percent between 2021 and 2022.
- The percentage of Rajasthan's sub-centers without regular water supply dropped by 70.81 percent between 2019 and 2022. The percentage of Sub Centers without Regular Water Supply decreased by 26.04 percent between 2020 and 2022. The percentage of census tracts without permanent access to piped-in water dropped by 23.15% between 2021 and 2022.
- There will be 32.6 percent more sub-centers in Uttar Pradesh without regular water supply between 2019 and 2022. There was no change (0.00%) in the percentage of sub-centers that lacked a consistent supply of water between 2020 and 2022. There was no change (0.00%) in the percentage of sub-centers that lacked reliable water service between 2021 and 2022.

Figure 3: Number of SCs with Separate toilets for Male and Female



- In 2019, Karnataka had 2,938 SCs with separate male and female separate toilets. In 2020, the number increased to 3,038, indicating improved sanitation facilities. Nevertheless, the number decreased to 2,247 in 2021, indicating a potential decline in the number of SCs with separate toilets. In 2022, the number decreased further to 2086. Overall, the availability of SCs with separate male and female separate toilets fluctuated in Karnataka, with a significant decrease observed in 2021 and 2022.
- Odisha: In 2019 and 2020, Odisha had the same number of 2,918 SCs with male and female separate toilets. In contrast, the number decreased significantly to 126 in 2021, indicating a potential problem with sanitation facilities in that year. In 2022, the number increased marginally to 241, but it remained significantly lower than in previous years. In 2021, Odisha saw a significant decline in the number of SCs with separate toilets, followed by a modest improvement in 2022.
- In 2019, Rajasthan had 3997 SCs with separate male and female facilities. The number increased to 4640 in 2020, indicating an improvement in sanitation facilities. There was an increase to 5084 in 2021 and 5487 in 2022, indicating further development in this area. In Rajasthan, the number of SCs with separate male and female separate toilets increased steadily over the years.
- The number of SCs with separate male and female separate toilets in Uttar Pradesh for 2019 is unavailable due to a lack of data. There were 8,120 SCs with separate toilets in 2020, indicating a substantial number of sanitation facilities. The number further increased to 8577 in 2021 and 8635 in 2022, suggesting continued efforts to enhance sanitation infrastructure. From 2020 to 2022, the availability of SCs with separate male and female separate toilets increased significantly in Uttar Pradesh, although data for 2019 are unavailable for comparison.

In conclusion, Karnataka has experienced fluctuations and a notable decline in recent years, Odisha has seen a decline followed by a minor improvement, Rajasthan has shown consistent growth, and Uttar Pradesh has made significant progress in terms of the availability of such sanitation facilities.

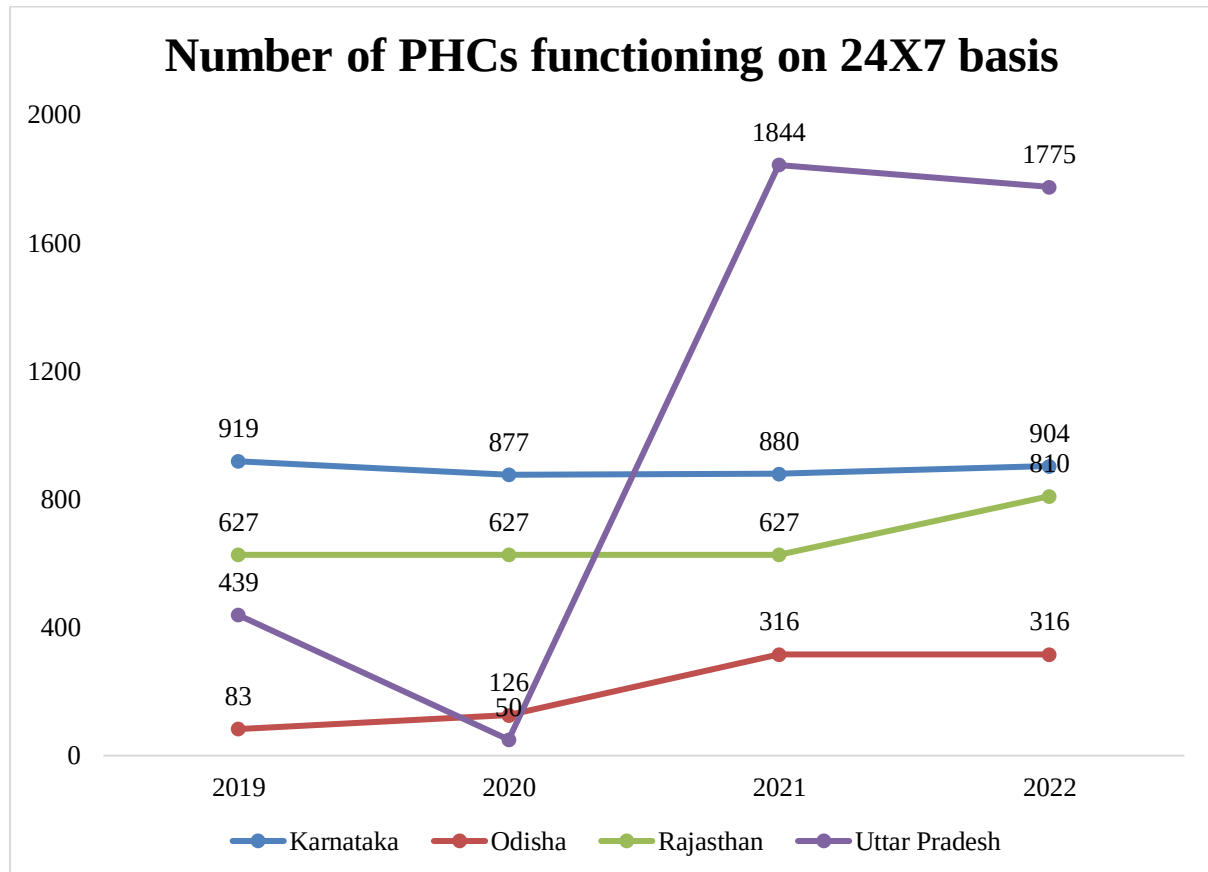
Percentage change –

- Karnataka: The number of available spaces dropped by 31.36 percent from 2019 and 2022. The decline was less severe from 2020 to 2022, at 7.17 percent. Separate male and female separate toilets were less common in Karnataka's SCs between previous years and 2022 than they were between 2019 and 2022, but the fall was still significant overall.
- Odisha: There was a huge rise of 91.27 percent in the provision of these amenities between 2019 and 2022. An additional 37.28% growth was predicted between 2020 and 2022. The percentage of SC households in Odisha having their own bathroom has shown a spectacular turnaround and huge increase between 2019 and 2022.
- There will be 91.27 percent more of these establishments available between 2019 and 2022. Additional growth of 18.25% was predicted between 2020 and 2022. Overall, the percentage of SCs in Rajasthan that have access to their own restroom fell has since recovered and increased noticeably, up to year 2022.

- There was a modest 6.34 percent rise in these centers' availability from 2019 to 2022. There was a further marginal increase of 0.68% from 2020 to 2022.

Primary Health Centers

Figure 4: Number of PHCs functioning on 24X7 basis



- Karnataka has 919 primary health care centers (PHCs) open 24*7 in 2019. By the year 2020, there would be only 877 PHCs. There was a little rise to 880 PHCs in the following year, 2021. The figure rose to 904 PHCs by 2022.
- In 2019, 83 primary health care centers in Odisha were open 24*7. By the year 2020, there would be 126 PHCs. There was a dramatic increase to 316 PHCs in 2021. There were still 316 PHCs in operation in 2022.
- In 2019, 627 primary healthcare centers (PHCs) in Rajasthan were open 24*7. There were still 627 PHCs in operation in 2020. In 2021, the number of PHCs did not shift from the previous year's total of 627. There was a significant rise to 810 PHCs in 2022.
- 439 primary healthcare centers (PHCs) in Uttar Pradesh were open around-the-clock in 2019. The number dropped dramatically to 50 PHCs by 2020. The number of PHCs dramatically increased to 1844 in 2021. A minor drop occurred in 2022, when there were only 1775 PHCs.

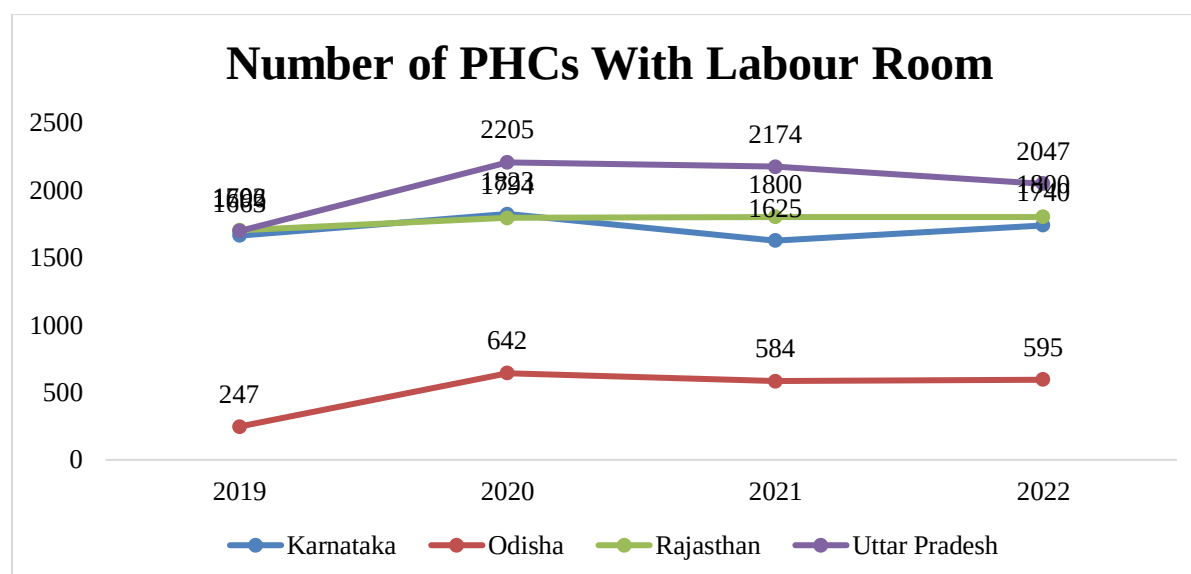
The number of PHCs open 24*7 has fluctuated throughout time and between states. There was growth in a few states and volatility or shifts in others.

Percentage change –

- From 2019 to 2022, Karnataka saw a 1.63% decline in the number of 24x7 PHCs. From 2020 to 2022, the number of PHCs grew by 3.08%. The growth rate was 2.73 percent between 2020 and 2021.
- From 2019 to 2022, Odisha saw a dramatic growth (280.72%) in the number of PHCs providing round-the-clock care. The number of PHCs increased by a whopping 150.79% between 2020 and 2022.
- The percentage of PHCs in Rajasthan that are open 24/7 rose by 29.19% between 2019 and 2022. The number of PHCs did not shift from 2020 to 2022 (-0.00%). From 2020 to 2021, the increase was likewise 29.19%.
- From 2019 to 2022, the number of PHCs in Uttar Pradesh that are open 24 hours a day, seven days a week increased by 304.33%. The number of PHCs increased by 3,450 percent between 2020 and 2022. The shift from the year 2021 to year 2022 was -3.74 percent.

The number of PHCs open 24*7 varies significantly amongst the states, as shown by the data. Some states had drops or variations in the number of PHCs open throughout the time period, while others saw large gains.

Figure 5: Number of PHCs With Labour Room



- In Karnataka, there were 1663 primary health care facilities (PHCs) in 2019 with a labour room. By the year 2020, there would be 1823 PHCs. In 2021, however, that figure dropped to 1625 PHCs. The figure jumped to 1,740 PHCs in 2022.
- There were 247 primary healthcare centers in Odisha that have a labour room in 2019. By 2020, there were 642, a massive increase from the previous year. In 2021, however, that number dropped to 584 PHCs. There were 590 primary health care providers in 2022.
- In 2019, there were 1702 primary health care facilities (PHCs) in Rajasthan that provide maternity care. In 2020, there were 1,794 primary health care providers.

There was a moderate growth to 1800 PHCs in 2021. In 2022, the number of PHCs remained same at 1800.

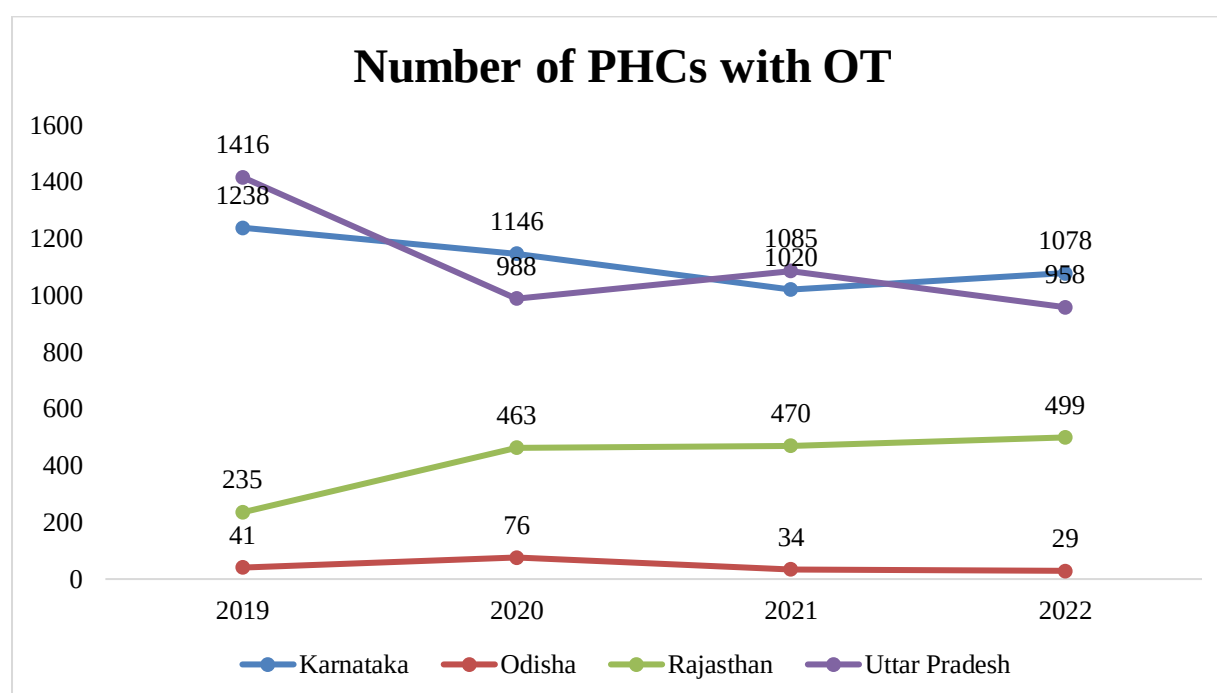
- In 2019, there were 1696 PHCs in Uttar Pradesh with a labour room. In 2020, there were 2,205 PHCs, a considerable increase from the previous year. The number of primary health care providers dropped to 2174 in 2021. By 2022, there would be just 2047 PHCs left.

The number of PHCs that have a labor room varies over time and among states. In some states, the numbers went up, while in others, they went down or fluctuated.

Percentage change –

- From 2019 to 2022, the percentage of Karnataka's PHCs that offer a labour room rose by 4.63 percentage points. The number of PHCs did, however, fall by 4.55 percent between 2020 and 2022. The rise from 2021 to 2022 was 7.08 percent.
- From 2019 to 2022, the percentage of Odisha's PHCs that offer a labour room climbed by a whopping 140.89 percent. The number of PHCs did, however, fall by 7.32 percent between 2020 and 2022. The rise from 2021 to 2022 was 1.88 percent.
- From 2019 to 2022, the percentage of PHCs in Rajasthan that offer a labour room rose by 5.76 percentage points. From 2020 to 2022, the total number of PHCs remained the same (0.33 percent). From 2020 to 2022, there was no change of any kind.
- The percentage of PHCs in Uttar Pradesh that offer a labour room rose by 20.70 percent between 2019 and 2022. The number of PHCs did, however, fall by 7.17 percent between 2020 and 2022. From 2020-21 to 2022-23, the percentage change was -5.84 percent.

