SUPREME AUDIT INSTITUTION OF INDIA
लोकहितार्थ सत्यनिष्ठा
Dedicated to Truth in Public Interest

Report of the Comptroller and Auditor General of India on Public Health Infrastructure and Management of Health Services

Government of Kerala

Report No. 6 of the year 2024
(Performance Audit – Civil)

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Comptroller and Auditor General of India
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PREFACE

This Report of the Comptroller and Auditor General of India for the year ended 31 March 2022 has been prepared for submission to the Governor of the State of Kerala under Article 151(2) of the Constitution of India.

This Report contains the results of the Performance Audit on 'Public Health Infrastructure and Management of Health Services' covering the period 2016-22.

The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Why CAG did this audit

Health is a vital indicator of human development. In view of the criticality of health facilities in providing necessary healthcare to the citizens, the Government spending on the same and the glaring gaps in the available health infrastructure which came forth with COVID-19 outbreak, CAG took up a Performance Audit to study the overall performance of health sector in Kerala.

Audit scope covered scrutiny of records for the period 2016-22, with an objective to examine (1) the availability of necessary human resources at all levels e.g., doctors, nursing staff, paramedics, etc., (2) the availability and management of healthcare infrastructure, (3) the availability of drugs, medicines, equipment and other consumables, (4) the adequacy of funding for healthcare, (5) the adequacy and effectiveness of the regulatory mechanisms for ensuring quality healthcare services and (6) whether the State spending on health has improved the health and wellbeing of people as per Sustainable Development Goal-3 (Good health and wellbeing).

Major Audit Observations

Shortage of doctors against sanctioned posts was noticed in all levels of hospitals under Modern system of Medicine. The shortage was more severe in the case of specialist doctors. Shortage of doctors was also noticed in tertiary level hospitals test-checked under AYUSH. Similarly, shortages of nurses, pharmacists and lab technicians were also noticed in the test-checked hospitals. The deficiency of manpower in public hospitals not just affects the accessibility of public to quality healthcare but also exerts pressure on the available resources thereby compromising on effective delivery of healthcare services. The doctor to population ratio was most adverse in two out of 14 districts of the State. The shortage of Accredited Social Health Activists in the districts ranged from three to 33 *per cent* in 13 out of 14 districts of the State.

Family Health Centres were not providing services as intended under Aardram Mission due to lack of infrastructure, required manpower, etc. and thus the aim to provide augmented services at reasonable cost, time and satisfaction had not been met. The number of doctors in the Out-Patient Departments of the hospitals was not commensurate with the number of patients seeking medical care creating overload for doctors as well as inconvenience for patients. The minimum essential services as prescribed by Indian Public Health Standards (IPHS) were not available in many of the hospitals. The entire gamut of desirable pathological services and equipment was not available in different categories of hospitals.

The main objective of formation of Kerala Medical Services Corporation Limited (KMSCL) was to avoid scarcity of drugs in hospitals at all times which can be realised only if indents are realistic and procurement of the indented

quantity is effected. Audit observed that the above objective was not met resulting in stock out of drugs in hospitals during the period of Audit. The shortage of drugs in hospitals was attributable to inadequate indenting due to financial cap set, lack of response to bid, delay/ non-supply of drugs by the vendors etc. Suppliers of around 82 *per cent* of the drugs delayed their consignment and in many instances, they were not penalised by KMSCL for the delay. The policy of subjecting only 10 *per cent* of drugs to quality check (QC) did not yield desired results as all the batches of 46 drugs and all supplies from 14 suppliers escaped QC during the audit period. Many vital medical equipment were not available in hospitals due to delay in purchase and non-maintenance of equipment. A mechanism for regular maintenance of equipment did not exist in the tertiary hospitals resulting in denial of services to patients.

For strengthening the healthcare system in the State, creation of essential infrastructure and deployment of trained work force are essential. The shortage of Primary Health Centres and Community Health Centres in the State when compared with IPHS was 14 and 35 *per cent* respectively. The progress in creation of planned infrastructure was slow. There was inordinate delay in commencement/ completion of infrastructure works mainly due to reasons such as delay in statutory clearances, defective planning, not identifying suitable sites, etc. Abandonment of works/ projects was also noticed due to lack of funds, change in plan etc. The projects/schemes meant to improve the tertiary care system in the State remained incomplete due to delay in issuing administrative sanction, release of fund, laxity in monitoring, etc., defeating the very objective of the projects/ schemes.

The percentage of health expenditure with reference to allocated funds declined from 97.64 *per cent* in 2016-17 to 93.28 *per cent* in 2020-21, however, the expenditure increased to 98.92 *per cent* of the outlay on health in the year 2021-22. State sector health spending did not meet the target of more than eight *per cent* of the budget as envisaged in the National Health Policy, 2017. Against the expenditure of ₹48,735.92 crore on health during the Audit period, the capital expenditure was only 4.24 *per cent*. The allotment of fund to KMSCL for purchase of drugs was not based on requirement.

Implementation of selected Centrally Sponsored Schemes in the health sector was not satisfactory. Under Pradhan Mantri Jan Arogya Yojana (PMJAY), inordinate delay in payment of insurance claims to beneficiaries was noticed. A District Implementation Unit to support the implementation of PMJAY and combined unit for anti-fraud, medical audit and vigilance at state level with district level officers were not formed. The number of beneficiaries covered under Janani Suraksha Yojana and Janani Shishu Suraksha Karyakram was low.

In several instances, the regulatory mechanism in the health sector was found to be inadequate. The implementation of Clinical Establishments Act and Rules which, *inter alia*, had the objective of prescribing standards of facilities and services had not progressed much and the objectives remain unachieved. Some blood banks in the State were found to be functioning without licences. The existing bio-medical waste treatment and disposal facilities in the State were

under stress and there was an immediate requirement for establishing more such facilities. Radiographic equipment was being utilised in some hospitals without Atomic Energy Regulatory Board licence.

Kerala has not yet formulated the action plan/ vision document for achieving the targets under Sustainable Development Goals. The assessment of the performance of the State with the inclusion of a few indicators *viz*. suicide rate, death rate due to road accidents and per capita out-of-pocket expenditure on health resulted in relegation of the State from first to ninth position in 2020-21. The per capita out-of-pocket expenditure on health in the State was second highest in the country. Similarly, the suicide rate per one lakh population and death rate due to road accidents exceeded the national average.

What CAG recommends

In this Report, 15 recommendations have been made covering the need to increase the outlay for health, enlarging healthcare facilities, purchase of adequate quantity of drugs, purchase and maintenance of essential equipment, strengthening enforcement of Clinical Establishments Act, establishment of bio-medical waste treatment plant, etc. The following recommendations have been made in this Report:

- Government should assess the requirement of doctors and paramedical staff at different levels and regions and ensure availability of human resources required as per the norms stipulated in IPHS/ Aardram Mission.
- Government should take action for reducing the wide disparity in doctor to population ratio in the State by increasing the strength of doctors in the districts with most adverse ratio.
- Government should ensure that minimum assured services, as per IPHS norms, are available at all levels of hospitals along with prescribed patient amenity services.
- Government should ensure availability of pathological services, equipment and manpower in hospitals for timely and quality treatment of patients.
- Government should issue necessary directions to KMSCL to take action to ensure availability of drugs in hospitals and supply should be based on the actual requirement, thereby ensuring that the drugs indented are purchased without delay.
- Government should issue guidelines to be followed for purchases made during crisis situation with emphasis on improved transparency and accountability so that a better equipped public procurement system capable of helping Government to respond effectively during such situation is in place.

- Government should ensure that vital medical equipment are available in the hospitals especially tertiary hospitals and that a proper system for maintenance and upkeep of the available equipment and condemnation of obsolete equipment is in place.
- Government should ensure that PHCs and CHCs proportional to population, required as per IPHS are available in all districts.
- Government should identify and analyse the infrastructure works which are pending completion and take remedial action for their expeditious completion. Government should also ensure that only those works which satisfy conditions like availability of unhindered land, etc. are sanctioned and there is no delay in the process of issuing requisite sanctions and release of funds.
- Government should formulate an action plan to enhance State sector health spending in line with the target set by the National Health Policy.
- Government should ensure that no eligible beneficiaries are deprived of the benefits envisaged under Janani Suraksha Yojana and Janani Shishu Suraksha Karyakram. This may be done through creating awareness about the projects among potential beneficiaries as well as by involving health workers /ASHAs.
- Government should ensure that the Clinical Establishments Act is implemented in the State in a time bound manner so that permanent registration is provided to those establishments which maintain prescribed minimum standards.
- Government should ensure that the Drugs Controller establishes a mechanism to monitor the validity of licences of blood banks and also ensures that the same are renewed without delay. Further, programmes may be conducted for Departmental staff to create awareness about the importance of adhering to relevant Acts and Rules.
- Government should ensure that urgent and time bound action is taken for establishment of new Bio-Medical Waste (BMW) Treatment Facility in the State and a mechanism established for assessing the BMW generated in the State, so as to ensure that all BMW is properly disposed of.
- Government should ensure that urgent steps are taken to formulate an Action Plan to achieve the targets under SDG-3 and improve performance against National level indicators relating to reduction of out-of-pocket expenditure on health etc.

CHAPTER I - INTRODUCTION

CHAPTER I
INTRODUCTION

National Health Policy, 2017 (NHP) consists of goals and objectives relating to (a) health status and programme impact, (b) performance of health systems and (c) strengthening of health systems. These goals are aligned to achieve sustainable development in health sector in keeping with the policy thrust. Goal-3 of Sustainable Development Goals (SDGs)[1], "Good health and wellbeing" calls on countries to ensure healthy lives and promote wellbeing for all at all ages.

The State of Kerala had a population of 334.06 lakh as per Census 2011. The healthcare system of Government of Kerala (GoK) consists of Modern Medicine, Indian Systems of Medicine (ISM)[2] and Homoeopathy. GoK provides healthcare to the people of the State through the Departments of Health and Family Welfare (HFWD) and AYUSH.

1.1. Health services

The domains considered for the review are shown below.

