

**Evaluation
of
Biomedical Equipment Maintenance and Management
Program and Diagnostic Services
in
Nagaland 2023-24**



**Conducted by:
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(Branch of NHSRC),
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Acknowledgement:

Evaluation of Biomedical Equipment Management and Maintenance Program (BMMP) and Free Diagnostic Services in Nagaland has been conducted by Regional Resource Centre for North-eastern States (RRC- NE, branch of National Health Systems Resource Centre), Guwahati, Assam. The Midterm evaluation has been carried out in two districts viz. Mokokchung and Mon districts.

At the outset, I offer my sincere gratitude to Mission Director, National Health Mission (NHM), Nagaland for extending the support for carrying out the evaluation of the program.

I appreciate the support extended by the State Nodal Officer and Officials of National Health Mission, Nagaland. Additionally, I appreciate the cooperation of other stakeholders, including functionaries of the District Programme Management Units (DPMU), officials and staff at the visited health facilities, and the PPP Service Provider, during the field-level assessment activities.

Last not the least, my sincere thanks go to all the staffs at RRC-NE, who have been associated in some way or the other with the evaluation study starting right from the preparing of schedules to the compilation of data, their interpretation and writing the report.

Finally, special thanks to all respondents who spared their valuable time and co-operated with the Investigators by providing the required information.

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Contents:

Sl	Topic	Page
I.	Executive Summary	4
II.	Introduction	5
III.	Methodology	6
IV	General Observations	8
V.	Suggestions and Recommendation	14
VI.	Facility wise field observation	15
VII.	Annexure I: facility wise list of installed haematology analysers under XV FC	23
IX.	Annexure II: List of Equipment and consumable procured under the XV FC	24

List of Tables

Sl	Name	Page
1.	List of technical staff of Services provider	9
2.	Number of facilities from where the calls are registered at least once	10
3.	Payment status	10
4.	Distribution of breakdown calls	11
5.	Distribution of calls against the total equipment	11
6.	Equipment wise analysis of calls	12

Executive Summary:

Biomedical Equipment Management and Maintenance Programme

The state of Nagaland has started the Biomedical Equipment Management & Maintenance Program (BMMP) through a Public-Private Partnership (PPP) arrangement, extending from the District Hospitals (DHs) to the Primary Health Centers (PHCs) level. The agreement for the comprehensive maintenance of biomedical equipment was signed on December 20, 2022, between the National Health Mission, Health & Family Department of the Government of Nagaland, and M/S Trimed Solutions (India) Private Limited. Subsequently, the Memorandum of Understanding (MoU) was renewed on August 1, 2023, for a 12-month period, involving a total of Rs. 178.27 Lakh. Total asset value stands at Rs. 51.05 Crores as on April 1, 2023.

A designated Nodal Officer has been assigned to oversee the Biomedical Equipment and Maintenance Programme at the State level, also managing additional programs along with BMMP. The State Nodal Officer is assisted by a Biomedical engineer recruited by the State under the National Health Mission (NHM). At the facility level, the Health Facility in-charge serves as the Nodal Officer for BMMP, with the Medical Superintendent or MO in-charge directly overseeing or designating a staff member as the nodal person for the program.

Call centre & Toll-Free number for raising a complaint during breakdown of equipment is functioning but most of the Officials / Staff of the health facilities directly call to the Service Engineer to lodge a complaint. Proper breakdown time cannot be measured if call has been made directly to the service engineer. Only 78 out of 169 health facilities were found to use the Toll Free number during last year.

It has been recommended that all facilities to maintain an asset register for all medical equipment, keep records of breakdown services, plan preventive maintenance (PPM), and calibration reports. The service provider should consider recruiting more service engineers as per the agreed-upon terms with the state.

There is a persistent need for an orientation workshop on BMMP, preferably conducted in a physical setting, where stakeholders such as state officials, District Medical Officer (DMO), hospital/facility in-charges, end-users, representatives from the service provider, and service engineers can participate.

The state is also recommended to scale up and complete the AERB registration of radiation-based equipment, as the Quality Assurance aspect falls under the scope of work of BMMP.

Diagnostic Services

The diagnostic services are being provided through in-house mode in the State and user fees are still being collected. The state has introduced the Chief Minister Health Insurance Scheme, alongside AYUSHMAN Bharat PMJAY, covering all residents of Nagaland, regardless of their employment status. The expenditure on diagnostic services is covered under the insurance scheme. Non-resident individuals in Nagaland have to bear the diagnostic expenditure who are not covered under the AYUSHMAN Bharat PMJAY scheme.

It is seen that 54 laboratory tests are being conducted at District Hospital, 35 in CHCs and 45 in PHCs. Daily internal quality control measures were being implemented but external quality assurance control is still missing. There are ample scopes for further improvement for implementing the Free Diagnostic Services in true sense.

It is heartening to observe that strengthening of diagnostic services under 15th FC is going on. The state has recently procured and installed various diagnostic equipment, including Hematology analyzers, Semi-auto analyzer, Hemoglobinometers, Glucometers, Urine analyzers, microscopes, Rotor/Shakers, refrigerators, consumables, and Rapid Test Kits with proper storage facilities to enhance diagnostic services at both at PHC level and at the Sub-center level.

The state is also suggested to strengthen supply chain mechanism and reagents storage facilities. Rs. 163.0 Lakhs for FY 2022-23 and Rs. 171.2 Lakhs for FY 2023-24 were approved under RoP 2022-24.

Considering the initiation of the Free Diagnostic Initiative program by the Government of India since 2014 and the ongoing support provided by NHM to the state of Nagaland, coupled with the allocated funds under the XV FC, it is plausible for the state to waive charges for diagnostic tests for all patients in near future.