Figure 6: Number of PHCs with OT



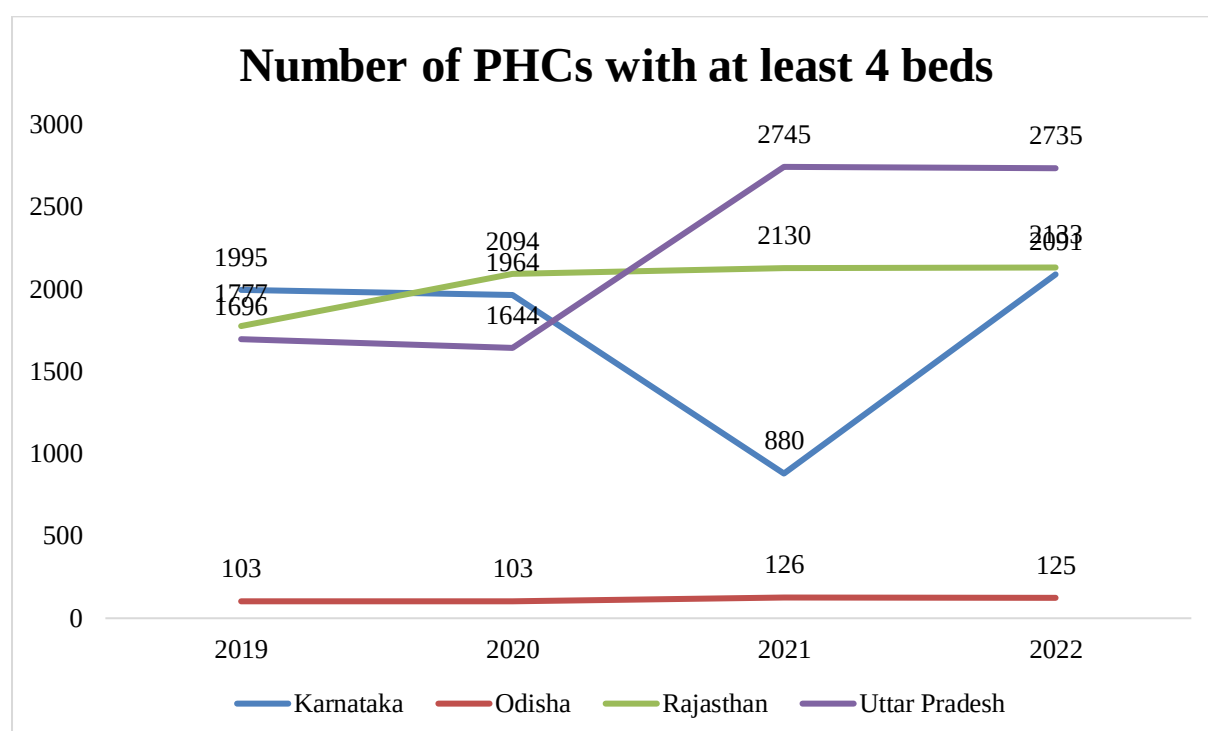
- There were 1238 PHCs in Karnataka with an OT in 2019. In 2020, there would be only 1146 PHCs. The number of PHCs dropped to 1020 in 2021. In 2022, however, that figure jumped to 1078 PHCs.
- In Odisha, there were 41 PHCs with an OT in 2019. By 2020, there would be 76 PHCs. However, that number dropped to just 34 PHCs by the year 2021. The number dropped to 29 primary health care centers in 2022.
- In 2019, 235 of the state's primary health care centers (PHCs) also have an operating room (OT). In 2020, there were 463 PHCs, a considerable increase from the previous year. There was a marginal rise to 470 PHCs in 2021. In 2022, there would be 499 primary health care facilities.
- The number of PHCs in Uttar Pradesh that offer OT services as of 2019 is 1416. In 2020, there would be only 988 PHCs. There will be 1085 primary health care centers by 2021. However, that figure dropped to 958 PHCs by 2022.

Percentage change –

- From 2019 to 2022, the percentage of Karnataka primary health care centers (PHCs) that also have an OT fell by 12.92 percent. From 2020 to 2022, the number of PHCs fell by 5.93% more. The rise from the year 2021 to the year 2022 was 5.69 percent.
- From 2019 to 2022, the percentage of Odisha primary health care centers (PHCs) that also had an OT dropped by a remarkable 29.27%. From 2020 to 2022, the number of PHCs dropped by a significant 61.84%. From 2020 to 2022, the proportion dropped by 14.71 percent.
- From 2019 to 2022, the proportion of PHCs in Rajasthan that also housed an OT rose by 112.34%. The number of PHCs grew by 7.78% between 2020 and 2022. The growth rate was 6.17 percent between 2020 and 2022.
- The percentage of PHCs in Uttar Pradesh that also have an OT fell by 32.34% between 2019 and 2022. The number of PHCs dropped by 3.04% between 2020 and 2022. From 2020 to 2022, the proportion dropped by 11.71 percent.

Overall, the data shows varying trends in the number of PHCs with an OT in different states. While some states experienced increases, others had fluctuations or decreases in the number of PHCs with an OT over the given period.

Figure 7: Number of PHCs with at least 4 beds



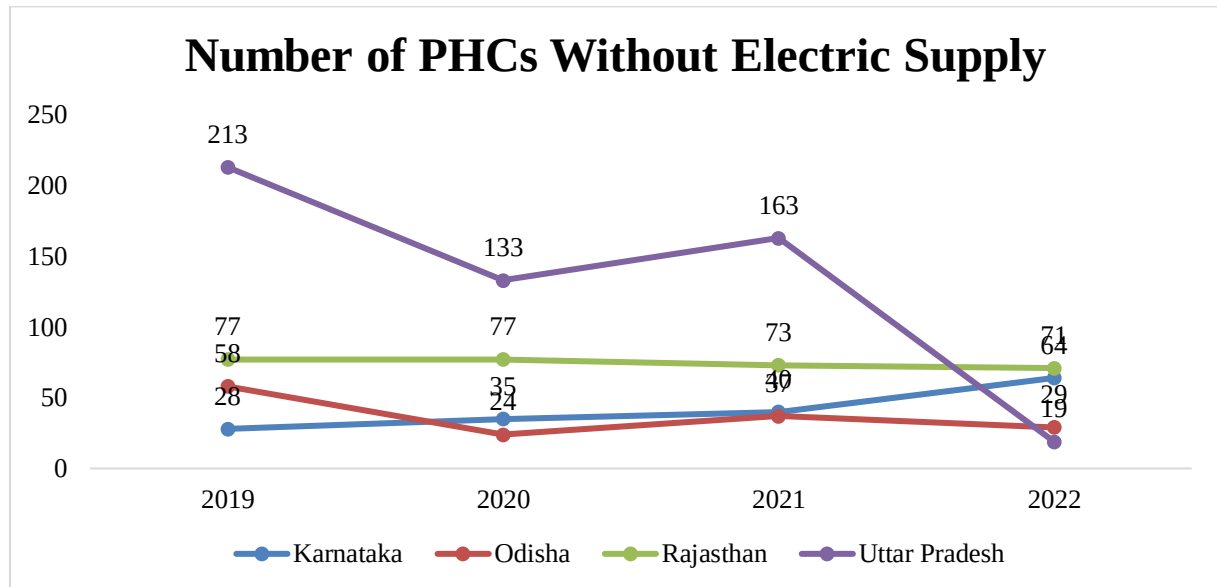
- Karnataka had 1995 primary health care facilities (PHCs) in 2019 with at least 4 beds. By 2020, there would be only 1964 PHCs. In 2021, however, that number dropped dramatically to just 880 PHCs. The figure jumped to 2091 PHCs in 2022.
- There were 103 PHCs in Odisha in 2019 with at least 4 beds. In 2020, there were still 103 PHCs. The number of PHCs increased to 126 in 2021. In 2022, however, that number dropped to 125 PHCs, a little decline.
- In 2019, there were 1777 PHCs in Rajasthan with at least 4 beds. In 2020, there were 2,094 primary health care providers. The number of PHCs increased further in 2021, reaching 2130. In 2022, the total stayed close to the same at 2133 PHCs.
- In 2019, there were 1696 PHCs in Uttar Pradesh with at least 4 beds. In the year 2020, there were only 1644 primary health care facilities. The number of PHCs dramatically increased to 2,745 in 2021. However, that figure dropped to 2735 PHCs in 2022, a tiny reduction from 2021.

Percentage change –

- From 2019 to 2022, the percentage of Karnataka primary healthcare facilities (PHCs) having at least 4 beds increased by 4.81%. The number of PHCs grew by 6.47 percent between 2020 and 2022. A massive increase of 137.51% was seen between years 2021 and 2022.
- From 2019 to 2022, the percentage of PHCs in Odisha having at least 4 beds increased by 21.36%. The number of PHCs grew by further 21.36 percent between 2020 and 2022. From 2020 to 2022, the percentage change was only -0.79%.

- From 2019 to 2022, the percentage of PHCs in Rajasthan having at least 4 beds increased by 20.03%. From 2020 to 2022, the number of PHCs grew by 1.86 percent. From 2020 to 2022, the proportion increased by 0.14%.
- There was a large increase (61.26%) in the number of PHCs in Uttar Pradesh that had at least 4 beds between 2019 and 2022. From 2020 to 2022, the number of PHCs increased by a significant 66.36%. From 2020 to 2022, the percentage change was only -0.36%.

Figure 8: Number of PHCs Without Electric Supply



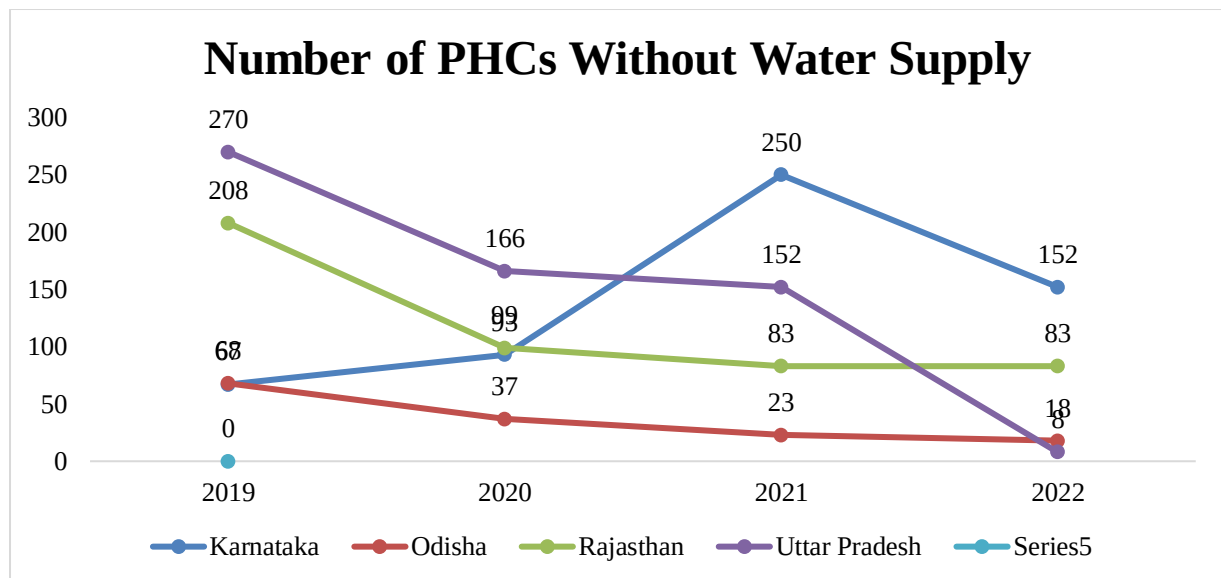
- In Karnataka, 28 primary health care centers lacked access to electricity in 2019. In 2020, there were 35, and in 2021, there were 40. In 2022, however, the number of PHCs without access to electricity increased dramatically, rising to 64.
- In Odisha, 58 primary health care facilities lacked access to electricity in 2019. In the year 2020, this figure dropped to 24. In 2021, however, it rose to 37, before dropping to 29 the following year.
- In Rajasthan, the percentage of PHCs without access to electricity remained stable throughout a four-year period (2019–2022). Each year, 77 PHCs didn't have access to electricity.
- In 2019, the state of Uttar Pradesh had the most PHCs without electricity, at 213. In 2020, which number dropped to 133, and in 2021, it dropped to 163. However, by 2022, the number of PHCs without access to electricity had dropped dramatically, to just 19.

Percentage change –

- The percentage of Karnataka's primary health care facilities (PHCs) without access to reliable electricity rose by a startling 128.57% between 2019 and 2022. A rise of 82.86% may be seen in the percentage increase from 2020 and 2022. The percentage of PHCs in the state without access to electricity rose by 60% between 2021 and 2022.

- There was a 50% drop in the number of PHCs in Odisha that lacked access to electricity between 2019 and 2022. There is a drop of 20.83 percent between 2020 and 2022. However, the percentage of PHCs without access to electricity rose by 20.83 percent between 2021 and 2022.
- The percentage of PHCs in Rajasthan without access to electricity fell by 7.79% between 2019 and 2022. There is little to no change in the proportion from 2020 to 2022 (-7.79%). A similar decline of 2.74% may be seen in the projection from 2020 to 2021.
- The percentage of PHCs in Uttar Pradesh without access to electricity dropped by 91.08 percent between 2019 and 2022. From 2020 to 2022, the percentage change is a staggering -85.71%. The percentage of PHCs in the state without access to electricity dropped by 8.83 percent between 2021 and 2022.

Figure 9: Number of PHCs Without Water Supply



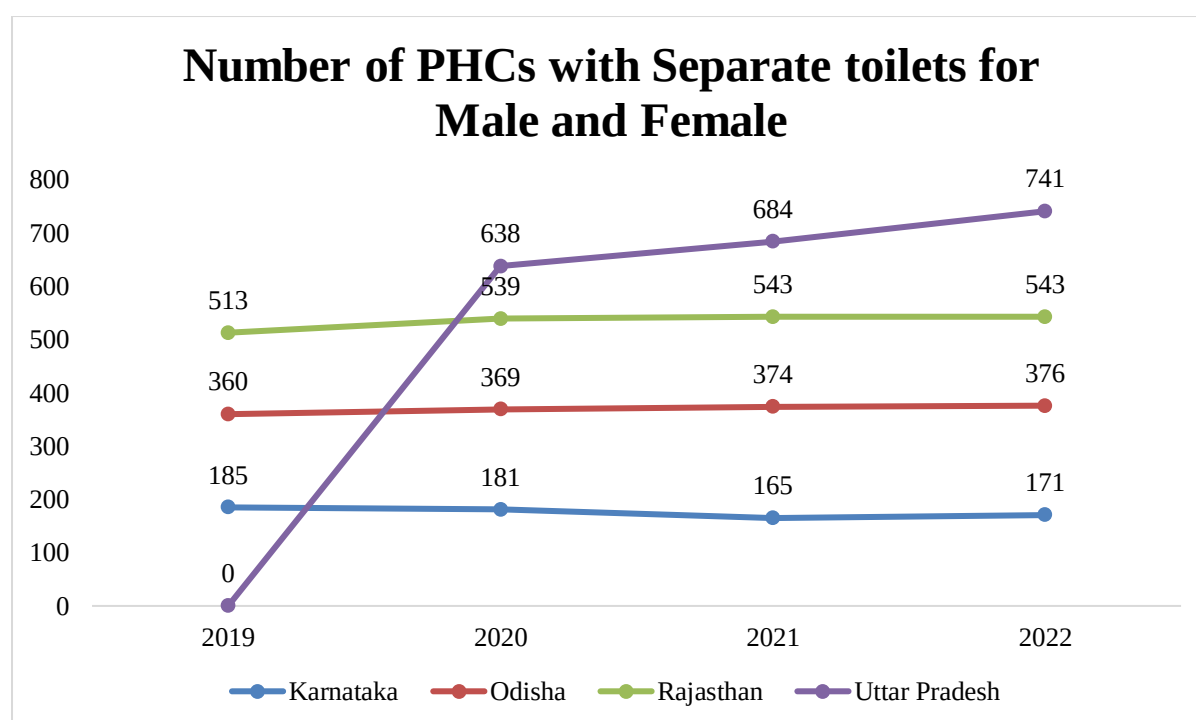
- 67 primary health care centers in Karnataka lacked access to running water in 2019. In 2020, the figure jumped to 93, and by 2021, it had doubled to 250. But by 2022, that number had dropped dramatically, to just 152 PHCs.
- In Odisha, 68 primary health care facilities (PHCs) lacked access to running water in 2019. In 2020, which number dropped to 37, and by 2021, it had dropped to 23. As few as 18 primary health care clinics (PHCs) lacked a reliable water source in 2022.
- 208 primary health care centers in Rajasthan lacked access to running water in 2019. In 2020, this number dropped to 99, and by 2021, it had dropped to 83. As of the year 2022, however, 83 primary health care centers (PHCs) remained without a reliable water source.
- In 2019, the state of Uttar Pradesh has the most PHCs (primary health care centers) without a working water system, with 270. In 2020, which number dropped to 166, and in 2021, it dropped to 152. In 2022, the number of PHCs without a reliable water source dropped dramatically, to just 8.