Line services	*Support services*
i. Outdoor patient department ii. Indoor patient department iii. Emergency services iv. Super specialty v. Maternity vi. Blood bank vii. Diagnostic services	i. Oxygen services ii. Dietary services iii. Laundry services iv. Biomedical waste management v. Ambulance services vi. Mortuary services
Auxiliary services	*Resource management*
i. Patient safety facilities ii. Patient registration iii. Grievance / complaint redressal iv. Stores	i. Building infrastructure ii. Human resource iii. Drugs and consumables iv. Equipment

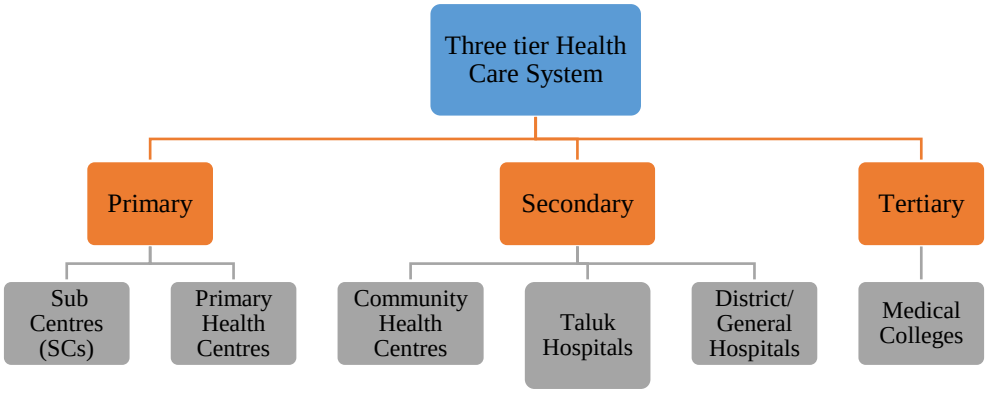
1.2. Overview of healthcare facilities in the State

Public healthcare facilities in Kerala are structured into three levels for providing primary, secondary and tertiary care as shown in **Figure 1.1**.

[1] The SDGs are a universal set of 17 Goals and 169 targets set up in 2015 by the United Nations General Assembly to help organise and streamline development actions for greater achievement of human wellbeing, while leaving no one behind, by 2030.

[2] ISM consists of Ayurveda, Siddha, Unani, Yoga and Naturopathy.

Figure 1.1: Three levels of public healthcare facilities in Kerala

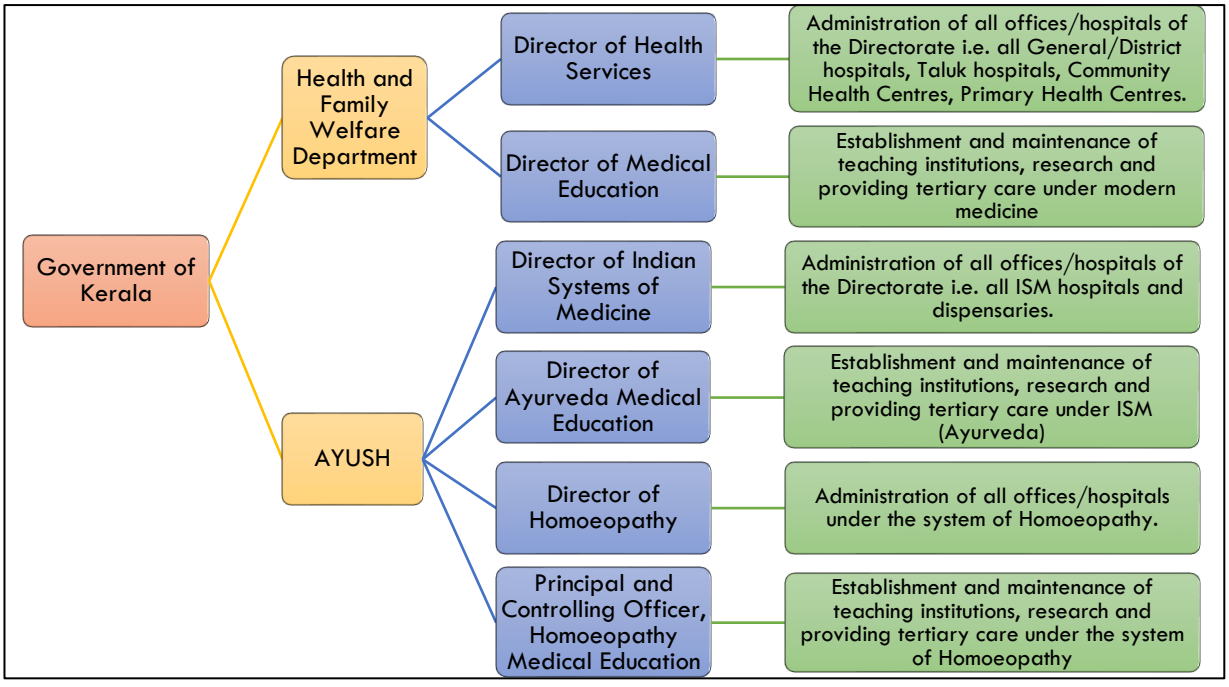


In view of the criticality of health facilities in providing necessary healthcare to the citizens, the Government spending on the same and the glaring gaps in the available health infrastructure which came forth with COVID-19 outbreak, a Performance Audit was conducted covering the period 2016-22 to study the overall performance of health sector in Kerala.

1.3. Organisational set up

Organisational set up of Health and Family Welfare and AYUSH Departments is as shown in **Figure 1.2**.

Figure 1.2: Organisational set up



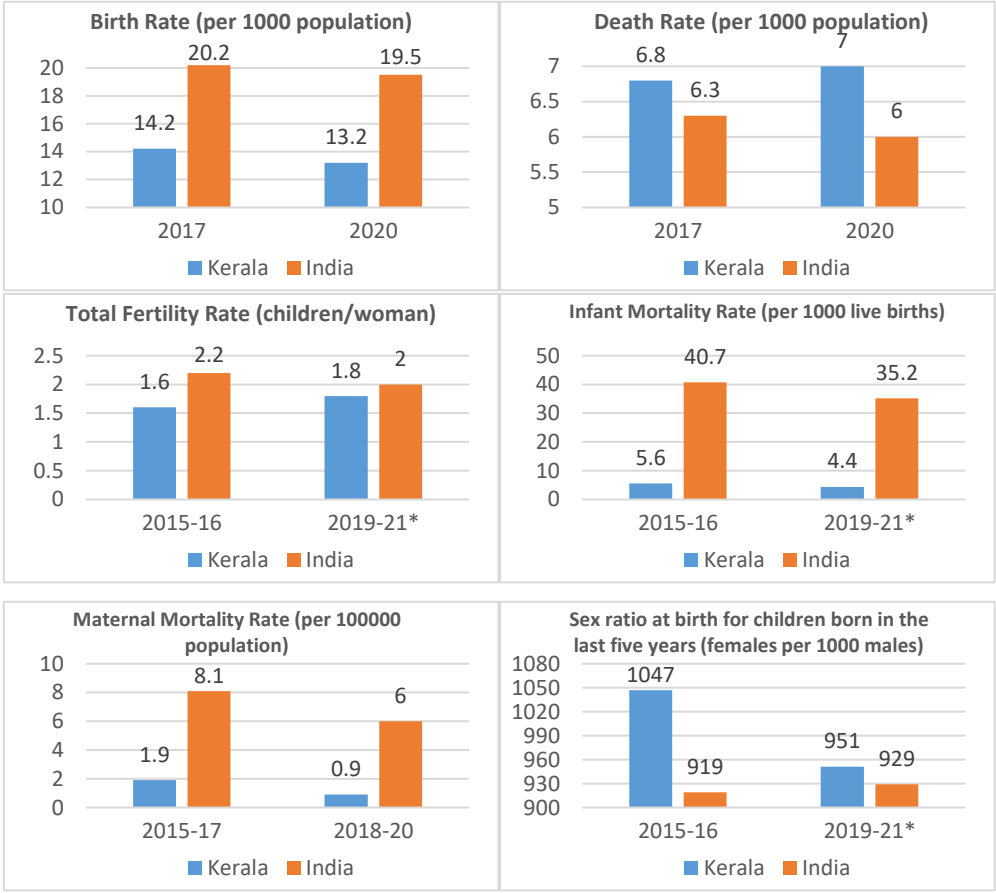
Besides, National Health Mission (NHM) and National AYUSH Mission (NAM) have under their control 503 primary care units functioning under these systems. Kerala Medical Services Corporation Limited (KMSCL) is the agency

for procurement of drugs and equipment for Modern Medicine. The Pharmaceutical Corporation (Indian Medicines) Kerala Limited (Oushadhi) and Kerala State Homoeopathic Cooperative Pharmacy (HOMCO) are the drug manufacturing and supplying agencies for ISM and Homoeopathy respectively.

1.4. Status of Health Indicators in the State

Major health indicators of the State compared with national figures is shown in **Chart 1.1**.

Chart 1.1: Health indicators in the State



* Figure for Kerala pertains to the period 2019-20

(Source: Sample Registration System bulletins for the respective years, National Family Health Survey-5, Special bulletin Maternal Mortality in India)

1.5. Improvement in overall Health Indicators under SDG

The overall performance of Kerala and its performance under Goal 3 - Good health and well-being, as featured under the SDG India Index for the three years 2018-2020 is discussed in paragraph 9.4.1.

1.5.1. Kerala Health Indicators compared with National Health Indicators as per National Family Health Survey

Health indicators of the State compared with National Health Indicators and the progress of the State as per the two National Family Health Surveys (NFHS-4 and NFHS-5) are shown in **Table 1.1**.

Table 1.1: Kerala Health Indicators as per NFHS

Indicator	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	Kerala	India	Kerala*	India
Sex ratio of the total population (females per 1,000 males)	1049	991	1121	1020
Sex ratio at birth for children born in the last five years (females per 1,000 males)	1047	919	951	929
Total fertility rate (children per woman)	1.6	2.2	1.8	2.0
Neonatal mortality rate (NNMR)	4.4	29.5	3.4	24.9
Infant mortality rate (IMR)	5.6	40.7	4.4	35.2
Under-five mortality rate (U5MR)	7.1	49.7	5.2	41.9
Mothers who had an antenatal check-up in the first trimester (*per cent*)	95.1	58.6	93.6	70
Mothers who had at least four antenatal care visits (*per cent*)	90.1	51.2	78.6	58.1
Mothers whose last child birth was protected against neonatal tetanus (*per cent*)	96.4	89	95.2	92
Mothers who consumed iron folic acid for 100 days or more when they were pregnant (*per cent*)	67.1	30.3	80	44.1
Mothers who consumed iron folic acid for 180 days or more when they were pregnant (*per cent*)	47.4	14.4	67	26.0
Registered pregnancies for which the mother received a Mother and Child Protection (MCP) card (*per cent*)	84.2	89.3	91.3	95.9
Mothers who received postnatal care from a doctor/ nurse/ LHV/ ANM/ midwife/ other health personnel within two days of delivery (*per cent*)	88.7	62.4	93.3	78
Average out-of-pocket expenditure per delivery in a public health facility (₹)	6901	3197	6710	2916
Children born at home who were taken to a health facility for a check-up within 24 hours of birth (*per cent*)	NA	2.5	NA	4.2
Children who received postnatal care from a doctor/nurse/LHV/ANM/ midwife/other health personnel within two days of delivery (*per cent*)	NA	NA	91.2	79.1
Institutional births (*per cent*)	99.8	78.9	99.8	88.6
Institutional births in public facility (*per cent*)	38.3	52.1	34.1	61.9
Home births that were conducted by skilled health personnel (*per cent*)	0.1	4.3	0.2	3.2
Births attended by skilled health personnel (*per cent*)	99.9	81.4	100	89.4
Births delivered by caesarean section (*per cent*)	35.8	17.2	38.9	21.5
Births in a private health facility that were delivered by caesarean section (*per cent*)	38.6	40.9	39.9	47.4
Births in a public health facility that were delivered by caesarean section (*per cent*)	31.4	11.9	37.2	14.3

NA – Not Available

*Figure for Kerala pertains to the period 2019-20

State health indicators, which have been shaded green above have improved, those which have deteriorated are shaded red.

