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Performance of health and wellness centre in providing primary care services in Chhattisgarh, India

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Abstract

Introduction Primary health care has regained its importance in global policy making. In 2018, the Government of India initiated the Ayushman Bharat - Comprehensive Primary Health Care (AB-CPHC) programme. It was based on upgrading the existing primary health facilities into Health and Wellness Centers (HWCs). The current study aimed to assess the readiness and performance of HWCs in providing comprehensive primary health care services in India's Chhattisgarh state.

Methods We conducted a cross-sectional health facility assessment with a state-representative sample of 404 HWCs. A standardized health facility survey tool was used to collect information on essential inputs and service outputs of HWCs. The expected population healthcare needs were estimated using secondary sources. The performance of HWCs was assessed by comparing the volume of services provided against the expected population need for outpatient care.

Results On an average, 358 outpatients including 128 non-communicable disease (NCD) patients were treated monthly at an HWC. HWCs were able to cover 31% of the total population's health need for outpatient care, 26% for hypertension, and 21% for diabetes care. In addition to services for reproductive and child health, HWCs provided services for common acute ailments (cold, cough, fever, aches and pains); infections of skin, eye, ear, and reproductive tract, and minor injuries. HWCs were also contributing significantly to national disease control programmes. Acute ailments followed by NCDs and communicable diseases had the largest share among services provided. The key gaps were in coverage of mental illnesses and chronic respiratory diseases. Most of the HWCs showed adequate readiness for the availability of required human resources, supplies, and infrastructure.

Conclusion HWCs were able to provide a comprehensive range of primary care services and able to cater to a sizable portion of the rural population's acute and chronic health care needs. The performance was made possible by the adequate availability of medicines, staff, training programmes and tele-consultation linkages. If HWCs in other states

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are able to reach a similar level of performance, the initiative will prove to be a game changer for equitable primary care in India.

Keywords Primary Health Care (PHC), Health and Wellness Centers (HWC), Community Health officers (CHO), Performance, Non-communicable disease (NCD)

Background

Primary health care (PHC) has regained its importance as a pivotal strategy for enhancing population health [1]. The Astana declaration in 2018 emphasized PHC as a key approach to and achieving universal health coverage (UHC) [2]. Due to its cost-effectiveness and emphasis on equity, PHC is especially relevant to the health systems of low- and middle-income countries (LMICs). In alignment with the global agenda, India also pledged to revise its primary care strategy in the National Health Policy 2017 [3]. In 2018, the government of India launched the Ayushman Bharat programme with the aim of providing UHC [4]. The Ayushman Bharat programme has two components; first Ayushman Bharat – Comprehensive Primary Health Care (AB-CPHC) and second Pradhan Mantri Jan Arogya Yojan (AB-PMJAY). AB-CPHC is aimed at strengthening primary care facilities to deliver a comprehensive range of primary health care services close to where the population live [4]. AB-PMJAY is a flagship national health insurance scheme to cover 500 million persons for hospitalization expenses [5].

India has a tiered system of rural health facilities - Sub-health centers (SHCs) for 3000–5000 population, primary health centers (PHCs) for 20,000–30,000 population, and Community Health Centers (CHCs) as the first referral units covering 80,000–120,000 population [6]. AB-CPHC programme is an architectural change in the public health system and it involves upgrading existing primary care facilities i.e., the sub-health centers (SHCs) into Health and Wellness Centers (HWCs) [4]. HWCs are envisaged to be the key facilities to deliver CPHC aimed at ensuring continuity of care with a life span approach on all aspects of population health needs and each HWC serves a 3000–5000 population [4, 6]. HWCs are expected to enroll and follow the entire catchment population and actively offer an expanded range of services, such as treatment for common illnesses, appropriate referral, ensuring continuity of care for chronic diseases, dispensing of medicines, and point-of-care diagnostic tests. A most important addition to primary care through HWCs is screening, diagnosis, and follow-up care for non-communicable diseases (NCDs) [4].

To operationalize HWCs existing SHCs were upgraded by augmenting human resources, strengthening infrastructure, improving the provision of drugs and diagnostics and use of technology, and digitization [4]. The major human resources reform in the operationalization of HWC was the addition of a Mid-Level Healthcare

Provider (MLHP) designated as a Community Health Officer (CHO) [7]. The CHOs are nursing graduates with an additional six-month training in the practice of community health nursing. HWCs have introduced the concept of a primary care team; the CHO, along with the auxiliary nurse midwife (ANM), the multi-purpose worker (MPW), and 5–10 community health workers (CHWs), forms the primary care team at HWC [4].