The data as a whole reveals that PHC water availability varies between states and over time. The number of Karnataka PHCs without a reliable water source rose sharply in 2021 but fell the following year. The percentage of PHCs in Odisha, Rajasthan, and Uttar Pradesh without access to running water steadily decreased over the study period. These figures represent the success or failure of these states in ensuring a steady supply of water for hospitals during the given time periods.

Percentage change –

- The percentage of Karnataka's primary health care facilities (PHCs) without access to clean water rose dramatically between 2019 and 2022, by 126.87%. A decline of 63.44 percent can be seen between 2020 and 2022. Water shortages at PHCs in the state decreased by 39.20% between 2021 and 2022.
- The percentage of PHCs in Odisha without access to running water dropped by 73.53 percent between 2019 and 2022. The percentage drop from 2020 to 2022 is 51.35 percent. The year-over-year reduction of 21.74% from 2021 and 2022 was insignificant.
- The percentage of PHCs in Rajasthan without access to clean water decreased by 60.10 percent between 2019 and 2022. A lesser 16.16% drop is shown by comparing 2020 and 2022 in terms of percentage change. Similarly, from 2021 and 2022, there was also zero percent (0%) change.
- The percentage of PHCs in Uttar Pradesh without access to running water dropped by an impressive 97.04% between 2019 and 2022. The percentage drop from 2020 to 2022 is very large, at 95.18 percent. The fraction of PHCs without a reliable water source did not change from 2021 to 2022.

Figure 10: Number of PHCs with Separate toilets for Male and Female



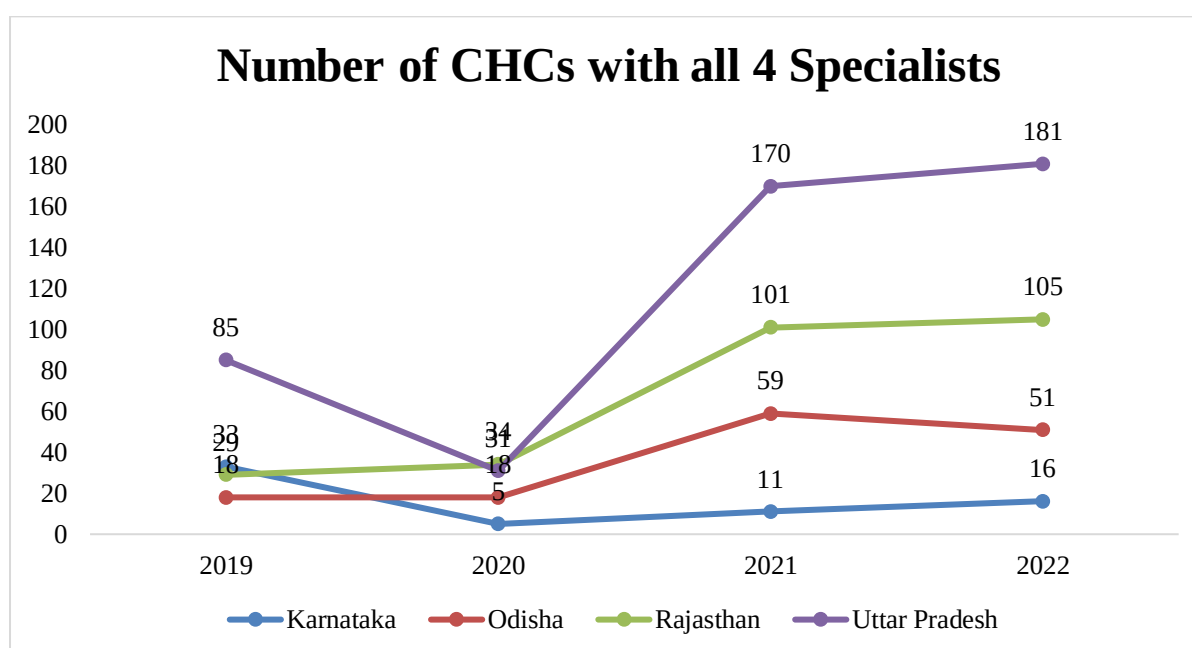
- In 2019, Karnataka had 2004 PHCs with distinct male and female facilities. The number decreased to 1887 in 2020, indicating a decline in the availability of such facilities. In 2021, the population dropped to 1613. In 2022, however, the number increased to 1972, indicating an improvement. In Karnataka, the number of PHCs with distinct toilets fluctuated during the mentioned years.
- In 2019, Odisha had 498 PHCs with distinct male and female separate toilets. In 2020, the number increased to 838, indicating improved sanitation facilities. However, this number decreased to 787 in 2021, indicating a possible decrease in the availability of such facilities. The number rose marginally to 809 in 2022. In Odisha, the number of PHCs with distinct toilets fluctuated over the years.
- In 2019, Rajasthan had 1713 PHCs with separate facilities for men and women. In 2020, the number dropped to 1637, indicating a minor decline. The population increased to 1,785 in 2021, indicating an improvement. In 2022, however, the number decreased to 1725. In Rajasthan, the number of PHCs with distinct toilets fluctuated over the years.
- There were 2,296 PHCs with separate toilets in Uttar Pradesh in 2020, indicating a significant number of such facilities. The number remained unchanged in 2021 and 2022, indicating a stable supply of separate toilets. From 2020 to 2022, Uttar Pradesh maintained a consistent number of PHCs with separate toilets, although data for 2019 are unavailable for comparison.

Percentage change –

- Karnataka: Between 2019 and 2022, there was a change of 4.50%, which means that more of these services will be available. From 2020 to 2022, the number of PHCs with separate toilets grew by a significant 22.26%.
- Odisha: From 2019 to 2022, the number of PHCs with separate toilets went up by 62.45%, which is a big change. From 2020 to 2022, there was a small drop of -3.46%, but generally, things got better. From 2021 to 2022, there was also a growth of 2.80%.
- Rajasthan: Between 2019 and 2022, there was a positive change of 5.38 percent, which shows that the number of these places is getting better. But there was a small drop of -3.36% between 2020 and 2022. We don't have any information about the percentage change from 2021 to 2022.
- Uttar Pradesh: The change from 2019 to 2022 is -1.48%, which shows that these kinds of services are available in a fairly stable way. We don't have any information about the rate changes from 2020 to 2022 and from 2021 to 2022.

Community Health Centers

Figure 11: Number of CHCs with all 4 Specialists



- Karnataka: In 2019, all four specialists were present at 33 CHCs in Karnataka. In 2020, this number was much lower, at only 5. In 2021, there was a small rise to 11 CHCs. In 2022, the number of CHCs with all four doctors rose to 16.
- Odisha: In 2019 and 2020, all four specialists were offered at 18 CHCs in Odisha. This number did not change. In 2021, there were 59 CHCs, which was a big jump. In 2022, however, there were only 51 CHCs with all four experts.
- Rajasthan: In 2019, all four experts could be found at 29 CHCs in Rajasthan. In 2020, this number went up to 34, and in 2021, it went up to 101. The number of CHCs with all four doctors kept going up until there were 105 of them in 2022.
- Uttar Pradesh: In 2019, all four specialists were present at 85 CHCs in Uttar Pradesh. In 2020, this number was down to 31. By 2021, there were 170 CHCs, which is a big jump. In 2022, the number of CHCs with all four doctors rose to 181.

In 2020, there was a big drop in Karnataka, but in the years after that, there was a slow rise. Odisha's population grew a lot in 2021, but it went down in 2022. In both Rajasthan and Uttar Pradesh, the number of CHCs with all four experts kept going up over time. These numbers show how hard people in these states worked to offer specific medical services during the years listed.

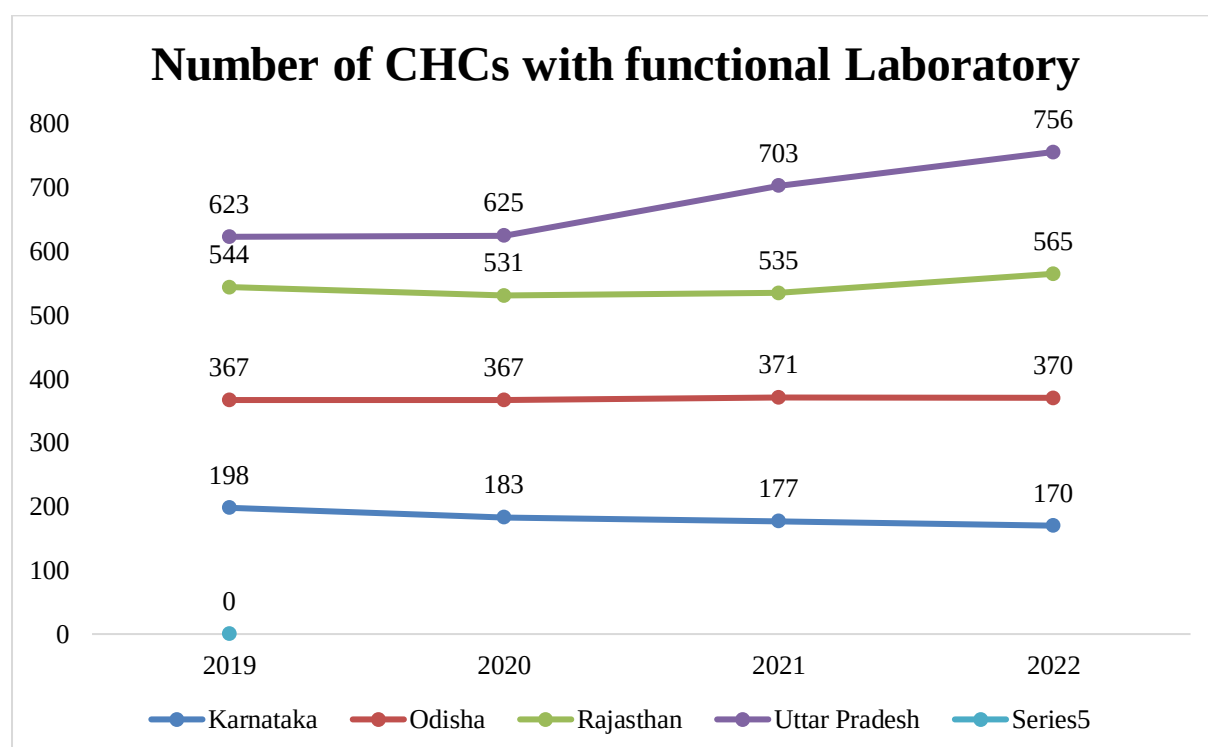
Percentage change –

- Karnataka: From 2019 to 2022, the number of CHCs with all four doctors dropped by 51.52% in Karnataka. The change in percentage from 2020 to 2022 shows a big jump of 220%. From 2021 to 2022, the number of CHCs in the state with all four doctors went up by 45.45%.
- Odisha: From 2019 to 2022, the number of CHCs with all four doctors grew by a huge 183.33% in Odisha. From 2020 to 2022, the percentage change shows a big

jump of 183.33%. From 2021 to 2022, the number of CHCs with all four doctors went down by -13.56%.

- Rajasthan: From 2019 to 2022, the number of CHCs with all four doctors increased by 262.07% in Rajasthan. From 2020 to 2022, the percentage change shows a rise of 208.82%. From 2021 to 2022, the number of CHCs with all four doctors went up by 3.96 percent.
- Uttar Pradesh: From 2019 to 2022, the number of CHCs with all four doctors increased by an impressive 112.94% in Uttar Pradesh. From 2020 to 2022, the percentage change shows a big jump of 483.87%. From 2021 to 2022, the number of CHCs in the state with all four specialists went up by 6.47 percent.

Figure 12: Number of CHCs with functional Laboratory



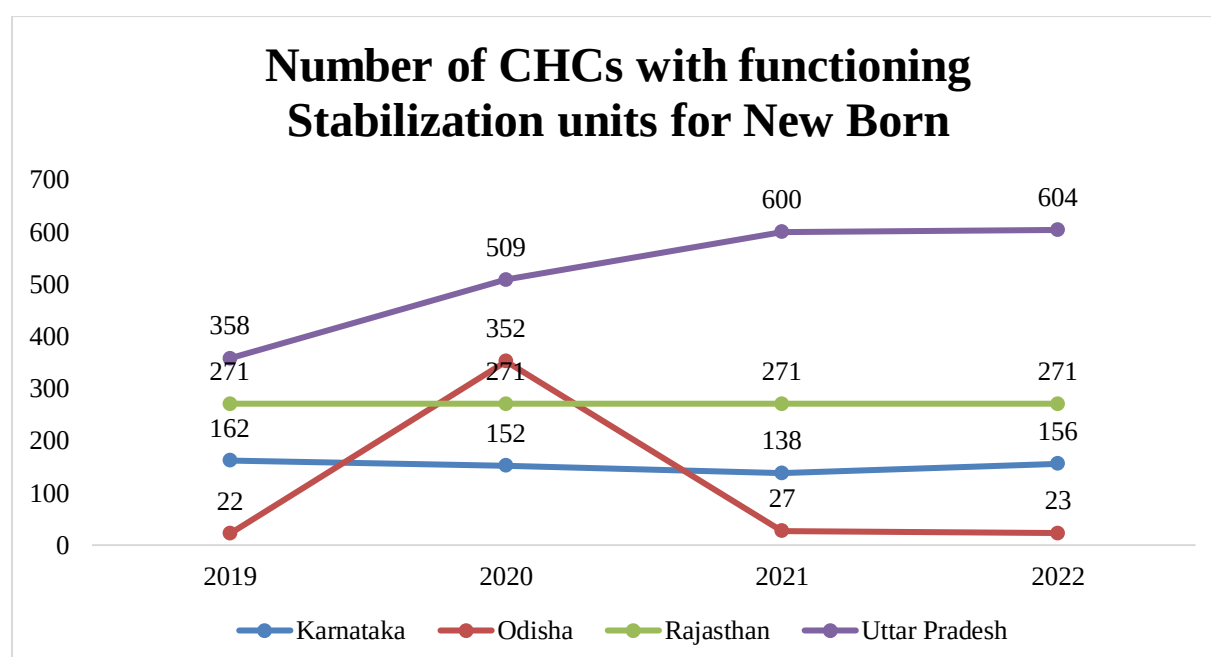
- Karnataka: As of 2019, 198 CHCs in Karnataka had working laboratories. In 2020, 183 people were involved; in 2021, 177; and in 2022, 170 people were involved.
- Odisha: In 2019, 2020, and 2021, there were a constant 367 CHCs in Odisha that had a functional laboratory. A functional laboratory is available at 370 CHCs as of 2022, a little increase.
- Rajasthan: As of 2019, 544 CHCs in Rajasthan had working laboratories. In 2020, it dropped to 531, but by 2021, it had risen to 535. The number expanded further in 2022, reaching 565 CHCs with a functional laboratory.
- Uttar Pradesh: As of 2019, 623 CHCs in Uttar Pradesh had working laboratories. At 625 in 2020, this number stayed comparatively constant. There was a noticeable rise to 703 CHCs with a functional laboratory in 2021. The total rose to 756 CHCs with functional laboratories in 2022.

