

Effectiveness of the health and wellness centers in improving identification and primary care of non-communicable diseases in Chhattisgarh State of India

Samir Garg¹, Narayan Tripathi¹, Kirtti K. Bebarta¹, Narendra Sinha², Ankita Tiwari²

¹State Health Resource Centre, Raipur, Chhattisgarh, India, ²National Health Mission, Chhattisgarh, India

ABSTRACT

Introduction: India launched a national initiative named Health and Wellness Centres (HWCs) in 2018 to provide population-based primary care including for the non-communicable diseases (NCDs) in rural areas. The current study assesses whether operationalization of HWCs improved the detection of NCDs and increased the share of public sector facilities in providing NCD services. **Methods:** Two rounds of household surveys were conducted in rural Chhattisgarh in 2019 and 2022. With a focus on NCDs, the household survey covered a representative sample of individuals above the age of 30 years – 2760 individuals in 2019 and 2638 in 2022. Multi-variate regression analysis was carried out to determine effects of HWCs on identification of NCDs and utilization of public sector services. **Results:** The population covered by HWCs had 25% greater chance of being identified with NCDs as compared to the population without HWCs (AOR = 1.25, $P = 0.03$). The NCD patients living in areas covered by HWCs had 70% greater chance of utilizing the public healthcare facilities (AOR = 1.70, $P = 0.01$). In the population covered by HWCs, the share of the public sector in NCD care increased from 41.2% in 2019 to 62.1% in 2022, whereas the share of informal private providers dropped from 23.5% in 2019 to 8.4% in 2022. **Conclusion:** The HWCs showed effectiveness in increasing detection of NCDs at the population level and bringing a larger share of NCD patients to utilize public sector services. They can prove to be a crucial architectural correction for improving primary care service delivery for NCDs and other population health needs in India.

Keywords: CPHC, Health and Wellness Centre, NCD care, public health system

Introduction

The escalating burden of non-communicable diseases (NCDs) is a major problem for population health globally.^[1] India and China account for a big share of the growth in the global NCD burden.^[2,3]

Address for correspondence: Mr. Narayan Tripathi, State Health Resource Centre, Additional Technical Capacity to Department of Health and Family Welfare, Raipur, Chhattisgarh, India. E-mail: narayanptripathi@gmail.com

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Hypertension and diabetes mellitus are two of the leading NCDs in India. Around 31% of the Indian population in the age range of 30–79 years is estimated to have hypertension. What is extremely alarming is that around 60% of those with hypertension in India are not aware that they have the condition.^[4] The same is true for diabetes mellitus and many other NCDs.^[5] This reflects the gap in population-based screening for NCDs in India. With poor availability of public sector services, a large share of the NCD patients forgo care or face large out-of-pocket expenditure for treatment.^[6,7] To

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deliver comprehensive primary health care (CPHC) including NCD services on the ground, the Indian government launched an initiative named Health and Wellness Centres (HWCs) in 2018.^[8,9] Each HWC is expected to cover around 5000 population.^[10] The HWCs are being created by upgrading the existing lowest level facilities known as the sub-centers. The key addition for each HWC is of a mid-level health provider known as the Community Health Officer (CHO). This cadre has been produced by providing 6 months of additional training to graduate nurses. The HWCs also got upgraded in terms of infrastructure and the range of diagnostics and medicines.^[9] The HWCs also seek to provide the continuity of care through referral linkages for complicated illnesses to higher public facilities.^[9]

Due to their proximity to people, HWCs offer the opportunity to screen the target population for NCDs, especially for hypertension and diabetes. Those in high risk are actively called by Accredited Social Health Activist (ASHA) community health workers to HWCs for screening. Those screened positive for hypertension or diabetes undergo further measurements and consultations for diagnosis which the CHO manages with support of the telemedicine linkages with medical doctors. Once the diagnosis is confirmed, the patients are put on treatment. Each NCD patient is expected to visit the HWC monthly for follow-up and collect their medicines from the CHO. The CHOs conduct daily out-patient clinics, and it allows them to carry out opportunistic screening.

