International Journal of Community Medicine and Public Health
Gairanlung T et al. Int J Community Med Public Health. 2026 Jul;13(7):3608-3614
https://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20262257

Original Research Article

Health facility assessment on the readiness to provide basic health-care interventions for management of non-communicable diseases based on the World Health Organization-package of essential non-communicable disease intervention in Manipur

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Received: 02 April 2026
Accepted: 14 June 2026

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ABSTRACT

Background: As disease pattern of the world is transitioning from communicable to non-communicable diseases (NCD), it is pertinent to study how ready the health facilities are to handle this changing burden. This study was done to assess the readiness of government health facilities in Manipur to provide essential NCD intervention as per the WHO-PEN guidelines.
Methods: A cross-sectional study was conducted across government health facilities in Manipur during 2022 to 2025. The DHs and CHCs were selected by universal sampling while PHCs were selected by Simple random sampling method. The facilities were assessed using a structured checklist adapted from the WHO-PEN facility assessment consisting of nine domains.
Results: A total of 53 health facilities were assessed covering 35 from valley and 18 from hill districts out of which 62% were PHCs. All three types of facilities were prepared in the domains of patient care services, human resources/staff, and outreach activities as the scores in these domains are above the cutoff of 70%. In the records and reports, monitoring and evaluation, and referral systems domains, PHCs and CHCs were not prepared, but only DHs were. All the three categories of facilities were not prepared in the crucial areas of medications, technologies, and tools.
Conclusions: The study concluded that PHCs were not ready to manage NCDs while CHCs and DHs were ready.

Keywords: Health Facility, NCD, Preparedness, WHO-PEN

INTRODUCTION

As most countries of the world have shifted from underdevelopment to modernization and advanced levels of development so have the disease pattern, from acute infectious and deficiency diseases to chronic non-communicable diseases (NCDs), usually referred to as the 'epidemiological transition'.[1] The global share of deaths attributable to NCDs rose from 61% in 2000 to almost 74% in 2019.[2] In 2021, 18 million people died prematurely from an NCD before the age of 70 years; 82% of these occurred in low- and middle-income countries. According to WHO NCD Country Profiles, 2018, NCDs are estimated to account for 63% of all deaths in India.[3] Prevention and control by reducing the common modifiable risk factors and detecting, screening and treating NCDs including palliative care are the key components of the response to NCDs. High impact essential NCD interventions can be delivered through a primary health care approach to strengthen early detection and timely treatment.[4] The WHO launched the first version of Package of Essential NCD interventions (WHO-PEN) for primary care in low-resource settings in

2010. It is an innovative and action-oriented set of cost-effective interventions that can be delivered to an acceptable quality of care, even in resource-poor settings. The package was expanded with additional guidance and tools in 2018 as PEN 2.0.[5]

The government of India, in response, launched the National Program for Prevention and Control of Cancer, Diabetes, CVDs and Stroke (NPCDCS) in 2010 to strengthen health systems to tackle the rising burden of NCDs on the Indian health system. The programme focuses on strengthening infrastructure, human resource development, early diagnosis, referral to an appropriate healthcare facility level for treatment and management, and health promotion and awareness generation for the prevention of NCDs. By March 2016, the program is under implementation in all 36 states/UTs. The programme has been renamed to National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD) in 2023 by including Chronic Obstructive Pulmonary Disease (COPD) and Asthma, Chronic Kidney Disease (CKD), Non-Alcoholic Fatty Liver Disease (NAFLD), Pradhan Mantri National Dialysis Programme (PMNDP). Under the program, 770 District NCD Clinics, 372 District Day Care Centres, 233 Cardiac Care Units, and 6410 Community Health Centre NCD Clinics have been set up till December, 2024.[6]

NCDs account for 58.5% of the total disease burden of Manipur. Ischemic heart disease, stroke, COPD, diabetes are the four major NCDs included in the top ten leading causes of death and disability in the state.[7] Unlike the centre to state share in the ratio of 60:40 while funding under NCD flexi-pool for the states, Manipur being a north-eastern and hilly region state, the share is 90:10.[8] Even with such advantages over the funding for NCDs, the burden of NCDs looms large in the state. Twenty-six percent of men and 14% of women, above 15 years of age, are hypertensive in Manipur against 24% and 21% respectively in India. Around 16.5% of men and 13.6% of women above 15 years of age have high or very high (>140mg/dl) blood sugar level or are taking medicine to control blood sugar while the national figures are 14% and 12% respectively.[9]

Despite having a greater burden of NCDs like cancer and stroke, it is found that the northeastern states reported using public health facilities frequently.[10] Studies have been conducted to assess the burden as well risk factors of NCDs at the national and state levels. But research and surveys on the status of health care system on the preparedness to address major NCDs are still in the nascent stage in a state like Manipur.