(Source: NFHS 4 and 5)

1.6. Audit Objectives

The Performance Audit has been carried out to examine:

- the availability of necessary human resources at all levels e.g., doctors, nursing staff, paramedics, etc.,

- the availability and management of healthcare infrastructure,
- the availability of drugs, medicines, equipment and other consumables,
- the adequacy of funding for healthcare,
- the adequacy and effectiveness of the regulatory mechanisms for ensuring quality healthcare services and
- whether the State spending on health has improved the health and wellbeing of people as per SDG-3.

1.7. Audit Scope and Methodology

Six directorates

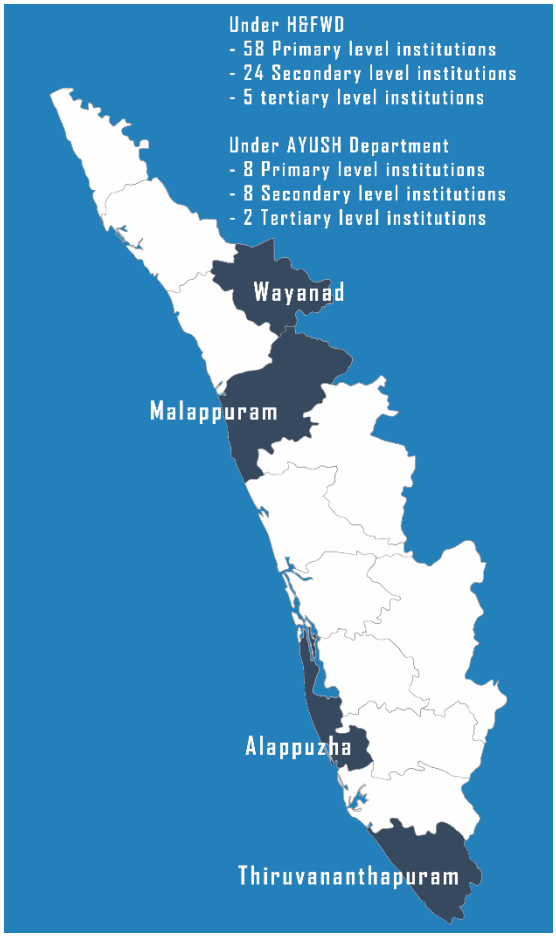
- Directorate of Health Services
- Directorate of Medical Education
- Directorate of Indian Systems of Medicine
- Directorate of Ayurveda Medical Education
- Directorate of Homoeopathy
- Office of the Principal and Controlling Officer, Homoeopathy Medical Education

Four districts (Thiruvananthapuram, Alappuzha, Malappuram and Wayanad) for field study out of 14 districts selected using Stratified Random Sampling Method

- Seven out of 13 District/ General Hospitals in selected districts
- Seven out of 23 Taluk/ Taluk Headquarters Hospitals
- Three out of 10 Speciality Hospitals
- Seven out of 58 Community Health Centres (CHCs)
- 32 out of 248 Primary Health Centres (PHCs)
- Six out of 35 Urban PHCs
- 20 out of 1641 Sub Centres
- Two AYUSH hospitals and two AYUSH dispensaries each from the selected districts
- All Medical Colleges in the selected districts (three Medical Colleges, one Dental College and SAT hospital under modern medicine and two Medical Colleges under AYUSH)

Audit scope covered scrutiny of records for the period 2016-22 in HFWD and Department of AYUSH and Directorates thereunder, Departments of Local Self-Government, Programme Implementation Evaluation and Monitoring and Environment and Climate Change, Office of the Drugs Controller (DC), State Planning Board, State Pollution Control Board, NHM, NAM, KMSCL, drug manufacturing units of Oushadhi and HOMCO. Also, District level offices and 105 healthcare institutions in four selected districts were selected as sample units out of 9,153 healthcare institutions (**Appendix 1.1**) functioning under the Departments in the State.

Districts selected for Audit in Kerala are depicted on the map below:



The list of institutions selected are given in **Appendix 1.2**.

Audit methodology was in accordance with the CAG's Auditing Standards, 2017 and involved scrutiny and analysis of records/ data as per the audit objectives, scope and criteria, evidence gathering by scanning records, joint physical inspection of various facilities of the test-checked hospitals and by taking photographs, issuing questionnaires/ audit observations and obtaining replies, etc. Analysis of database of web application (Drug Distribution and Management System of KMSCL) was also conducted.

The Entry Conferences were held with the Additional Chief Secretary (ACS) and the Principal Secretary, HFWD on 03 November 2021 and with the Principal Secretary, AYUSH Department on 01 February 2022 wherein audit objectives, audit criteria, audit scope and methodology were discussed. The Exit Conference was held on 31 August 2022 with the ACS, HFWD wherein the audit findings were discussed in detail.

GoK replies pertaining to DME (October 2022) and KMSCL (November 2023) under the HFWD, ISM and Homoeopathy under the AYUSH Department (October 2023) and for paragraphs relating to SDG and Bio-Medical Waste management (September 2023) were received and incorporated in the Report. Response of GoK relating to DHS and DC is yet to be received (February 2024).

1.8. Consideration of Ayushman Bharat in this Report

Government of India (GoI) had launched Ayushman Bharat scheme during September 2018 which includes promotive, preventive, curative, palliative and rehabilitative aspects of universal healthcare through access of Health and Wellness Centres (HWCs) at the primary level and provision of financial protection for accessing curative care at the secondary and tertiary levels through engagement with both public and private sector. It adopts a continuum of care approach, comprising of two inter-related components:

- Creation of HWCs.
- Pradhan Mantri Jan Arogya Yojana (PMJAY).

HWCs

- Creation of 1,50,000 HWCs by transforming the existing Sub Centres and Primary Health Centres.
- Aim to deliver Comprehensive Primary Health Care (CPHC) covering maternal and child health services and non-communicable diseases, including free essential drugs and diagnostic services.

PMJAY

- Aims to provide a cover of ₹ five lakh per family per year for secondary and tertiary care hospitalisation across public and private empanelled hospitals in India.
- Over 10.74 crore poor and vulnerable families (approximately 50 crore beneficiaries) are eligible for these benefits.
- Provides cashless access to healthcare services for the beneficiary at the point of service, that is, the hospital.
- Benefits of the scheme are portable across the country i.e., a beneficiary can visit any empanelled public or private hospital in India to avail cashless treatment.
- Services include approximately 1,393 procedures covering all the costs related to treatment, including but not limited to drugs, supplies, diagnostic services, physician's fees, room charges, surgeon charges, OT, and ICU charges etc.
- Public hospitals are reimbursed for the healthcare services at par with the private hospitals.

The details of HWCs and PMJAY are given in Chapters V and VII of this Report.

1.9. Doctors'/ Patients' survey

Audit conducted beneficiary survey of 400 patients in selected hospitals and a survey of 200 doctors serving in various departments of selected healthcare facilities on random basis.

1.10. Audit Criteria

The audit findings were derived from the audit criteria including National Health Policy, 2017, National Medical Commission Act, 2019, Indian Public Health Standards, 2012, Bio-Medical Waste Management Rules, 1998 and 2016, etc., as given in **Appendix 1.3**.

1.11. Acknowledgement

Audit acknowledges the cooperation extended by Health and Family Welfare Department and AYUSH Department and also appreciates the assistance provided by the field functionaries of these Departments for the smooth conduct of the Audit.

1.12. Structure of the Report

The Report has been divided into the following Chapters (besides Chapter I):

- Chapter II : Human resources
- Chapter III : Healthcare services
- Chapter IV : Availability of drugs, medicines, equipment and other consumables
- Chapter V : Healthcare infrastructure
- Chapter VI : Financial management
- Chapter VII : Implementation of Centrally Sponsored Schemes
- Chapter VIII: Adequacy and effectiveness of the regulatory mechanisms
- Chapter IX : Sustainable Development Goal – 3

CHAPTER II – HUMAN RESOURCES

CHAPTER II
HUMAN RESOURCES

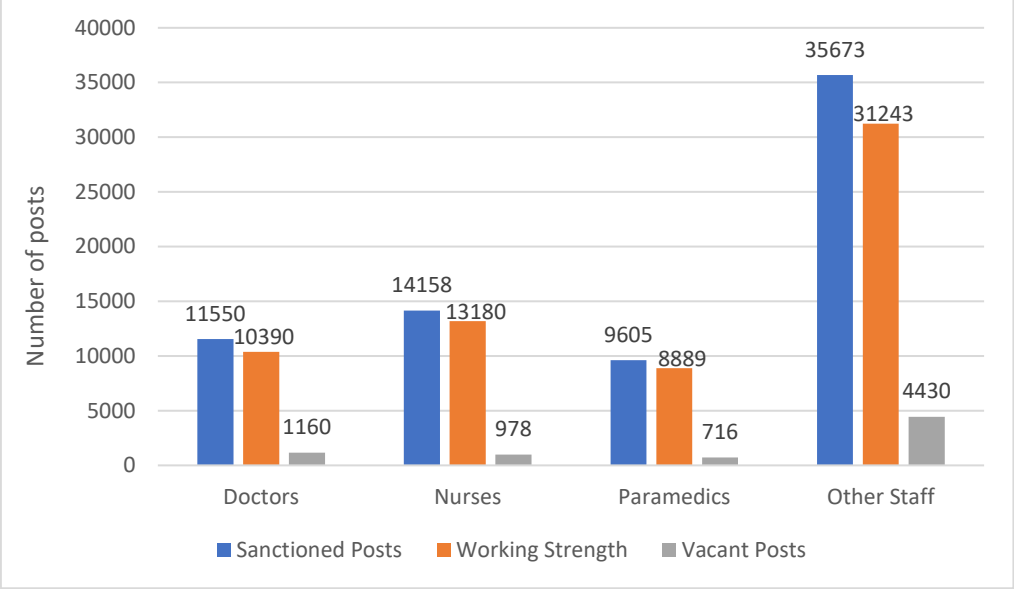
Shortage of doctors against sanctioned posts was noticed in all levels of hospitals under Modern system of Medicine. The shortage was more severe in the case of specialist doctors. Shortage of doctors was also noticed in tertiary level hospitals test-checked under AYUSH. Similarly, shortage of nurses, pharmacists and lab technicians was also noticed in the test-checked hospitals. The deficiency of manpower in public hospitals not just affects the accessibility of public to quality healthcare but also exerts pressure on the available resources, therby compromising on effective delivery of healthcare services. The doctor to population ratio was most adverse in two out of the 14 districts of the State. The shortage of Accredited Social Health Activists in the districts ranged from three to 33 *per cent* in 13 out of the 14 districts of the State.

