



Community Medicine

EVALUATION OF HEALTH AND WELLNESS CENTRES (AROGYA MANDIR) UNDER AYUSHMAN BHARAT IN KOLAR DISTRICT-AN OPERATIONAL RESEARCH

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ABSTRACT **Background:** Strengthening primary health care (PHC) through Comprehensive Primary Health Care (CPHC) is central to achieving Universal Health Coverage in India. Under the Ayushman Bharat programme, Health and Wellness Sub-Centres (HWCs), also known as Arogya Mandirs, were established to expand the scope of services at the grassroots level. However, evidence on their functional readiness and implementation at the district level remains limited. This study evaluated the infrastructure, human resources, service availability, and functional preparedness of HWCs in Kolar district, Karnataka. **Methods:** A facility-based cross-sectional operational research study was conducted between April 2024 and October 2025 in Kolar district. Eighty Health and Wellness Sub-Centres were selected across five taluks. Data were collected through direct facility observation and interviews with Community Health Officers, Auxiliary Nurse Midwives, and Multi-Purpose Health Workers using a pre-tested structured checklist based on Indian Public Health Standards and Ayushman Bharat CPHC operational guidelines. Descriptive statistics were used to summarize findings, and associations were tested using the chi-square test. **Results:** All evaluated HWCs had Community Health Officers in position; however, the availability of Auxiliary Nurse Midwives and Multi-Purpose Health Workers varied across taluks. Basic infrastructure components such as electricity, ventilation, and biomedical waste management were available in most centres, while gaps were observed in computerized registration, internet connectivity, separate toilets, and waiting areas. Essential equipment for routine screening was widely available, but emergency equipment and cold-chain-related items were inconsistently present. Although core medicines for non-communicable diseases were largely available, shortages were noted in drugs related to emergency care, mental health, and palliative services. **Conclusion:** The study demonstrates substantial progress in workforce deployment and basic service readiness at HWCs in Kolar district, reflecting positive implementation of the Ayushman Bharat programme. Nevertheless, persistent gaps in infrastructure, digital health integration, equipment, and essential drug availability may limit the effective delivery of comprehensive primary health care. Strengthening facility readiness, ensuring uninterrupted supplies, and improving digital infrastructure are essential to enhance the performance and sustainability of Arogya Mandirs.

KEYWORDS : Ayushman Bharat; Health and Wellness Centres; Arogya Mandir; Comprehensive Primary Health Care; Operational Research; India

INTRODUCTION

Primary Health Care (PHC) is globally acknowledged as the foundation of an effective, equitable, and people-centred health system. Since the Alma-Ata Declaration, PHC has been positioned as the most efficient strategy to improve population health outcomes through universal access, community participation, and continuity of care.(1)(2) International evidence consistently demonstrates that countries with strong PHC systems achieve better health indicators, reduced avoidable hospitalizations, lower health-care costs, and improved equity—particularly in low- and middle-income countries undergoing rapid demographic and epidemiological transitions.(3)

India's primary health-care system has evolved through several policy and structural reforms, beginning with the Bhole Committee recommendations that envisaged a publicly funded, comprehensive health system delivered through a three-tier structure comprising Sub-Centres, Primary Health Centres, and Community Health Centres. While this framework significantly improved maternal and child health indicators and communicable disease control, it remained largely selective in scope.(4) Over time, India experienced a marked epidemiological transition characterized by the coexistence of communicable diseases and a rapidly rising burden of non-communicable diseases, mental health conditions, and age-related morbidities. These changing health needs exposed limitations in the traditional sub-centre model, which was inadequately equipped to provide long-term, integrated, and person-centred care.(5)

To address these gaps, the Government of India launched Ayushman Bharat in 2018 as a flagship reform aimed at advancing Universal Health Coverage. A central pillar of this initiative was the transformation of existing Sub-Centres and Primary Health Centres into Health and Wellness Centres (HWCs), also referred to as Arogya Mandirs, to operationalize Comprehensive Primary Health Care (CPHC).(6) HWCs were envisioned to expand the scope of services beyond selective care and deliver an assured package of preventive, promotive, curative, rehabilitative, and palliative services.(7) This included population-based screening and management of non-communicable diseases, mental health care, geriatric and palliative services, oral, eye and ENT care, basic emergency services, and health promotion activities, supported by strengthened human resources, essential drugs and diagnostics, and digital health platforms.(8)