The central Indian state of Chhattisgarh has been at the forefront of CPHC reforms, beginning with a pilot initiation of HWCs in 2017. Five years after implementation, very limited evidence is available about the overall functionality of HWCs in Chhattisgarh, and other states. A few existing studies in India described the clinical competence of CHOs, facility readiness, time spent on NCD care, the motivation level of CHOs, and their challenges in health systems [8, 9]. However, there is limited or no evidence on the overall performance of HWCs in catering to population health needs. Though HWCs are expected to provide CPHC including preventive, promotive, and rehabilitative care, no assessments are available of their performance in delivering curative primary care. Making curative primary care available to people close to where they live is an important component of PHC and studies have found Indian health systems to be deficient in delivering it [10].

Therefore, this study aimed to assess the service delivery readiness and performance of HWCs in providing curative primary care services. The specific objectives were to assess the essential inputs and service delivery outputs of HWCs.

Methods

Study design

This was a cross-sectional study involving a quantitative assessment of health facilities that included operational HWCs in the state of Chhattisgarh. The health facility survey was conducted from August to October 2023.

Study setting

Chhattisgarh is one of the poorest states in India with a predominantly rural population. The state has a total population of 30 million. Around one-third of the population of Chhattisgarh is a vulnerable social group known as the Scheduled Tribes (STs) [11]. When the state was split off from a larger state in 2000, it took with it a deficient healthcare system and a dire scarcity of medical personnel. When it came to NCDs, there was an acute

service shortage in the public health system. The latest data showed that the state has a maternal mortality of 137 per 100,000 live births and infant mortality of 38 per 1000 live births. The state has 31.3% of under-five age children underweight [12]. The state also has a higher prevalence of malaria, tuberculosis, and leprosy. Among the adult age group, 10% had blood sugar levels > 140 mg/dl and 16.3% had hypertension [13, 14].

The state has a three-tier healthcare delivery system named primary, secondary, and tertiary level. It starts from Sub-health Centers which are being upgraded to HWCs covering 3000–5000 population. It has Primary Health Centers (PHCs) for 20,000–30,000 population and Community Health Centers (CHCs) as the first referral units covering 80,000–120,000 population and district hospitals as tertiary healthcare centers [6].

All 5200 SHCs in the state are expected to be upgraded into HWCs. Currently, in state 3350 SHC-HWC are operational with a CHO posted [15].

Sampling

A two-stage sampling was adopted to select the HWCs for the facility survey. In the first stage, more than 50% of districts (18 out of 33) of the state were selected randomly from five administrative divisions of Chhattisgarh. In the second stage, HWCs were chosen through systematic random sampling from a district-wise list of HWCs that had been operating for more than a year with a CHO posted. There were variations in the number of HWCs in each district. To have a fair representation from each district, HWCs were covered in proportion to the total HWCs in each sample district. The required sample size for health facility assessment was 386 HWCs. It was calculated using an absolute precision of 5% and a confidence level of 95%. The study aimed for a 10% additional sample and was able to cover 404 HWCs.

Chhattisgarh is a predominantly tribal state and among 18 selected districts 9 (50%) were tribal districts. Under the National Health Mission, Chhattisgarh is considered a high-priority state and it has five high-priority districts. Among these five districts, we have included three high-priority districts named Bilaspur, Jashpur, and Sarguja.

Data collection

For data collection, a structured health facility survey tool was developed (Supplementary File S1). The facility assessment tool was developed and standardized by following the operational guidelines of Health and Wellness Centers. The data of facility assessment was collected in Google form. Data was collected by district consultants working with the State Health Resource Center, Chhattisgarh. All of them had post-graduate degrees in public health. They spent around 4–6 hour at each HWC for data collection. The information collected through record

review, observation, and staff interviews was recorded in a structured survey tool. The tool was pilot-tested before finalization. The facility assessment tool had information in two broad categories – 1. Essential inputs – Human resources, drugs, diagnostics, Infrastructure and capacity buildings, and 2. Service delivery outputs. The list of expected inputs and outputs was based on the operational guidelines for HWCs issued by the Ministry of Health and Family Welfare, Government of India [4].