Karnataka observed a drop in the number of CHCs with working laboratories, whereas Odisha exhibited stable figures with a little increase in 2022, Rajasthan saw variances with an overall increase, and Uttar Pradesh saw a steady rise. The efforts undertaken to offer diagnostic facilities and enhance healthcare services in these states throughout the aforementioned years are reflected in these figures.

Percentage change –

- Karnataka: From 2019 to 2022, the state's CHCs with functional laboratories decreased by 14.14 percent. There was a drop of 7.10% in the percentage change from 2020 and 2022. There was a modest drop of 3.95% in the number of CHCs with operable laboratories between 2021 and 2022.
- Odisha: From 2019 to 2022, there was a marginal 0.82% rise in the number of CHCs in Odisha having a functional laboratory. There is a slight increase of 0.82% between 2020 and 2022 in terms of percentage. There was a slight drop in the number of CHCs with a working laboratory from 2021 to 2022 of -0.27%.
- Rajasthan: The number of CHCs with a working laboratory increased by 3.86% between 2019 and 2022. There is a bigger increase of 6.40% in the percentage change from 2020 to 2022. A functional laboratory was present in 5.61 percent more CHCs in 2022 than in 2021.
- Uttar Pradesh: From 2019 to 2022, there was a considerable rise of 21.35% in the proportion of CHCs in Uttar Pradesh that had a working laboratory. The percentage difference between 2020 and 2022 reveals a significant increase of 20.96%. A functional laboratory was present in 7.54 percent more CHCs in 2022 than in 2021.

Figure 13: Number of CHCs with functioning Stabilization units for Newborn



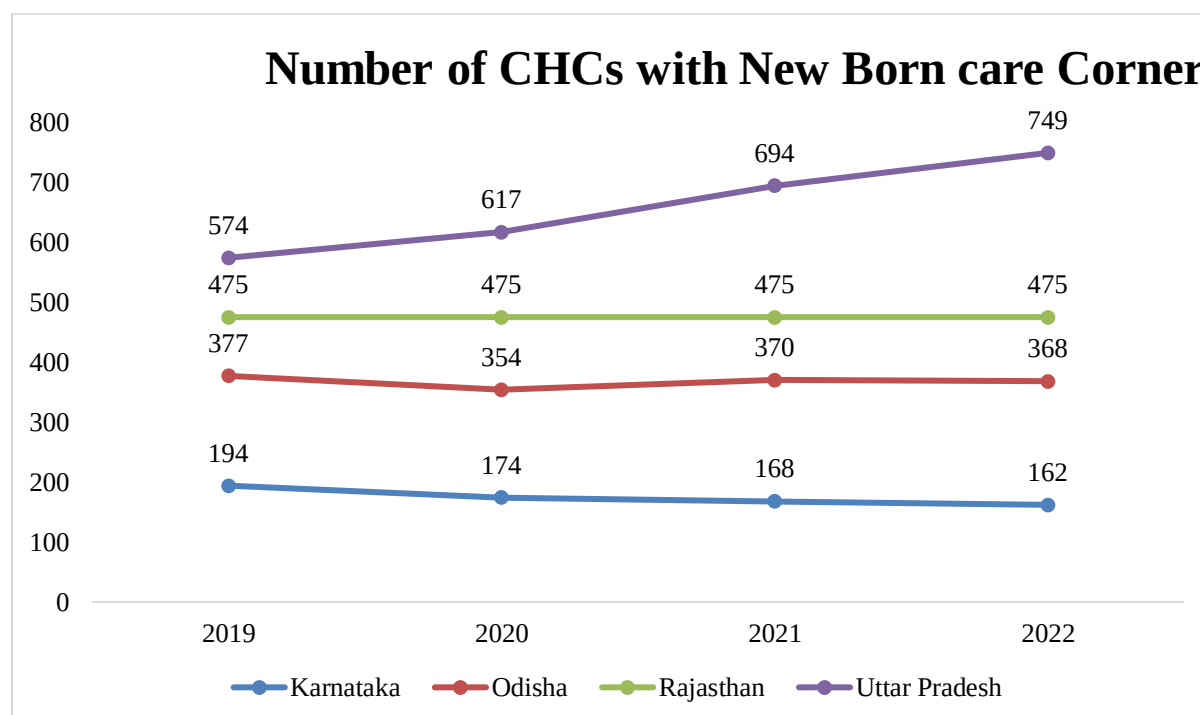
- Karnataka: In 2019, there were 162 CHCs in Karnataka that have operational Stabilization Units for New Born. In 2020, it dropped to 152, and in 2021, it dropped even more, to 138. A small improvement was made in 2022, nevertheless, with 156 CHCs having operational Stabilization units for Newborns. Overall, Karnataka saw a shaky trend with a modest uptick in 2022 compared to the year before.
- Odisha: In 2019, there were 22 CHCs in Odisha with operational Newborn Stabilization Units. To 352 in 2020, the number greatly grew. However, it decreased to 27 in 2021 and further to 23 in 2022. According to the data, Odisha had a significant increase in CHCs with operational Stabilization units for New Born in 2020 but a subsequent reduction in the following years.
- Rajasthan: Rajasthan had a constant number of 271 CHCs with operational Stabilization units for New Born in all four years (2019, 2020, 2021, and 2022). Over this time, no changes in the data were seen. Throughout these years, Rajasthan maintained the same standard of infant stabilization facilities.
- Uttar Pradesh: In 2019, there were 358 CHCs in Uttar Pradesh with operational Newborn Stabilization Units. In 2020, it increased to 509, and in 2021, it increased again to 600. There was a small rise in 2022, reaching 604 CHCs with operational Stabilization units for Newborns. Over time, Uttar Pradesh saw a constant rise in the number of CHCs that provide stabilization facilities for infants.

Percentage change –

- Karnataka: The number of CHCs in Karnataka having operational Stabilization units for New Born decreased by 3.70% between 2019 and 2022. However, infrastructure saw an increase of 2.63 percent from 2020 to 2022. The number of CHCs with operational Stabilization units for New Born increased significantly by 13.04% between 2021 and 2022, according to the percentage difference between those two years. Overall, Karnataka saw a modest decline between 2019 and 2022, but infrastructure saw significant growth between 2020 and 2022, with a notable gain in 2022.
- Odisha: According to the data, Odisha's infrastructure has significantly deteriorated. There was a significant 93.47% drop of CHCs with operational Stabilization units for New Born between 2019 and 2022. According to the percentage change between 2020 and 2022, infrastructure will have decreased by 14.81%. It's interesting to see that infrastructure changed 0% from 2021 and 2022. With a sharp fall from 2019 to 2022, Odisha had a significant setback in the infrastructure of CHCs with operational Stabilization units for New Born.
- Rajasthan: Rajasthan maintained a constant number of CHCs with operational Stabilization units for New Born in terms of infrastructure, with no change in the data. Infrastructure changed little from 2019 and 2022, pointing to a stable state of affairs. The percentage change from 2020 to 2022 is 0%, as is the percentage change from 2021 to 2022, showing no changes to the infrastructure during these years.
- Uttar Pradesh: The infrastructure for CHCs with operational Stabilization Units for New Born has improved in Uttar Pradesh, which is a good sign. The percentage of

CHCs having operational Stabilization units for New Born increased significantly from 2019 to 2022, rising by 68.72%. Infrastructure is expected to grow by 18.66% from 2020 to 2022, according to the percentage change. Infrastructure saw a modest gain from 2021 to 2022 of 0.67%. Infrastructure development in Uttar Pradesh increased significantly between 2019 and 2022.

Figure 14: Number of CHCs with New Born care Corner



- Karnataka: There were 194 CHCs with Newborn Care Corners in Karnataka in 2019. In 2020, it dropped to 174, and in 2021, it dropped even more, to 168. Another decline occurred in 2022, when only 162 CHCs had Newborn Care Corners. Over the aforementioned years, Karnataka had a general decline in the number of CHCs with Newborn Care Corners.
- 2019 saw 377 CHCs in Odisha with Newborn Care Corners. The amount significantly climbed to 370 in 2021 after a little decline to 354 in 2020. With 368 CHCs having Newborn Care Corners in 2022, there was a modest reduction. According to the data, Odisha experienced a small increase between 2020 and 2021 in the number of CHCs with Newborn Care Corners.
- Rajasthan: Rajasthan maintained a constant number of 475 CHCs with Newborn Care Corners during the course of the four years (2019, 2020, 2021, and 2022). Over this time, no changes in the data were seen. Throughout these years, Rajasthan maintained the same standard of amenities for Newborn Care Corners.
- Uttar Pradesh: There were 574 CHCs with Newborn Care Corners in Uttar Pradesh in 2019. In 2020, it increased to 617, and in 2021, it jumped again to 694. There was a considerable growth in the number of Newborn Care Corners in CHCs in 2022,

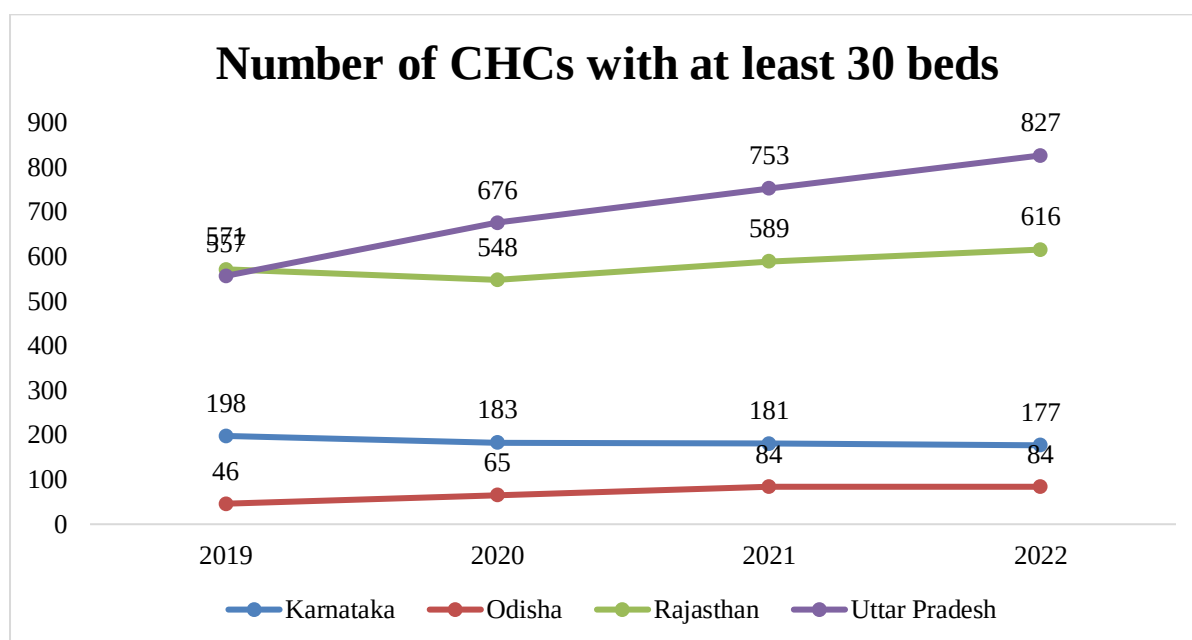
reaching 749. Over the years, Uttar Pradesh had a constant rise in the number of CHCs that provided Newborn Care Corners.

Overall, the data reveals a variety of trends in the states' CHCs with Newborn Care Corners. Over the specified period, the number of Newborn Care Corners was declining in Karnataka, fluctuating in Odisha, maintaining a steady level in Rajasthan, and significantly increasing in Uttar Pradesh.

Percentage change –

- Karnataka: The infrastructure of CHCs with Newborn Care Corners decreased by 16.49% in Karnataka between 2019 and 2022. Infrastructure will have decreased by 6.90% between 2020 and 2022, according to the percentage change. There was a further drop in the number of CHCs with Newborn Care Corners from 2021 to 2022 of 3.57%. Over the aforementioned years, infrastructure in Karnataka generally saw a severe deterioration.
- In Odisha, the infrastructure of CHCs with Newborn Care Corners is showing a mixed trend, according to the data. Infrastructure saw a small decline from 2019 to 2022 of 2.39%. However, the number of CHCs offering Newborn Care Corners increased by 3.95% between 2020 and 2022. It's interesting to see that there was a 0% change in infrastructure between 2021 and 2022. The infrastructure of CHCs with Newborn Care Corners in Odisha underwent some changes, with a minor decline from 2019 to 2022 and growth from 2020 to 2022.
- Rajasthan: Rajasthan maintained a constant number of 475 CHCs with Newborn Care Corners in terms of facilities, and there was no change in the statistics. Infrastructure changed little from 2019 and 2022, pointing to a stable state of affairs. The percentage change from 2020 to 2022 is 0%, as is the percentage change from 2021 to 2022, showing no changes to the infrastructure during these years.
- Uttar Pradesh: The infrastructure of CHCs with Newborn Care Corners has grown significantly in Uttar Pradesh. There was a significant rise in the number of CHCs having Newborn Care Corners between 2019 and 2022, rising by 30.49%. Infrastructure is expected to grow by 21.39% from 2020 to 2022, according to the percentage change. Infrastructure saw an additional rise of 7.93% from 2021 to 2022. Infrastructure development in Uttar Pradesh increased significantly between 2019 and 2022.

Figure 15: Number of CHCs with at least 30 beds



- Karnataka: In 2019, there were 198 CHCs in Karnataka that have at least 30 beds. In 2020, it dropped to 183, and in 2021, it dropped even more, to 181. Another decline occurred in 2022 when just 177 CHCs had at least 30 beds. Over the preceding years, Karnataka saw a general decline in CHCs with at least 30 beds.
- Odisha: As of 2019, there were 46 CHCs in Odisha with at least 30 beds. In 2020, it went up to 65, and in 2021 and 2022, it went up to 84. Over the aforementioned period, Odisha saw a continuous increase in the number of CHCs with at least 30 beds.
- Rajasthan: Rajasthan had a stable number of CHCs with at least 30 beds in each of the four years (2019, 2020, 2021, and 2022), with only minor variations. In 2019, there were 571 CHCs with at least 30 beds; in 2020, that number dropped to 548. Nevertheless, the amount climbed to 589 in 2021 and then to 616 in 2022. Overall, Rajasthan maintained a small number of CHCs with at least 30 beds over the years, with very minor modifications.
- Uttar Pradesh: There were 557 CHCs with at least 30 beds in Uttar Pradesh in 2019. In 2020, it increased to 676, and in 2021, it jumped again to 753. 827 CHCs had at least 30 beds by 2022, which was a major rise. Over the aforementioned time, Uttar Pradesh saw a constant increase in the number of CHCs with at least 30 beds.

Overall, the data reveals a variety of patterns in the number of CHCs in the aforementioned states with at least 30 beds. Odisha and Uttar Pradesh saw steady increase, Karnataka had a fall, and Rajasthan maintained a largely stable figure with minor variations.