The health workforce can be defined as "all people engaged in actions whose primary intent is to enhance health". Achievement of health goals depends mainly on knowledge, skills, motivation and deployment of the people responsible for organizing and delivering health services. These human resources include clinical staff such as physicians, nurses, pharmacists and dentists, as well as management and support staff – those who do not deliver services directly but are essential for the effective performance of health systems.

2.1. Availability of human resources against sanctioned strength

Audit analysed the availability of the staff for the efficient functioning of the healthcare system under all systems of medicines across the State and the details are as depicted in **Chart 2.1.**

Chart 2.1: Manpower position in Government health institutions (as on 31.03.2023)



(Source: Data furnished by the Directorates (May 2023))

Table 2.1: Manpower position across the different Health Directorates as on 31.03.2023

Name of the Directorate	Name of post	Sanctioned strength (SS)	Share in total workforce of posts (in *per cent*)	Working strength	Vacant posts	Percentage of vacancy
Director of Health Services (DHS)	Doctors	6326	54.77	5917	409	6.47
	Nurses	9101	64.28	8554	547	6.01
	Paramedics	4084	42.52	3818	266	6.51
	Other Staff	29985	84.06	25731	4254	14.19
Director of Medical Education (DME)	Doctors	2979	25.79	2428	551	18.50
	Nurses	4386	30.98	4057	329	7.50
	Paramedics	1751	18.23	1523	228	13.02
	Other Staff	4544	12.74	4467	77	1.69
Director of Indian Systems of Medicine (DISM)	Doctors	1180	10.22	1115	65	5.51
	Nurses	443	3.13	378	65	14.67
	Paramedics	2340	24.36	2197	143	6.11
	Other Staff	618	1.73	553	65	10.52
Director of Ayurveda Medical Education (DAME)	Doctors	216	1.87	148	68	31.48
	Nurses	105	0.74	88	17	16.19
	Paramedics	103	1.07	89	14	13.59
	Other Staff	300	0.84	278	22	7.33
Director of Homoeopathy (DoH)	Doctors	774	6.70	756	18	2.33
	Nurses	103	0.73	88	15	14.56
	Paramedics	1292	13.45	1233	59	4.57
	Other Staff	177	0.50	169	8	4.52

Name of the Directorate	Name of post	Sanctioned strength (SS)	Share in total workforce of posts (in *per cent*)	Working strength	Vacant posts	Percentage of vacancy
Principal and Controlling Officer (P and CO), Homoeopathy Medical Education	Doctors	75	0.65	26	49	65.33
	Nurses	20	0.14	15	5	25.00
	Paramedics	35	0.36	29	6	17.14
	Other Staff	49	0.14	45	4	8.16

Scales determined by Audit	Good (< 10 *per cent*)	Poor (10 to 20 *per cent*)	Very poor (21 to 50 *per cent*)	Extremely poor (> 50 *per cent*)

(Source: Data furnished by the Directorates (May 2023)). Data in respect of DHS is as of March 2023 and with respect to others, the position is as of March 2022.

Analysis of availability of clinical staff under each system of medicine revealed the following:

- In the primary and secondary level hospitals (DHS, DISM, DoH) functioning under all systems of medicine, the availability of doctors was around 94 to 98 *per cent* of the sanctioned strength.

  However, in the tertiary level hospitals[3], the percentage of doctors in position against sanctioned strength was in the range of 35 to 82 only. Acute shortage was observed in Homoeopathy Medical Colleges, where the regular doctors in position was only 35 *per cent*. Even after engaging 22 doctors on contract basis, 36 *per cent* of the sanctioned posts remained vacant during the audit period. GoK stated (October 2023) that against the sanctioned strength of 75 doctors, 61 doctors (24 regular, 10 on deputation and 27 provisional doctors) were engaged in Homoeopathy Medical colleges as of October 2023. The recruitment process of regular doctors through Kerala Public Service Commission (KPSC) would be completed soon.

- The vacancies of nurses, pharmacists and lab technicians reported to KPSC by the Homoeopathy Medical Colleges remained unfilled as no appointments were made during the entire audit period. In the Medical Colleges under ISM also, the vacancies in the post of nurses reported to KPSC remained unfilled from the year 2018-19 as no appointments were made. GoK replied (October 2023) that vacancies of nurses had been filled and non-availability certificates for filling the vacancies of pharmacists and lab technicians were received from KPSC and that the appointment process of provisional employees to the above vacancies through Employment Exchanges would be done shortly.

- In the primary and secondary level hospitals under all the systems of medicine, shortage of staff was observed in posts of nurses, paramedics and other staff. The vacancy position of nurses showed an upward trend

[3] Functioning under DME, DAME and P and CO, Homoeopathy Medical Education

in primary/ secondary hospitals of ISM (58 in 2016-17 to 135 in 2021-22) and in tertiary level hospitals it increased from three in 2016-17 to 16 in 2021-22. GoK replied (October 2023) that the reported vacancies under the Department of ISM were filled up from the rank list of paramedical staff available with KPSC. Absence of periodical filling up of vacancies resulted in the risk of denial of uninterrupted delivery of quality healthcare services to the patients.

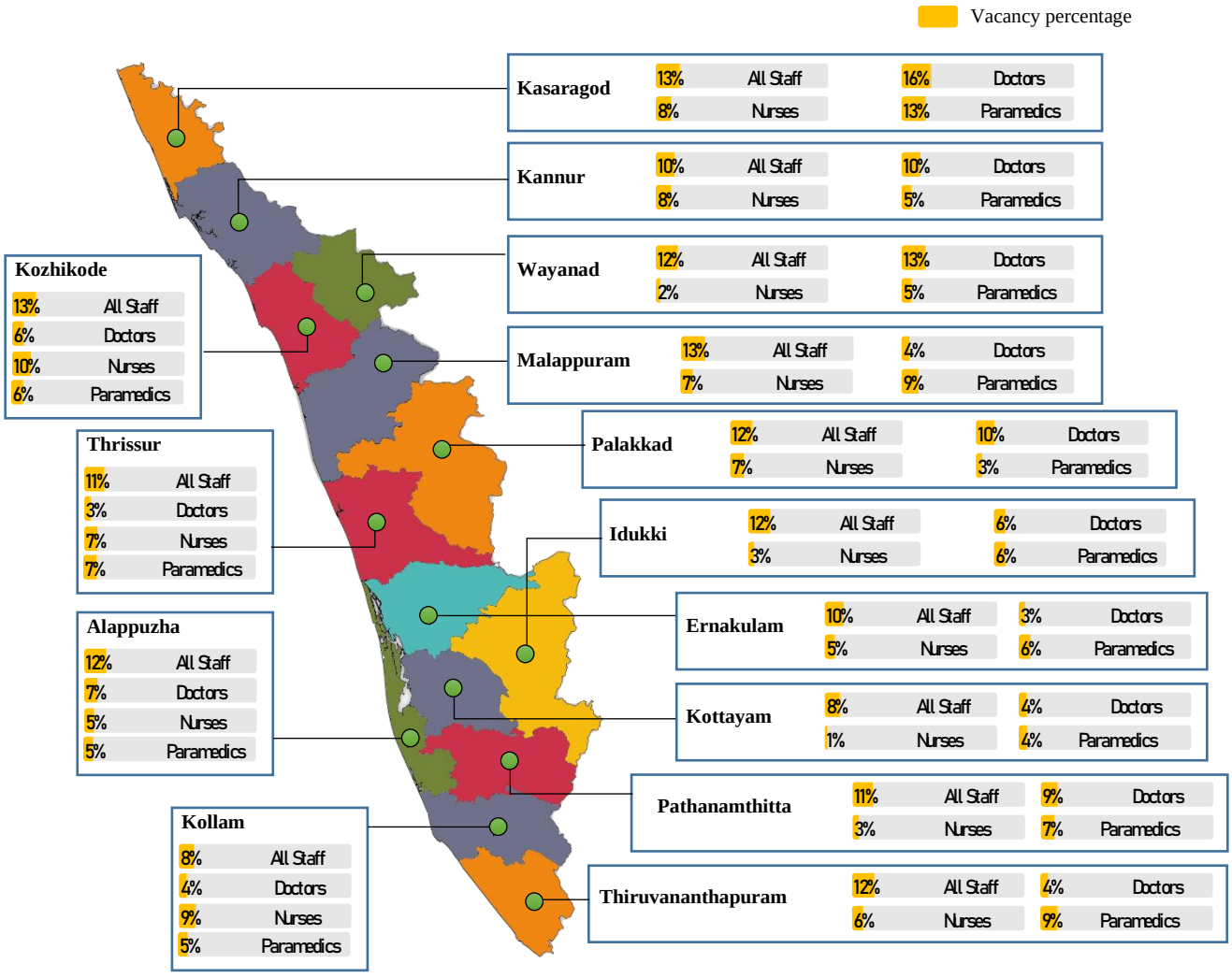
2.2. Availability of staff in various posts under DHS

Indian Public Health Standards (IPHS) issued by GoI prescribes the minimum essential and desirable requirement of human resources to be made available in the primary and secondary level institutions under Modern Medicine. Audit analysed the availability of manpower with reference to IPHS and sanctioned strength and observations thereon are given in the succeeding paragraphs.

2.2.1. Distribution of available manpower in DHS

It is observed that against the sanctioned strength of 49,496 posts across the State under all categories of staff under DHS, 5,476 (11 *per cent*) posts remained vacant (March 2023). The district-wise shortage of all categories of staff ranged from eight *per cent* to 13 *per cent.* The highest vacancy position (13 *per cent*) was observed in the northern districts of Kasaragod, Kozhikode and Malappuram. District-wise vacancy position of all categories of staff is furnished in **Figure 2.1**.