Introduction

I. Biomedical Equipment Management and Maintenance Programme

Ministry of Health and Family Welfare has designed comprehensive guidelines on Biomedical Equipment Management and Maintenance Program (BMMP), linked with uptime of equipment (95% in District Hospitals, 90% in Community Health Centres, and 80% in Primary Health Centres). The guidelines along with the model tender document were developed in 2014. Under BMMP the financial support is provided under NHM to State Governments to outsource medical equipment maintenance comprehensively for all its machinery across all the facilities.

The state of Nagaland has implemented the Biomedical Equipment Management & Maintenance Program (BMMP) through a Public-Private Partnership (PPP) arrangement, extending from the District Hospital (DH) to the Primary Health Center (PHC) level. For the second phase of implementation the agreement for the comprehensive maintenance of biomedical equipment was signed on December 20, 2022, between the National Health Mission, Health & Family Department of the Government of Nagaland, and M/S Trimed Solutions (India) Private Limited. A study was organized to assess the effectiveness of the Biomedical Equipment Management & Maintenance Program (BMMP).

II. Free Diagnostic Service Initiative in India:

Out-of-pocket expenditures on diagnostics continues to be high and an area of concern. To address the urgent need for accessible and quality diagnostics in public health facilities, the Ministry of Health and Family Welfare, Government of India under the aegis of National Health Mission launched the Free Diagnostics Scheme in July 2015. The objective of the Free Diagnostic Service Initiative program is to ensure availability and access to diagnostic tests at public health facilities so that providers can make rational decisions regarding treatment and patients benefit by getting their tests conducted within the facility free of cost to reduce out of pocket expenditure incurred by patients on diagnostics.

To streamline the processes and standards related to diagnostic services, MoHFW has formulated the NHM Free Diagnostic Services guidelines that were shared with the States/UTs on 2nd July 2015.

In 2019, a Guidance Document for Implementing Laboratory Services in States prepared by MoHFW Govt. of India with more details about number of tests (SC/ HWC-SC: 14, PHC/HWC-PHC: 64, CHC: 97, SDH: 111, DH: 134) to be performed and types of equipment required at each level of Health Facilities for performing the indicated tests was released and shared with the States. The guidance document also emphasised on how to improve in-house diagnostic facility through Hub & Spoke model. SC/PHC/CHC/SDH/DH facilities in states need to strengthen to enable delivery of diagnostic services, especially low-cost high volume diagnostic tests by the public health facilities. However, in such facilities where the medical equipment, human resource, or infrastructure for performing tests does not exist, outsourcing (PPP) mechanism for the time being could be used.

Methodology:

Objective

The assessment of the Biomedical Equipment Maintenance programme of Nagaland implemented in the PPP mode has been done as per the request of State.

The evaluation BMMP & FDSI have been conducted considering the following objectives:

1. To assess the implementation status of Biomedical Equipment Management & Maintenance Program (BMMP) in different level of health facilities in Nagaland.
2. To evaluate Service Providers compliance to the prescribed clauses as per the MoU between NHM Nagaland & the services provider considering the BMMP guideline.
3. To understand the issues related to the implementation of the program from State & Service Provider's lenses.
4. Implementation of Free Diagnostic services in remote districts with number of laboratory tests at different level of health facilities.

Methodology of assessment:

- a. Field visit to different level of Health Facilities to assess the functional status of the equipment
- b. Discussion with Medical Superintendent/ Head of the health facility to understand about the implementation process of the program.

Study Design:

- a. Two districts were selected viz. Mon and Mokokchung.
- b. In the selected district, the study team visited 2 District Hospital (DH), 2 CHCs and 2 PHCs.

List of visited facilities are below:

Day	Districts	Facilities
05-12-2023	Mokokchung	1. DH Mokokchung 2. PHC Ungma
06-12-2023	Mokokchung Mon	1. CHC Wangtongya 2. CHC Wakching
07-12-2023	Mon	1. DH Mon 2. PHC Tang

Tools for data collection:

- a. Quantitative data & other relevant information was collected through structured questionnaire with multiple choice answers from key informants, i.e., State Nodal Officer, Medical Superintendent, MO i/c and Lab. Technician, Nursing Staff of OT / labour room and other persons like store keeper etc.
- b. Separate Tools were used for State Nodal Officer, Medical Superintendent, MO i/c and Service Provider.

Field observations:

A. Biomedical Equipment Management & Maintenance Program (BMMP)

The state of Nagaland has implemented the Biomedical Equipment Management & Maintenance Program (BMMP) through Public Private Partnership (PPP) mode from DH to PHC level. The agreement for the comprehensive maintenance of biomedical equipment was made on 20th December 2022 between National Health Mission, Health & Family Department, Government of Nagaland and the, M/S Trimed Solutions (India) Private Limited. Subsequently the MoU was renewed on 1st August 2023, for a period of 12 Months i.e. 1st August 2023 to 31st July 2024 for a total of Rs. 1,78,27,600.

Rs. 81.0 Lakh for each FY 2022-23 and FY 2023-24 was approved under NHM for Biomedical equipment maintenance programme.

The scope of work under the agreement includes:

1. Preventive Maintenance:

To provide Planned Preventive Maintenance and Corrective Maintenance for all medical equipment under all public healthcare facilities in entire Nagaland state upto the level of PHC Service Provider to prepare equipment wise Preventive Maintenance report and a copy shall be submitted to respective Hospital

2. Calibration:

Provide Calibration to all applicable biomedical equipment under contract in all public healthcare facilities upto level of PHCs

Service provider to provide Quality Assurance services for all X-ray machines under contract and issue Quality Assurance Report.

3. User Training:

The service provider to arrange periodic user trainings of all equipment once a year per healthcare centre

4. Medical equipment that are under AMC/CMC:

Service Provider shall administer contract on behalf of National Health Mission Nagaland.