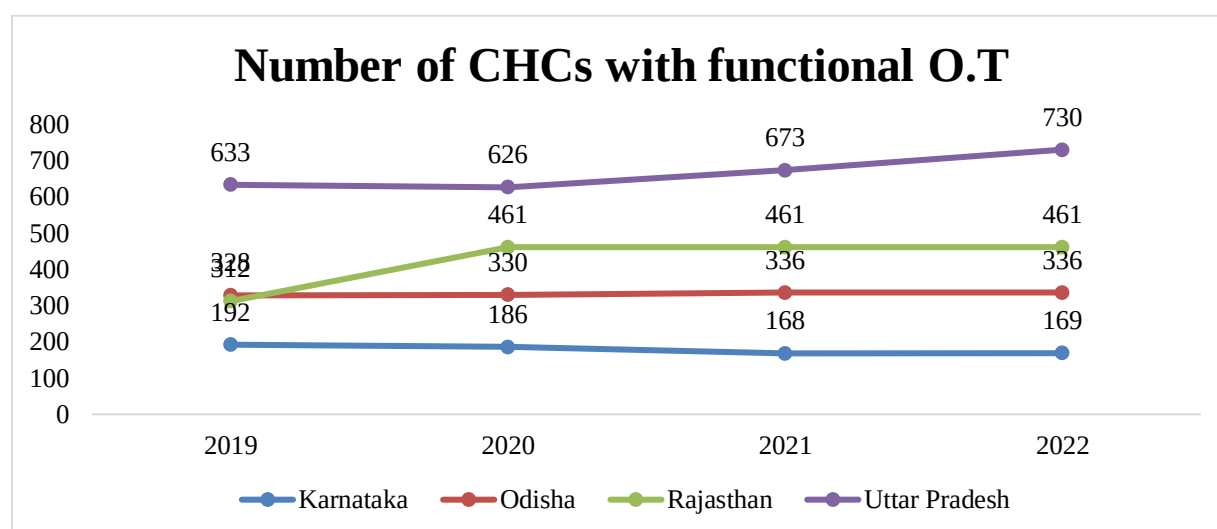
Percentage change –

- Karnataka: Between 2019 and 2022, the infrastructure of CHCs with at least 30 beds decreased by 10.61% in Karnataka. Infrastructure will have decreased by 3.28% between 2020 and 2022, according to the percentage change. The number of CHCs

with at least 30 beds decreased by a further 2.21% between 2021 and 2022. Over the aforementioned years, Karnataka had a general deterioration in infrastructure.

- Odisha: Odisha showed notable infrastructural growth in CHCs with at least 30 beds. There was a significant rise in the number of CHCs with at least 30 beds between 2019 and 2022, rising by 82.61%. Infrastructure is expected to grow by 29.23% between 2020 and 2022, according to the percentage change. It's interesting to see that there was 0% change in infrastructure between 2021 and 2022. Infrastructure in Odisha grew significantly, particularly between 2019 and 2022.
- Rajasthan: Rajasthan maintained, with only minor variations, a reasonably constant number of CHCs with at least 30 beds. Infrastructure increased by 7.88% between 2019 and 2022. According to the percentage change between 2020 and 2022, there will be a 12.41% increase of CHCs with at least 30 beds. Infrastructure saw an additional rise of 4.58% between 2021 and 2022. Over the aforementioned years, Rajasthan maintained a relatively steady infrastructure with just minor changes.
- Uttar Pradesh: The infrastructure of CHCs with at least 30 beds has grown significantly in Uttar Pradesh. The number of CHCs with at least 30 beds increased significantly from 2019 to 2022, by 48.47%. Infrastructure is expected to grow by 22.34% from 2020 to 2022, according to the percentage change. Infrastructure saw an additional rise of 9.83% from 2021 to 2022. Infrastructure development in Uttar Pradesh increased significantly between 2019 and 2022.

Figure 16: Number of CHCs with functional O.T



- Karnataka: Between 2019 and 2022, the infrastructure of CHCs with at least 30 beds decreased by 10.61% in Karnataka. Infrastructure will have decreased by 3.28% between 2020 and 2022, according to the percentage change. The number of CHCs with at least 30 beds decreased by a further 2.21% between 2021 and 2022. Over the aforementioned years, Karnataka had a general deterioration in infrastructure.
- Odisha: Odisha showed notable infrastructural growth in CHCs with at least 30 beds. There was a significant rise in the number of CHCs with at least 30 beds between 2019 and 2022, rising by 82.61%. Infrastructure is expected to grow by 29.23% between 2020 and 2022, according to the percentage change. It's interesting to see that

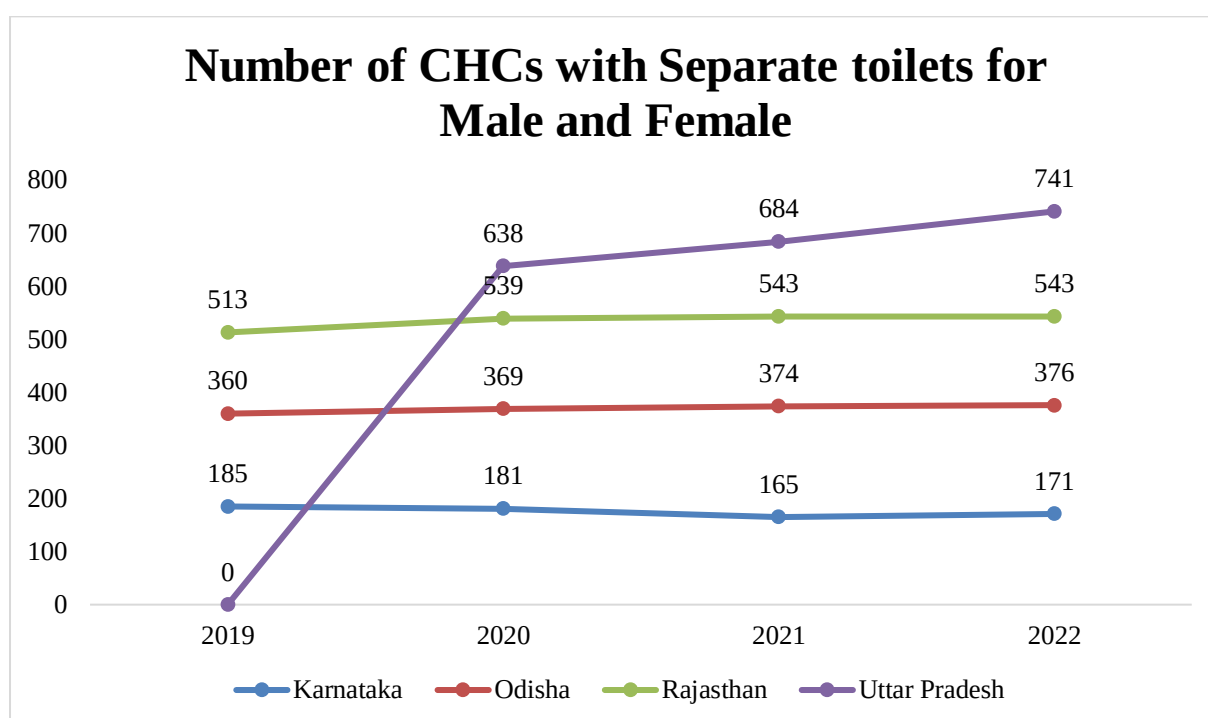
there was 0% change in infrastructure between 2021 and 2022. Infrastructure in Odisha grew significantly, particularly between 2019 and 2022.

- Rajasthan: Rajasthan maintained, with only minor variations, a reasonably constant number of CHCs with at least 30 beds. Infrastructure increased by 7.88% between 2019 and 2022. According to the percentage change between 2020 and 2022, there will be a 12.41% increase of CHCs with at least 30 beds. Infrastructure saw an additional rise of 4.58% between 2021 and 2022. Over the aforementioned years, Rajasthan maintained a relatively steady infrastructure with just minor changes.
- Uttar Pradesh: The infrastructure of CHCs with at least 30 beds has grown significantly in Uttar Pradesh. The number of CHCs with at least 30 beds increased significantly from 2019 to 2022, by 48.47%. Infrastructure is expected to grow by 22.34% from 2020 to 2022, according to the percentage change. Infrastructure saw an additional rise of 9.83% from 2021 to 2022. Infrastructure development in Uttar Pradesh increased significantly between 2019 and 2022.

Percentage change –

- Karnataka: The proportion of CHCs with functional OTs decreased by 3.13% between 2019 and 2020. From 2020 to 2021, there was a further decline of 9.68%. From 2021 to 2022, there was a very small increase of 0.60%. Over the aforementioned years, Karnataka saw a reduction in the number of CHCs with functional OTs, with a modest uptick seen in the most recent year.
- Odisha: The number of CHCs with functional OTs increased somewhat between 2019 and 2020, by 0.61%. Between 2020 and 2021, there was an additional rise of 1.82%. The number of CHCs with functional OTs did not vary from 2021 to 2022, albeit (0.00%). Over the aforementioned years, Odisha maintained a generally stable condition with a minor increase in the number of CHCs with functional OTs.
- Rajasthan: The number of CHCs with functional OTs increased significantly by 47.76% between 2019 and 2020 in Rajasthan. From 2020 to 2021 and from 2021 to 2022, there was no change (0.00%) in the number of CHCs with functional OTs. In Rajasthan, the availability of CHCs with functional OTs increased significantly overall between 2019 and 2020, but the number remained consistent after that.
- Uttar Pradesh: The proportion of CHCs having operational OTs decreased somewhat by 1.10% from 2019 and 2020. Between 2020 and 2021, there was a noticeable increase of 7.51%. From 2021 to 2022, there was an additional gain of 8.48%.

Figure 17: Number of CHCs with Separate toilets for Male and Female



- Karnataka: From 185 in 2019 to 181 in 2020, Karnataka's CHCs have separate toilets for men and women. This shows a slight drop. A further drop to 165 CHCs from 2020 to 2021 indicates a persistent decline in the number of separate toilets. However, there was a modest increase to 171 CHCs in 2022, indicating a slight improvement from the year before.
- Odisha: From 360 in 2019 to 369 in 2020, there were more CHCs in Odisha with separate toilets. In 2020 and 2021, the total increased to 374 CHCs. A little increase to 376 CHCs in 2022 shows a consistent improvement in the accessibility of separate toilets in CHCs in Odisha.
- Rajasthan: A favorable development was seen in Rajasthan, where the number of CHCs with separate toilets climbed from 513 in 2019 to 539 in 2020. However, there was only a slight increase to 543 CHCs from 2020 to 2021, indicating a mostly steady status. The amount stayed the same in 2022 at 543 CHCs, indicating no change from the year before.
- Uttar Pradesh: There were 638 CHCs with separate toilets in 2020, an increase from the year before data was available. There was a further growth from 2020 to 2021, reaching 684 CHCs. The number of CHCs increased significantly to 741 in 2022, showing that separate toilets are now more readily available in CHCs in Uttar Pradesh.

Percentage change –

- Karnataka: There was a decline of 5.52% from 2019 to 2022. However, there was an improvement with a rise of 3.64% from 2020 to 2022. There was a further rise of 4.44% from 2021 to 2022.

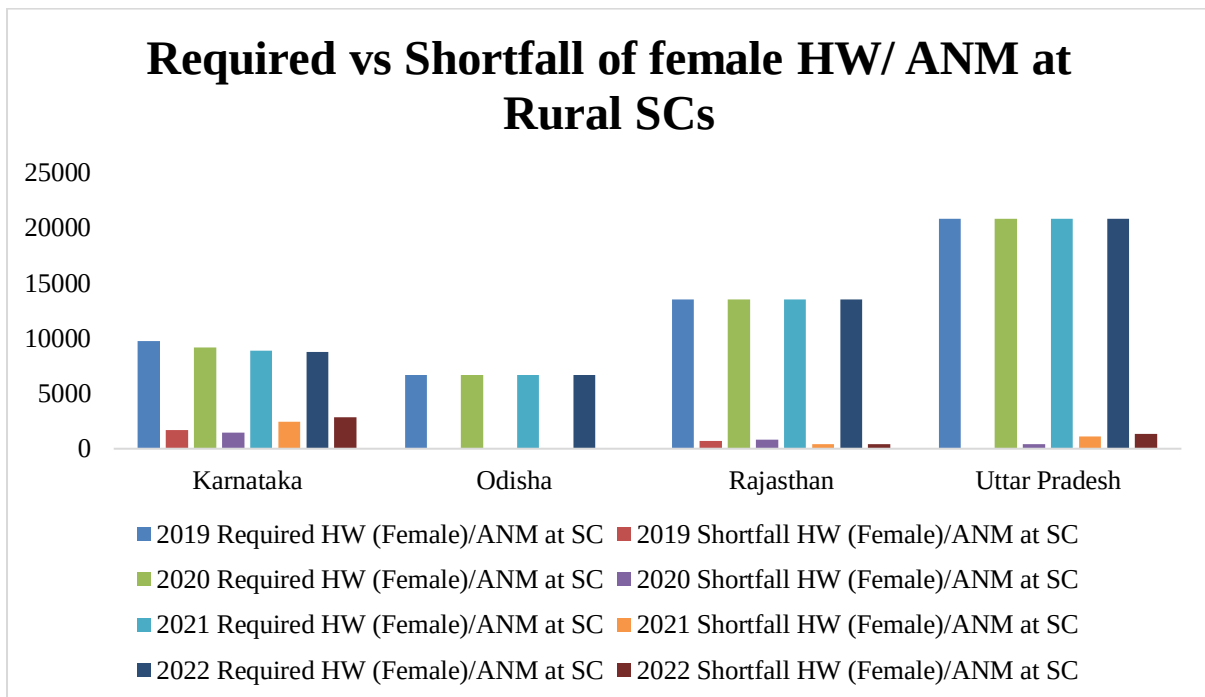
- Odisha: The change from 2019 to 2022 was negligible, increasing by 0.53%. There was a considerable increase of 5.85% from 2020 and 2022. There was a minuscule 0.74 percent gain from 2021 to 2022.
- Rajasthan: There was a huge growth of 16.14% from 2019 to 2022. There was a further increase of 8.33% from 2020 to 2022.
- Uttar Pradesh: Throughout the period of 2019 to 2022, there was an increase of 4.44%.