So, this study was done to assess the government health facilities across the state on the readiness to provide basic health-care interventions for management of NCDs as per the WHO-PEN standards.

METHODS

A cross-sectional study was conducted between October, 2022 and March, 2025 across the government health facilities (DHs, CHCs and PHCs) in the valley and hill districts of Manipur to ensure geographical representation. Out of the 16 districts in Manipur a total of 10 districts, 5 hill and 5 valley districts were selected by simple random sampling. All the DHs and CHCs were universally selected while 50% of the total PHCs were selected by simple random sampling for the study. A checklist adapted from the WHO-PEN facility assessment was used to assess the facilities.[6] The checklist consisted of nine domains namely - (i) Background characteristics of the health facility, (ii) Patient care services, (iii) Human resources/Staff, (iv) Essential technologies and tools, (v) Core list of medicines, (vi) Records and reports, (vii) Monitoring and evaluation, (viii) Referral systems and (ix) Outreach activities. The assessment was done by either staff interview or observation method or both as per the questionnaire.

Operational definitions

Domain-wise Readiness Index: Based on a review of the literature and in consultation with experts, the average percentage of each of the nine domains was compared to a cut-off of 70%. Facilities with a score of at least 70% were considered prepared for that domain.

General Readiness Index: Based on a review of the literature and in consultation with experts, the average percentage of all domains was compared to the cutoff of 70% for the general readiness index, and a facility score of ≥70% was considered prepared for management of NCDs.

Statistical analysis

The collected data were first entered in Microsoft Excel Sheet, filtered and cleansed. Then the filtered data were exported to IBM SPSS software version 27. Descriptive statistics like mean, median, frequencies, percent, standard deviation were generated.

Ethical considerations

Before conducting the study, ethical clearance was obtained from the Institutional Ethics Committee [Registration No. ECR/1333/Inst/MN/2025/RR (DCGI, CDSCO)] for protocol No. 431/44/PGT/2023.

RESULTS

A total of 53 health facilities were assessed in the study, thirty-five (35) from valley and Eighteen (18) from hill districts. Most (33, 62%) of the facilities assessed were Primary Health Centres (PHCs) (Table 1). The performance of the PHCs were below the cut-off level in the domain of records and reports (40.0%), monitoring

and evaluation (17.1%), referral systems with back referral (08.6 %), and availability of essential tools like WHO CVD risk prediction chart (02.9%) (Table 2). Availability of core CVD essential drugs like aspirin (22.9%), glyceryl trinitrate (11.4%), statin (34.3%) was below the cut-off level for the PHCs. Similarly essential drugs for diabetes, COPD and asthma were below the cut-off level for the PHCs (Table 3).

Table 1: Distribution of facilities assessed according to type in the two districts (n=35).

District type	Name of district	Type of facility				Total
		DH	CHC	PHC	UPHC	
Valley district	BPR	1	2	3	-	6
	IE	-	1	6	1	8
	IW	-	2	6	1	9
	Kakching	-	2	3	-	5
	Thoubal	1	2	4	-	7
	Total	2	9	22	2	35
Hill district	Chandel	1	1	1	-	3
	Noney	-	1	3	-	4
	Senapati	1	1	3	-	5
	Tamenglong	1	-	1	-	2
	Ukhrul	1	-	3	-	4
	Total	4	3	11	-	18

Table 2: Distribution of facilities based on availability of NCD services (N=53).

