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Assessment of Health and Wellness Centres/Ayushman Arogya Mandir in Jodhpur District, Rajasthan, India: A Facility-Based Cross-Sectional Study

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Abstract

Background

Health and Wellness Centres (HWCs), now renamed as Ayushman Arogya Mandir, are the cornerstone of comprehensive primary health care delivery under Ayushman Bharat. Systematic assessment of HWC functioning is essential for identifying implementation gaps and informing policy reforms.

Objectives

To assess infrastructure, human resources, service delivery, and essential medicine availability at HWCs and compare findings

Methods

A facility-based cross-sectional study was conducted across 24 HWCs. Structured self-administered questionnaires were completed by Community Health Officers (CHOs). Data on inputs and outputs from the selected 24 HWCs were analyzed using IBM SPSS Statistics for Windows, Version 28.0.

Results

Infrastructure deficiencies were pervasive: separate gender-segregated toilets were available in only 3 (12.5%) HWCs, fire safety devices in 5 (20.8%), and clean running water in 5 (20.8%). Class IV/sanitation workers were absent in all 24 HWCs (100.0%). ASHA/ANM availability was 23/24 (95.8%). Service delivery was comparatively strong, with childhood/adolescent health, family planning, communicable disease management, and NCD screening achieved at 24/24 (100.0%) HWCs. Among individual essential medicines, Antipyretics and Vitamins were most available (23/24; 95.8% each), while Antifungal agents and Antihistamines had the lowest availability (16/24; 66.7% each). The overall Medicine Readiness Score was 83.3% (140/168 possible observations). Seventeen HWCs (70.8%) stocked ≥ 80% of assessed essential medicines.

Conclusion

Significant infrastructure, sanitation staffing, and medicine gaps exist at the assessed HWCs. Targeted investment in sanitation infrastructure, Class IV worker deployment, and supply-chain strengthening is urgently required to bring HWCs into the Indian Public Health Standards (IPHS 2022) conformity.

Introduction

Health and Wellness Centres (HWCs), renamed as Ayushman Arogya Mandirs (AAMs), represent the foundation of India's Ayushman Bharat programme, one of the country's most ambitious healthcare reforms aimed at strengthening primary healthcare services and advancing Universal Health Coverage (UHC) (1). HWCs are mandated to deliver Comprehensive Primary Health Care (CPHC) services, including preventive, promotive, and screening services for Non-Communicable Diseases (NCDs)(2). To ensure uniform standards of service delivery, the Indian Public Health Standards (IPHS) provide detailed guidelines on infrastructure, human resources, service delivery, diagnostics, and the availability of essential medicines required for the effective functioning of these facilities.

Over the past few years, a large number of HWCs have become operational across the country. However, the extent to which these facilities meet the standards envisioned by the IPHS framework remains underexplored, particularly in routine field settings (3). Understanding the actual status of infrastructure, workforce availability, healthcare services, and medicine supply at the facility level is essential for identifying implementation gaps and strengthening the delivery of comprehensive primary healthcare.

Jodhpur district of Rajasthan comprises 14 administrative blocks and has a wide network of Health and Wellness Centres serving predominantly rural populations. Despite the rapid expansion of Ayushman Arogya Mandirs in the region, there is limited evidence regarding their operational readiness and compliance with IPHS standards. To address this gap, 24 Health and Wellness Centres were randomly selected from the 14 blocks of Jodhpur district, and data were collected using a structured assessment tool based on the IPHS 2022 guidelines.

The present study was undertaken to assess the status of HWCs across key domains, including infrastructure, human resources, service delivery, and essential medicine availability. In addition, the study aimed to identify operational challenges and areas requiring improvement in order to support the effective implementation of the Ayushman Bharat programme. The findings are expected to provide valuable insights for policymakers and programme managers and contribute to ongoing efforts to strengthen primary healthcare services in Rajasthan.

Methodology

Study Design and Setting

A facility-based cross-sectional study was conducted among Health and Wellness Centres (HWCs), also known as Ayushman Arogya Mandirs (AAMs), in Jodhpur district, Rajasthan. Jodhpur comprises 14 administrative blocks, from which 24 HWCs were selected using simple random sampling. The study was undertaken in accordance with the Indian Public Health Standards (IPHS) 2022 guidelines for Health and Wellness Centres.