Figure 2.1: District-wise vacancy position of staff under DHS

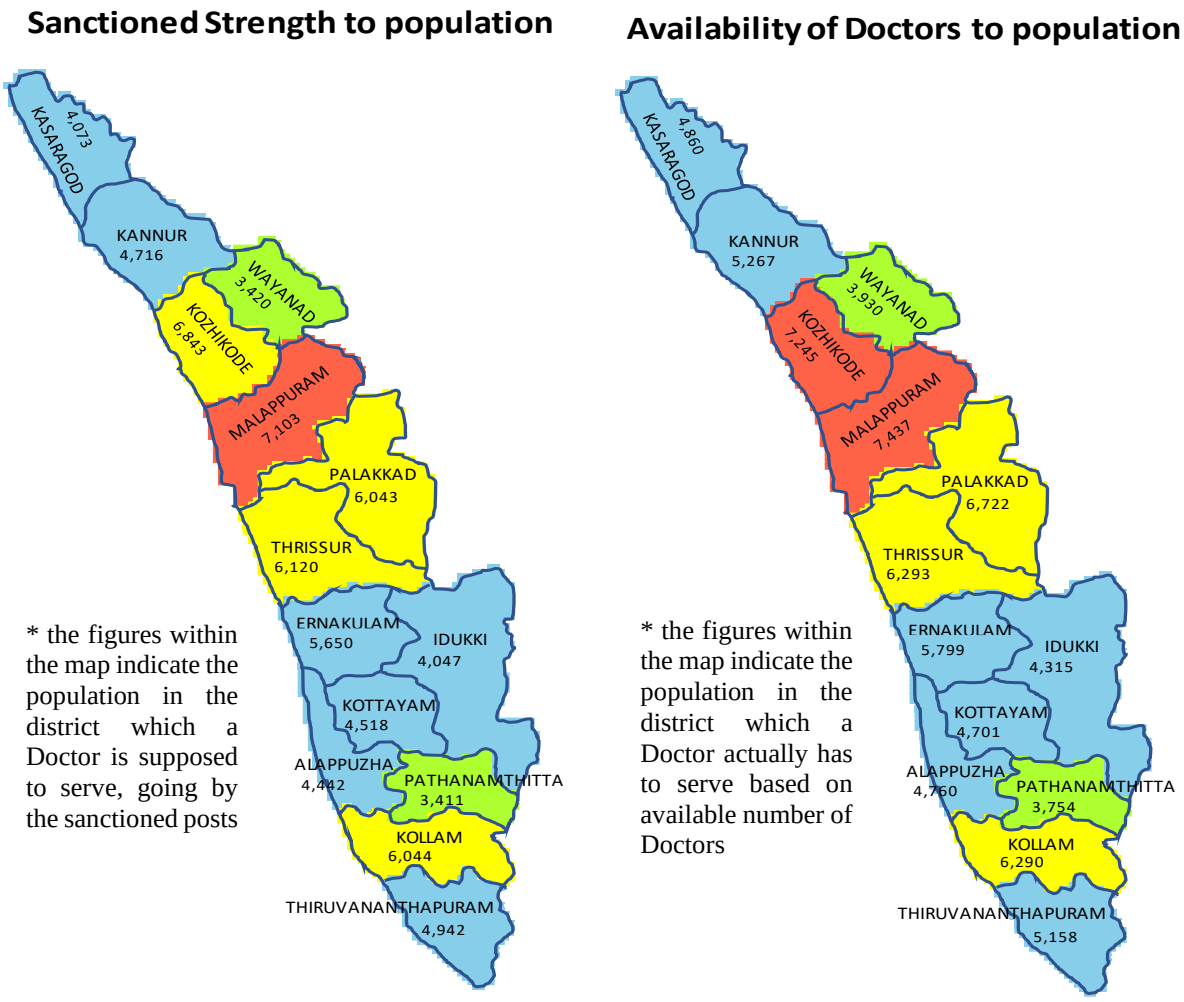


(Source: Data furnished by the DHS in May 2023)

2.2.1.1. Uneven distribution of doctors at district level

Audit noticed wide disparity in sanctioned strength of doctors with respect to population across the State as shown in **Figure 2.2**. While in Pathanamthitta district the ratio was 1:3411, in Malappuram district it was 1:7103.

Figure 2.2: District-wise sanctioned strength and availability of doctors compared with the population



Scales determined by Audit	Good (< 4000)	Poor (4000 to 6000)	Very poor (6001 to 7000)	Extremely poor (> 7000)

(Source: Data furnished by the DHS in May 2023)

Doctor to population ratio was most adverse in the Kozhikode and Malappuram districts.

2.2.1.2. Availability of specialist doctors in hospitals under DHS in the State

The availability of specialist doctors across the State is shown in the **Table 2.2** below.

Table 2.2: District-wise shortage of specialist doctors (as on 31.03.2023)

Sl. No.	District	DH/ GH			TH/THQH			CHC		
		Sanctioned Strength (SS)	Persons in position (PIP)	Vacancy	SS	PIP	Vacancy	SS	PIP	Vacancy
1.	Thiruvananthapuram	129	125	4	70	68	2	3	3	0
2.	Kollam	46	40	6	89	85	4	0	0	0
3.	Pathanamthitta	77	70	7	35	33	2	0	0	0
4.	Alappuzha	83	74	9	64	60	4	0	0	0
5.	Kottayam	112	107	5	25	23	2	9	9#	-
6.	Idukki	51	49	2	38	36	2	0	0	0
7.	Ernakulam	112	112	0	83	80	3	0	0	0
8.	Thrissur	73	73*	-	64	59	5	4	4	0
9.	Palakkad	40	34	6	58	55	3	10	10	0
10.	Malappuram	121	109	12	58	54	4	4	4	0
11.	Kozhikode	67	62	5	52	48	4	1	1	0
12.	Wayanad	57	46	11	28	23	5	5	5	0
13.	Kannur	89	81	8	67	58	9	7	6	1
14.	Kasaragod	66	54	12	10	10	0	2	2	0
	Total	**1123**	**1036**	**87**	**741**	**692**	**49**	**45**	**44**	**1**

**74 specialist doctors were working against SS of 73*
#10 specialist doctors were working against the SS of nine.
(Source: Data furnished by the DHS (May 2023))

Eighty seven posts (7.75 *per cent*) of specialist doctors in DH/ GHs and 49 posts (6.61 *per cent*) in TH/ THQHs remained vacant. While examining the speciality/district-wise availability of doctors, the following points were noticed:

- Pathologist , as required in IPHS, was not sanctioned/ posted in any of the DH/ GHs.
- Vacancies of specialists were noticeably high for General Medicine and General Surgery (in DHs and THs) and was in the range of 10 to 17 *per cent* of sanctioned posts.
- Vacancies of the specialists in DH/ GHs were higher in the districts of Kasaragod (18 *per cent*) and Wayanad (19 *per cent*).
- The specialist post of Dental Surgeon was available only in 11 out of 87 TH/ THQHs though it was an essential requirement as per norms.
- Against the requirement of six specialist doctors per CHC as per norms, the total specialists available in the 227 CHCs[4] was only 45.

2.2.2. Availability of clinical staff in test-checked hospitals

The minimum essential and desirable requirement of human resources for primary and secondary level Modern Medicine institutions are prescribed in

[4] This includes 42 CHCs converted to FHCs

IPHS. Under Aardram Mission[5], GoK prepared (July 2018) a Mission document in which the staff pattern to be implemented for each level of hospital under DHS was specified. Since all the PHCs were to be covered under the Mission, Audit examined the availability of human resources in hospitals with respect to norms specified in Aardram Mission as well as in IPHS. However, in the case of hospitals from the level of CHCs, the availability of the staff has been examined with reference to IPHS only, as the standardisation of the hospitals under the Mission was in implementation stage.

Audit analysed the availability of the clinical staff whose services are more crucial for the efficient functioning of the healthcare system i.e., doctors, nurses, lab technicians and pharmacists in the test-checked hospitals under DHS in four districts as discussed in the following paragraphs:

2.2.2.1. Vacancy position of doctors

The IPHS requires the services of at least one Medical Officer in a PHC level hospital. This stipulation was met in all the test-checked hospitals. IPHS prescribes specialty services from the secondary level hospitals and a minimum requirement of 28 to 66 doctors and 19 to 23 doctors at district level hospitals and taluk level hospitals respectively depending on the bed strength of the hospital. In the case of CHCs, the minimum requirement was 10 doctors. Status of availability of doctors in the test-checked hospitals under DHS are as shown below :

Table 2.3: Availability of doctors in hospitals under DHS [6]

	No. of hospitals test-checked	Required number of doctors as per IPHS	SS	PIP	Vacancy		Shortage in SS against IPHS	Contract Staff
					No.	in *per cent*		
DH/GH	7	359	281	270	11	4	78	31
TH/ THQH	7	153	120	114	6	5	33	17
CHC	7	70	34	34	0	0	36	6
PHC/ FHC	32	32	78	66	12	15	0	38
Total	**53**	**614**	**513**	**484**	**29**		**147**	**92**

(Source: Records of the test-checked hospitals)

Against the requirement of 614 posts of doctors, 513 posts were sanctioned in these hospitals and the percentage of shortage was 16. Out of the sanctioned posts itself, 29 posts remained vacant (31 March 2021). Audit noticed a shortage of 147 doctors with respect to IPHS in secondary level hospitals.

- Aardram scheme of GoK envisaged a staff pattern of three Medical Officers for every FHC. Audit noticed that out of the 32 FHCs test-checked, the prescribed manpower was sanctioned only in 12 hospitals.

[5] A GoK scheme for improving the quality of healthcare services in the State as detailed in Paragraph 3.1.2.1 of this Report

[6] Status as on 31 March 2021 has been included based on audit conducted at selected healthcare institutions between November 2021 and April 2022.

The prescribed manpower was available only in seven[7] out of these 12 hospitals.

Thus, it could be seen that the doctors-in-position were overburdened due to lack of sufficient manpower which is detailed in Chapter III.

2.2.3. Short availability of specialist doctors in test-checked hospitals under DHS

Audit also examined the availability of specialist doctors in the test-checked hospitals and noticed the following deficiencies:

- Specialists for Microbiology and Pathology were not provided in any of the test-checked DHs/ GHs.
- Posts of Radiologists and Pathologists were not sanctioned in any of the test-checked TH/ THQHs.
- Posts of Psychiatrist were not sanctioned in GH Neyyattinkara and DH Nedumangad. Gynaecologist was not available in GH Alappuzha.

Audit also noticed shortage in availability of following categories of specialist doctors as detailed in **Table 2.4**.

Table 2.4: Availability of specialist doctors in DH/ GH/ TH/ THQH/ CHCs

Specialist doctors (No of units covered in Audit)	Required as per IPHS	SS	PIP	Shortage in SS against IPHS
DH/ GHs				
Obstetrics and Gynaecology	32	23	22	9
Paediatrics	28	22	22	6
Anaesthesia	21	16	17	5
Dental	16	10	9	6
Radiology	12	6	5	6
TH/ THQHs				
Dermatology/ Venereology	5	1	1	4
Anaesthesia	7	4	4	3
ENT	7	4	4	3
Ophthalmology	7	4	5	3
Orthopaedics	7	4	4	3
CHCs				
Obstetrics and Gynaecology	7	0	0	7
Paediatrics	7	1	1	6
Anaesthesia	7	0	0	7
Dental	7	2	2	5

(Source: Records of the test-checked hospitals)

- Specialist posts for Obstetrics and Gynaecology and Anaesthesia were not sanctioned in any of the CHCs test-checked.

[7] FHC Pozhiyoor, FHC Meppadi, FHC Parappanangadi, PHC Kannamangalam, FHC Aryad, FHC Chokkad, FHC Cheruthana

- Posts of Dental Surgeons were sanctioned only in CHC Tanur and Government Tribal Hospital (GTH), Nalloornad and Paediatrician in GTH Nalloornad, out of the seven CHCs test-checked.