Domain	Variable	PHC (N=35) Yes, N (%)	CHC (N=12) Yes, N (%)	DH (N=6) Yes, N (%)
Patient care services	Separate NCD clinic	09 (25.7)	11 (91.7)	06 (100)
	Separate NCD OPD days	21 (60.0)	11 (91.7)	06 (100)
	NCD guidelines available	28 (80.0)	12 (100)	06 (100)
	Individual counseling done	31 (88.6)	12 (100)	06 (100)
	NCD screening done	35 (100)	12 (100)	06 (100)
Human resources/staff	Dedicated staff for NCD	25 (71.4)	11 (91.7)	06 (100)
	Are staff trained for NCD	31 (88.6)	12 (100)	05 (83.3)
Records and reports	Unique ID no. assigned for each patient	14 (40.0)	06 (50.0)	06 (100)
	Separate NCD register maintained	24 (68.6)	12 (100)	06 (100)
	Computerised records available	14 (40.0)	07 (58.3)	05 (83.3)
Monitoring and evaluation	Is NCD dashboard maintained	12 (34.3)	10 (83.3)	06 (100)
	Performance indicators maintained	06 (17.1)	02 (16.7)	03 (50.0)
	Any reminder system for patients	11 (31.4)	10 (83.3)	05 (83.3)
	Are NCD patient's record books provided	16 (45.7)	08 (66.7)	05 (83.3)
Referral systems	Is NCD referral slip available	09 (25.7)	07 (58.3)	05 (83.3)
	Back referral	03 (8.6)	06 (50.0)	05 (83.3)
Outreach activities	Outreach sessions for NCD held	31 (88.6)	12 (100)	06 (100)
	Community participation	35 (100)	12 (100)	06 (100)
	IEC materials available	29 (82.9)	12 (100)	06 (100)
Essential tools	WHO CVD risk prediction chart	01 (2.9)	0 (0.0)	03 (50.0)
	Evidence-based clinical protocols	19 (54.3)	09 (75.0)	04 (66.7)
	Flow charts with referral criteria	17 (48.6)	08 (66.7)	05 (83.3)
	Patient clinical record	32 (91.4)	12 (100)	06 (100)
	Medical information register	16 (45.7)	06 (50.0)	04 (66.7)
	Audit tools	02 (5.7)	0 (0.0)	01 (16.7)

The general readiness index for PHCs was 53.6%, which is below the cut-off of 70% as shown in Figure 1. Hence, PHCs were not ready to manage NCDs. The General Readiness Index for CHCs and DHs were 72.5% and 81.6% respectively. Thus, CHCs and DHs were ready to manage NCDs.

All three types of facilities were ready in the patient care services, human resources/staff and outreach activities as the scores in these domains are above the cutoff 70% (Table 4).

Table 3: Distribution of facilities based on availability of essential drugs and technologies for NCD services (n=53).

Domain	Variable	PHC (n=35) Present, N (%)	CHC (n=12) Present, N (%)	DH (n=6) Present, N (%)
Essential drugs - Core CVD Drugs	Angiotensin inhibitor (Enalapril)	09 (25.7)	09 (75.0)	03 (50.0)
	Aspirin	08 (22.9)	06 (50.0)	04 (66.7)
	Beta blockers (Atenolol)	19 (54.3)	08 (66.7)	04 (66.7)
	CCBs (Amlodipine)	32 (91.4)	11 (91.7)	05 (83.3)
	Glyceryl trinitrate	04 (11.4)	05 (41.7)	01 (16.7)
	Heparin	02 (5.7)	01 (8.3)	03 (50.0)
	Isosorbide dinitrate	01 (2.9)	01 (8.3)	0 (0.0)
	Statin (Simvastatin)	12 (34.3)	02 (16.7)	02 (33.3)
	Spironolactone	01 (2.9)	01 (8.3)	01 (16.7)
	Thiazide diuretic	03 (8.6)	02 (16.7)	03 (50.0)
Essential drugs - Core diabetes drugs	Glibenclamide	04 (11.4)	0 (0.0)	01 (16.7)
	Glucose injectable solution	26 (74.3)	10 (83.3)	05 (83.3)
	Insulin	18 (51.4)	10 (83.3)	04 (66.7)
	Metformin	30 (85.7)	11 (91.7)	06 (100)
Essential drugs - Drugs for COPD and asthma	Beclomethasone	06 (17.1)	06 (50.0)	03 (50.0)
	Codeine	01 (2.9)	0 (0.0)	0 (0.0)
	Hydrocortisone	08 (22.9)	12 (100)	05 (83.3)
	Oxygen	27 (77.1)	11 (91.7)	05 (83.3)
	Prednisolone	21 (60.0)	10 (83.3)	04 (66.7)
	Salbutamol	24 (68.6)	11 (91.7)	04 (66.7)
Essential technologies	Thermometer	34 (97.1)	12 (100)	05 (83.3)
	Stethoscope	35 (100)	12 (100)	06 (100)
	BP apparatus	35 (100)	12 (100)	06 (100)
	Measurement tape	31 (88.6)	12 (100)	06 (100)
	Weighing machine	35 (100)	12 (100)	06 (100)
	Peak flow meter	01 (2.9)	0 (0.0)	01 (16.7)
	Spacers for inhaler	05 (14.3)	06 (50.0)	01 (16.7)
	Glucometer	34 (97.1)	12 (100)	05 (83.3)
	Blood glucose test strips	33 (94.3)	12 (100)	05 (83.3)
	Semmes-Weinstein 10g monofilament	0 (0.0)	0 (0.0)	0 (0.0)
	Urine protein test strips	05 (14.3)	01 (8.3)	0 (0.0)
	Urine ketones test strips	02 (5.7)	0 (0.0)	0 (0.0)
	Nebulizer	27 (77.1)	12 (100)	05 (83.3)
	Pulse oximeter	35 (100)	12 (100)	06 (100)
	Blood cholesterol assay	27 (77.1)	11 (91.7)	06 (100)
	Lipid profile	27 (77.1)	11 (91.7)	06 (100)
	Serum creatinine assay	26 (74.3)	11 (91.7)	05 (83.3)
	Urine microalbuminuria test strips	02 (5.7)	01 (8.3)	01 (16.7)
	Tuning fork	10 (28.6)	06 (50.0)	02 (33.3)
	ECG	05 (14.3)	09 (75.0)	05 (83.3)