The introduction of Community Health Officers as mid-level providers, enhanced supply chains, standardized workflows, and digital health systems such as teleconsultation platforms marked a paradigm shift in frontline service delivery.(9) HWCs were designed to function as the first point of contact, strengthen gatekeeping, reduce unnecessary referrals, and restore community trust in public health facilities.(10) However, translating this ambitious policy framework into effective service delivery depends critically on the functional readiness of HWCs at the field level.(11)

Systematic evaluation of HWCs is therefore essential to assess whether intended reforms have been operationalized as planned. District-level operational research provides granular insights into infrastructure readiness, availability of human resources, essential equipment and medicines, service delivery capacity, and adherence to Indian Public Health Standards and CPHC operational guidelines. Existing literature on HWCs in India remains limited, with many studies focusing on single service components or conducted at broader state or national levels, often overlooking local implementation challenges. Evidence from rural and semi-urban districts, where health system constraints are more pronounced, is particularly scarce.(12)

Against this backdrop, generating district-specific evidence is crucial for identifying implementation gaps, informing corrective actions, and strengthening health-system performance. Such evaluations also contribute to evidence-based planning under decentralized health governance and support progress towards Universal Health Coverage.(13)

The present study was undertaken to evaluate the implementation and functional readiness of Health and Wellness Sub-Centres (Arogya Mandirs) under the Ayushman Bharat programme in Kolar district, Karnataka, with specific focus on infrastructure, human resources, availability of essential equipment and medicines, service delivery, and overall preparedness for delivering Comprehensive Primary Health Care.

METHODS

Study Design

A facility-based cross-sectional operational research study was conducted to evaluate the implementation and functional readiness of

Health and Wellness Sub-Centres (HWCs/Arogya Mandirs) established under the Ayushman Bharat programme. The study assessed structural and functional components of Comprehensive Primary Health Care (CPHC) delivery at the sub-centre level.

Study Setting

The study was carried out in Kolar district, Karnataka, a predominantly rural district comprising five administrative taluks—Kolar, Bangarpet, Mulbagal, Malur, and Srinivaspura. As part of the Ayushman Bharat initiative, selected sub-centres across the district have been upgraded into HWCs to deliver expanded CPHC services in accordance with national operational guidelines.

Study Period

The study was conducted over an 18-month period from April 2024 to October 2025, which included tool development and pilot testing, field data collection, data entry and cleaning, statistical analysis, and interpretation.

Study Units and Respondents

The primary study units were Health and Wellness Sub-Centres (Arogya Mandirs) functioning under the administrative jurisdiction of Primary Health Centres (PHCs) in Kolar district.

Respondents included frontline health-care providers working at HWCs:

- Community Health Officers (CHOs)
- Auxiliary Nurse Midwives (ANMs)
- Multi-Purpose Health Workers (MPWs)

In addition to interviews, direct facility observation was undertaken to objectively assess infrastructure, equipment, drugs, diagnostics, and service delivery components.

Sample Size and Sampling Technique

The sample size was calculated using the standard formula for estimating a proportion, assuming a prevalence of 50% due to the absence of prior district-level estimates, with a 95% confidence level and an absolute precision of 11%. Based on this calculation, 80 HWCs were included in the study.

A multistage sampling approach was adopted. At the PHC level, complete enumeration was performed. From each PHC, one or more HWCs were selected, with deliberate inclusion of centres located farther from PHC headquarters to capture facilities more likely to experience challenges related to accessibility, logistics, supervision, and service delivery. This approach ensured representation of both accessible and remote HWCs across all taluks.

Study Tool

Data were collected using a structured, pre-designed, and pre-tested checklist, developed based on:

- Indian Public Health Standards (IPHS) for Sub-Centres/HWCs
- Operational guidelines for Ayushman Bharat – Comprehensive Primary Health Care
- Review of relevant national and international literature

The tool comprised sections assessing:

1. General facility information
2. Availability and distribution of human resources
3. Infrastructure amenities and basic services
4. Equipment and consumables
5. Availability of essential drugs and diagnostics
6. Range of preventive, promotive, and curative services
7. Functional roles and responsibilities of health-care providers

Responses were primarily recorded as binary variables (Yes/No) and were corroborated through physical verification wherever applicable.