Around 100,000 HWCs had become operational across rural India by 2022.^[11] A time motion study on staff in HWCs in Punjab showed that CHOs spent 40% of their time on NCD services.^[12] Rapid assessments in Meghalaya and Manipur have reported on high motivation of CHOs alongside the systemic constraints they face.^[13,14] A facility survey of HWCs in Punjab assessed their readiness in terms of having essential inputs such as infrastructure, workforce, and medicines.^[15] But there is no quantitative evaluation available on whether the HWCs have led to improvement in NCD care in India. The current study was aimed to provide an assessment on two of the key objectives of HWCs, that is, whether the operationalization of HWCs has improved the detection of NCDs among the population aged above 30 years and whether a greater share of patients now utilize the public sector services for NCD care.

Subjects and Methods

Study setting

The study was conducted in Chhattisgarh, a state in central India. A non-profit organization in Chhattisgarh called Jan Swasthya Sahayog played a pioneering role in initiating the HWCs. The state government conducted a pilot on HWCs in 2017 in a district called Korba. The national roll out of HWCs also got launched from Chhattisgarh on April 14, 2018. By the end of 2022, a total of 2650 HWCs had become operational in rural areas of the state. The study was approved by the institutional

ethics committee of State Health Resource Centre on date 21/03/2019.

Chhattisgarh is one of the poorer states in India. Around three-fourth of its population lives in rural areas. The scheduled tribes (STs), a vulnerable social group in India, constitute 31% of Chhattisgarh's population.^[16] The state was carved out of a bigger state in year 2000, and it inherited a weak health system with a severe shortage of health workforce.^[17] The shortage of services was particularly severe in the case of the NCDs.^[18]

Sampling for household survey

Two waves of household surveys were conducted in 2019 and 2022. The surveys used a representative sample of rural Chhattisgarh. The household survey covered around 1200 households each year. The sample selection involved multiple stages. The state has five geographical divisions, and one district was selected randomly from each division. Eight villages were selected by using systematic random sampling out of the total list of villages in each sample district. Since the study was focused on NCDs, the individuals above the age of 30 years were included in the survey. The surveyors interviewed all available individuals above the age of 30 years in every alternate household in the sampled villages. In both waves of the survey, the same set of sample households were interviewed.

For a 5% detectable difference at 95% confidence, the minimum sample size required for current study was 384. The survey covered 2760 individuals above the age of 30 years in 2019 and 2638 in 2022. The sample size covered was adequate for the statistical analysis required for the study.

Data collection

A structured interview questionnaire was used to collect data on household characteristics (caste, family size, and monthly household consumption expenditure) and individual characteristics (sex, age, education, and marital status).

A chronic disease was defined as any illness continuing for more than 3 months. During household survey, the individuals were asked whether they suffered from a chronic condition. For individuals who did not report any chronic disease in response to the above question, the surveyors further probed by asking about 17 specific chronic conditions. Those individuals who reported chronic diseases were asked about the type of provider they were utilizing for treatment at the time of survey.

Data analysis

The list of study variables is given in Additional File S1. For analysis, the population covered was divided in two groups – population with a functional HWC and those without a functional HWC. Cross-tabulations were used to find out the share of different types of providers in treating NCDs. Multi-variate regression analysis was carried out to find out the effect of HWCs in identification of NCD cases. The data were analyzed using STATA-15.

Results

Sample profile

The socio-demographic profile of individuals interviewed in the two waves of the household surveys is given in Table 1.

In 2019, only 7.1% of the population was covered by an HWC and it increased to 47.1% by 2022.

Detection of NCDs

Table 2 shows the results of multi-variate regression analysis on the determinants of identification of chronic diseases from the household survey. It shows that individuals in the richest quintile had a greater chance of being identified with an NCD as compared to the poor quintile. Women were more likely to get identified with NCDs than men. The likelihood of NCDs increased with age. Individuals living in HWC areas had 25% greater chance of being identified with NCDs as compared to those living in non-HWC areas (AOR = 1.25, $P = 0.03$).

Type of health providers accessed

Figure 1 shows the type of providers utilized for chronic NCDs in areas with and without HWCs. It shows that the share of public sector providers in utilization for NCD care did not change from 2019 to 2022 in non-HWC areas, whereas the share of the public sector increased from 41.2% in 2019 to 62.1% in 2022 in the HWC areas. Simultaneously, the share of unqualified informal providers dropped from 23.5% in 2019 to 8.4% in 2022.

The results of the logistic regression model on determinants of utilizing public sector health providers for NCDs are given in Table 3.