4.1.2 Manpower

Table 4: Required vs. Shortfall of female HW/ ANM at Rural SCs

	2019		2020		2021		2022	
	Required HW (Female)/ ANM at SC	Shortfall HW (Female)/ ANM at SC	Required HW (Female)/ ANM at SC	Shortfall HW (Female)/ ANM at SC	Required HW (Female)/ ANM at SC	Shortfall HW (Female)/ ANM at SC	Required HW (Female)/ ANM at SC	Shortfall HW (Female)/ ANM at SC
Karnataka	9758	1681	9188	1461	8891	2463	8757	2867
Odisha	6688	0	6688	0	6688	0	6688	0
Rajasthan	13512	690	13480	824	13531	440	13523	440
Uttar Pradesh	20782	0	20778	389	20778	1103	20781	1335

Figure 18: Graphical representation for required vs. Shortfall of female HW/ ANM at Rural SCs



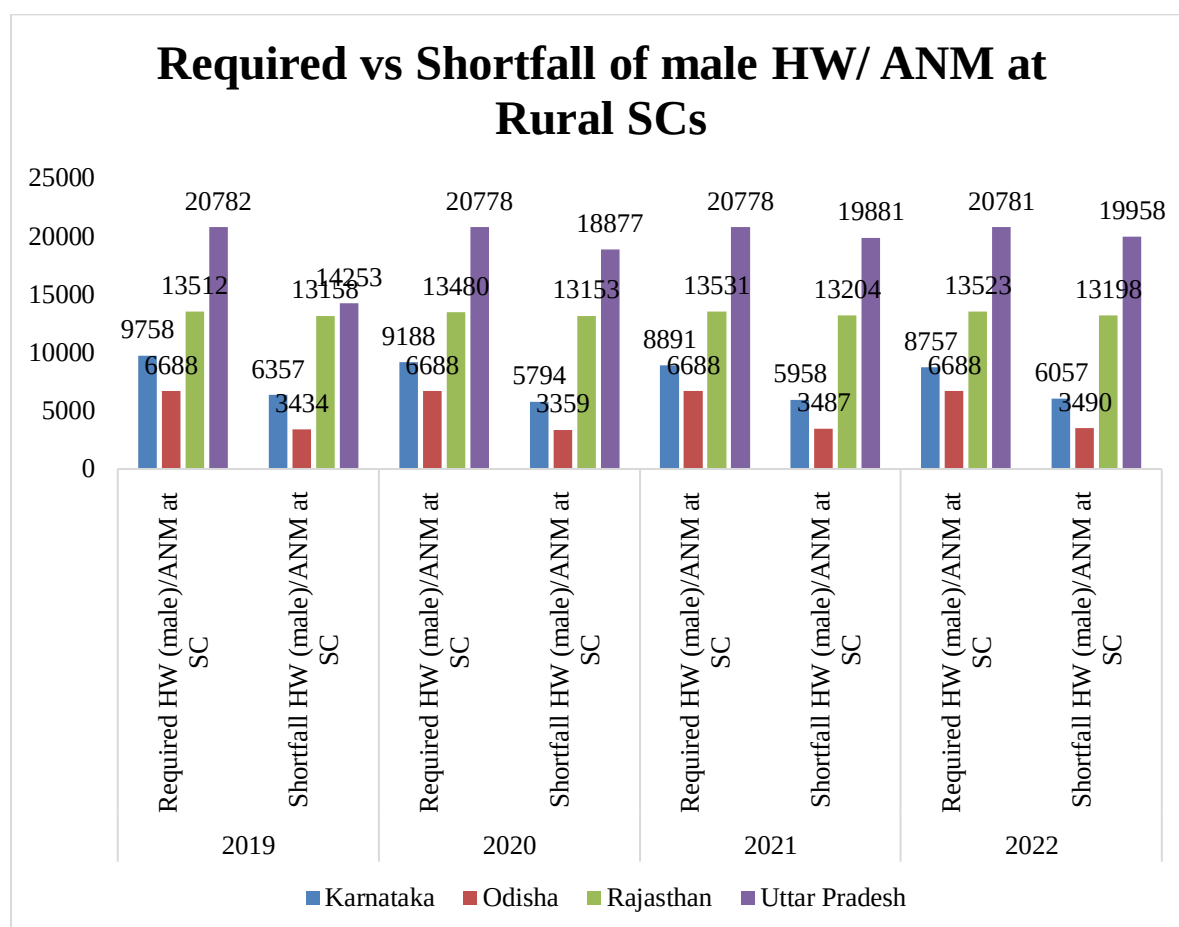
- In Karnataka, there were 1681 fewer female HW/ANMs than were necessary in 2019—9758 at SC. The needed number dropped to 9188 in 2020, while the shortfall fell to 1461. The necessary number was further reduced in 2021 to 8891, while the shortage climbed to 2463. The needed number was still 8757 in 2022, and the shortfall was still significant at 2867.

- Odisha: In 2019, the SC needed 6688 Female HW/ANMs, and there was no shortage, suggesting that the need was satisfied. The necessary number remained at 6688 in 2020, 2021, and 2022, and there was still no gap, indicating that the criteria was still being satisfied.
- Rajasthan: There were 690 less female HW/ANM at SC than needed in 2019, which was 13512. 2020 saw a decrease in the necessary number to 13480, but an increase in the shortage to 824. The needed number climbed marginally to 13531, but the shortage shrank to 440 in 2021. The necessary number (13523) and the shortfall (440) remained unchanged in 2022.
- Uttar Pradesh: In 2019, 20782 Female HW/ANMs were needed at SC; there was no shortage, indicating that the need was satisfied. The necessary number was 20778 in 2020, but there were 389 fewer than needed. The needed number remained 20778 in 2021, while the deficit climbed to 1103 that year. The needed number climbed slightly to 20781 in 2022, and the shortage increased even more to 1335.

Table 5: Required vs. Shortfall of male HW/ ANM at Rural SCs

	2019		2020		2021		2022	
	Required HW (male)/A NM at SC	Shortfall HW (male)/A NM at SC	Required HW (male)/A NM at SC	Shortfall HW (male)/A NM at SC	Required HW (male)/A NM at SC	Shortfall HW (male)/A NM at SC	Required HW (male)/A NM at SC	Shortfall HW (male)/A NM at SC
Karnataka	9758	6357	9188	5794	8891	5958	8757	6057
Odisha	6688	3434	6688	3359	6688	3487	6688	3490
Rajasthan	13512	13158	13480	13153	13531	13204	13523	13198
Uttar Pradesh	20782	14253	20778	18877	20778	19881	20781	19958

Figure 19: Graphical representation for required vs. Shortfall of male HW/ ANM at Rural SCs

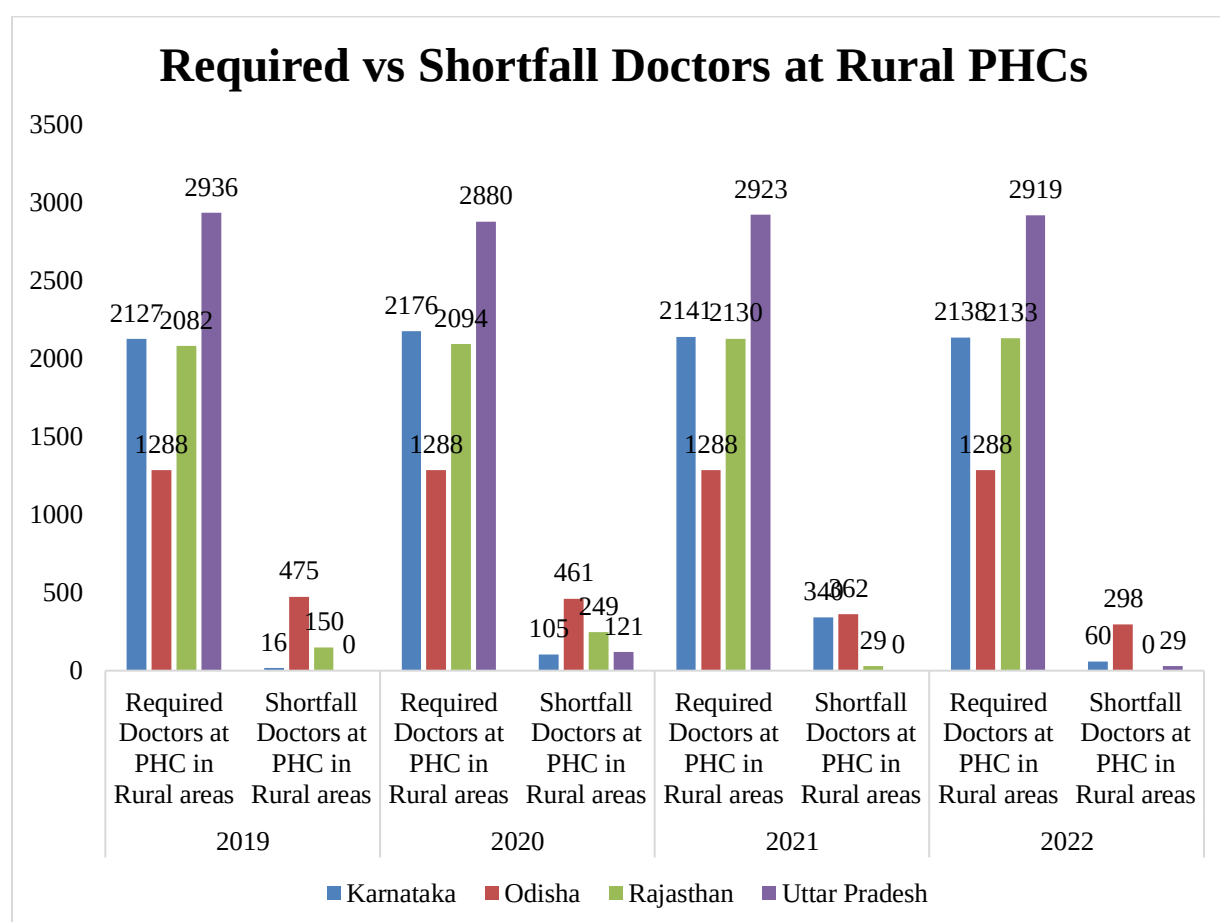


- In Karnataka, there were 6357 fewer Male HW/ANM at SC positions than were necessary in 2019. The necessary number fell to 9188 in 2020, and the deficit fell to 5794. The needed number dropped to 8891 in 2021, while the shortage fell to 5958. The needed number stayed at 8757 in 2022, and the deficit shrank to 6057.
- Odisha: The necessary number of Male HW/ANM at SC in 2019 was 6688, yet there was a 3434-person shortage. The needed number stayed the same in 2020 at 6688, and the deficit shrank to 3359. The needed number stayed the same in 2021 at 6688, but the shortfall climbed somewhat to 3487. The needed number stayed the same in 2022 at 6688, but the shortfall climbed little to 3490.
- Rajasthan: In 2019, there was a major shortage of 13158 Male HW/ANM at SC, compared to the needed number of 13512. The needed number dropped to 13480 in 2020, but the deficit remained significant at 13153. The needed number climbed somewhat to 13531 in 2021, while the deficit increased marginally to 13204. The necessary number (13523) and the gap (13198) remained unchanged in 2022.
- Uttar Pradesh: In 2019, there was a severe 14253-person gap in the number of Male HW/ANM at SC positions that were needed. 2020 saw a stable necessary number of 20778 and a considerable increase in the shortage to 18877. The needed number stayed the same in 2021 at 20778, and the deficit climbed to 19881. The needed number increased slightly to 20781 in 2022, and the deficit grew further to 19958.

Table 6: Required vs. Shortfall Doctors at Rural PHCs

	2019		2020		2021		2022	
	Required Doctors at PHC in Rural areas	Shortfall Doctors at PHC in Rural areas	Required Doctors at PHC in Rural areas	Shortfall Doctors at PHC in Rural areas	Required Doctors at PHC in Rural areas	Shortfall Doctors at PHC in Rural areas	Required Doctors at PHC in Rural areas	Shortfall Doctors at PHC in Rural areas
Karnataka	2127	16	2176	105	2141	340	2138	60
Odisha	1288	475	1288	461	1288	362	1288	298
Rajasthan	2082	150	2094	249	2130	29	2133	0
Uttar Pradesh	2936	0	2880	121	2923	0	2919	29

Figure 20: Graphical representation for required vs. Shortfall of Doctors at Rural PHCs



- Karnataka: The necessary number remained at 2127 in 2019, and there was no shortage, indicating that the criteria were still met. The needed number grew slightly to 2176 in 2020, and there were 16 fewer doctors than needed. The needed number grew to 2141 in 2021, and there were 105 fewer doctors than needed. The needed number (2138) and the shortfall (60) were essentially unchanged in 2022.

- Odisha: In rural PHCs, the necessary number was 1288 in 2019, 2020, 2021, and 2022, but there was a gap each year, with varied amounts ranging from 298 to 475 doctors.
- Rajasthan: In 2019, the needed number rose to 2082, and there were 150 fewer doctors than needed. The needed number grew to 2094 in 2020, and there were 249 fewer doctors than needed. The needed number grew to 2130 in 2021, and there were 29 fewer doctors than needed. The needed number (2133) and the deficiency (0) were essentially unchanged in 2022.
- Uttar Pradesh: The required number was 2936 in 2019, and there was no shortage, indicating that the criteria were still met. The minimum number was further reduced in 2020 to 2880, and there were 121 fewer doctors than needed. The needed number rose slightly to 2923 in 2021, yet there were still 0 doctors lacking. The needed number (2919) and the shortfall (29) were essentially unchanged in 2022.

4.2 Comparative Analysis of Regional Disparities

4.2.1 Infrastructure

A thorough analysis of healthcare facilities in India's four most populous states is provided by a comparison of health infrastructural indicators for the years 2019, 2020, 2021, and 2022 across the states of Karnataka, Odisha, Rajasthan, and Uttar Pradesh. The goal of this study is to evaluate the healthcare systems in each state over the chosen time period with respect to their overall success, problems, and inequities.

Table 7: Comparative Analysis for the indicators of Infrastructure

Indicators	Analysis			
	Karnataka (South)	Odisha (East)	Rajasthan (West)	Uttar Pradesh(North)
Sub-centers				
Number of Sub Centers Without Regular Water Supply	• 2019: The best infrastructure in 2019 was in Uttar Pradesh, which had no sub-centers lacking a consistent supply of water. There were 5684 sub-centers in Rajasthan and 282 in Karnataka that lacked regular access to water. • 2020: In 2020, there were 1274 sub-centers in both Orissa and Uttar Pradesh that lacked regular access to water. Rajasthan had 2243, and Karnataka had 2487. • 2021: Orissa had the finest infrastructure in 2021, with only 42 sub-centers without consistent access to water. Karnataka had 3030; Rajasthan had 2156, while Uttar Pradesh had 1690. • 2022: Orissa had the greatest infrastructure in 2022 once more, with only 9 sub-centers lacking consistent access to water. Rajasthan and Uttar Pradesh both had the same amount, 1690. Bangalore had 3107.			
Number of Sub Centers without Electricity Supply	• 2019: 212 sub-centers in Karnataka need electricity. Odisha			

	has 3135 sub-centers without access to power.4707 sub-centers in Rajasthan doesn't have access to power7377 sub-centers in Uttar Pradesh lack power. Karnataka has the fewest sub-centers without electrical supply in 2019, which suggests that its infrastructure is relatively better than that of the other three states. • 2020: 2777 sub-centers in Karnataka need electricity. Odisha: 2768 sub-centers lack access to electricity4695 sub-centers in Rajasthan doesn't have access to power15614 sub-centers in Uttar Pradesh don't have access to electricity. The fact that Odisha has the fewest sub-centers without electricity in 2020 suggests that the state had better infrastructure than the other three states. • 2021: 243 sub-centers in Karnataka lack power.945 sub-centers in Odisha lack power.1753 sub-centers in Rajasthan don't have access to electricity. 5385 sub-centers in Uttar Pradesh need power. The fact that Karnataka had the fewest sub-centers without electricity in 2021 suggests that the state had better infrastructure than the other three states. • 2022: 446 sub-centers in Karnataka lack power.945 sub-centers in Odisha lack power.1750 sub-centers in Rajasthan don't have access to power, 5385 sub-centers in Uttar Pradesh need power. The fact that Karnataka has the fewest sub-centers without electricity in 2022 suggests that the state has better infrastructure than the other three states.
Number of SCs with Separate toilets for Male and Female	• 2019: 2939 separate toilets for male and female in Karnataka, 2918 in Orissa, 3997 in Rajasthan. According to the data provided, Rajasthan has the most SCs with separate toilets in 2019. • 2020: 3039separate toilets for male and female in Karnataka 2918 in Orissa, 4640 in Rajasthan, 8112 in Uttar Pradesh. Uttar Pradesh had the most SCs with separate toilets in 2020. • 2021: 2247separate toilets for male and female in Karnataka, 126 in Orissa, 5084 in Rajasthan, 8577 in Uttar Pradesh. Uttar Pradesh has the most SCs with separate toilets in 2021. • 2022: 2086separate toilets for male and female in Karnataka, 241 in Orissa, 5487 Rajasthan, 8635 in Uttar Pradesh. Uttar Pradesh has the most SCs with separate toilets in 2022. Result - According to the statistics available, Uttar Pradesh had the greatest percentage of SCs with separate toilets in three of the four years.