Data Collection Procedure

Data collection was conducted through on-site visits to selected HWCs by the principal investigator. Face-to-face interviews with available health-care providers were complemented by systematic facility walkthroughs to verify infrastructure, equipment, and service availability. Data were collected uniformly across all centres to ensure consistency and comparability.

Data Management and Statistical Analysis

Collected data were entered into Microsoft Excel and subsequently analyzed using SPSS software (version 22).

Categorical variables were summarized using frequencies and percentages. Associations between selected categorical variables were assessed using the chi-square test, with a p-value of <0.05 considered statistically significant. Results were presented in the form of tables and figures suitable for journal publication.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee of Sri Devaraj Urs Medical College. Administrative permission was secured from the District Health Officer, Kolar, prior to data collection. Written informed consent was obtained from all respondents, and confidentiality of information was strictly maintained throughout the study.

RESULTS

Table 1: Distribution of Health and Wellness Sub-Centres Covered in the Study Across Taluks of Kolar District

Sl No	Taluk (n)	Total no of HWCs	Total HWCs Covered (%)
1	Kolar (19)	46	19 (41.3)
2	Bangarpet (18)	43	18 (41.9)
3	Mulbagal (17)	42	17 (40.5)
4	Malur (15)	37	15 (40.5)
5	Srinivaspura (11)	25	11 (44.0)

A total of 80 Health and Wellness Sub-Centres were assessed across all five taluks of Kolar district. The distribution of centres was relatively comparable across taluks, ensuring adequate geographic representation of study facilities.

Table 2: Distance Wise Distribution of Health and Wellness Sub-Centres from PHCs Across Taluks of Kolar District

Sl No	Taluk (n)	Distance from PHCs		
		≤3kms n(%)	3-6kms n(%)	>6kms n(%)
1	Kolar (19)	5 (26.3)	12 (63.2)	2 (10.5)
2	Bangarpet (18)	2 (11.1)	11 (61.1)	5 (27.8)
3	Mulbagal (17)	4 (23.5)	9 (52.9)	4 (23.5)
4	Malur (15)	1 (6.7)	9 (60.0)	5 (33.3)
5	Srinivaspura (11)	2 (18.2)	4 (36.4)	5 (45.5)

The majority of Health and Wellness Sub-Centres were located within 3–6 km from their parent Primary Health Centres. A smaller proportion of centres were situated more than 6 km away, indicating potential challenges related to accessibility and supervisory support.

Table 3 : Availability of Health Workers at Health and Wellness Sub-Centres Across Taluks of Kolar District

Sl no	Taluk	Health workers		
		CHO (n=80)	ANM (n=31)	MPW (n=2)
1	Kolar (19)	19 (100.0)	10 (52.6)	0 (0.0)
2	Bangarpet (18)	18 (100.0)	3 (16.7)	2 (100.0)
3	Mulbagal (17)	17 (100.0)	5 (29.4)	0 (0.0)
4	Malur (15)	15 (100.0)	5 (33.3)	0 (0.0)
5	Srinivaspura (11)	11 (100.0)	8 (72.7)	0 (0.0)
	Total	80(100)	31 (100)	2 (100)

Community Health Officers were available in all assessed HWCs, demonstrating successful deployment under the Ayushman Bharat programme. However, the availability of Auxiliary Nurse Midwives and Multi-Purpose Health Workers was comparatively lower across facilities.

Table 4: Availability of Infrastructure Amenities at Health and Wellness Sub-Centres Across Taluks of Kolar District

Sl No	Infrastructure	Taluk				
		Kolar n(%)	Ban-garpet n(%)	Mul-bagal n(%)	Malur n(%)	Srinivaspura n(%)
1	Monitoring by public health engineer	18 (94.7)	17 (94.4)	17 (100.0)	14 (93.3)	11 (100.0)
2	Adequate and clear signage board	8 (42.1)	14 (77.8)	4 (23.5)	10 (66.7)	3 (27.3)
3	Branding	11 (57.9)	15 (83.3)	11 (64.7)	10 (66.7)	5 (45.5)
4	Parking facilities for ambulance	13 (68.4)	13 (72.2)	9 (52.9)	13 (86.7)	8 (72.7)