Table 3 shows that individuals belonging to the scheduled tribes were more likely to use public sector services for NCD care than private providers. Individuals living in HWC areas had 70% greater chance of utilizing public providers for NCD care

Characteristic	Category	Year 2019 n=2760	Year 2022 n=2638
Social Group (Caste)	Scheduled Tribes	37.1	39.52
	Scheduled Castes	12.74	10.68
	Other backward classes	49.05	48.18
	Others	1.09	1.64
Sex	Male	50.41	50.39
	Female	49.58	49.6
Age Category	30-44 years	46.36	47.64
	45-59 years	32.64	32.4
	60 years or above	20.99	19.94
Education	No formal education	42.47	40.35
	Primary school	23.89	24.04
	High school	23.89	24.16
	Graduation or above	9.74	11.43
Individuals living in an area covered by a HWC		7.1	47.1

as compared to those living in non-HWC areas (AOR = 1.70, $P = 0.01$).

Discussion

This is one of the first evaluations of India's HWC initiative on their role with respect to the NCDs. It showed that the HWCs were effective in increasing the detection rate of NCDs through population-based screening. This is highly significant considering that a majority of people with NCDs in India are unaware of their condition which puts them at a grave risk of severe outcomes.^[4]

The areas covered by HWCs showed a remarkable jump in the share of NCD patients accessing public sector services. This is important as NCD services in the public sector in India involve much lower out-of-pocket expenditure for patients than utilizing the private sector.^[7] Also, HWCs brought the services closer to where people live, and this can reduce the costs further. But HWCs can be useful only if they continue to receive adequate supplies of essential medicines for NCDs. Studies from other parts of the country have reported some gaps in this regard.^[12-15]

The increase in share of the public sector was accompanied by a sharp decrease in the share of unqualified or informal private providers. This is very significant from the quality-of-care perspective. Unqualified providers often offer poor-quality services, and it can be especially true for NCDs. In this regard, the experience in Chhattisgarh seems to be similar to countries such as Thailand and Sri Lanka, where the unqualified private providers were pushed out by expansion of primary care services of the public sector.^[19] It showed that while the formal private sector was unable to replace the poor-quality informal private sector, making reasonable quality public sector services available was able to do so. Sri Lanka and Thailand offer the leading examples as models of providing equitable primary health care in low- to middle-income countries.

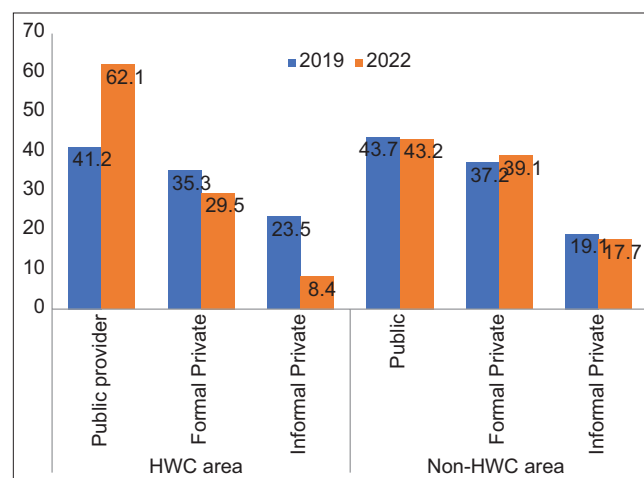


Figure 1: Share (%) of different types of providers accessed by NCD patients in HWC areas and non-HWC areas in 2019 and 2022 (n = 724)

Table 2: Results of logistic regression model for determinants of identification of NCDs (n=5273)

Variables and categories	Adjusted Odds Ratio (AOR)	P	95% CI	
Household Size	0.92	<0.01	0.88	0.95
Caste (Social Group)				
Scheduled Tribes	1			
Scheduled Castes	1.54	<0.01	1.19	2.01
Other Backward Classes	1.28	0.01	1.06	1.54
Others	2.28	0.01	1.25	4.17
Per-capita Household Consumption Expenditure Quintile				
Q1 (Poorest)	1			
Q2 (Poor)	1.00	1.00	0.79	1.27
Q3 (Middle)	0.93	0.59	0.71	1.22
Q4 (Rich)	1.24	0.13	0.94	1.62
Q5 (Richest)	1.46	0.01	1.10	1.95
Sex				
Male	1			
Female	1.41	<0.01	1.18	1.68
Age Category				
30-44 Years	1.00			
45-59 Years	4.35	<0.01	3.55	5.33
60 Years or above	7.29	<0.01	5.80	9.16
Education				
Not Literate	1			
Primary	0.87	0.21	0.70	1.08
High school	0.95	0.69	0.74	1.22
Graduation or above	0.95	0.75	0.67	1.33
Living in an area covered by an HWC				
Non-HWC area	1			
HWC area	1.25	0.03	1.02	1.54
Year				
2019	1			
2022	0.96	0.18	0.90	1.02

A significant feature of the Indian HWCs similar to Thailand's model is of task sharing and task shifting between medical doctors and mid-level health providers such as the CHOs.^[20] The creation of the primary care team combining the existing community health workers, paramedical staff, and newly inducted CHOs also seems to be an important advancement similar to Thailand's primary care system.