To collect data related to above mentioned categories tool was divided into four parts as follows:

1. The first part covered the profile of sample HWCs in terms of population coverage, remoteness, and years of operationalization. This part also covers the human resources available in HWCs and socio-demographic characteristics of mid-level providers (CHOs) and their training details. This data was collected by interviewing the CHOs.
2. The second part covered infrastructure readiness, telemedicine, ambulance services, and biomedical waste management. This data was collected through observation, record review, and interview of the primary care team.
3. The third part covered the inputs on the availability of essential medicines and diagnostic services at HWC. For assessment 30 important medicines covering the larger health needs were taken from the recent Essential Medicine List (EML) of the state. This information was gathered through physical verification of supplies and by review of stock registers.
4. The fourth part covered the service delivery outputs of HWCs. It captures the range of primary care services delivered. This information was collected from service delivery records available at HWC.

Data analysis

Data were imported into MS Excel and analyzed using SPSS version 20. We have analyzed data descriptively and presented it as mean, confidence interval at 95%, frequency, and percentages. The service delivery outputs for CPHC services were analyzed for five major categories: reproductive and child health (RCH), communicable diseases, NCDs, emergency care, and common acute ailments.

The performance of HWCs was assessed against the expected healthcare needs of the catchment population. The performance of HWCs was measured in terms of a monthly number of out-patient visits and NCD patients. The expected healthcare need for outpatient care and NCD care was calculated from recent studies in Chhattisgarh [13]. The calculation of HWC performance on

Table 1 General profile of HWCs (n = 404)

Profile	No. of HWCs (%)
Average number of villages covered under HWC	4
HWC Operational duration	
1–2 years	206 (50.9%)
More than 2 years	198 (49.1%)
Type of population coverage area	
HWCs in tribal areas	200 (49.5%)
HWCs in non-tribal areas	204 (50.4%)
Population coverage	
1000–3000	67 (16.5%)
3000–5000	166 (41%)
More than 5000	171 (42.3%)
Distance (in Kilo meters) of HWC from District Head Quatres	
Less than 10	38 (9.4%)
11–25	84 (20.8%)
26–40	113 (28%)
More than 40	169 (41.8%)
Distance (in Kilo meters) of nearest CHC from HWC	
Less than 10	138 (34.2%)
11–20	134 (33.2%)
21–30	64 (15.8%)
More than 30	68 (16.8%)
Distance (in Kilo meters) of nearest PHC from HWC	
Less than 5	145 (35.9%)
6 to 10	112 (27.7%)
more than 11	147 (36.4%)

outpatient care and NCD care (for hypertension and diabetes) was described in Additional File 1. A recent study on measuring UHC in India has used similar indicators [16]. A study on health facility performance in India has also used similar measures [17].

Ethics declaration

The study was conducted in accordance with the National Ethical Guidelines for Biomedical and Health Research Involving Human Participants Issued by the Indian Council of Medical Research. The study was approved by the Institute Ethics Committee of the State Health Resource Center (SHRC), Chhattisgarh, India (L. No./1469/SHRC/21.09.2022). Informed consent was taken from HWC staff before data collection including interviews and their confidentiality was maintained.

Results.

General profile of HWCs

The profile of HWCs included in this study is shown in Table 1. On average, an HWC covered four revenue villages and a population of 5083. An HWC's average distance from the state and district headquarters was 229 km and 40 km, respectively. An HWC was located on average 11 km away from the closest PHC and 19 km

Table 2 Infrastructure readiness of HWCs (n = 404)

Infrastructure details	No. of HWCs (%)
Clinic time displayed	291 (72%)
Brandings and appropriate signage	368 (91.1%)
Water supply	
Running water	345 (85.4%)
Nearby tubewell (hand operated)	20 (4.9%)
Poor access to water	39 (9.6%)
Electricity supply	398 (98.5%)
Functional toilets	
No toilet	39 (9.7%)
One toilet	199 (49.3%)
Two or more toilets	166 (41%)
Functional labour room	366 (90.6%)
Functional baby warmer	217 (53.7%)
Availability of refrigerator	309 (76.4%)
Color-coded bins available	389 (96.3%)
Hub and Needle cutter available	399 (98.8%)
Method of sterilization used	
Autoclave	53 (13.1%)
Boiling	351 (86.9%)
Deep pit constructed	207 (51.2%)
Sharp pit constructed	197 (48.8%)

away from the nearest CHC. Around two-thirds of the HWCs were located more than five kilometers away from any PHC.