Penalty Clause

As per agreement penalty will be levied on Equipment breakdown under the following conditions:

Sl.	Details	Penalty Provision After 7 days-
1	For equipment whose declared asset value is below Rs. 10,000	Rs. 200/day
2	For equipment whose declared asset value is above Rs. 10,000 but below Rs. 1,00,000	Rs. 300/day
3	For equipment whose declared asset value is above Rs. 1,00,000 but below Rs. 10,00,000	Rs. 500/day
4	For equipment whose declared asset value is above Rs. 10,00,000	Rs. 1000/day

Exclusion clause

1. Medical devices that are under the warranty and under the service support of OEM
2. Service support for high end equipment listed below, is not covered under the current scope
 - 2.1 CT machine, MRI, CT film printer GENEXPERT (CBNAAT Machine), Laser (Zeiss, and other makes), Lithotripsy, Voltage stabilizer and UPS.
 - 2.2 All consumables like ECG Electrodes, Papers, Gel, Reagents, Cautery Pencils, Ventilator and Anaesthesia machine patient tubing, soda lime etc.

a. Equipment Mapping

The initial and most important phase of Biomedical equipment maintenance and management programme is mapping and tagging each medical equipment with a unique identification number or a bar code. The number may be used as a reference during the time of registering medical complains and for other records. It was observed across the facilities that the equipment mapping of newly installed equipment is yet to be completed. State BME in collaboration with the service provider needs to ensure that all the equipments are tagged. As per dashboard, 4816 pieces of equipment are tagged and of which 24 are under warranty or AMC.

b. Servicer Provider HR list

Table 1. List of technical staff of Services provider

SL	Employee Name	Designation
1	Rahul Kumar Kashyap	Regional Manager
2	Kiron Moni Singh	Senior Bio Medical Engineer
3	M Bulang Khamniungan	Senior Bio Medical Engineer
4	Sarath AV	Senior Bio Medical Engineer
5	Dermal Shubin	Technical Specialist
6	Anah konyak	Junior Bio Medical Engineer
7	Imchawapang Jamir	Junior Bio Medical Engineer
8	Metsezo	Junior Bio Medical Engineer
9	Mohammed Salman Kaithal	Junior Bio Medical Engineer
10	Phomngai M	Junior Bio Medical Engineer
11	Santanu Nath	Junior Bio Medical Engineer
12	Imo Jungba	Refrigerator / Cold Chain Technician

Service provider has engaged 12 engineers to look after the whole of Nagaland are being recruited as per the dashboard, of which 6 are Junior engineers.

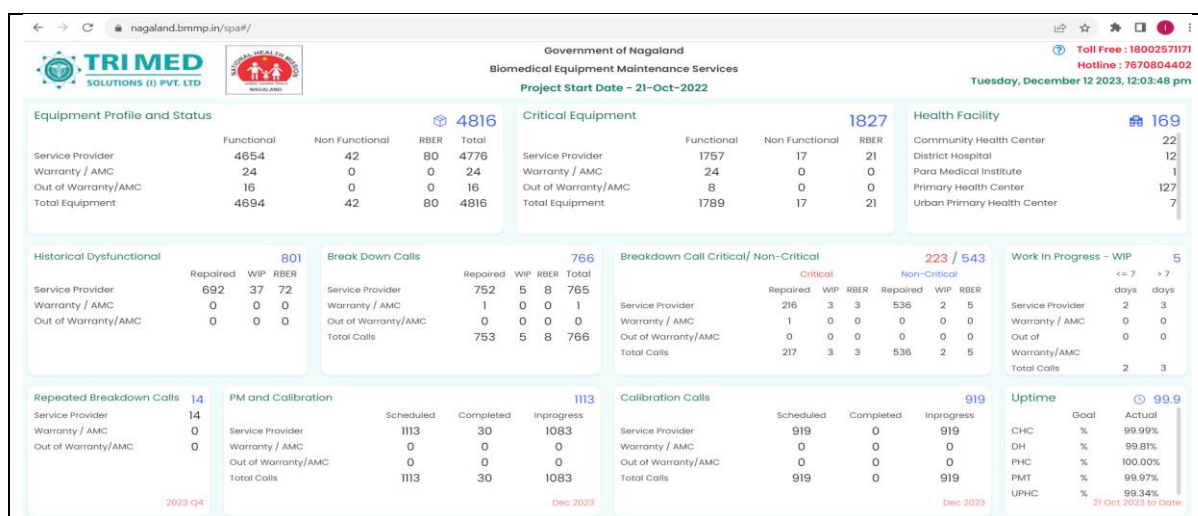
c. Calibration & Planned Preventive Maintenance of Equipment:

The service provider shared that, planned preventive maintenance (PPM) is completed for 1463 is completed against the schedule PPM 1463. As per the dashboard out of the 1515 equipment scheduled for calibration 916 are completed.

d. Equipment Management Information System, The Dashboard

Link for State BMMP dashboard: <https://nagaland.bmmp.in/spa#/>

Figure 1: Dashboard



e. Centralized Call Centre:

Call centers are the backbone of the equipment maintenance programme. The service provider has established the call center at Kohima. Both Nagamish and English are the preferred language for registering the calls

Breakdown call details (State data):

Of the Total 169 registered health facilities in the state as per the dashboard records, breakdown calls are from 78. The remaining facilities have not made a single call, this means the awareness about the programme is very low. The PPP engineers needs to visit every CHC once in a month, PHC once in a quarter, irrespective of the calls generated.

Table 2. Number of facilities from where the calls are registered at least once

Level health facility	Number of Health Facility	Number of Health facilities from where calls received
PHC/UPHC	134	47
CHC	22	18
DH	12	12
Paramedical institute	1	1
Total	169	78

f. Payment mechanist

The regular payment is an important component to ensure smooth implementation of the programme. As mentioned by the state, the payment are usually done on quarterly basis.