Earlier in India, NCDs were mostly diagnosed and treated at the secondary or tertiary care level. The services were out of reach for a big part of the rural population, especially the poorer sections. The operationalization of HWCs has opened up the pathways for equitable management of NCDs at the primary care level.

The results of the current study suggest that the central and state governments in India should continue to support this initiative through measures such as strengthening the skills of CHOs, improving availability of essential medicines, and facilitating HWC teams including the ASHA community health workers to carry out screening and follow-up for NCDs.

Though the HWC policy is beginning to show some significant results as highlighted in the current study, these are still early days for HWCs. It remains to be seen how far the improved rates of

detection are accompanied by effective follow-up of patients and control of the NCDs.

The HWCs still have a long way to go in ensuring services for a wider range of NCDs. As of now, their effectiveness is largely limited to hypertension and diabetes. There are many NCDs, for example, epilepsy, mental illnesses, and cancers, that afflict people in large numbers and require further attention for development of primary care services.

Further research is recommended to measure the impact of HWCs on specific diseases and health outcomes along with the factors underlying the extent of their effectiveness.

Limitations

The current study did not collect data on the out-of-pocket expenditure incurred by patients. The health outcomes of the NCD patients were not studied.

Conclusion

The HWCs represent a crucial architectural correction in the design of a public health system in India. They seem to have made a promising start as the programmatic engine to provide

Table 3: Results of logistic regression model for determinants of using public sector for NCD care – Results of logistic regression model (n=724)

Variables and categories	Adjusted Odds Ratio (AOR)	P	95% CI	
Household Size	0.99	0.78	0.92	1.06
Caste (Social Group)				
Scheduled Tribes	1			
Scheduled Castes	0.37	<0.01	0.23	0.60
Other Backward Classes	0.38	<0.01	0.27	0.56
Others	0.43	0.11	0.15	1.19
Per-capita Household Consumption Expenditure Quintile				
Q1 (Poorest)	1			
Q2 (Poor)	0.82	0.40	0.52	1.30
Q3 (Middle)	0.82	0.45	0.49	1.37
Q4 (Rich)	0.92	0.75	0.55	1.55
Q5 (Richest)	0.71	0.21	0.41	1.21
Sex				
Male	1			
Female	1.28	0.18	0.90	1.82
Age Category				
30-44 Years	1			
45-59 Years	1.23	0.32	0.82	1.83
60 Years or above	1.41	0.11	0.92	2.17
Education				
Not Literate	1			
Primary school	0.71	0.10	0.47	1.07
High school	0.86	0.55	0.53	1.41
Graduation or above	0.85	0.63	0.44	1.65
Living in an area covered by an HWC				
Non-HWC area	1			
HWC area	1.70	0.01	1.16	2.48
Year				
2019	1			
2022	1.09	0.17	0.97	1.22

comprehensive primary health care in India. They showed effectiveness in increasing the detection of NCDs at the population level. They also showed success in bringing a larger share of NCD patients to utilize the public sector services. This is likely to improve not only the access to NCD care but also its affordability and quality. The large-scale implementation of HWCs across the country offers the hope of achieving faster progress in expanding the primary care services including for the NCDs.

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Conflicts of interest

There are no conflicts of interest.

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Additional File S1

List of variables

Household Size (in numbers)	
Caste (Social Group)	Scheduled Tribes Scheduled Castes Other Backward Classes Others
Per-capita Household Consumption Expenditure Quintile	Q1 (Poorest) Q2 (Poor) Q3 (Middle) Q4 (Rich) Q5 (Richest)
Sex	Male Female
Age Category	30-44 Years 45-59 Years 60 Years or above
Education	Not Literate Primary High school Graduation or above
Living in an area covered by an HWC	Non-HWC area HWC area
Year	2019 2022