Data Collection Tool and Procedure

Data was collected using a structured facility assessment questionnaire developed based on IPHS 2022 recommendations (**Supplementary File 1**). Information related to infrastructure, human resources, service delivery components, and availability of essential medicines was obtained through direct observation, verification of facility records, and interaction with healthcare personnel during site visits.

Domain-wise compliance was assessed using the formula:

Compliance (%) = (Available Components / Total Assessed Components) × 100

Gap analysis was performed using the formula:

Gap (%) = 100 − Availability (%)

Medicine Readiness (%) = (Total medicines available across all HWCs ÷ Total possible medicine-HWC observations) × 100

Data Analysis

Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics version 28.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the findings. Categorical variables were expressed as frequencies and percentages. The results were presented using tables and graphical representations.

Ethical Considerations

The study was conducted under the research project approved by the Institutional Ethics Committee of the ICMR–National Institute for Implementation Research on Non-Communicable Diseases (ICMR-NIIRNCD), Jodhpur, Rajasthan (subsequently renamed the ICMR–National Institute of Health Research [ICMR-NIHR], Jodhpur, with effect from 29 April 2026) (IEC Ref No- NIIRNCD/2022/002). The present facility assessment constituted a component of the broader approved research project. Written informed consent was obtained from all participants prior to data collection. Participation was voluntary, and confidentiality of the collected information was maintained throughout the study. All procedures involving human participants were performed in accordance with the ethical standards of the Institutional Ethics Committee and in compliance with the relevant guidelines and regulations.

RESULTS

Table 1 presents infrastructure availability across 24 HWCs. The highest infrastructure availability was recorded for fans, tube lights, and bulbs (14 HWCs; 58.3%) and road/walkway connectivity (13 HWCs; 54.2%). Biomedical waste management protocols were followed in 11 HWCs (45.8%). Proper electric supply and patient seating arrangement were each available in only 9 HWCs (37.5%). Critical deficiencies were recorded for water and sanitation infrastructure. Clean running water supply and functional fire

safety devices were each available in only 5 HWCs (20.8%). Gender-segregated toilets for male and female patients were present in only 3 HWCs (12.5%), representing the single greatest infrastructure gap.

Table 1
Availability of Infrastructure Components at Health and Wellness Centres/ Ayushman Arogya Mandir (n = 24)

S.No.	Infrastructure Component	Available n (%)	Not Available n (%)
1	Fans, tube lights, and bulbs	14 (58.3)	10 (41.7)
2	Connectivity (road or walkway) to HWC	13 (54.2)	11 (45.8)
3	Biomedical waste management protocols followed	11 (45.8)	13 (54.2)
4	Proper electric supply	9 (37.5)	15 (62.5)
5	Proper seating arrangement for patients	9 (37.5)	15 (62.5)
6	Fire safety devices are installed and functional	5 (20.8)	19 (79.2)
7	Clean running water supply	5 (20.8)	19 (79.2)
8	Separate toilets for males and females	3 (12.5)	21 (87.5)

HWC = Health and Wellness Centre; values expressed as frequency (percentage).

Human Resource Availability

Table 2 presents human resource availability. ASHA/ANM availability was reported at 23 of 24 HWCs (95.8%); one facility reported availability of ANM only (recoded as available), and one reported no ASHA/ANM. Class IV workers or sanitation staff were not available across all 24 HWCs (100.0% gap), constituting the most severe single human resource deficit identified in this study.

Table 2
Availability of Human Resources at Health and Wellness Centres (n = 24)

Human Resource Component	Available n (%)	Not Available n (%)
ASHA/ANM available at HWC*	23 (95.8)	1 (4.2)
Class IV workers/sanitation staff	0 (0.0)	24 (100.0)

**One HWC reported "Only ANM available"; recoded as available for binary analysis. ASHA = Accredited Social Health Activist; ANM = Auxiliary Nurse Midwife.*

Essential Medicine Availability

Table 3 presents individual essential medicine availability across the 7 assessed medicine categories, ranked from highest to lowest availability. Antipyretics and Vitamins recorded the highest availability (23

HWCs each; 95.8%), followed by Antibiotics (22 HWCs; 91.7%) and Analgesics (21 HWCs; 87.5%). Antiseptics were available at 19 HWCs (79.2%). Antifungal agents and Antihistamines recorded the lowest availability, each present at only 16 HWCs (66.7%).