Table 3. Payment status

Date of Invoice	For the year	Amount submitted by Service Provider	Amount paid to Service Provider	Penalty
22/02/2023	2022-23	Rs. 37.76 Lakh	Rs. 37.76 Lakh	Nil

Table 4. Distribution of breakdown calls

District	FY 2022-23			FY 2023-24 upto November			
	Total	Completed Calls <= 7 Days	Completed Calls > 7 Days	Total	Completed Calls <= 7 Days	Completed Calls > 7 Days	Pending Calls > 7 Days
Dimapur	58	55	3	171	169	2	0
Kiphire	1	1	0	13	13	0	0
Kohima	51	37	14	146	112	33	1
Longleng	2	2	0	50	49	1	0
Mokokchung	11	11	0	37	37	0	0
Mon	2	2	0	14	14	0	0
Noklak	4	2	2	9	9	0	0
Peren	9	9	0	40	38	2	0
Phek	17	17	0	51	51	0	0
Tuensang	0	0	0	11	11	0	0
Wokha	0	0	0	11	11	0	0
Zunheboto	13	12	1	18	18	0	0

It may be observed from the table above that the number of total calls in 2023-24 have increased and nearly doubled for all the districts in comparison to FY 2022-23

The maximum calls were registered from the 3 districts of Nagaland viz. Kohima (146 nos.), Dimapur (171 nos.) and Phek (51 nos.)

Table 5. Distribution of calls against the total equipment

FY 2023-24 upto November			
District	Total available equipment	Total calls logged	Percentage calls logged against equipment
Dimapur	542	171	31.55
Kiphire	278	13	4.68
Kohima	972	146	15.02
Longleng	167	50	29.94
Mokokchung	616	37	6.01
Mon	300	14	4.67
Noklak	145	9	6.21
Peren	247	40	16.19
Phek	633	51	8.06
Tuensang	305	11	3.61
Wokha	285	11	3.86
Zunheboto	326	18	5.52
Total	4816	571	

Form the table above it may be observed that calls corresponding to the equipment present in districts is maximum in Dimapur (31.55 %) and less than 10 % in 8 districts, which corresponds to the low awareness among the end users.

Table. 6 Equipment wise analysis of calls

Sl.	Name of Medical Equipment	Total equipment	Total calls	Call % against total calls	% Call against number of equipment	Call completed (in Days)			
						1	1-2	2- 7	> 7
1	Blood Gas analyser	4	Zero calls						
2	HbA1C analyser	3							
3	Electrolyte analyser	12							
4	Semi auto analyser	40	3	0.39	7.50	2		1	
5	Colorimeter	10	Zero calls						
6	Fully Biochemistry analyser	12							
7	Coagulation analyser	5							
8	5 Part Blood cell counter	3							
9	3part blood Cell Counter	31	2	0.26	6.45	2			
10	ESR analyser	1							
11	ELISA Reader	6	2	0.26	33.33				2
12	Hb analyser	8	Zero calls						
13	Immunoanalyser	2							
14	POCT immunoassay analyser	9							
15	Anesthesia work station	13	3	0.39	23.08	1	1	1	
16	Boyle apparatus	16							
17	Urine analyser	5							
18	Suction Machine	294	42	5.48	14.29	14	15	9	4
19	PCR machine	21			0.00				
20	Audiometer	3	1	0.13	33.33	1			
21	Auto Refractometer	7	3	0.39	42.86	2		1	
22	CBNAAT	1	Zero calls						
23	TRUENAAT Prep system	35							
24	Centrifuge	148	18	2.35	12.16	8	3	6	1
25	Dental Chair	41	21	2.74	51.22	17	2	1	1
26	Deep Freezers	9	1	0.13	11.11		1		
27	ECG machine	34	7	0.91	20.59	3		4	
28	Electrosurgical Units	36	21	2.74	58.33	12	3	1	5
29	Vaccine Freezer	24	1	0.13	4.17	1			
30	Dialysis Machine	23	3	0.39	13.04			3	
31	Lab Incubator	38	1	0.13	2.63			1	
32	Syringe/Infusion Pump	82	1	0.13	1.22		1		
33	Insufflator Laparoscopic	10	1	0.13	10.00			1	
34	Laminar Air flow	3	2	0.26	66.67				2
35	Laparoscope Set	3	2	0.26	66.67				1
36	Light Source	13	1	0.13	7.69			6	
37	Examination Light	30	1	0.13	3.33				2
38	OT Light	120	16	2.09	13.33	7	2	5	2

Sl.	Name of Medical Equipment	Total equipment	Total calls	Call % against total calls	% Call against number of equipment	Call completed (in Days)			
						1	1-2	2-7	> 7
39	Laboratory Microscope	198	21	2.74	10.61	11	2	2	6
40	Operating Microscope	11	4	0.52	36.36	3		1	
41	Blood Mixer	24	2	0.26	8.33			1	1
42	Patient Monitor	147	52	6.79	35.37	24	4	9	15
43	Nebulizer	66	5	0.65	7.58	3		2	
44	Hot Air Oven	27	3	0.39	11.11	2	1		
45	Pulse Oximeter	13	4	0.52	30.77			4	
46	Oxygen Concentrator	503	7	0.91	1.39	5		2	
47	Photometer	15	1	0.13	6.67			1	
48	Infant Phototherapy	43	10	1.31	23.26	8	1		1
49	Dental X Ray	27	3	0.39	11.11	2		1	
50	Mobile X Ray -HF	30	9	1.17	30.00	6		2	1
51	X Ray -Fixed 500/300 mA	8	5	0.65	62.50		1	2	2
52	Blood bank Refrigerator	21	5	0.65	23.81	2	1	1	1
53	Lab refrigerator	180	4	0.52	2.22	1		1	2
54	Blood bag Weighing Machine	10	4	0.52	40.00	2			2
55	Weighing machine	63		0.00	0.00				
56	Digital Infant Scale	93	1	0.13	1.08				1
57	Ultrasound Scanner	33	2	0.26	6.06	1			1
58	Electronic BP Machine	72	3	0.39	4.17	1	1		1
59	Mercury BP Machine	449	234	30.55	52.12	172	30	31	1
60	Instrument Sterilizer/Autoclave	620	145	18.93	23.39	107	17	17	4
61	OT Table	30	1	0.13	3.33		1		
62	Tissue Processor	2	2	0.26	100.00	1	1		
63	ICU Ventilator	167	4	0.52	2.40	1	1		2
64	Endoscope Processor	3	3	0.39	100.00	1	1		1
65	Baby Radiant Warmer	241	47	6.14	19.50	34	4	6	3
66	RO Plant	2	2	0.26	100.00	1			1
Total (excluding other)			741			458	94	123	66
Others (Tube sealer needle cutter, muscle stimulator etc)		563							15
Total		4816	766						

From the above table it may be observed that combine total percentage of calls registered electronic and mercury BP machine is 49 % against the total call completed. And average calls % against number of corresponding equipment is nearly 27 %.