Thus, it could be seen that there was shortage of specialist doctors at DHs/ GHs, TH/ THQHs and CHCs. However, the shortage was more acute in THs. It is a matter of concern that there were no specialist doctors in Obstetrics and Gynaecology in any of the test-checked CHCs.

2.2.4. Availability of nurses, pharmacists and lab technicians in hospitals under DHS

Audit verified the availability of the posts of nurses and essential paramedical posts of pharmacists and lab technicians in the test-checked hospitals.

The IPHS prescribes the minimum requirement[8] of nurses and the paramedical staff in each level of hospitals. For taluk and district level hospitals, the minimum staff requirement is based on the bed strength of the hospital. The availability of the staff in the test-checked hospitals are as detailed in **Table 2.5**.

Table 2.5: Availability of nurses, pharmacists and lab technicians in hospitals under DHS

Level of Hospital	No. of hospitals	Required staff strength as per IPHS	SS	PIP	Vacancy		Shortage in SS against IPHS	Contract Staff
					No.	*Per cent*		
Nurses								
DH/ GH	7	1125	459	424	35	8	666	155
TH/ THQH	7	186	132	127	5	4	54	52
CHC	7	70	33	28	5	15	37	12
PHC/ FHC	32	96	65	58	7	11	31	42
TOTAL	**53**	**1477**	**689**	**637**	**52**		**788**	**261**
Pharmacists								
DH/ GH	7	64	37	36	1	3	27	33
TH/ THQH	7	26	23	21	2	9	3	16
CHC	7	7	9	9*	0	0	0	6
PHC/ FHC	32	32	42	34	8	19	0	18
TOTAL	**53**	**129**	**111**	**100**	**11**		**30**	**73**
Lab Technicians								
DH/ GH	7	96	52	47	5	10	44	46
TH/ THQH	7	33	21	20	1	5	12	22
CHC	7	14	7	7	0	0	7	4
PHC/ FHC	32	32	22	18	4	18	10	14
TOTAL	**53**	**175**	**102**	**92**	**10**		**73**	**86**

**Against the SS of nine, PIP was 13*
(Source: Records of the test-checked hospitals)

[8] Minimum requirement: Nurse -Three for PHCs, 10 for CHCs, 18 to 30 for THs and 45 to 225 for district level hospitals; Pharmacists - One for PHC/ CHC, three to four for THs and four to 12 for GHs depending on bed strength; Lab technicians – One for PHCs, two for CHCs and four to 16 for DH/ THs according to the bed strength.

Audit observed the following:

- The sanctioned posts of nurses and lab technicians were only 46.65 *per cent* and 58.29 *per cent* respectively of the required strength prescribed in IPHS.
- The hospitals deployed 261 contract nurses to cover this shortage. Even after taking into account the deployment of contract nurses, the shortage with respect to IPHS was 39.20 *per cent*.
- The overall availability of sanctioned posts of pharmacists against the IPHS norms was 86.05 *per cent* in the test-checked primary and secondary level hospitals. However, in the DHs, the availability of sanctioned posts was only 57.81 *per cent*.
- Aardram norms envisage four nurses for an FHC. Audit observed that the prescribed manpower was sanctioned only in five out of 32 FHCs test-checked. Even in these five hospitals, the prescribed manpower was available only in FHC Meppadi and FHC Perumbalam.
- The IPHS and Aardram stipulate one lab technician for every FHC. The post of lab technician was not sanctioned in 13 out of 32 test-checked FHCs.
- Against the requirement of two lab technicians per hospital, only one lab technician was available in all the seven test-checked CHCs.
- The IPHS stipulates one nurse per six beds in the general ward. The availability of nursing service as per records of February 2020[9], in seven test-checked DHs/ GHs are given in **Table 2.6**.

Table 2.6: Beds against one nurse in IPD in DHs/ GHs

Shift	DH Mananthavady	DH Mavelikkara	DH Nedumangad	DH Tirur	GH Alappuzha	GH Neyyattinkara	GH Kalpetta
Shift-I	14	7	26	13	9	16	8
Shift-II	20	12	51	16	13	42	15
Shift-III	20	17	51	15	14	60	18

(Source: Records in test-checked hospitals)

In the test-checked DH/ GHs, Audit observed that the nurses attended seven (DH Mavelikkara) to 60 beds (GH Neyyattinkara). Nurse to bed ratio was most adverse in GH Neyyattinkara (1:60) and DH Nedumangad (1:51). DHS stated (November 2022) that the requisite staff pattern was not provided to DH Nedumangad even though it was upgraded in 2013 and in GH Neyyattinkara, the staff pattern was inadequate.

[9] Audit of the selected institutions was carried out during the period from November 2021 to April 2022 covering the period 2016-17 to 2020-21. As the number of patients approaching health institutions had drastically come down after March 2020 due to COVID-19, February 2020 was selected for detailed scrutiny.

- Further, in the seven test-checked THs/ THQHs, the average number of beds attended by one nurse was higher than six, except in THQH Vythiri.

  Thus, except THQH Vythiri, none of the test-checked hospitals complied with the norms regarding nurse to bed ratio. The sub-optimal ratio would have an undesirable effect on the health services provided in public hospitals.

- As per the IPHS, one nurse is required for each bed in ICU. Audit noticed that this ratio was not maintained in the ICUs in any of the test-checked GH/ DHs[10] as detailed in **Table 2.7**.

Table 2.7: Availability of nurses in ICUs

	GH Alappuzha	DH Tirur	DH Nedumangad	DH Mananthavady	GH Kalpetta
ICU bed (No.)	8	15	6	9	6
No. of nurses required as per IPHS	8	15	6	9	6
No. of nurses posted in ICU	4	4	3	3	4
Shortage of nurses (in *per cent*)	4(50)	11(73)	3(50)	6(67)	2(33)

(Source: Records of test-checked hospitals)

The shortage of nurses as per IPHS norms ranged from 33 to 73 *per cent* in the above test-checked hospitals. No remarks were furnished by GoK (November 2023).

2.3. Human Resources under DME

The National Medical Commission Act, 2019 prescribes the minimum standard requirement of doctors to be maintained in Medical Colleges.

The availability of manpower in Government Medical Colleges (GMC) in test-checked districts was examined with reference to National Medical Commission (NMC) norms and the strength sanctioned by GoK.

2.3.1. Vacancy position of doctors

The National Medical Commission norms (Minimum Requirements for Annual MBBS Admissions Regulations, 2020) stipulate the number of doctors to be maintained in the Medical College based on the number of annual MBBS admissions.

Audit examined the availability of doctors in the three test-checked GMCs (Thiruvananthapuram, Alappuzha and Manjeri) as detailed in **Table 2.8**.

[10] ICU was not available in GH Neyyattinkara and DH Mavelikkara when Audit was conducted during November 2021 to April 2022

Table 2.8: Availability of doctors in Medical Colleges

Name of GMC	Annual MBBS admissions	Professors/ Associate Professors/ Assistant Professors/ Senior Residents					
		Minimum requirement as per NMC	SS	PIP	Shortage in SS against NMC	Vacancy against SS	Vacancy (*per cent*)
GMC Thiruvananthapuram	250	254	579	505	Nil	74	12.80
GMC Alappuzha	175	192	305	247	Nil	58	19.00
GMC Manjeri	110	150	113	90	37	23	20.40
Total		**596**	**997**	**842**	**37**	**155**	**15.55**

(Source: Records of DME)

Though the sanctioned strength was higher than the minimum requirement as per norms in GMCs at Thiruvananthapuram and Alappuzha, category-wise analysis revealed that the required number of posts of Senior Residents was not sanctioned in both the Medical Colleges. The analysis revealed that in GMC Manjeri, minimum requirement of doctors as per the NMC norms was not maintained. Against a minimum requirement of 150 Professors/ Associate Professors/ Assistant Professors/ Senior Residents required in the hospital, the sanctioned strength and PIP were only 113 and 90 respectively. Audit noticed that the minimum requirement of teaching staff as per norms was not sanctioned in 15 departments and 15.55 *per cent* (155 out of 997) of the posts remained vacant against the sanctioned strength in the test-checked hospitals.

2.3.2. Availability of nurses, pharmacists and lab technicians in DME hospitals

Audit noticed that posts of 22 nurses (1.87 *per cent*), 10 pharmacists (18.87 *per cent*) and four lab technicians (11.76 *per cent*) were vacant against the sanctioned strength as shown in **Table 2.9**.

Table 2.9: Availability of nurses, pharmacists and lab technicians in GMCs as on 31 March 2021

Name of GMC	SS	PIP	Vacancy	Vacancy (*per cent*)	Contract staff
Nurses					
GMC Thiruvananthapuram	655	637	18	2.7	-
GMC Alappuzha	374	370	4	1.1	81
GMC Manjeri	143	143	-	-	167
Total	**1172**	**1150**	**22**	**1.87**	**248**
Pharmacists					
GMC Thiruvananthapuram	19	13	6	31.6	3
GMC Alappuzha	26	22	4	15.4	20
GMC Manjeri	8	8	-	-	37
Total	**53**	**43**	**10**	**18.87**	**60**
Lab technicians					
GMC Thiruvananthapuram	18	14	4	22.2	1
GMC Alappuzha	12	12	-	-	26
GMC Manjeri	4	4	-	-	0
Total	**34**	**30**	**4**	**11.76**	**27**

(Source: Records of the test-checked hospitals)

Though there were no/less vacancies in GMC Alappuzha and GMC Manjeri, Audit noticed that nurses, pharmacists and lab technicians were appointed on contract basis. Further, despite having full PIP against SS, GMC Manjeri had employed 204 contract staff.

2.4. Human Resources under AYUSH

In the case of primary and secondary level institutions under AYUSH, Audit observed that the staff pattern for Ayurveda and Homoeopathy hospitals with reference to the bed strength was fixed as early as in May 1978 and in March 1980 respectively by GoK.

As the staff pattern has not been revised, Audit verified the availability of human resources with reference to the sanctioned strength as shown in **Table 2.10**.

Table 2.10: Manpower position under AYUSH

Name of post	SS	PIP	Vacancy	Vacancy (*per cent*)
Doctors	2245	2062	183	8.15
Nurses	671	559	112	16.69
Paramedics	3770	3563	207	5.49
Other Staff	1692	1449	243	14.36
Total	**8378**	**7633**	**745**	**8.89**

(Source: Data obtained from DISM, DAME, Director of Homoeopathy, P and CO, Homoeopathy Medical College)

Table 2.11: District-wise manpower position under AYUSH

Sl. No.	District	SS	PIP	Vacancy	Vacancy (*per cent*)
1	Thiruvananthapuram	1310	1179	131	10.00
2	Kollam	520	500	20	3.85
3	Pathanamthitta	366	342	24	6.56
4	Alappuzha	549	507	42	7.65
5	Kottayam	579	532	47	8.12
6	Idukki	412	376	36	8.74
7	Ernakulam	832	759	73	8.77
8	Thrissur	670	581	89	13.28
9	Palakkad	563	523	40	7.10
10	Malappuram	626	603	23	3.67
11	Kozhikode	634	567	67	10.57
12	Wayanad	251	233	18	7.17
13	Kannur	722	626	96	13.30
14	Kasaragod	344	305	39	11.34
	Total	**8378**	**7633**	**745**	**8.89**

(Source: Data obtained from Directorates)

The manpower position in the test-checked health institutions under AYUSH as on 31 March 2021 is given in the subsequent paragraphs:

2.4.1. Availability of doctors in test-checked AYUSH Hospitals

- In the AYUSH system, doctors were available as per the sanctioned strength in the test-checked eight dispensaries.