Two HWCs reported additional medicines beyond the seven standard categories: one reported DOTS (for tuberculosis), antihypertensive, and antidiabetic medicines; another reported oral care, eye, and ear care preparations. These were noted but excluded from the standardised seven-medicine analysis to maintain comparability.

The overall Medicine Readiness Score, computed as the ratio of available medicine observations to total possible observations, was 83.3% (140 of 168 possible observations).17 HWCs (70.8%) had ≥ 80% of assessed essential medicines available, 5 HWCs (20.8%) had 50–79% available, and 2 HWCs (8.3%) had fewer than 50% of assessed medicines available. One HWC reported only 1 of 7 medicines (Antibiotics only; 14.3%), constituting the most severely medicine-deficient facility. One HWC reported 3 of 7 medicines (42.9%), also falling below the 50% threshold.

Table 3
Availability of Essential Medicines at Health and Wellness Centres (n = 24)

S.No.	Essential Medicine	Available n (%)	Not Available n (%)
1	Antipyretics	23 (95.8)	1 (4.2)
2	Vitamins	23 (95.8)	1 (4.2)
3	Antibiotics	22 (91.7)	2 (8.3)
4	Analgesics	21 (87.5)	3 (12.5)
5	Antiseptics	19 (79.2)	5 (20.8)
6	Antifungal	16 (66.7)	8 (33.3)
7	Antihistamines	16 (66.7)	8 (33.3)
Summary Indicators			
1.	HWCs with ≥ 80% of essential medicines available	17 (70.8)	—
2.	HWCs with 50–79% of essential medicines available	5 (20.8)	—
3.	HWCs with < 50% of essential medicines available	2 (8.3)	—
	Overall, Medicine Readiness Score†	**140/168 (83.3%)**	**28/168 (16.7%)**

† Medicine Readiness Score = (Total medicine-HWC available observations ÷ Total possible medicine-HWC observations) × 100 = (140 ÷ 168) × 100 = 83.3%.

Two HWCs reported additional medicines not included in the standard seven-category analysis (DOTS/anti-hypertensive/anti-diabetic; oral/eye/ear care preparations).

Service Delivery Coverage

Table 4 present service delivery coverage across nine CPHC domains. Five domains achieved full coverage at all 24 HWCs (100.0%): childhood and adolescent health care including immunization; family planning and contraceptive services; management of communicable diseases and general OPD; NCD prevention, screening and management; and NHP-linked communicable disease management (22/24; 91.7%). Basic oral health care was provided at 22 HWCs (91.7%) and mental health screening at 20 HWCs (83.3%). Care in pregnancy and childbirth was provided at 19 HWCs (79.2%), with two additional facilities reporting partial services. Neonatal and infant health care had the lowest service delivery coverage: only 14 HWCs (58.3%) reported providing this service, with 10 HWCs (41.7%) reporting non-availability.

Table 4
Availability of Service Delivery Components at Health and Wellness Centres (n = 24)

S.No.	Service Delivery Component	Provided n (%)	Not Provided n (%)
1	Childhood and adolescent health care including immunisation	24 (100.0)	0 (0.0)
2	Family planning, contraceptive services, and reproductive care	24 (100.0)	0 (0.0)
3	Management of communicable diseases and general OPD	24 (100.0)	0 (0.0)
4	Prevention, screening and management of non-communicable diseases	24 (100.0)	0 (0.0)
5	Management of communicable diseases (National Health Programmes)	22 (91.7)	2 (8.3)
6	Basic oral health care	22 (91.7)	2 (8.3)
7	Screening and basic management of mental health ailments	20 (83.3)	4 (16.7)
8	Care in pregnancy and childbirth*	19 (79.2)	5 (20.8)
9	Neonatal and infant health care	14 (58.3)	10 (41.7)

**Two HWCs reported partial care in pregnancy and childbirth; coded as "Yes" for aggregate reporting. OPD = Outpatient Department; NCD = Non-Communicable Disease; NHP = National Health Programme.*

Gap Analysis According to IPHS 2022 Standards

Table 5 presents a ranked gap analysis of all 26 assessed components across the four functional domains. Class IV/sanitation workers recorded a 100.0% gap, the highest single deficit. In the infrastructure domain, the top three gaps were gender-segregated toilets (87.5%), fire safety devices (79.2%), and clean running water supply (79.2%). Among medicine components, Antifungal agents and Antihistamines had the highest gaps (33.3% each), followed by Antiseptics (20.8%) and Analgesics (12.5%). Antibiotics, Antipyretics, and Vitamins had gaps of 8.3%, 4.2%, and 4.2%, respectively. Four service delivery domains showed a zero gap, indicating complete implementation at all 24 HWCs.