Infrastructure readiness of health and wellness centers

Around three-fourth (72%) of HWCs have displayed the clinic timings and external branding and appropriate signage were done in 91% of facilities. Most of the HWCs (85%) had running water supply, around 90% had at least one functional toilet, and all most all (98%) had electricity. Around 91% have functional labour rooms, more than half (54%) had functional baby warmers, and three-fourths (76%) have refrigerators. Most of them (96%) had colour-coded bio-medical waste collection bins, hub and needle cutters and half of them had deep and sharp pits constructed. Around 45% of the HWCs had utilized ambulance services at least once during a month. Information on the infrastructural readiness of HWCs is shown in Table 2.

Human resources readiness of health and wellness centers

All the HWCs had a CHO posted. Majority of HWCs (96%) had an additional paramedical staff posted and of that around half of the HWCs (51%) have two paramedical workers posted. More than half of the CHOs (55%) had done the 6-month Community Health Certificate (CHC) bridge course after their bachelor's degree in nursing and the rest had undergone an integrated course where CHC curricula were part of their nursing degree. Almost all the CHOs had had received multiple rounds

training on standard treatment protocols and most of the paramedical staff (ANM & MPW) have received training for common ailments. The characteristics of human resources working at HWC are shown in Table 3.

A majority of CHOs (83%) were below age of 30 years and around 90% were female. Almost 72% of the CHOs were posted in a HWC located in their respective native districts. Around half (45%) stayed in the same village where they were posted and around 23% had residential facilities in the HWC. HWCs have a provision for the formation of Jan Arogya Samiti (JAS). 99.2% of the HWCs had formed JAS and doing monthly meetings. JAS serves as an institutional platform for community participation. (Table 3).

Table 3 Characteristics of the primary care team working at health and wellness centers ($n=404$)

Characteristics of Primary Care Team	No. of HWCs (%)
HWCs with CHOs posted	404 (100%)
Paramedical health workers posted (Axillary-nurse cum midwife (ANM) and Multi-purpose health worker)	
One	120 (29.7%)
Two	205 (51%)
Three	63 (16%)
Vacant	16 (4%)
Trainings of CHO	
CHOs with 6 months of community health nursing bridge course after nursing graduation	223 (55.2%)
CHOs with integrated nursing courses (covering community health nursing)	181 (44.8%)
Additional in-service training of CHOs on Standard Treatment Protocols	394 (97.5%)
Training of paramedical health workers on common diseases	337 (83.4%)
Profile of Community Health Officers (CHOs)	
Age (CHO)	
22–25 year	123 (30.4%)
26–29 years	215 (53.2%)
30–33 years	59 (14.6%)
> 33 years	7 (1.7%)
Gender (CHO)	
Female	366 (90.6%)
Male	38 (9.4%)
Whether CHO posted in the native district	292 (72.3%)
Location of CHO's residence	
Within the same village	180 (44.6%)
Outside the village	224 (55.4%)
Type of residence CHO has	
Government building at HWC	92 (22.8%)
Own house	170 (42.1%)
Rented house	142 (35.1%)
Formation of Jan Arogya Samiti in HWC	401 (99.2%)

Availability of drugs and diagnostics at health and wellness centers

The mean availability and stock-out of important essential drugs at HWCs are given in Table 4. Almost all the HWCs have a fair availability of various class of essential medicines. However, the medicines used in the treatment of mental illnesses were stocked out in the majority of the HWCs.

The availability of essential drugs at HWCs is shown in Table 4.

The availability of essential diagnostics kits at HWC is shown in Table 5. The majority of the centers have the availability of rapid kit-based diagnostic tests for pregnancy, malaria, urine (albumin/sugar), and sickle cell disease. The majority of HWCs were providing sputum collection services for tuberculosis.

Comprehensive range of primary care services provided by health and wellness centers

On an average 358 OPD patients including 128 NCD patients were treated monthly at HWCs. Among NCD patients, 93 received monthly medicines from HWCs while others received screening and follow-up care. More than half (58%) of the HWCs conducted more than 20 digital teleconsultations per month, whereas 22% of HWCs had done none.

The profile of curative services provided at HWC is shown in Fig. 1. Acute illnesses had the largest share in the volume of services provided at HWC, followed by care for NCDs, communicable diseases, RCH services, and emergency care (3%).

Among acute illnesses, the major conditions treated at HWC were pain, common cold and fever. Along with the communicable diseases under national disease control programmes, HWCs also provided care for skin infections, eye and ear infections and reproductive tract infections. In addition to the numbers reported here, there were services provided by the HWC primary care team as a part of outreach services, especially the RCH services (antenatal care, immunization, home visits for RCH services). Care related to pregnancy and childbirth was also provided at HWCs and on average 2 (2–3) deliveries were conducted monthly. Almost 75% of the HWCs conducted at least one delivery per month. HWCs provided primary care for minor injuries and burns. The disease-specific volume of primary care services is shown in Table 6.