- At secondary level, 26 doctors were available against the sanctioned strength of 27 in test-checked AYUSH hospitals. In addition, 20 doctors were appointed on contract basis.
- The Indian Medicine Central Council (Requirements of Minimum Standards for undergraduate Ayurveda Colleges and attached Hospitals) Regulations, 2016 and the Homoeopathy Central Council (Minimum Standards Requirement of Homoeopathic Colleges and attached Hospitals) Regulations, 2013 stipulate the number of Professors/ Associate Professors/ Assistant Professors/ Senior Residents to be maintained in Ayurveda and Homoeopathy Medical Colleges based on the number of BAMS/ BHMS admissions. Audit compared the availability of doctors in test-checked Medical Colleges with reference to the Regulations and sanctioned strength as detailed in **Table 2.12**.

Table 2.12: Availability of doctors in AYUSH Medical Colleges

Hospital	Annual BAMS/ BHMS admissions	Professors/ Associate Professors/ Assistant Professors/ Senior Residents				
		Minimum requirement as per norms	SS	PIP	Shortage in SS against norms	Vacancy against SS
Government Ayurveda Medical College, Thiruvananthapuram (GAMC)	88	45	84	67	Nil	17
Government Homoeopathic Medical College, Thiruvananthapuram (GHMC)	63	40 (28 regular staff + 12 guest faculty)	50	34 (21 regular staff + 13 guest faculty)	Nil	16

(Source: Records of the test-checked hospitals)

The vacancy against the sanctioned strength was 20 *per cent* in GAMC and 32 *per cent* in GHMC. GoK stated (October 2023) that in GHMC, 41 teaching doctors (21 regular and 20 provisional) were working as of October 2023 and the recruitment process of regular teaching doctors through KPSC would be completed soon.

2.4.2. Availability of nurses, pharmacists and lab technicians in AYUSH hospitals

Shortage of nurses in position in the secondary and tertiary level hospitals against the sanctioned strength was observed in AYUSH hospitals. Against the sanctioned strength of 93 nurses in hospitals/ colleges test-checked, 13 posts were vacant as on 31 March 2021[11]. There were six nurses appointed on contract basis.

There were no vacant posts of pharmacists in dispensaries and in GAMC. Against the sanctioned strength of nine, there were seven pharmacists in the

[11] Status as of March 2021 has been included based on audit conducted at selected healthcare institutions between November 2021 and April 2022.

test-checked eight AYUSH hospitals. In GHMC, against the three sanctioned posts, one post remained vacant.

There was vacancy of one lab technician each in GAMC and GHMC. The details are shown in **Table 2.13**.

Table 2.13: Availability of nurses/ pharmacists/ lab technicians in AYUSH hospitals

	No. of hospitals	SS	PIP	Vacancy	Contract/ Daily wages staff
Nurses					
Hospitals	8	31	25	6	3
GAMC	1	54	51	3	3
GHMC	1	8	4	4	0
Total	**10**	**93**	**80**	**13**	**6**
Pharmacists					
Dispensaries	8	8	8	0	0
Hospitals	8	9	7	2	3
GAMC	1	16	16	-	-
GHMC	1	3	2	1	-
Total	**18**	**36**	**33**	**3**	**3**
Lab Technicians					
Hospitals	8	3	3	-	4
GAMC	1	13	12	1	1
GHMC	1	5	4	1	-
Total	**10**	**21**	**19**	**2**	**5**

(Source: Records of the test-checked hospitals)

GoK stated (October 2023) that vacancies of pharmacists under the department of ISM and nurses under GHMC were filled up subsequently. Vacancies of nurses under Homoeopathy department were reported to KPSC and non-availability certificates for filling the vacancies of pharmacists and lab technicians were obtained from KPSC.

2.5. Shortage of manpower affecting service delivery

The impact of shortage of manpower on the delivery of services brought out in this Report is given in **Table 2.14**.

Table 2.14: Details of services affected due to shortage of staff

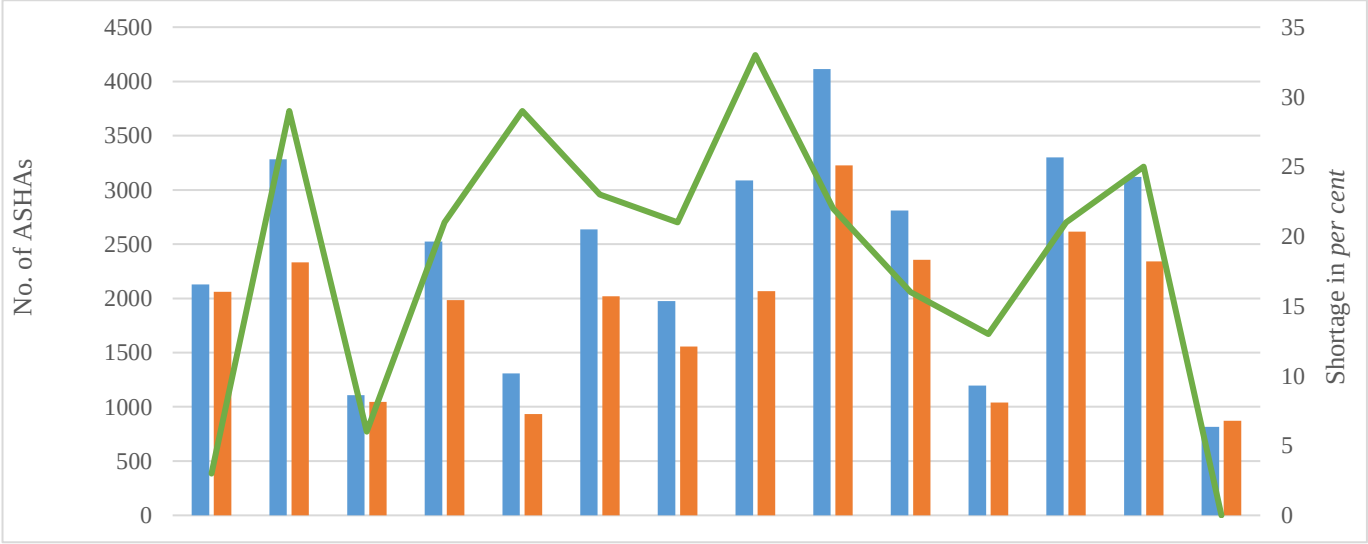
Sl. No.	Impacted service	Paragraph reference
1.	Shortage in OP registration counter	3.1.5
2.	High daily patient load per doctor	3.1.4
3.	Ultrasonography machine in GH Kalpetta was not being utilised due to non-availability of sonologist	3.9.1
4.	Idling of various equipment in hospitals	4.7.5
5.	Shortfall in attaining the operationalisation targets of HWCs	5.3.2

(Source: Data obtained from test-checked hospitals)

2.6. Availability of Accredited Social Health Activists

One of the key components of NHM is to provide every village in the country with a trained female community health activist namely Accredited Social Health Activist (ASHA). Selected from the village itself and accountable to it, the ASHA will be trained to work as an interface between the community and the public health system. Guidelines on ASHA of NHM prescribe one ASHA per 1,000 population. Audit verified the availability of ASHAs as of March 2022 and had noticed shortage in all the districts except in Wayanad as shown in **Chart 2.2**.

Chart 2.2: District-wise shortfall in availability of ASHAs as per norms



	Alappuzha	Ernakulam	Idukki	Kannur	Kasaragod	Kollam	Kottayam	Kozhikode	Malappuram	Palakkad	Pathanamthitta	Thiruvananthapuram	Thrissur	Wayanad
ASHA requirement	2128	3282	1109	2523	1307	2635	1975	3086	4113	2810	1197	3301	3121	817
ASHA available	2060	2333	1047	1984	933	2019	1555	2065	3225	2357	1041	2616	2341	872
Shortage (in *per cent*)	3	29	6	21	29	23	21	33	22	16	13	21	25	0

No remarks were furnished by GoK (November 2023).

2.7. Recruitment of manpower

The recruitment done by the DHS, DMS, DAME, DISM, DoH and P and CO during 2016-17 to 2022-23 and category-wise details of number of employees recruited is shown in the tables and charts below:

Table 2.15: Manpower recruited during the period 2016-23

Financial year	Number of Employees recruited	
	Under modern system of medicine	Under AYUSH
2016-17	2861	286
2017-18	3148	356
2018-19	2371	261
2019-20	3329	209
2020-21	2950	331
2021-22	2767	246
2022-23	2242	351
Grand Total	**19668**	**2040**

(Source: Data obtained from Directorates)

Chart 2.3: Category-wise number of employees recruited under modern system of medicine

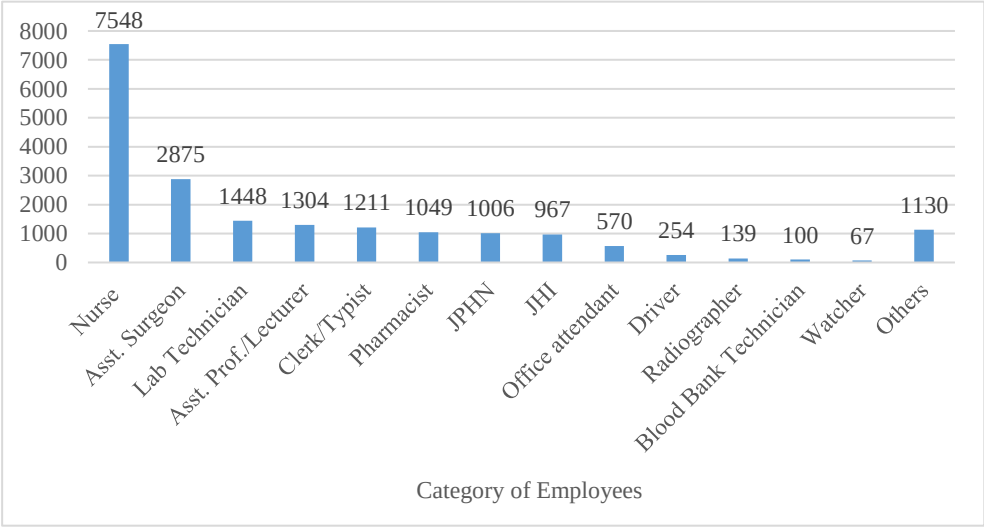
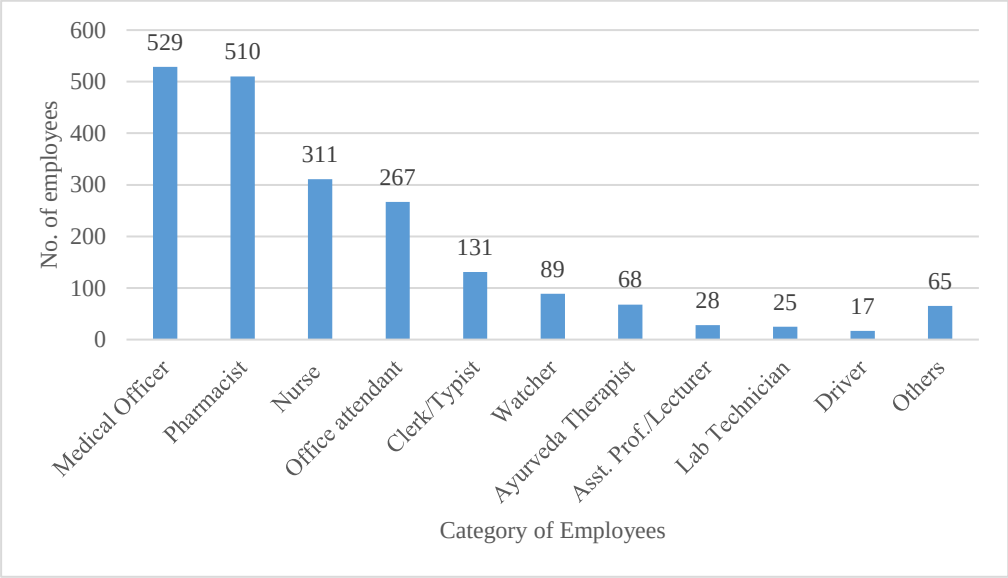