Table 5
Gap Analysis of Health and Wellness Centres According to IPHS 2022 Standards (n = 24)

Rank	Component	Domain	Gap (%)
1	Class IV workers/sanitation staff	HR	100.0
2	Separate toilets for males and females	Infra	87.5
3	Fire safety devices installed and functional	Infra	79.2
3	Clean running water supply	Infra	79.2
5	Proper electric supply	Infra	62.5
5	Proper seating arrangement for patients	Infra	62.5
7	Biomedical waste management protocols	Infra	54.2
8	Connectivity (road or walkway)	Infra	45.8
9	Neonatal and infant health care	Service	41.7
9	Fans, tube lights, and bulbs	Infra	41.7
11	Antifungal agents	Medicine	33.3
11	Antihistamines	Medicine	33.3
13	Antiseptics	Medicine	20.8
13	Care in pregnancy and childbirth	Service	20.8
15	Mental health screening and management	Service	16.7
16	Analgesics	Medicine	12.5
17	Antibiotics	Medicine	8.3
17	Basic oral health care	Service	8.3
17	NHP communicable disease management	Service	8.3
20	ASHA/ANM availability	HR	4.2
20	Antipyretics	Medicine	4.2
20	Vitamins	Medicine	4.2
23	Childhood/adolescent health and immunization	Service	0.0
23	Family planning and contraceptive services	Service	0.0
23	Communicable disease management (OPD)	Service	0.0
23	NCD prevention, screening and management	Service	0.0

Gap (%) = proportion of HWCs where the component was absent, not available, or not provided. HR = Human Resources; Infra = Infrastructure. Components with equal gap percentages share the same rank.

The gap analysis reveals a domain-specific pattern: infrastructure and human resource components drive the largest gaps, with five infrastructure parameters and one human resource parameter exceeding 50% gap. Medicine components cluster in the mid-range (4.2–33.3%), and service delivery components demonstrate predominantly low gaps (0–41.7%). The only service delivery component with a gap > 30% is neonatal and infant health care (41.7%), warranting focused programmatic attention.

Discussion

The present facility-based cross-sectional study assessed the readiness and functioning of 24 Health and Wellness Centres (HWCs)/Ayushman Arogya Mandirs in Jodhpur district, Rajasthan, using the Indian Public Health Standards (IPHS) 2022 framework. Overall, the findings revealed that service delivery was relatively well established across most facilities, whereas significant gaps persisted in infrastructure, support staffing, and selected categories of essential medicines. These findings suggest that frontline healthcare services are being delivered despite important constraints in facility readiness.

Infrastructure deficiencies constituted the most prominent challenge identified in this study. Separate toilet facilities, running water supply, fire safety devices, and reliable electricity were unavailable in a substantial proportion of HWCs, despite being essential requirements under IPHS 2022 standards (2). Similar infrastructure gaps have been reported from Bihar, Chhattisgarh, and Haryana, where deficiencies in sanitation facilities, water supply, and basic amenities were identified as major barriers to effective HWC functioning (12–14). Such shortcomings may adversely affect infection prevention practices, patient comfort, staff productivity, and overall quality of care.

With respect to human resources, the availability of ANM and ASHA personnel was encouraging and reflects the strengthening of frontline healthcare services under the National Health Mission (1). However, the lack of Class IV workers or sanitation staff across all surveyed HWCs represents a critical operational concern. Similar workforce-related challenges have been documented in studies conducted in Chhattisgarh, Jammu and Kashmir, and Madhya Pradesh, where shortages of key personnel adversely affected facility performance and service delivery (13,15,17). The findings highlight that effective primary healthcare delivery requires not only clinical personnel but also adequate support staff to maintain sanitation, waste management, and routine facility operations.