Suggestions & Recommendations: -

Biomedical Equipment Management and Maintenance Programme

1. More sensitization of end users on utilization of Toll-Free number, dashboard for monitoring and planning purpose is needed.
2. Dashboard needs to be updated on quarterly basis. Each medical equipment in the Government health facilities needs to be given unique barcode irrespective of equipment outsourced for CMC to the OEM, equipment under warranty, equipment received under CSR, MLA fund, other sources.
3. State is advised to form 'Hospital Equipment Committee' at DHs and CHCs for annual equipment audit, reviewing the upkeep time of critical and sophisticated equipment on weekly basis/monthly basis, total number of breakdown call logged in a particular month, random inspection during routine filed visit etc. This will improve the program outcomes.
4. The State is also suggested to scale up and complete the AERB registration of radiation-based equipment, as under the BMMP service provider are sharing the Quality Assurance report of the radiation-based equipment.
5. For the optimal utilization of equipment state needs to conduct proper gap analysis based on case load.
6. The PPP engineers needs to visit every CHC once in a month, PHC once in a quarter, irrespective of the Breakdown calls generated or not.

B. Free Diagnostic Services (FDS):

The diagnostic services are being provided through in-house mode in the State and although user fee is still being collected. The state has introduced the Chief Minister Health Insurance Scheme, alongside AYUSHMAN Bharat PMJAY, covering all residents of Nagaland, regardless of their employment status. The expenditure on diagnostic services is covered under the insurance scheme. Non-resident individuals in Nagaland had to bear the diagnostic expenditure who are not covered under the AYUSHMAN Bharat PMJAY scheme.

The free diagnostic services program has not been completely implemented in a true sense. It is seen that 54 laboratory tests are being conducted at District Hospital, 35 in CHCs and 45 in PHCs. Daily internal quality control measures were being implemented but external quality assurance control is still missing. There is ample scope for improvement.

It is encouraging state has recently procured and installed various diagnostic equipment, including Hematology analyzers, Semi-auto analyzer, Hemoglobinometers, Glucometers, Urine analyzers, microscopes, Rotor/Shakers, refrigerators, and consumables, to enhance diagnostic services at PHC level. And for the strengthening diagnostic services at the Sub-center level state has procured equipment and test kit such as test Hemoglobinometers, Glucometers, kits for HCG, Urine strips, Malaria kits, HIV and Syphilis kits, salt testing kits, water testing kits, and sample containers.

The state is suggested to strengthen supply chain mechanism and reagents storage facilities. Rs. 163.0 Lakhs for FY 2022-23 and Rs. 171.2 Lakhs for FY 2023-24 were approved under RoP

2022-24.

Considering the initiation of the Free Diagnostic Initiative program by the Government of India since 2014 and the ongoing support provided by NHM to the state of Nagaland, coupled with the allocated funds under the XV FC, it is plausible for the state to waive charges for diagnostic tests for all patients.

Table 7 shows the Human Resource (HR) and major equipment available in the health facilities to conduct laboratory tests. It is seen that the patient load at both the district hospital laboratory is encouraging. Few additional Laboratory Technician may be placed in DH Mon to increase the range of tests.

Table 7: Facility wise availability of HR, equipment & number of tests conducted.

Name of Facility	Number of Lab. Tests conducted	Major Equipment Available	HR Available
DH Mokokchung	61	Semi Biochemistry Analyser, Fully Biochemistry analyser 5-part Haematology analyser, Electrolyte analyser, Thermocycle, True NAAT machine etc, ABG in ICU.	Pathologist -1 Microbiologist -1 Laboratory Technician – 12 nos. Radiographer-2
CHC Changtongya	36	Semi biochemistry analyser	Laboratory Technician – 5 nos.
PHC Ungma	45	Semi-biochemistry analyser, Haematology analyser	Laboratory Technician – 2
DH Mon	47	Semi biochemistry analyser, Fully Biochemistry analyser, 5-part Haematology analyser, Electrolyte analyser, CBNAAT in TB centre, True NAAT, ABG in ICU	Pathologist-1 Laboratory Tech -7 Radiographer -4
CHC Wakching	12	5 Part Haematology analyser	Laboratory Tech- 1
PHC Tang	Only Kit based (Malaria, dengue and Pregnancy)	No analyser available	No Laboratory Technician

Table 8: Patient availing laboratory services

Name of Health Facility	Average Laboratory patients per month
DH Mokokchung	580
CHC Changtongya	150
PHC Ungma	63
DH Mon	Around 1000
CHC Wakching	100
PHC Tang	Nonfunctional Laboratory

Suggestions & Recommendations: -

Diagnostic services

1. It is recommended that the State implement Free Diagnostic services in the true sense by abolishing user fee for the patients to reduce OOPE.
2. Range of diagnostic test may increase as per the NHM Free Diagnostic Guidance Document; the number of tests: 134 at DH, 97 at CHC, 63 at PHC, and 14 at SC.
3. To ensure the quality of testing, the facility should actively participate in inter-laboratory comparison or an external quality assurance scheme.
4. Urgent placement of a medical officer and laboratory technician at PHC Tang is essential to ensure a comprehensive package of services.
5. Immediate renovation is required for CHC Wakching, including the laboratory room. Despite the facility's conversion from a PHC to a CHC, infrastructure improvements and HR postings are yet to be completed.
6. There is a sufficient fund under the XV FC, the same may be utilised to strengthen the in-house diagnostic services.