Major value addition in HWC services was screening, ensuring diagnosis, dispensing medicines, and follow-up care for NCD services, especially for hypertension and diabetes.

Table 4 Stock-out of important essential medicines at HWCs ($n = 404$)

Essential medicines	No. of HWCs with stock-out (%)
Analgesics and Antipyretics medicines	
Tablet Diclofenac sodium 50 mg	8.9%
Syrup Paracetamol 125mg 5 ml	4.9%
Tablet Paracetamol 500 mg	0.5%
Anti-Infective	
Tablet Amoxicillin 500 mg	4.2%
Antimalarial	
Tablet Chloroquine 150mg	38.4%
Gastrointestinal medicines	
Antacid Aluminum Hydroxide	6.9%
Syrup Ondansetron 2 mg 5 ml/30 ml	15.8%
Tablet Domperidone 10mg	37.6%
Vitamins & Minerals	
Calcium Elemental with Vitamin D	10.6%
ORS Pouches	2.5%
Antiallergics	
Tablet Cetirizine 10mg	4%
Ophthalmological preparations	
Ciprofloxacin Eye drop 5 ml	14.1%
Psychotherapeutic medicines	
Tablet Clonazepam 25 mg	91.8%
Tablet Escitalopram 5 mg	94.8%
Anti-diabetic	
Tablet Metformin 500 mg	0
Dermatological medicines	
Permethrin Lotion 1ww 50 ml	24.5%
Povidone Iodine Ointment	7.4%
Tablet Fluconazole 200 mg	17.1%
Clotrimazole Cream	12.6%
Cardiovascular medicines	
Tablet Amlodipine 5 mg	1.5%
Solutions correcting electrolyte	
Ringer lactate IV Fluids	8.7%
Medicine acting on respiratory tract	
Syrup Salbutamol 2mg/5ml	42.8%

Table 5 Availability of essential diagnostic kits at HWCs ($n = 404$)

Diagnostic tests	No. of HWCs where available (%)
Hemoglobin Test	288 (71.2%)
Rapid test for pregnancy	379 (93.8%)
Rapid kit for Malaria	383 (94.8%)
Kit for Sickle cell solubility test	353 (87.3%)
Rapid kit for Hepatitis B	262 (64.8%)
Rapid kit for VDRL	203 (50.2%)
Rapid kit for Urine (Albumin/sugar)	331 (81.9%)
Sputum collection done for tuberculosis screening (preceding month)	378 (93.6%)

Performance of Health and wellness centers in coverage of population health need

The performance of HWCs in coverage of population health needs for out-patient and for NCD care is shown in Table 7. HWCs were able to cover the one-third (31%) of the total population's health need for out-patient care. In terms of care for NCDs, HWCs were able to cover around one-fourth (26%) of the total population need for hypertension care and around one-fifth (21%) in case of diabetes.

Since Chhattisgarh is a predominantly tribal-populated state, we calculated the performance of HWCs for tribal and non-tribal (rural) districts. The monthly outpatient performance of HWCs in tribal and non-tribal districts was 36% (34–38) and 34% (32–36) respectively. Also, the performance of HWCs in hypertension and diabetes care in tribal areas was 29% (27–32) and 22% (21–24) as compared to performance in rural areas i.e., 29% (27–32) and 24% (22–26) respectively.

Discussion

The current study has assessed the service delivery readiness and performance of HWCs in terms of coverage achieved of population health needs for curative primary care. Findings showed that a majority of HWCs had reached readiness in terms of the essential inputs required for service delivery. The assessment showed that HWCs were providing services to cover a variety of primary care including acute ailments, NCDs, communicable diseases, RCH, and minor injuries. HWCs catered to a substantial share of the estimated need for outpatient care, hypertension, and diabetes. To the best of our knowledge, this was one of the first large-scale studies in India that has assessed the performance of HWCs in providing CPHC services.