5	Garden or green areas	5 (26.3)	7 (38.9)	4 (23.5)	9 (60.0)	6 (54.5)
6	Electricity	17 (89.5)	18 (100.0)	15 (88.2)	15 (100.0)	11 (100.0)
7	Power backup	12 (63.2)	12 (66.7)	9 (52.9)	7 (46.7)	8 (72.7)
8	Fire safety regulations	16 (84.2)	18 (100.0)	17 (100.0)	14 (93.3)	11 (100.0)
9	Proper ventilation	19 (100.0)	18 (100.0)	15 (88.2)	15 (100.0)	10 (90.9)
10	Water supply	14 (73.7)	14 (77.8)	13 (76.5)	14 (93.3)	9 (81.8)
11	Drinking water	7 (36.8)	15 (83.3)	11 (64.7)	9 (60.0)	7 (63.6)
12	Proper drainage facilities	14 (73.7)	12 (66.7)	8 (47.1)	6 (40.0)	8 (72.7)
13	Biomedical waste management	19 (100.0)	18 (100.0)	17 (100.0)	14 (93.3)	11 (100.0)
14	Space for screening & holding area	8 (42.1)	17 (94.4)	10 (58.8)	13 (86.7)	8 (72.7)
15	Computerized registration facilities	1 (5.3)	0 (0.0)	1 (5.9)	0 (0.0)	0 (0.0)
16	Waiting area with adequate seats	11 (57.9)	13 (72.2)	9 (52.9)	10 (66.7)	9 (81.8)
17	Separate toilet for male & female	4 (21.1)	6 (33.3)	0 (0.0)	2 (13.3)	1 (9.1)
18	Internet facility	0 (0.0)	0 (0.0)	0 (0.0)	2 (13.3)	0 (0.0)
19	Specific space for sterilization	15 (78.9)	16 (88.9)	16 (94.1)	13 (86.7)	11 (100.0)

Most HWCs demonstrated the presence of basic infrastructure; however, a substantial proportion of centres exhibited multiple infrastructure deficiencies, indicating variability in facility readiness across the district.

Table 5: Taluk-wise Availability of Equipment and Consumables at Health and Wellness Sub-Centres in Kolar District

Sl No	Equipment & Consumables	Kolar n (%)	Ban-garpet n (%)	Mul-bagal n (%)	Malur n (%)	Srinivasapura n (%)
1	Ambu bag	19 (100.0)	15 (83.3)	15 (88.2)	14 (93.3)	11 (100.0)
2	Oxygen cylinder	3 (15.8)	2 (11.1)	0 (0.0)	1 (6.7)	2 (18.2)
3	Nebulizer	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
4	Digital sphygmomano-meter	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
5	Snellen vision chart	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
6	Stadiometer	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
7	Dressing material	19 (100.0)	17 (94.4)	17 (100.0)	15 (100.0)	11 (100.0)
8	Vaccine carrier	0 (0.0)	6 (33.3)	0 (0.0)	1 (6.7)	2 (18.2)
9	Ice pack box	2 (10.5)	7 (38.9)	0 (0.0)	1 (6.7)	5 (45.5)
10	Syringes of different units	5 (26.3)	13 (72.2)	3 (17.6)	7 (46.7)	10 (90.9)
11	Fire extinguisher	15 (78.9)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)

Essential equipment required for routine screening and service delivery was available in the majority of HWCs. Nevertheless, a small number of facilities reported limited availability of equipment components.