Facility wise Observations:

A. District Hospital Mokokchung: -




1. The hospital, originally designed with 100 beds, has currently been expanded to accommodate 150 beds.
2. Specialist doctors at the facility include 1 Pathologist, 1 Radiologist, 1 Anesthesiologist, 1 Pediatrician, 1 Orthopedist, 1 Ophthalmologist, 1 Gynecologist, 1 Medicine Specialist, 3 Dentists, 1 General Surgeon, and 1 ENT specialist.
3. The hospital is equipped with three Operation Theatres (General, Gynecology, and Eye).
4. The role of overseeing the BMMP has been assigned to the pathologist, acting as the nodal person. The pathologist was away on an official visit and was not available at the hospital.
5. The state is in the planning stages of establishing a G+1 Integrated Public Health Laboratory adjacent to the existing laboratory building. The designated area has been identified and assessed.
6. The facility operates a functional 3-bedded dialysis center.
7. The in-house laboratory functions 24/7.
8. The area adjacent to the existing laboratory is identified for the IPHL, and a new structure will be constructed as mentioned by the Medical Superintendent.
9. Medical equipment in the laboratory includes a Biochemistry analyzer, 5-part Hematology analyzer, electrolyte analyzer and TrueNAAT machines, Thermocycler etc.

The list of Laboratory tests provided at the DH:

SI	Name of test	Remark
1	Hemoglobin Estimation	
2	Total Leucocyte count	
3	Differential Leucocyte count	
4	Platelet count	
5	Complete blood count	
6	Erythrocyte sedimentation rate	
7	Blood group and Rh typing	
8	Blood cross matching	
9	Peripheral blood film	
10	Beeding time and clotting time	
11	Coombs test direct with titre	
12	Coombs test indirect with titre	
13	MP slide method	
14	Prothrombin Time (PT) and INR	
15	Urine test for ph, specific gravity, leucocyte	
16	Urine microscopy	
17	Urine for microalbumin	
18	Stool for ova and cyst	
19	Stool for Occult Blood	
20	Test for Dengue	
21	RPR/VDRL test for syphilis	
22	HIV test (Antibody 1 and 2)	
23	Hepatitis B surface antigen test	
24	HCV antibody test (Anti HCV)	
25	Typhoid test (IgM)	
26	Blood Sugar	
27	S. Bilirubin (T)	
28	S. Bilirubin direct and indirect	
29	S. Creatine	
30	SGPT	
31	SGOT	
32	S. Alkaline Phosphotase	
33	S. Total Protein	
34	S. Globulin	
35	S. Total Cholesterol	
36	S. Triglycerides	
37	S. HDL	
38	S. VLDL	
39	S. LDL	
40	S. Uric acid	
41	S. Amylase	
42	Glycosylated haemoglobin (HbA1C)	
43	S. Sodium	

SI	Name of test	Remark
44	S. Potassium	
45	S. Calcium	
46	S. Chloride	
47	Gram staining for clinical specimen	
48	TB Mantoux	
49	Scrub typhus test	
50	Test for Chikungunya	
51	S. TSH (including for new born screening	
52	RA factor	
53	Cytology Pap smear	
54	CSF analysis	
55	Fluid analysis	
56	CD4 count	
57	Viral load count for HCV	
58	Viral load count for HBV	
59	Urine culture	
60	Fungal culture	
61	Other culture (pus,throat swab)	

Photo gallery

		
Dialysis Centre	Laboratory sample collection and report collection area	Operation Theatre

B. District Hospital Mon:-

1. The district hospital, originally capacity of 100 beds, has been temporarily expanded to 175 beds to meet the increased demand resulting from the dengue outbreak.
2. The staff comprises specialists in Medicine (1), Pediatrics (1), Anesthesiology (1), Gynecology (1), Physical Medicine and Rehabilitation (PMR) (1), Dental (1), General Duty Medical Officers (GDMO) (2), Staff Nurses (SN) (2), Laboratory Technicians (7), and Lab Attendants (2).
3. The in-house laboratory operates 24/7 and is fully functional.

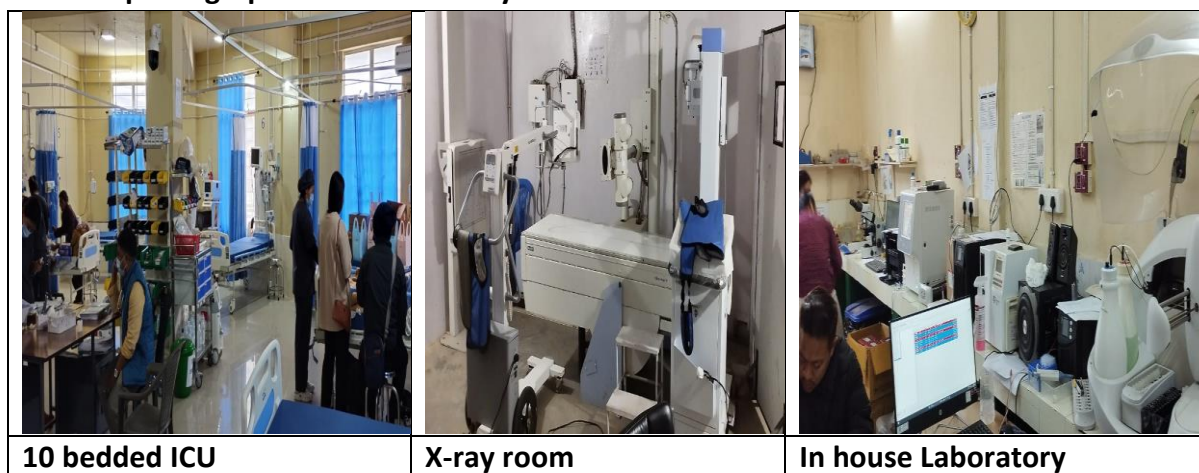
4. The laboratory is equipped with a Biochemistry analyzer and two Hematology analyzers (3-part analyzer and 5-part analyzer).
5. The facility received over 20 ventilators during the COVID-19 pandemic, but currently, they are not in use as the 10-bedded ICU is already full with ventilator.
6. In the radiology department, two radiographers operate four X-ray machines, all of which are functional (two 100mA, one 500mA in the X-ray room, and one 100mA in the ICU).
7. Land has been identified within the hospital premises for IPHL setup, an existing building will be renovated.
8. The facility conducts approximately 3200 tests per month.
9. The in-house laboratory is staffed with a pathologist and seven laboratory technicians.
10. User fees are charged for laboratory and radiology tests, and the hospital utilizes the funds to purchase reagents, as there is currently no supply from the state.