Poor availability of infrastructure adversely affects service provisioning whereas sound infrastructure promotes the quality of care, patient trust, and well-being [19]. Ten years ago, a study of five North Indian states reported that less than one-fifth of the SHCs had electricity supply, water connection, and functional toilets [20]. The current study showed that more than four-fifths of HWCs had the above three utilities and amenities. Along with this a report on public health facility and solarisation reported that in 2021 state has solarized almost 99% of SHC/HWC for power backup [21]. This represents a remarkable improvement in the basic infrastructure of SHCs with their upgradation into HWCs. HWC program also has various platforms for community participation such as Jan Arogya Samiti (JAS), Village Health Sanitation and Nutrition Committee (VHSNC) [4]. This committee has members of the community who participate in the decision-making of activities related to patient wellness and community interventions. Strengthening

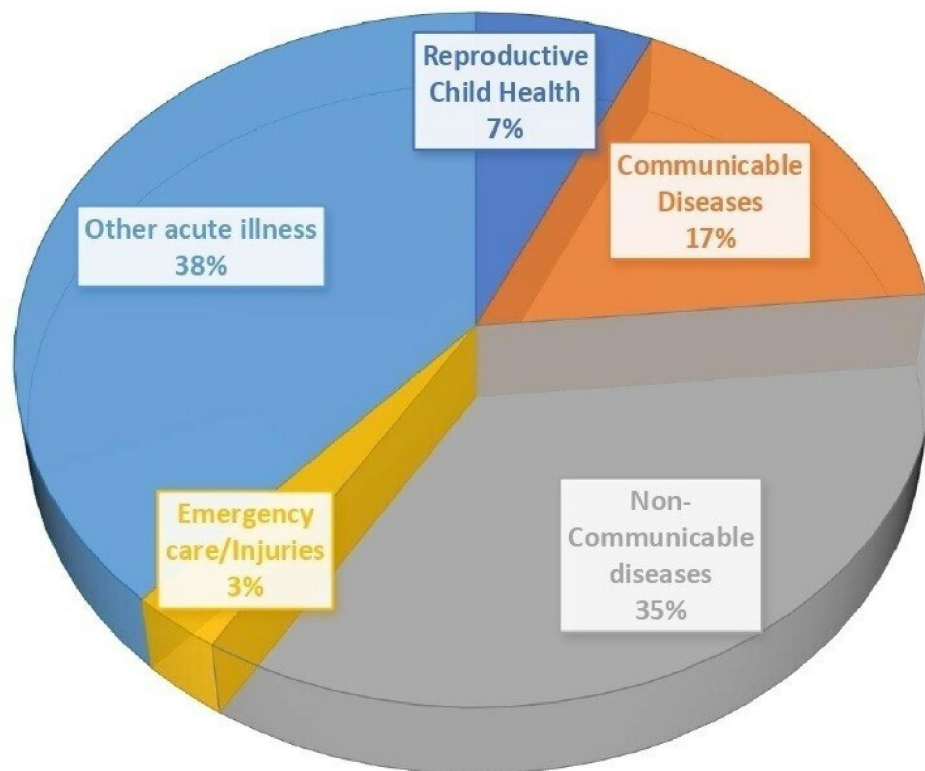


Fig. 1 Share of clinical services provided by health and wellness centers

these community platforms can play an important role in demand generation and delivery of CPHC services.

The availability of essential medicines and point-of-care diagnostics is an essential element of services expected at HWCs [4]. Our study found that most of the HWCs had the required tests. The essential medicines for the management of common ailments and infections, hypertension, diabetes, and emergency care were available. The availability of medicines for mental illnesses was poor. CHOs at HWC do not prescribe medicines for chronic diseases. However, they dispense the medicines prescribed by the Medical Officers or specialists from the higher centers.

The availability of adequate human resources is the most important prerequisite to service delivery. HWCs brought in a major change in this regard through the concept of a primary care team that includes CHO, paramedical staff, and community health workers each assigned specific roles and responsibilities [20, 22]. The current study found that most of the HWCs had one or more paramedical staff in addition to the CHO. Notably, CHOs have demonstrated satisfactory clinical skills and the potential to provide care for common ailments, including non-communicable diseases (NCDs) [22]. A majority of the CHOs had received multiple rounds of in-service training in addition to the mandatory pre-service training. The in-service-job training programme for the

primary care team focused on standard treatment protocols (STP) for common primary care conditions [4, 23]. Another finding was that around three-fourths of the CHOs had been posted in their native districts. This is important because earlier studies have shown the advantages of better rural retention of health staff when they get an opportunity to work in areas they belong to and their greater motivation to serve due to their cultural affinity with local communities [24].