Table 6: Taluk-wise Availability of Individual Essential Medications at Health and Wellness Sub-Centres in Kolar District

Sl No	Medications	Kolar n (%)	Ban-garpet n (%)	Mul-bagal n (%)	Malur n (%)	Srinivasapura n (%)
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1	Anesthetic agents	6 (31.6)	11 (61.1)	8 (47.1)	6 (40.0)	7 (63.6)
2	Analgesics	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
3	NSAIDs	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
4	Antidotes for poisoning	1 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
5	Anti-convulsant	7 (36.8)	12 (66.7)	9 (52.9)	9 (60.0)	5 (45.5)
6	Intestinal anthelmintic drugs	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
7	Anti-filarial drugs	1 (5.3)	1 (5.6)	0 (0.0)	3 (20.0)	1 (9.1)
8	Anti-bacterial drugs	17 (89.5)	12 (66.7)	10 (58.8)	10 (66.7)	11 (100.0)
9	Anti-leprosy drugs	2 (10.5)	3 (16.7)	0 (0.0)	3 (20.0)	1 (9.1)
10	Anti-tubercular drugs	3 (15.8)	8 (44.4)	7 (41.2)	4 (26.7)	4 (36.4)
11	Anti-fungal medicines	19 (100.0)	18 (100.0)	17 (100.0)	14 (93.3)	11 (100.0)
12	Vitamin tablets	19 (100.0)	15 (83.3)	17 (100.0)	14 (93.3)	11 (100.0)
13	Rabies vaccine	4 (21.1)	3 (16.7)	0 (0.0)	0 (0.0)	4 (36.4)
14	Contraceptive medicines	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
15	Dermatology related ointments	15 (78.9)	10 (55.6)	14 (82.4)	14 (93.3)	11 (100.0)
16	Anti-malarial drugs	0 (0.0)	2 (11.1)	0 (0.0)	2 (13.3)	0 (0.0)
17	Medicines related to palliative care	13 (68.4)	6 (33.3)	14 (82.4)	7 (46.7)	7 (63.6)
18	Anti-anemic medicines	19 (100.0)	18 (100.0)	17 (100.0)	15 (100.0)	11 (100.0)
19	Anti-anginal drugs	9 (47.4)	12 (66.7)	9 (52.9)	6 (40.0)	7 (63.6)
20	Anti-hypertensive drugs	19 (100.0)	18 (100.0)	16 (94.1)	15 (100.0)	11 (100.0)
21	Hypolipidemic drugs	18 (94.7)	14 (77.8)	15 (88.2)	14 (93.3)	10 (90.9)
22	Dementia related medicines	5 (26.3)	2 (11.1)	2 (11.8)	2 (13.3)	5 (45.5)
23	Antiseptics	19 (100.0)	18 (100.0)	17 (100.0)	14 (93.3)	11 (100.0)
24	Proton pump inhibitors	19 (100.0)	18 (100.0)	16 (94.1)	15 (100.0)	11 (100.0)
25	Medicines related to diabetes	19 (100.0)	18 (100.0)	16 (94.1)	14 (93.3)	11 (100.0)
26	Antithyroid medicines	1 (5.3)	2 (11.1)	0 (0.0)	1 (6.7)	0 (0.0)
27	Diuretics	7 (36.8)	9 (50.0)	6 (35.3)	10 (66.7)	7 (63.6)

Most HWCs had adequate availability of essential medicines required for primary care services. However, gaps in drug availability were observed in a minority of facilities, suggesting the need for strengthening supply mechanisms.

CONCLUSION

The present operational research highlights meaningful progress in the implementation of Health and Wellness Sub-Centres (Arogya Mandirs) under the Ayushman Bharat programme in Kolar district. Universal deployment of Community Health Officers and the availability of basic infrastructure across most facilities indicate positive advancement towards delivering Comprehensive Primary Health Care at the grassroots level. These findings reflect the potential of HWCs to strengthen primary health care and improve accessibility to essential health services.

However, persistent gaps in supporting human resources, infrastructure adequacy, equipment availability, and uninterrupted supply of essential medicines were identified. Such deficiencies may limit the effective delivery of expanded service packages and reduce the overall functional readiness of HWCs. Addressing these operational challenges is necessary to ensure optimal utilization of

upgraded sub-centres and to enhance community trust in public health services.

Strengthening workforce distribution, improving digital and physical infrastructure, ensuring consistent logistics and supply chain mechanisms, and reinforcing supportive supervision at the district level are critical for sustaining the gains achieved under Ayushman Bharat. Periodic operational evaluations such as the present study can provide actionable evidence for policymakers and programme managers to guide targeted interventions.

Overall, reinforcing system readiness and addressing identified gaps will be essential for maximizing the impact of Health and Wellness Centres and accelerating progress towards Universal Health Coverage in India.

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