Primary Health Center(PHC)	
Number of PHCs functioning on 24X7 basis	• 2019: With 919 PHCs operating continuously in 2019, Karnataka had the most, followed by Rajasthan with 627, Uttar Pradesh with 439, and Orissa with 83. • 2020: With 877 PHCs, Karnataka once again led the way in 2020. Rajasthan came in second with 627, Orissa came in third with 126, and Uttar Pradesh came in fourth with 50. • 2021: With 1844 PHCs operating continuously in 2021, Uttar Pradesh led all other states, followed by Rajasthan with 627, Karnataka with 880, and Orissa with 316. • 2022: With 1775 PHCs, Uttar Pradesh had the most in 2022. Rajasthan came in second with 810, followed by Karnataka with 904 and Orissa with 316. Result -The maximum number of PHCs operating continuously throughout the year, Uttar Pradesh had the most in 2021 and 2022 while Karnataka had the most in 2019 and 2020. With the exception of 2021, when it had more than Rajasthan, Rajasthan consistently had a modest number of operational PHCs, whereas Orissa consistently had the lowest numbers.
Number of PHCs With Labour Room	• 2019: Compared to Orissa and Uttar Pradesh, Karnataka and Rajasthan have more PHCs with labor rooms in 2019. • 2020: The state of Karnataka will have the most primary health centers (PHCs) with labor rooms in 2020, followed by Uttar Pradesh, Rajasthan, and Orissa. • 2021: The majority of PHCs with labor rooms in 2021 were found in Uttar Pradesh, followed by Rajasthan, Karnataka, and Orissa. • 2022: In 2022, Uttar Pradesh, followed by Rajasthan, Karnataka, and Orissa, will have the most PHCs with labor rooms. Result -In 2020, 2021, and 2022, Uttar Pradesh regularly displays a higher number. Rajasthan and Karnataka, however, also performs well in some years.
Number of PHCs with OT	• 2019: The state having the most PHCs with OT in 2019 was Uttar Pradesh (1416), followed by Karnataka (1238), Rajasthan (235), and Odisha (41). • 2020: The highest number was still in Uttar Pradesh (988) in

	2020, followed by Karnataka (1146), Rajasthan (463), and Odisha (76). • 2021: Uttar Pradesh continued to have the most in 2021 with 1085, followed by Rajasthan with 470, Karnataka with 1020, and Odisha with 34. • 2022: The state having the most PHCs with OT in 2022 was Karnataka (1078), followed by Uttar Pradesh (958), Rajasthan (499), and Odisha (29). Result -Uttar Pradesh had the most PHCs with OT in 2019 and 2020. The state of Uttar Pradesh has the most PHCs with OT in 2021, closely followed by Rajasthan. Karnataka outpaced the other states in 2022 and had the most proportion of PHCs with OT.
Number of PHCs with at least 4 beds	• 2019: Compared to Orissa and Uttar Pradesh, Karnataka and Rajasthan have more PHCs with at least 4 beds in 2019. • 2020: In comparison to Orissa, Karnataka, Rajasthan, and Uttar Pradesh have more PHCs with at least 4 beds in 2020. • 2021: Rajasthan, Karnataka, Orissa, and Uttar Pradesh have the most PHCs with at least 4 beds as of 2021. • 2022: Rajasthan, Karnataka, Orissa, and Uttar Pradesh have the most PHCs with at least 4 beds as of 2022. Result -In both 2021 and 2022, Uttar Pradesh consistently had the most PHCs with at least 4 beds, showing a stronger infrastructure in that area.
Number of PHCs Without Electric Supply	• 2019: The number of PHCs without access to electricity in 2019 was highest in Uttar Pradesh (213), followed by Rajasthan (77), Orissa (58), and Karnataka (28). • 2020: The most PHCs without access to electricity in 2020 were in Uttar Pradesh (133), followed by Karnataka (35), Rajasthan (77), and Orissa (24). • 2021: The biggest percentage of PHCs without access to electricity (163) was still found in Uttar Pradesh in 2021, followed by Rajasthan (73), Orissa (37), and Karnataka (40). • 2022: With regard to PHCs without access to electricity in 2022, Uttar Pradesh had the fewest (19), followed by Orissa (29), Rajasthan (71), and Karnataka (64). Result -Compared to other states, Uttar Pradesh has seen a decrease in the proportion of PHCs without access to electricity over time.

Number of PHCs Without Water Supply	• 2019: Karnataka: 67 PHCs lack access to water 68 PHCs in Odisha (previously Orissa) lack access to water. Rajasthan: 208 PHCs lack access to water 270 PHCs in Uttar Pradesh don't have access to water. While Rajasthan and Uttar Pradesh had a substantially larger number of PHCs without water service in 2019, Karnataka and Odisha had a comparable amount. • 2020: Karnataka has 93 PHCs without access to water. Odisha: 37 PHCs lack access to water. 99 PHCs in Rajasthan lack water supply. 166 PHCs in Uttar Pradesh lack access to water. The least amount of PHCs without access to water in 2020 was in Odisha, followed by Rajasthan, Uttar Pradesh, and Karnataka. • 2021: Karnataka: 250 PHCs lack access to water. Odisha: 23 PHCs lack access to water. Rajasthan: 83 PHCs lack access to water. 152 PHCs in Uttar Pradesh don't have access to water. The least amount of PHCs without access to water in 2021 was in Odisha, which was followed by Rajasthan, Uttar Pradesh, and Karnataka. • 2022: Karnataka: 152 PHCs lack access to water. Odisha: 18 PHCs lack access to water. Rajasthan: 83 PHCs lack access to water. 8 PHCs in Uttar Pradesh don't have access to water. Result -Odisha, Rajasthan, Karnataka, and Uttar Pradesh had the fewest PHCs without access to water in 2022.
Number of PHCs with Separate toilets for Male and Female	• 2019: Karnataka: PHCs have separate toilets for men and women as of 2004. 498 PHCs in Odisha have separate toilets for men and women. In Rajasthan, there are 1713 PHCs with separate toilets for men and women. According to the statistics provided, Rajasthan has the most PHCs in 2019 with separate toilets for men and women. • 2020: 1887 PHCs in Karnataka have separate toilets for men and women. 838 PHCs in Odisha have separate toilets for men and women. 1637 PHCs in Rajasthan have male and female toilets that are separate. In Uttar Pradesh, there are 2296 PHCs with separate toilets for men and women. According to the information provided, Uttar Pradesh will have the most PHCs with separate toilets for men and women in 2020. • 2021: 1613 PHCs in Karnataka have separate toilets for men and women. 787 PHCs in Odisha have separate toilets

	for men and women. In Rajasthan, there are 1785 PHCs with separate toilets for men and women. In Uttar Pradesh, there are 2296 PHCs with separate toilets for men and women. According to the available data, Uttar Pradesh will have the most PHCs with separate toilets for men and women in 2021. • 2022: Karnataka: PHCs have separate toilets for men and women since 1972. 809 PHCs in Odisha have separate toilets for men and women. In Rajasthan, there are 1725 PHCs with separate toilets for men and women. 2262 PHCs in Uttar Pradesh have separate toilets for men and women. According to the available statistics, Karnataka will have the most PHCs with separate toilets for men and women in 2022. Result -In conclusion, the state with the greatest proportion of PHCs with separate toilets for men and women varies throughout time, according to the data. It was Rajasthan in 2019. 2020 and 2021 belonged to Uttar Pradesh. It was Karnataka in 2022.
Community Health Centers(CHC)	
Number of CHCs with all 4 Specialists	• 2019: 33 CHCs in Karnataka have all four specialists.18 CHCs in Odisha have all four specialists.29 CHCs with all four experts are in Rajasthan.85 CHCs in Uttar Pradesh have all four specialties. Compared to the other states, Uttar Pradesh had the most CHCs with all four experts in 2019. • 2020: Five CHCs in Karnataka have all four specialists.18 CHCs in Odisha have all four specialists.34 CHCs with all four experts are in Rajasthan.31 CHCs in Uttar Pradesh have all four specialties. Compared to the other states, Rajasthan has the most CHCs with all four experts in 2020. • 2021: 11 CHCs in Karnataka have all four specialists.59 CHCs in Odisha have all four specialists.101 CHCs with all four experts are in Rajasthan.170 CHCs in Uttar Pradesh have all four specialties. When compared to the other states, Uttar Pradesh had the most CHCs with all four experts in 2021. • 2022: 16 CHCs with all four specialties are in Karnataka.51 CHCs in Odisha have all four specialists.105 CHCs in Rajasthan have all four specialists.181 CHCs in Uttar Pradesh have all four specialties. When compared to the other states, Uttar Pradesh had the most CHCs with all four experts in 2022.

	Result -According to the information provided, in the years 2019, 2021, and 2022, Uttar Pradesh continuously had the greatest number of CHCs with all four specialists. Rajasthan, however, had the greatest number in 2020. With the exception of 2020, when Rajasthan had the highest number of CHCs with all four specialists, it can be said that Uttar Pradesh did better generally than the other states in terms of infrastructure (number of CHCs with all four specialists).
Number of CHCs with functional Laboratory	• 2019: The most CHCs with working laboratories were found in Uttar Pradesh (623), followed by Rajasthan (544), Orissa (367), and Karnataka (198). • 2020: The largest number was maintained by Uttar Pradesh (625), followed by Rajasthan (531), Orissa (367), and Karnataka (183) in 2020 • 2021: The biggest number was still in Uttar Pradesh (703), followed by Rajasthan (535), Orissa (371), and Karnataka (177) in 2021. • 2022: The largest number (756) was recorded in Uttar Pradesh in 2022, followed by Rajasthan (565), Orissa (370), and Karnataka (170). Result -Accordingly, from 2019 to 2022, Uttar Pradesh continuously had more CHCs with working laboratories than Karnataka, Orissa, and Rajasthan, according to the statistics provided.
Number of CHCs with functioning Stabilization units for New Born	• 2019: 162 CHCs in Karnataka, 22 CHCs in Orissa, 271 CHCs in Rajasthan, 358 CHCs in Uttar Pradesh. In 2019, Uttar Pradesh, followed by Rajasthan, Karnataka, and Orissa, had the most CHCs with operational stabilization units for newborns. • 2020: 152 CHCs in Karnataka, 352 CHCs in Orissa, 271 CHCs in Rajasthan, 509 CHCs in Uttar Pradesh. The state with the most CHCs in 2020 was Uttar Pradesh, followed by Orissa, Rajasthan, and Karnataka. • 2021: CHCs in Karnataka are 138, 27 CHCs in Orissa, 271 CHCs in Rajasthan, 600 CHCs in Uttar Pradesh. The state with the most CHCs in 2021 was Uttar Pradesh, followed by Rajasthan, Karnataka, and Orissa. • 2022: CHCs in Karnataka are 156, 23 CHCs in Orissa, 271 CHCs in Rajasthan, 604 CHCs in Uttar Pradesh. The state with the most CHCs in 2022 was Uttar Pradesh, followed by Rajasthan, Karnataka, and Orissa. Result -According to the information provided, it is

	evident that across all years, Uttar Pradesh continuously had the highest percentage of CHCs having operational Stabilization units for Newborns. 271 CHCs have consistently existed in Rajasthan over the years. Though their numbers fluctuated slightly, Karnataka and Orissa had lower totals than Uttar Pradesh and Rajasthan.
Number of CHCs with New Born care Corner	• 2019: 194 CHCs with New Born Care Corner in Karnataka, 377 CHCs with New Born Care Corner in Orissa, 475 CHCs with Newborn Care Corner in Rajasthan, 574 CHCs with Newborn Care Corner in Uttar Pradesh. According to data for 2019, Rajasthan, Orissa, and Karnataka have the next-highest number of CHCs with New Born Care Corners, followed by Uttar Pradesh. • 2020: 174 CHCs in Karnataka have a Newborn Care Corner, 354 CHCs with New Born Care Corner in Orissa, 475 CHCs with Newborn Care Corner in Rajasthan, and 617 CHCs with Newborn Care Corner in Uttar Pradesh. Rajasthan, Orissa, and Karnataka were the states with the next-highest number of CHCs with New Born Care Corners in 2020, after Uttar Pradesh. • 2021: 168 CHCs in Karnataka have a Newborn Care Corner, 370 CHCs in Orissa have a Newborn Care Corner, 475 CHCs with Newborn Care Corner in Rajasthan, 694 CHCs with New Born Care Corner in Uttar Pradesh. After Rajasthan, Orissa, and Karnataka, Uttar Pradesh had the most CHCs with New Born Care Corners in 2021. • 2022: 162 CHCs with New Born Care Corner in Karnataka, 368 CHCs with Newborn Care Corner in Orissa, 475 CHCs with Newborn Care Corner in Rajasthan, 749 CHCs with Newborn Care Corner in Uttar Pradesh. After Rajasthan, Orissa, and Karnataka, Uttar Pradesh had the most CHCs with New Born Care Corners in 2022. Result -According to the information given, Uttar Pradesh consistently had the most CHCs with New Born Care Corners across the years compared. In all the years, Rajasthan had the second-highest number, followed by Orissa and Karnataka.
Number of CHCs with at least 30 beds	• 2019: Karnataka had 557 CHCs, CHCs in Odisha were 198, 571 CHCs in Rajasthan, 557 CHCs in Uttar Pradesh. Rajasthan, Uttar Pradesh, and Karnataka were the states with the most CHCs with at least 30 beds in 2019, while Odisha had the fewest. • 2020: Karnataka had 676 CHCs, CHCs in Odisha were 183, 548 CHCs in Rajasthan, 548 CHCs in Uttar Pradesh.

	Karnataka, Rajasthan, and Uttar Pradesh had the next-highest concentrations of CHCs with at least 30 beds in 2020, with Odisha having the fewest. • 2021: Karnataka had 753 CHCs, 181 CHCs in Odisha, 589 CHCs in Rajasthan, and 589 CHCs in Uttar Pradesh. Karnataka, Rajasthan, and Uttar Pradesh had the highest concentrations of CHCs in 2021, while Odisha had the lowest. • 2022: 827 CHCs in Karnataka, CHCs in Odisha: 177, Rajasthan had 616 CHCs, 616 CHCs in Uttar Pradesh. Karnataka, Rajasthan, and Uttar Pradesh had the next-highest concentrations of CHCs with at least 30 beds in 2022, with Odisha having the lowest concentrations. Result -Karnataka consistently has the most CHCs with at least 30 beds in all the years covered, according to the data provided. As a result, in each of the aforementioned years, Karnataka outperformed Odisha, Rajasthan, and Uttar Pradesh in terms of infrastructure, specifically the quantity of CHCs.
Number of CHCs with Separate toilets for Male and Female	• 2019: CHCs in Karnataka were 185; Orissa has 360 CHCs, 513 CHCs in Rajasthan. Rajasthan had the most number of CHCs in 2019 that have separate toilets for men and women, followed by Orissa and Karnataka. • 2020: 181 CHCs in Karnataka, Orissa has 369 CHCs, 539 CHCs in Rajasthan, 638 CHCs in Uttar Pradesh. Rajasthan once more had the most CHCs with separate toilets in 2020, followed by Uttar Pradesh, Orissa, and Karnataka. • 2021: CHCs in Karnataka were 165, Orissa has 374 CHCs, 543 CHCs in Rajasthan, 684 CHCs in Uttar Pradesh. The number of CHCs with separate toilets was highest in Rajasthan in 2021, followed by Uttar Pradesh, Orissa, and Karnataka. • 2022: 171 CHCs in Karnataka, Orissa has 376 CHCs, 543 CHCs in Rajasthan, 741 CHCs in Uttar Pradesh. Rajasthan once more had the most CHCs with separate toilets in 2022, followed by Uttar Pradesh, Orissa, and Karnataka. Result -Rajasthan continuously has the most CHCs with separate toilets for men and women in each of the years, making it comparatively better than the other states in terms of this infrastructure factor. In the majority of years, Uttar Pradesh had the second-highest count, while Karnataka and Orissa had lower totals.