A notable strength of the present study is the assessment of individual essential medicine categories rather than relying solely on overall medicine availability indicators. Although the overall medicine readiness was satisfactory, important differences were observed across medicine groups and facilities. Antipyretics, vitamins, antibiotics, and analgesics were available in most centres, whereas gaps were identified in the availability of antifungal agents, antihistamines, and antiseptics. Previous studies have largely focused on overall medicine availability and logistics readiness (13,14,16), whereas the present

findings demonstrate that aggregate indicators may conceal clinically important shortages affecting routine patient care.

Service delivery emerged as the strongest-performing domain. Most HWCs reported providing maternal and child healthcare services, family planning services, communicable disease management, implementation of national health programmes, and non-communicable disease screening. Similar observations have been reported from Chhattisgarh, Haryana, Punjab, and Madhya Pradesh, where service delivery indicators generally performed better than infrastructure and logistics indicators (13,14,16,17). However, mental health services and oral healthcare services were not universally available, indicating ongoing challenges in implementing the expanded package of comprehensive primary healthcare services envisioned under Ayushman Bharat.

When assessed against IPHS 2022 standards, the surveyed HWCs demonstrated relatively stronger compliance in service delivery than in infrastructure and human resource readiness. This pattern is consistent with findings reported from several Indian states (12–17) and suggests that while the Ayushman Bharat programme has substantially expanded access to primary healthcare services, investments in infrastructure strengthening, support staffing, and medicine supply systems remain essential. Addressing these gaps will be critical for improving the quality, sustainability, and effectiveness of primary healthcare services delivered through Ayushman Arogya Mandirs.

Although limited by its sample size and geographic scope, this study provides valuable field-level evidence regarding the operational readiness of HWCs in rural Rajasthan. The findings may inform programme managers and policymakers in prioritizing interventions aimed at strengthening facility preparedness and achieving full compliance with IPHS standards. Further multicentric studies involving larger samples are warranted to generate more comprehensive evidence on the functioning of Ayushman Arogya Mandirs across diverse settings.

CONCLUSION

This facility-based cross-sectional study of 24 HWCs in a sub-district of Rajasthan demonstrates a consistent pattern of strength in service delivery alongside critical deficiencies in infrastructure and human resources. Gender-segregated toilets, clean water supply, fire safety, and electricity were absent in the majority of HWCs. Class IV sanitation workers were entirely absent across all facilities. Disaggregated essential medicine analysis revealed an overall Medicine Readiness Score of 83.3%, with Antifungal agents and Antihistamines showing the greatest gaps (33.3% each), and two HWCs stocking fewer than 50% of assessed medicines. Service delivery performance was relatively strong, with five of nine CPHC domains achieving full coverage. These findings highlight the urgent need for infrastructure investment, Class IV staff recruitment, and supply-chain strengthening to bring HWCs into conformity with IPHS 2022 standards. The medicine-disaggregated methodology employed in this study may serve as a replicable model for future large-scale HWC assessments under Ayushman Bharat.

Abbreviations

HWC
Health and Wellness Centre
AAM
Ayushman Arogya Mandir
IPHS
Indian Public Health Standards
CPHC
Comprehensive Primary Health Care
CHO
Community Health Officer
ASHA
Accredited Social Health Activist
ANM
Auxiliary Nurse Midwife
NCD
Non-Communicable Disease
OPD
Outpatient Department.

Declarations

Ethics approval and consent to participate

The study was approved by the Institutional Ethics Committee of ICMR–National Institute for Implementation Research on Non-Communicable Diseases (ICMR-NIIRNCD), Jodhpur, Rajasthan (Ref. No. NIIRNCD/2022/002). On 29 April 2026, the Institute was renamed as the ICMR–National Institute of Health Research (ICMR-NIHR), Jodhpur. Written informed consent was obtained from all participants prior to data collection. All procedures involving human participants were performed in accordance with the ethical standards of the Institutional Ethics Committee and in compliance with the relevant guidelines and regulations.

Consent for publication

Not applicable. No individual participant data, images, or identifying information are included in this manuscript.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' contributions

JKG and GD contributed equally to the conception and design of the study, data collection, data analysis, interpretation of the findings, and drafting of the manuscript. AK contributed to data collection and manuscript revision. PB provided overall supervision, critically reviewed the manuscript for important intellectual content, and guided the study throughout its execution. All authors read and approved the final manuscript.

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Supplementary Files

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- SupplementaryFile1questionnaire.docx