In the records and reports, monitoring and evaluation, and referral systems domains only DHs were ready while PHCs and CHCs were not ready. All the three types of facilities were not ready in the essential - drugs, technologies, and tools domains. The readiness indices of all the types of facilities were not uniform across all the nine domains as visualized from the irregular shapes of the polygons in the spidergram (Figure 2). PHCs and CHCs were weak in the domains of referral systems, monitoring and evaluation, records and reports, essential - tools, technologies, and drugs. However, they were ready in the remaining three domains. DHs were ready in six-patient care services, human resources/staffs, records and reports, monitoring and evaluation, referral systems, outreach activities out of the nine domains.

Table 4: Distribution of health facilities according to their domain-wise readiness index (%) (n=53).

Domains	PHC, %	CHC, %	DH, %
Patient care services	70.9	96.7	100
Human resources/staffs	80.0	95.8	91.7
Records and reports	49.5	69.4	94.4
Monitoring and evaluation	32.1	62.5	79.2
Referral systems	17.1	54.2	83.3
Outreach activities	90.5	100	100
Essential drugs	41.0	57.4	56.1
Essential technologies	59.9	68.3	65.9
Essential tools	41.4	48.6	63.9

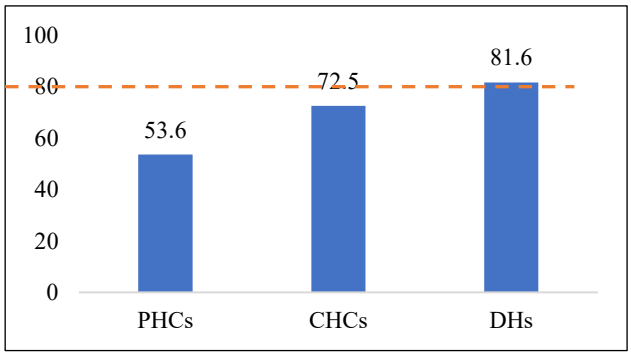

Figure 1: Bar chart showing general readiness index (%) across the facilities (n=53).

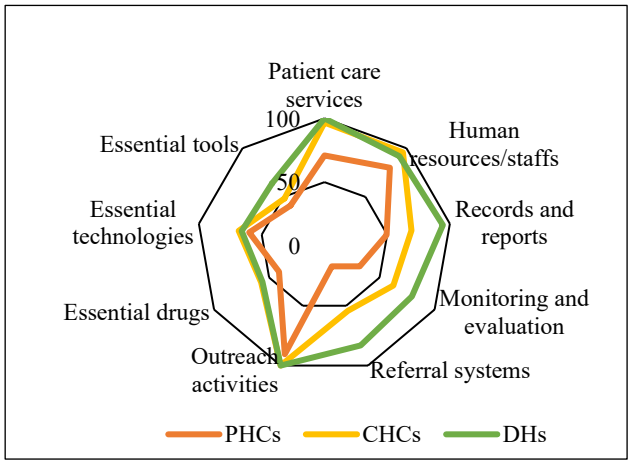

Figure 2: Spider diagram showing distribution of health facilities according to their domain-wise readiness index (n=53).

DISCUSSION

The findings of this study provide critical insights into the readiness of health facilities in Manipur to implement the WHO-PEN. Given the increasing burden of non-communicable diseases (NCDs) in India, ensuring adequate preparedness of healthcare facilities is crucial in mitigating morbidity and mortality associated with these diseases. The study's findings are in line with the findings of various similar studies conducted in other countries as well as other states and in Manipur though some findings are contradictory to few other studies of the same nature.