4.2.2 Manpower

Table 8: Comparative Analysis for indicators of Manpower

Indicators	
Shortfall HW (Female)/ANM at SC	• 2019: Karnataka: 1,681 shortfall; Odisha: 0 shortfall, Rajasthan: 690 shortfall. Odisha has no deficiency in 2019, placing it ahead of the other states in terms of achieving the necessary HW/ANM at SC. • 2020: Karnataka: 1,461 shortfalls, Odisha have no shortfall, Rajasthan: 824 shortfalls, Uttar Pradesh: 389 are missing. Odisha will still have no deficit in 2020, outperforming the other states. • 2021: Karnataka: 2,463 shortfalls, Odisha have no shortfall, Rajasthan: 440 are not enough, Uttar Pradesh: 1,103 shortfalls. Odisha maintains no deficiency in 2021, demonstrating its superior performance to the other states. • 2022: Karnataka: 2,867 shortfalls, Odisha have no shortfall, Rajasthan: 440 are not enough, Uttar Pradesh: 1,335 are missing. Odisha will once more have no deficiency in 2022, placing it ahead of the other states.
Required HW (Female)/ANM at SC	• 2019: 9758 in Karnataka, 6688 in Odisha, 13512 in Rajasthan, 20782 in Uttar Pradesh. With 20,782 needed HW (Female)/ANM at SC in 2019, Uttar Pradesh had the highest number, followed by Rajasthan (13,512), Karnataka (9,758), and Odisha (6,688). • 2020: Odisha: 6688, Karnataka: 9188, Rajasthan: 13480, 20778 in Uttar Pradesh. With 20,778 necessary HW (Female)/ANM at SC in 2020, Uttar Pradesh had the highest number, followed by Rajasthan (13,480), Karnataka (9,188), and Odisha (6,688). • 2021: Karnataka: 8891, 6688 in Odisha, 13531 in Rajasthan, 20778 in Uttar Pradesh. With 20,778, Uttar Pradesh had the most HW (Female)/ANM at SC positions that were required in 2021, followed by Rajasthan (13,531), Karnataka (8,891), and Odisha (6,688). • 2022: 8757 in Karnataka, 6688 in Odisha, 13523 in Rajasthan, 20781 in Uttar Pradesh. With 20,781, Uttar Pradesh had the most HW (Female)/ANM

	at SC positions that were required in 2022, followed by Rajasthan (13,523), Karnataka (8,757), and Odisha (6,688). Result -These figures show that during all the years analyzed, Uttar Pradesh continuously had the greatest number of HW (Female)/ANM at SC needed, followed by Rajasthan, Karnataka, and Odisha.
Required HW (male)/ANM at SC	• 2019: 9758 in Karnataka, 6688 in Odisha, 13512 in Rajasthan, Uttar Pradesh has 20782. Compared to the other three states, Odisha has the fewest required health workers (6688), indicating a better scenario. • 2020: 9188 in Karnataka, 6688 in Odisha, 13480 in Rajasthan, 20778 in Uttar Pradesh. Odisha still has the fewest required health workers (6688) in 2020, showing improvement over the other three states. • 2021: 8891 in Karnataka, 6688 in Odisha, 13531 in Rajasthan, 20778 in Uttar Pradesh. Odisha continues to have the fewest mandatory health workers (6688), which suggest that its condition is better than that of the other three states. • 2022: 8757 in Karnataka, 6688 in Odisha, 13523 in Rajasthan, 20781 in Uttar Pradesh. Odisha still has the fewest required health workers (6688) in 2022, showing improvement over the other three states. Result -According to the available data, Odisha regularly has the lowest annual requirement for ANMs or Health Workers, showing a scenario that is somewhat better than that of Karnataka, Rajasthan, and Uttar Pradesh.
Shortfall HW (male)/ANM at SC	• 2019: Male HW/ANM shortfall at SC: 6357 in Karnataka. HW (male)/ANM at SC shortfall in Odisha: 3434. HW (male)/ANM at SC shortfall in Rajasthan: 13158. Uttar Pradesh: Shortfall HW (male)/ANM at SC: 14255. With the lowest deficiency among the states in 2019, Odisha performed considerably better than the other states. • 2020: Karnataka: SC HW (male)/ANM Shortfall: 5794. Odisha: SC HW (male)/ANM shortfall: 3359. Rajasthan: 13153 HW (male)/ANM at SC shortfall. Uttar Pradesh: HW (male)/ANM at SC shortfall: 18877

	Odisha once again had the lowest deficiency in 2020, demonstrating an improvement over the other states. • 2021: Karnataka: SC HW (male)/ANM Shortfall: 5958. Odisha: SC HW (male)/ANM Shortfall: 3487. HW (male)/ANM shortfall at SC: 13204 in Rajasthan. HW (male)/ANM shortfall at SC: 19881 in Uttar Pradesh. Odisha had the lowest gap in 2021, which suggests a stronger performance than the other states. • 2022: Karnataka: SC HW (male)/ANM Shortfall: 6057 Odisha: Shortfall of HW (male)/ANM at SC: 3490 Rajasthan: 13198 HW (male)/ANM at SC shortfall HW (male)/ANM shortfall at SC: 19958 in Uttar Pradesh Odisha has the lowest deficiency in 2022, which suggests a stronger performance than the other states. Result -Odisha consistently had the lowest shortfall in each year, according to the analysis of the data provided, indicating that Odisha performed somewhat better than Karnataka, Rajasthan, and Uttar Pradesh in terms of meeting the necessary numbers of Health Workers (HW)/ANM at Sub-Centers (SC) year over year.
Required Doctors at PHC in Rural areas	• 2019: Karnataka: Required 2127 doctors, Odisha: Required 1288 doctors, Rajasthan: Required 2082 doctors, Uttar Pradesh: Required 2936 doctors. In 2019, Odisha had the lowest required number of doctors at PHCs in rural areas compared to the other states, indicating a relatively better situation. • 2020: Karnataka: Required 2176 doctors, Odisha: Required 1288 doctors, Rajasthan: Required 2094 doctors, Uttar Pradesh: Required 2880 doctors. In 2020, Odisha had the lowest required number of doctors at PHCs in rural areas compared to the other states, indicating a relatively better situation. • 2021: Karnataka: Required 2141 doctors, Odisha: Required 1288 doctors, Rajasthan: Required 2130 doctors, Uttar Pradesh: Required 2923 doctors. In 2021, Odisha had the lowest required number of doctors at PHCs in rural areas compared to the other states, indicating a relatively better

	situation. • 2022: Karnataka: Required 2138 doctors, Odisha: Required 1288 doctors, Rajasthan: Required 2133 doctors, Uttar Pradesh: Required 2919 doctors. In 2022, Odisha had the lowest required number of doctors at PHCs in rural areas compared to the other states, indicating a relatively better situation. Result -Based on the provided data, Odisha consistently had the lowest required number of doctors at PHCs in rural areas compared to Karnataka, Rajasthan, and Uttar Pradesh across all four years (2019-2022).
Shortfall Doctors at PHC in Rural areas	• 2019: Karnataka: 16 doctors were needed. Odisha: 475 doctors were needed. Rajasthan: 150 doctors were needed. Uttar Pradesh has no shortage of physicians. In contrast to other states, Uttar Pradesh has no shortage of doctors at PHCs in rural regions in 2019, indicating an improved condition. • 2020: Karnataka: 105 doctors were needed. Odisha: 461 doctors were needed. Rajasthan: 249 doctors were needed. Uttar Pradesh: 121 doctors were needed. Compared to the other states, Uttar Pradesh had a lesser doctor shortage at PHCs in 2020, indicating a somewhat better position. • 2021: Karnataka: 340 doctors were needed. Odisha: 362 doctors were needed. Rajasthan: 29 doctors were needed. Uttar Pradesh has no shortage of physicians. In contrast to the other states, Uttar Pradesh reported no doctor shortage at PHCs in rural regions in 2021, indicating a better condition. • 2022: Karnataka: 60 doctors are needed. Odisha: 298 doctors are needed. Rajasthan has no shortage of physicians. Uttar Pradesh: 29 doctors are needed. In contrast to the other states, Rajasthan reported no shortage of doctors at PHCs in rural areas in 2022, indicating a better condition. Result -It is assumed that Uttar Pradesh outperformed the other states in terms of having shortfall of doctors in PHCs in two out of the four years (2019 and 2021), as opposed to the other states. Rajasthan did better in 2022 since there was no deficit.

4.3 Comprehensive State-by-State Performance Analysis

Here, while stating the overall results, overall performance of each state is mentioned, quoted from the above used indicator, sequentially –

Uttar Pradesh

In three out of four years, Uttar Pradesh had the highest percentage of SCs with access to separate toilets. The number of PHCs in Uttar Pradesh with at least 4 beds was continuously higher in 2021 and 2022, suggesting better infrastructure in that state. In 2019, 2020, and 2021, the state had the most PHCs with OT, and in 2022, it was just slightly behind Rajasthan. Uttar Pradesh's percentage of PHCs without access to electricity has decreased over time, relative to that of other states. In 2020 and 2021, the state of Uttar Pradesh had the highest rate of PHCs with gender-separate facilities. In 2019, 2021, and 2022, the state of Uttar Pradesh had the most comprehensive CHC network, as measured by the number of CHCs staffed by each of the four specialists. In every single year examined, Uttar Pradesh had the highest rate of CHCs that also possessed Newborn Stabilization facilities. Across all time periods considered, Uttar Pradesh consistently has the most CHCs with New Born Care Corners. The highest requirement for HW (Female)/ANM at SC were consistently in Uttar Pradesh, showing a greater need for healthcare professionals there.

Rajasthan

There were always a fair number of functioning PHCs in Rajasthan, while in Orissa there were never more than a handful. In 2021, after Uttar Pradesh, Rajasthan had the most primary health care centers that offered OT. Across all years, the percentage of CHCs in Rajasthan that had gender-separate stalls for men and women was the highest. In 2020, the highest concentration of CHCs staffed by all four types of specialists was in Rajasthan. There were consistently more newborn stabilization units at CHCs in Rajasthan than any other state.

Karnataka

In both 2019 and 2020, Karnataka maintained the highest number of primary health care centers (PHCs) open year-round. In 2022, the percentage of PHCs in Karnataka that offered OT was the highest. There were more community health centers (CHCs) in Karnataka with at least 30 beds per year. After Uttar Pradesh, Karnataka consistently had the most CHCs with New Born Care Corners.

Odisha

The number of functional PHCs was lowest in Odisha year after year. In 2022, fewer primary health care facilities in Odisha lacked access to water than any other state. When compared to other states, Odisha's situation is slightly more favorable in terms of meeting the required numbers of ANMs or Health Workers on a yearly basis. The annual percentage gap between the actual and needed number of Health Workers (HW)/ANM at Sub-Centers (SC) in Odisha was the smallest of any state. Odisha's primary healthcare centers (PHCs) in rural areas routinely has the fewest required physicians.

The analysis shows that overall; each state is particularly strong in some facet of its healthcare system. The availability of SCs, specialized care at CHCs, and other medical infrastructure is strong in Uttar Pradesh. PHCs and CHCs in Rajasthan have better infrastructure, including their own restrooms. Karnataka excels in terms of the number of CHCs with at least 30 beds and the percentage of its PHCs that are open 24/7. In terms of providing sufficient nurses and doctors to public health clinics, Odisha excels.

Chapter 5: Conclusion and Recommendations

5.1 Summary of Findings

Every Indian person has the right to timely, high-quality medical care that doesn't break the bank. Therefore, a proposal for comprehensive overhaul of the healthcare system by integrating the public and private sectors as well as allopathic medical practices into a single, nationalized health care delivery system (the "Integrated National Health System") should be anticipated. This would improve health outcomes for all patients and hold all parties involved in the delivery of care to greater account. The government should take the lead in providing health care, especially to underprivileged and rural areas. This includes both curative and preventative measures. The state must guarantee access to health care for all Indians by establishing and regulating a comprehensive health insurance program that covers the whole range of services offered by the public, private, and nonprofit sectors(14).

5.2 Implications of the Study

Significant challenges and barriers in rural healthcare infrastructure and staff availability are highlighted in the report. A key barrier to providing high-quality healthcare services is the shortage of medical experts and the absence of healthcare facilities and resources in rural areas. Inadequate funding, a lack of available facilities and resources, and gaps between urban and rural communities all contribute to making this problem worse. To overcome these obstacles and guarantee universal coverage and equitable service delivery, the study stresses the importance of government involvement in healthcare delivery, especially in developing countries.

This research has two main ramifications. First, it highlights the critical importance of investing in and improving rural healthcare infrastructure. Healthcare providers in remote areas have unique challenges, including a lack of resources and infrastructure. Especially in underdeveloped rural areas, governments and healthcare authorities should prioritize devoting resources to construct and maintain healthcare facilities. This involves facilitating access to telemedicine and other forms of remote healthcare by making sure that basic medical supplies are readily available in both urban and rural locations. Health inequalities between rural and urban areas can be decreased if the current gaps in healthcare facilities are fixed.

Second, the research stresses the significance of having an adequate number of properly qualified healthcare workers in rural locations. Access to primary healthcare services is constrained in rural areas due to a lack of medical experts. Investing in training programs, incentivizing healthcare professionals to work in rural areas, and implementing mechanisms for their equal distribution are all essential to overcoming this obstacle. Further, utilizing community health workers, traditional medical practitioners, and other allied health professionals can help improve primary healthcare delivery and fill in the gaps caused by a lack of medical expertise. The healthcare delivery system can become more inclusive and responsive to the requirements of rural communities by focusing on the development and deployment of a competent healthcare staff in rural areas.

5.3 Limitations

As it is a secondary analysis of existing data and literature available, some of the limitations listed below highlight gaps in a generalized way of rural health infrastructure and manpower, are mostly drawn from the detailed review of literature and not the data alone –

- Insufficient resources: Both developed and developing countries lack facilities, equipment, and technology, according to the report. In rural and remote places, this limits quality healthcare. Healthcare in these locations is hampered by financing and resource shortages.
- Disparities between urban and rural areas: The report notes that most healthcare resources are concentrated in metropolitan centers, whereas rural communities generally lack access to healthcare services. Rural residents have unequal healthcare access due to this inequality.
- Medical experts are few in rural and remote locations. The study emphasizes the necessity for enough competent healthcare personnel with sufficient knowledge and expertise to deliver quality rural healthcare. Medical experts are scarce in these areas, limiting healthcare delivery.
- Inadequate healthcare infrastructure: The study stresses the relevance of physical structures and support systems in healthcare delivery. Rural and remote locations lack enough health service infrastructures, which limits effective healthcare. Healthcare in these locations is hampered by poor infrastructure.
- The report notes the lack of training and healthcare professional distribution. Lack of investment and training, as well as competent workers migrating abroad, worsens the healthcare professional deficit. High-tech, specialist-delivered, hospital-based medical treatment has devalued primary care and evidence-based approaches.
- Governance and implementation issues: The study underlines the gap between healthcare system planning and implementation, particularly in developing nations. States adopt national health initiatives, but lack of coordination and management can lead to inefficient healthcare delivery. Governance issues and mismanagement impede health infrastructure and manpower growth.

It is particularly essential to address these constraints in order to improve healthcare access and quality in rural and remote locations.

5.4 Recommendations for Future Actions

The Integrated National Health System should have three primary desired outcomes:

- The delivery and provision of high-quality health services to all Indian people can be assured to rural communities when the infrastructural and personnel is strongly embedded in the healthcare systems.
- The financial burden of health care on individuals is kept at an affordable par.
- To give individuals the ability to take responsibility for their own health care and to hold the health care system accountable.
- Create a separate body to oversee the distribution of all types of medical personnel, including doctors, nurses, social workers, and administrators.
- Increase the effectiveness of community health workers by improving their training, compensation, and opportunities for advancement.
- Increased pay and other incentives, such as the opportunity to teach children in underserved areas, should be offered to entice employees to accept assignments there.
- In underserved areas, push for the establishment of medical schools and schools of nursing.¹

¹ The recommendations listed above are taken and later articulated from the paper Zodpey S, Negandhi H, Tiwari R. Human Resources for Health in India: Strategic Options for Transforming Health Systems Towards Improving Health Service Delivery and Public Health. *Journal of Health Management*. 2021 Mar;23(1):31–46.

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