The list of Tests conducted

Sl.	Name of the test	Remark
1	Hemoglobin Estimation	
2	Total Leucocyte count	
3	Differential Leucocyte count	
4	Platelet count	
5	Complete blood count	
6	Erythrocyte sedimentation rate	
7	Blood group and Rh typing	
8	Blood cross matching	
9	Peripheral blood film	
10	Reticulocyte count	Shortage of stain
11	Absolute eosinophil count	
12	Bleeding time and clotting time	
13	D-Dimer	Machine not working
14	PT and INR	Machine not working
15	Urine microscopy	
16	Stool for OVA and Cyst	
17	Test for Dengue	
18	RPR/VDRL test for syphilis	
19	HIV test (Antibodies 1 and 2)	
20	Hepatitis B surface antigen test	
21	HCV Antibody Test (Anti HCV)	
22	Sputum, pus etc. for AFB	
23	Typhoid test (IGM)	
24	Blood sugar	
25	S. Bilirubin (T)	
27	S. Bilirubin direct and indirect	
28	S. Creatinine	
29	Blood Urea	

Sl.	Name of the test	Remark
30	SGPT	
31	SGOT	
32	S. Alkaline Phosphatase	
33	S. Total Protein	
34	S. Total Cholesterol	
35	S. Triglycerides	
36	S. VLDL	
37	S.HDL	
38	S. LDL	
39	S. GGT	
40	S. Sodium	
41	S. Potassium	
42	Stool for hanging drop for Vibrio Cholera	
43	TB Mantoux	
44	Scrub Typhus test	
45	Troponin -I/Troponin-T	
46	Cytology- FNAC	
47	Viral load count for HBV	

Some photographs from the facility



C. Community Health Centre Changtongya :-




1. The facility is a 17 bedded facility including the isolation beds.
2. The Human Resource includes 3 nos. of Medical Officer (Allopathic + AYUSH + Dental), S/N-9 nos., ANM-3 nos., Medical Attendent-3, Chowkidar-2 nos. , Ward boy-2 nos. , Sweeper- 2-nos, UDA-1, LDA-1, Pharmacist-2, Ophthalmic Asst-1, Cook-1, Mali-1, Vaccinator-1, Lab Attendent-1, Laboratory Technician- 5 nos. (2 from malaria and 1 from ICTC), LHV-1,
3. The facility caters a population of around 15,000 people including 3 PHCs
4. A portable ultrasound machine has been donated to the facility by a local politician, and it is currently under an Annual Maintenance Contract (AMC).

5. The average laboratory tests per month is 200 and patient is around 100
6. The facility is receiving samples for malaria and TB testing from PHCs/SCs.
7. The facility incharge were recently transferred and other doctors and

List of Tests conducted at the CHC

SI	Name of the test	Remark
1	Hemoglobin Estimation	
2	Total leucocyte count	
3	Differential leucocyte count	
4	Platelet count	
5	Complete blood count	
6	Erythrocyte sedimentation rate	
7	Blood group and Rh typing	
8	Bleeding time and clotting time	
9	Coombs test directly with titre	
10	Coombs test indirect with titre	
11	MP slide method and Malaria strip method	
12	Human chorionic gonadotropin (HCG)	
13	Urine test for ph, specific gravity, leucocyte esterase, glucose etc	
14	Urine Microscopy	
15	Stool for ova and cyst	
16	RPR/VDRL test for syphilis	
17	HIV tests	
18	Hepatitis B surface antigen test	
19	HCV Antibody Test (Anti HCV)	
20	Sputum for AFB	
21	Blood sugar	
22	S. Bilirubin (T)	
23	S. Bilirubin direct and indirect	
24	S. Creatinine	
25	Blood Urea	
26	SGPT	
27	SGOT	
28	S. Alkaline Phosphatase	
29	S. Total Protein	
30	S. Albumin & AG ratio	
31	S. Globulin	
32	S. Total Cholesterol	
33	S. Triglycerides	
34	S. Uric acid	
35	S. Calcium	
36	TB- Mantoux	

Some images from facilities

		
<p>In house laboratory</p>	<p>Baby warmer</p>	<p>Recently Dental X-ray machine was calibrated and preventive maintenance was done and tag was pasted, although machine is nonfunctional from last 9 months.</p>

D. Community Health Centre Wakching:-

1. The 6 bedded facility caters to a population of approximately 12,000 people, including the 5 Sub-Centres (SCs) and 1 Primary Health Center (PHC) under its catchment area.
2. It is a 6-bedded facility.
3. The facility has been without a General Nursing and Midwifery (GNM) staff member for more than 4 months following the retirement of the last one.
4. Additionally, the facility has not had an Auxiliary Nurse Midwife (ANM) for over a year since the last transfer.
5. The posted vaccinator, as indicated by the staff, is a qualified ANM by profession, necessitating her involvement in multitasking.
6. The facility is equipped with 1 Gypsy ambulance (Patient Transport Vehicle)
7. The average monthly OPD at the facility is between 100-120.