HWCs are mandated to provide a comprehensive range of outpatient department (OPD) services closer to the community [4]. Our assessment showed that HWCs were able to provide a considerable range of services and came close to meeting the comprehensive primary care needed. An experience from the Punjab state showed that HWCs provided ante-natal checkups, family planning services, and screening for hypertension, and oral and breast cancer [9]. Our study found that in addition to the above, HWCs also provided treatment for common acute ailments (cold, cough, fever, aches and pains); infections of skin, eye, ear, and reproductive tract; NCDs (hypertension and diabetes), and minor injuries. HWCs were also contributing significantly to national disease control programmes such as malaria, tuberculosis, leprosy, and sickle cell disease. In the past, most of the above services were not offered at SHCs. The advantage of HWCs was that they brought all these services closer

Table 6 Primary care services delivered at HWCs - disease wise visits of patients per month

	Mean (95% CI)
a. Reproductive and Child Health	
Ante-natal care	16 (16–18)
Post natal care	7 (6–8)
Deliveries	2 (2–3)
Newborn illness	1 (0.2-1)
Sub-total (a)	26 (25–28)
b. Communicable Diseases	
Diarrhea	11 (10–12)
ARI/Pneumonia	1 (0.6-1)
Tuberculosis follow up	2 (1–2)
Reproductive tract infection	2 (1–2)
Skin infection	17 (15–19)
Ear infection	6 (6–7)
Eye infection	22 (19–25)
Malaria	1 (0–1)
Sub-total (b)	62 (56–66)
c. Non-Communicable diseases	
Hypertension cases	81 (76–86)
Diabetes cases	40 (38–43)
Sickle cell cases	2 (1–2)
Epilepsy cases	1 (0.7-1)
Suspected Cancer cases	4 (3–4)
Sub-total (c)	128 (92–129)
d. Emergency care/Injuries	
e. Other acute ailments	
Fever	41 (37–43)
Cold and cough	45 (42–50)
Aches and pains	52 (48–57)
Sub-total (e)	138 (142–161)
Total (a + b + c + d + e)	358 (336–382)

to the community. As the services of HWCs were offered free of cost to patients, it reduced the out-of-pocket expenditure and holds promise to lower the overall costs of care in health systems [25].

The services being provided closely matched the availability of related medicines in HWCs. A provision that has helped HWCs in catering to a wide variety of health needs is of teleconsultation. The present study showed that most of the HWCs had functional teleconsultation services. This has empowered the CHOs to provide treatment for a variety of illnesses and reduced the need for referring patients to higher facilities. Yet, further improvements are needed in teleconsultation services to meet some important health needs that were poorly covered by HWCs including mental illnesses, epilepsy, and chronic respiratory diseases.

The most important finding of the current study is on the performance of HWCs in coverage of expected population need for out-patient care and NCD care. HWCs are a new architectural adjustment in healthcare delivery systems to provide gatekeeping for acute and chronic care ailments. The assessment showed that HWCs were able to cover around one-third of the total population's health needs for outpatient care. In 2019, when very few HWCs had got operationalized, a demand side assessment in Chhattisgarh had reported that all types of public facilities together accounted for 40% share of out-patient care [13]. The present study found that the HWCs alone were able to fulfill 31% of the population's need for outpatient care. Considering that India has a vast diversity of providers of outpatient care, a single type of facility (HWC) being able to cover around one-third of the outpatient care visits is remarkable.

Table 7 Performance of health and wellness centers in coverage of actual health needs of the population

Performance of HWC in coverage of out-patients need				
Indicator	Average Population covered by HWC	*Expected monthly out-patients (A)	Average Monthly out-patients at HWC (B)	Performance of HWC on coverage of population health need (B/A) (CI)
Monthly out-patients	5083	1144	359	31% (29–34)
*Population health need - A recent study on demand side assessment in Chhattisgarh reported 2700 out-patient visits in 1000 population per month [13]				
Performance of HWC in NCD care				
Indicator	*Target Population at risk of NCD	#Expected monthly patients (A)	Average monthly patients at HWC (B)	Performance of HWC on coverage of population health need (B/A) (CI)
Hypertension cases on follow up	1881	307	81	26% (24–28)
Diabetes cases on follow up	1881	188	40	21% (20–22)
*Target Population at risk of NCDs- 37% of the population is of above 30 years age [18]. # Expected number of NCD patients - A recent community-based study in Chhattisgarh showed 16.3% prevalence of Hypertension [14] whereas a state representative sample from a national survey showed 10% prevalence of diabetes in above 30 age group [12]. As per current guidelines, a NCD patient is expected to visit a health facility every month.				