Readiness of health facilities

The results of this study indicate that while CHCs and DHs are ready to handle NCDs, PHCs are found to be not prepared. This finding aligns with the results of the National Noncommunicable Disease Monitoring Survey (NNMS) which concluded that government primary and secondary care facilities were ill-equipped to handle India's NCD burden in a comprehensive manner.[11] This is also in agreement with the findings of a study conducted by Gupta et al which was carried out in the same state, using the same study tool but was more focused in valley districts whereas this study had equal representation of both valley and hill districts in the state.[12] General readiness index of PHCs, CHCs, and DHs in this study was 53.6%, 72.5% and 81.6% respectively i.e. only PHCs were not ready while it was 47%, 66.3%, and 73.2% respectively in the other study i.e. PHCs and CHCs were not ready.[12] The slightly better finding may be due to the larger sample size and the timing of the study. The efforts of the government in recent years to strengthen the public health facilities might have paid off and brought the changes as CHCs were not ready to manage NCDs in the previous study.

Similar studies in other regions of India like the one conducted in Bengaluru, Karnataka, Madhya Pradesh and Odisha and Kerala have also reported that readiness of PHCs were comparatively inadequate in various domains.[13-16] Studies conducted in other LMICs such as Nepal, Kenya, Uganda, Nigeria, Myanmar, Bhutan also showed similar pattern where the primary health care level facilities were ill-equipped as per the WHO-PEN guidelines when it comes to managing NCDs.[17-22]

Availability of essential medicines and equipment

One of the key components of WHO-PEN is ensuring access to essential medicines for managing NCDs and the study results showed that all the facilities are lagging behind in this particular domain. The study found that essential medicines were available in only 41% of PHCs which is lower than the finding (55.5%) of a similar study in Bengaluru.[13] When it comes to CHCs, availability of essential drugs is higher (57.4%) as compared to the same study (50%).

In essential technologies domain equipment such as peak flow meter, spacers for inhaler and ECG were available in only 2.9%, 14.3% and 14.3% of the PHCs in this study. This finding of ill-equipped facilities is also shown in the study results of the study in Bengaluru in which peak flow meter and spacers for inhaler were not available in all the facilities while ECG was available in only one CHC.[13]

Human resource

Another critical aspect of facility readiness is the availability of healthcare providers. The study revealed that most of the health facilities have dedicated staff for NCDs. This was in contrast with the findings of the study by Gupta et al in which dedicated NCD staff were present in only 57% of the facilities.[12]

The strength of this study is that it was carried out using a standard tool developed by WHO specifically designed to assess facilities and healthcare providers delivering NCD services. Also, facilities were assessed physically which allows for verification at the spot of any information given by the staff.

This study has some limitations. The assessment was limited to selected health facilities and may not be fully representative of all healthcare settings in Manipur. The findings might not be the clear picture as the services and supply chain have been disrupted due to the prevailing law and order situation.

CONCLUSION

The CHCs and DHs are ready while the PHCs are not ready to provide basic primary care interventions for NCDs as per the WHO-PEN guidelines. All three types of facilities were prepared in the domains of patient care services, human resources/staff, and outreach activities. In the domains of records and reports, monitoring and evaluation, and referral systems, PHCs and CHCs were not prepared, but only DHs were. The three categories of facilities were not prepared in the crucial areas of medications, technologies, and tools.

Recommendations

The findings of this study highlight the need for policy interventions to improve health system preparedness for NCD management. Strengthening primary healthcare infrastructure, ensuring the uninterrupted supply of essential medicines and diagnostics, and integrating NCD training into routine capacity-building programs are critical steps. Additionally, leveraging digital health technologies for remote consultations and patient monitoring can enhance access to NCD care, especially in rural and underserved areas of Manipur. Future research should focus on a broader evaluation, including patient perspectives and cost-effectiveness analyses of WHO-PEN implementation.

The study underscores the urgent need to strengthen healthcare readiness for NCD management in Manipur. Addressing infrastructural gaps, ensuring a steady supply of essential medicines, and enhancing the capacity of healthcare workers are essential to effectively implement WHO-PEN. These efforts will contribute to better health outcomes and align with global and national strategies for NCD control and prevention.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee [Registration No. ECR/1333/Inst/MN/2025/RR (DCGI, CDSCO)] for protocol No. 431/44/PGT/2023

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Cite this article as: Gairanlung T, Rajkumari B. Health facility assessment on the readiness to provide basic health-care interventions for management of non-communicable diseases based on the World Health Organization-package of essential non-communicable disease intervention in Manipur. Int J Community Med Public Health 2026;13:3608-14.