List of tests conducted in CHC Wakching

SI	Name of test	Remark
1	Hemoglobin Estimation	
2	Blood Sugar and Rh typing	
3	Bleeding time and clotting time	
4	Coombs test directly with titre	
5	Malaria rapid test	
6	Urine test for ph, specific gravity, leucocyte esterase, glucose, bilirubin, etc	
7	Urine microscopy	
8	VDRL test for syphilis	

SI	Name of test	Remark
9	HIV test (antibodies 1 / 2 and HIV 1 / 2)	
10	Hepatitis B surface antigen test	
11	Typhoid test (IgM)	
12	Blood sugar	




Some images from facilities

		
General Wards	In house laboratory	Unused prefab structure by Han Foundation.

E. Primary Health Centre Tang: -

1. The 2-bedded PHC serves a population of approximately 2000 individuals.
2. The facility oversees 7 Sub-Centres.
3. The facility has been converted into a health and wellness center, although package of services is not increased. The laboratory is nonfunctional from more than 2 years.
4. The medical officer has been transferred for the past 4 months, and a replacement is yet to be appointed.
5. The facility has been without a laboratory technician for over 2 years, rendering the laboratory nonfunctional.
6. The average monthly OPD is between 50-70 cases, with a spike observed during the August to September period due to a dengue outbreak in the MON area.
7. The facility staff includes one Staff Nurse (Male), ANM-1, Grade IV-1, Female Attendant-1, Male Attendant-1, Chowkidar-1, Sweeper-1, and ASHAs-5.
8. Occasionally, the staff nurse (male) has been administering drugs, with consultation over phone with the Mon District Hospital.

Some images from the facility

		
HWC Tang front entry	Solar water heater	Radiant warmer

F. Primary Health Centre Ungma:-




- The single bedded health facility is covering a population of 4,500 in PHC catchment area and covers 3 Sub-Centres
- The Human Resource includes medical officer (2 nos.), Laboratory Technician-2, ANM-2, Pharmacist-1, B/W -1, F/W-1, Medical Attendant -4, LDA-1 and ASHAs -6.
- Average number of OPD is 200/month
- The AYUSH OPD registers an average of 50-100 per month
- A noteworthy observation is that the community is well-informed about AYUSH medicine and places trust in its effectiveness.
- The facility was having both a biochemistry analyzer and Hematology analyzer in place.

Table 11. List of Tests performed in PHC Ungma

SI	Name of Tests	Remark
1	Hemoglobin Estimation	
2	Total Leucocyte	
3	Differential Leucocyte count	
4	Platelet count	
5	Complete blood count	
6	Erythrocyte sedimentation rate	
7	Blood group and Rh typing	
8	Peripheral blood film	
9	Reticulocyte count	
10	Absolute eosinophil count	
11	Bleeding time and clotting time	
12	Malaria Slide and rapid test	
13	Prothrombin Time (PT)	
14	Activated Partial Thromboplastin time (APTT)	
15	Human chorionic gonadotropin (HCG)	
16	Urine test for ph, specific gravity, leucocyte esterase	
17	Urine microscopy	
18	24-hrs urinary protein	
19	Urine for microalbumin	
20	Urine for creatinine and Albumin to creatinine ratio (ACR)	
21	Stool for ova and cyst	
22	RPR/VDRL test for syphilis	
23	HIV test (Antibodies 1 / 2 and HIV 1 / 2)	
24	Hepatitis B surface antigen	
25	HCV Antibody test (Anti HCV)	
26	Sputum for AFB	
27	Typhoid test (IgM)	
28	Blood sugar	
29	Glucose Tolerance Test (GTT)	
30	S. Bilirubin (T)	

SI	Name of Tests	Remark
31	S. Bilirubin direct and indirect	
32	S. Creatinine	
33	Blood urea	
34	Uric acid	
35	SGPT	
36	SGOT	
37	S. Alkaline Phosphatase	
38	S. Total protein	
39	S. Albumin & AG ratio	
40	S. Total Cholesterol	
41	S. Triglycerides	
42	S. HDL	
43	Gram staining for clinical specimen	
44	Throat swab for Diphtheria	
45	Urine culture and antimicrobial sensitivity	

Some photo from the facility

		
Solar plant at PHC	Hematology analyzer	Semi biochemistry analyzer

Contributors:

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Mr. Kevichalie	National Health Mission Nagaland
Reviewers	
Dr. Ashoke Roy	Director, RRCNE

**List of facilities which have received Haematology analyser under XV FC
(installation is completed)**

SL	District	Name of Health Centre
1	Dimapur	Piphema
		Kuhuboto phc
2	Kohima	Tuophema
		Botsa
		Jakhama
		Kimipfüphe
		Khonoma PHC
		Sechu Zubza PHC
		Chunlikha PHC
3	Peren	Ahthibung PHC
4	Zunheboto	Akuluto PHC
		VK PHC
5	Kiphire	PHC Likimro
		Sitimi PHC
6	Phek	Weziho PHC
		Thuda/Phor PHC
		Chizami PHC
		Zuketsa PHC
		Kikruma PHC
7	Longleng	Yongnyah PHC
8	Mokokchung	Chuchuyimlang PHC
		Longjang PHC
		Mongsenyimti PHC
		Ungma PHC
		Tsurangkong PHC
9	Wokha	Englan
		Chukitong PHC
		Wozhuro PHC
10	Mon	Wakching CHC
		Aboi CHC
		Naginamora PHC
11	Noklak	Thonoknyu
		Panso
12	Tuensang	Chare PHC
		Chessore PHC
		Noksen PHC
		Longpang HWC PHC
		Srinagesh PHC