Hypertension and diabetes are the two most common NCDs and we found that HWCs were able to cover around one-third and one-fifth of the estimated patients respectively. Earlier NCDs were treated mainly at secondary or tertiary facilities in India [26, 27]. A recent study had shown that HWCs through their screening services were effective in detecting the NCDs in the population, thereby opening the path to their management [28]. The current study shows that HWCs are playing a big role in the management and follow-up of hypertension and diabetes. However, HWCs still need to provide services for many non-communicable diseases such as chronic respiratory diseases, mental illness, and cancers.

The experience of HWCs in Chhattisgarh seems to be similar to other Southeast Asian countries such as Thailand and Sri Lanka, where equitable primary care services were expanded by upgrading the public sector facilities [29, 30]. Thailand also implemented a model of deploying mid-level health providers at the primary care level which led to a significant improvement in services. This also helped Thailand in improving quality of clinical care by reducing the share of the unqualified informal private providers in healthcare utilization [29]. We expect a similar change in Indian states where HWCs are able to reach a comparable level of performance in service delivery. Multilateral agencies like the World Health Organization (WHO) also support and advocate the quality-of-care improvement and certification for HWCs in Chhattisgarh [31].

The HWC program has been able to make the reach of NCD services to the remotest and tribal areas of the state, particularly for hypertension and diabetes. This showed that the HWC program can cater to the comprehensive healthcare needs of the population. To sustain and enhance the programme, it is imperative for the central and state governments to consistently invest in HWCs. The required support includes sustained funding and ensuring the supply of essential medicines and diagnostics. CHOs, being a new cadre of the health workforce, will need continuous capacity building and support to play their role in clinical activities as well as in the management responsibilities of HWCs and primary care teams.

Novelty of the study In addition to the large sample of HWCs surveyed, our study has several strengths. To our knowledge, this is the first study to assess the performance of HWCs in terms of delivering services and relating them to the expected healthcare needs of the population. The study provides important operational insights for the policymakers and programme implementers to evaluate and improve HWCs for meeting the aim of CPHC.

Study limitations The study used the facility survey data to assess the performance of HWCs and no feedback was collected from the patients or community representatives. Demand side studies and regression analysis are needed to supplement and confirm the findings on the performance of HWCs. A significant volume of services is provided by primary care teams of HWCs, especially the ANM and community health workers, through outreach activities. However, the study did not include the outreach services and covered only the facility-based part of the contribution HWCs are making. The study was focused on curative care and did not assess the promotive, preventive, and rehabilitative care services expected from HWCs.

Conclusion

The current study concludes that the AB-CPHC initiative is bearing fruit in Chhattisgarh though these are early experiences. HWCs were able to provide a comprehensive range of primary care services and covered a sizable share of the rural population's acute and chronic care needs. HWCs might prove to be a crucial architectural modification that made a big difference to provision of primary care services for India's population.

Abbreviations

AB-CPHC	Aayushman Bharat Comprehensive Primary Health Care
ANM	Auxiliary Nurse Mid-wife
AB-PMJAY	Ayushman Bharat Pradhan Matri Jan Aarogya Yojna
CHC	Community Health Centre
CHO	Community Health Officer
CHW	Community Health Worker
HWC	Health and Wellness Centre
LMIC	Low- and Middle-Income Country
NCD	Non-Communicable Diseases
PBI	Performance based Incentive
PHC	Primary Health Care
SHC	Sub Health Centre
UHC	Universal Health Coverage

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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Not applicable.

Author contributions

SG and NT contributed to the study design; NT and PP contributed to writing of the manuscript; NT, PP, SSB, SKR analyzed the data; SG, and VRK reviewed the manuscript and provided supervisory support; NT, SG, PP, SSB, SKR contributed to design of tools. AP, AS, AB, CB, VA, AS, RR, AG, MG, SA, RS, MA, SG, JS, DY, PS contributed to the data collection. All authors read and approved the final manuscript.

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Data availability

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

Declarations**Ethics approval and consent to participate**

The study conducted in accordance with the National Ethical Guidelines for Biomedical and Health Research Involving Human Participants Issued by Indian Council of Medical Research. The study was approved by the Institute Ethics Committee of the State Health Resource Center (SHRC), Chhattisgarh, India (L. No./1469/SHRC/21.09.2022). Informed consent was taken from HWC staff before data collection including interviews and their confidentiality was maintained.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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