Chart 2.4: Category wise number of employees recruited under AYUSH



Though 21,708 employees were recruited under modern system of medicine and AYUSH during 2016-23, there was shortage of staff as discussed in above paragraphs (**Paragraphs 2.1 to 2.4**).

2.8. Recommendations

- Government should assess the requirement of doctors and paramedical staff at different levels and regions and ensure availability of human resources required as per the norms stipulated in IPHS/ Aardram Mission.
- Government should take action for reducing the wide disparity in doctor to population ratio in the State by increasing the strength of doctors in the districts with most adverse ratios.

CHAPTER III – HEALTHCARE SERVICES

CHAPTER III
HEALTHCARE SERVICES

Family Health Centres were not providing services as intended under Aardram Mission due to lack of infrastructure, required manpower, etc. and thus the aim to provide augmented services at reasonable cost, time and satisfaction had not been met. The number of doctors in the OP Departments of the hospitals was not commensurate with the number of patients seeking medical care creating overload for doctors as well as inconvenience to patients. The minimum essential services as prescribed by IPHS were not available in many of the hospitals. The entire gamut of desirable pathological services and equipment was not available in different categories of hospitals.

The IPHS envisage that each level of hospital should deliver the prescribed essential services (minimum assured services) and aspire to deliver specialised services to address the needs of patients. The standards also stipulate patient amenity requirements to be provided for efficient management of services.

Availability of all essential services is required for providing quality healthcare services to patients. As many of the services like emergency care, operation theatre, blood bank, etc., are interrelated, absence of one service would prevent optimal utilisation of other resources present in the hospital. Thus, it is essential that all hospitals are equipped with all essential services for emergency treatment of patients.

3.1. Out-Patient Department services

To avail out-patient services in the hospitals, patients first register at the hospital and approach the out-patient department (OPD) where the doctors concerned examine the patients and prescribe either diagnostic tests for evidence-based diagnosis or drugs as per the diagnosis done during the consultation process.

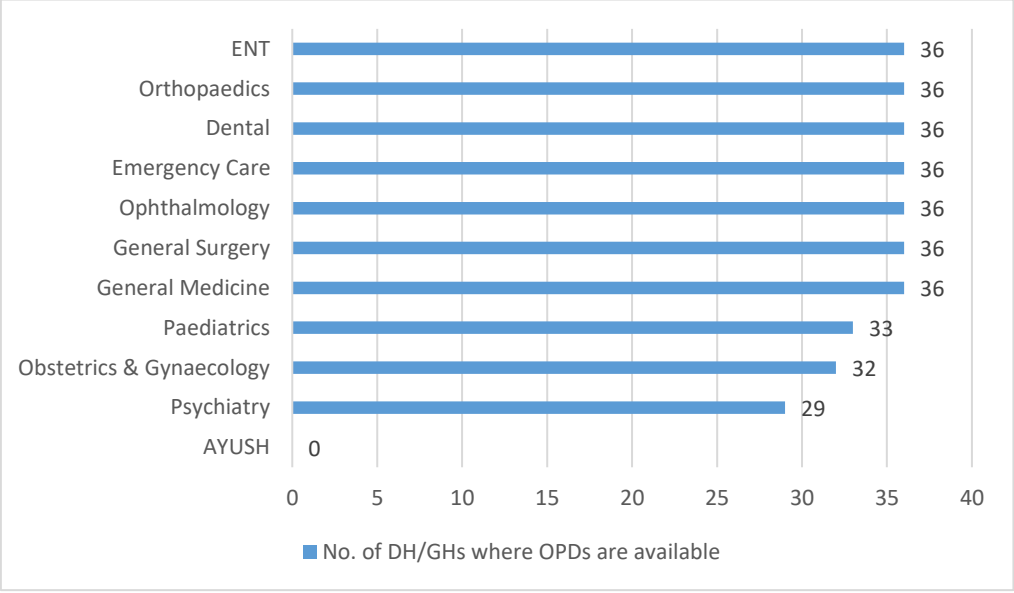
3.1.1. Availability of OPD services in hospitals

The availability of OPD services which are essential as per IPHS in the DH/ GHs, TH/ THQHs and the CHCs across the State are as follows:

3.1.1.1. District Hospitals/ General Hospitals

While seven out of the 11 essential OPD services were provided through the 36 DH/ GHs in the State, Paediatrics, Obstetrics and Gynaecology (O and G) and Psychiatry services were not provided in three, four and seven hospitals respectively. AYUSH services were not provided in any of the DH/ GHs in the State. The details are given in **Chart 3.1**.

Chart 3.1: Availability of OPD services in the 36 DH/ GHs in the State



(Source: Data furnished by the DHS (May 2023))

Availability of these essential services in the seven test-checked DH/ GHs is shown in **Table 3.1**.

Table 3.1: Availability of OPD services in DH/ GHs

Specialty services (OPD)	Alappuzha		Malappuram	Thiruvananthapuram		Wayanad	
	GH Alappuzha	DH Mavelikkara	DH Tirur	GH Neyyattinkara	DH Nedumangad	DH Mananthavady	GH Kalpetta
ENT	A	A	A	A	A	A	A
Orthopaedics	A	A	A	A	A	A	A
Dental	A	A	A	A	A	A	A
Emergency care	A	A	A	A	A	A	A
Ophthalmology	A	A	A	A	A	A	A
General Surgery	A	A	A	A	A	A	A
General Medicine	A	A	A	A	A	A	A
Paediatrics	A	A	A	A	A	A	A
O and G	NA	A	A	A	A	A	A
Psychiatry	A	A	A	NA	NA	A	A
AYUSH	NA	NA	NA	NA	NA	NA	NA

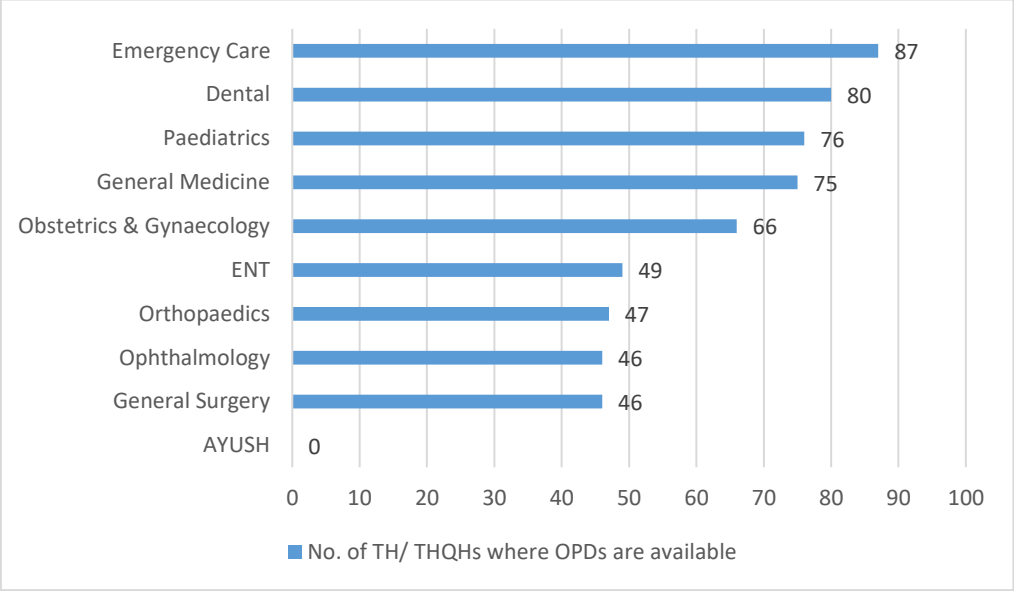
Colour code: Green colour/ A = Available; Pink colour/ NA = Not available
(Source: Information furnished by test-checked DH/ GHs (March 2022))

Psychiatry service was not provided in two major hospitals in Thiruvananthapuram district and O and G service was not available in GH Alappuzha.

3.1.1.2. Taluk Hospitals

As against the 10 essential OPD services, only Emergency care was available in all the 87 TH/ THQHs in the State. General Surgery, Ophthalmology, Orthopaedics and ENT services were available in less than 50 hospitals. AYUSH services were not provided in any of the TH/ THQHs in the State. The details are given in **Chart 3.2**.

Chart 3.2: Availability of OPD services in the 87 TH/ THQHs in the State



(Source: Data furnished by the DHS (May 2023))

Availability of these essential services in the seven test-checked TH/ THQHs is shown in **Table 3.2**.

Table 3.2: Availability of OPD services in TH/ THQHs

Specialty services (OPD)	Alappuzha		Wayanad	Thiruvananthapuram		Malappuram	
	TH Thuravoor	THQH Kayamkulam	THQH Vythiri	TH Fort	THQH Malayinkeezhu	THQH Thirurangadi	TH Wandoor
ENT	NA	A	NA	NA	NA	A	NA
Emergency care	A	A	A	A	A	A	A
General Medicine	A	A	A	A	A	A	A
Paediatrics	A	A	A	A	A	A	A
General Surgery	NA	A	A	A	NA	A	NA
Ophthalmology	A	A	NA	NA	NA	A	NA
Dental	A	A	A	A	A	A	A
O and G	A	A	A	A	NA	A	A
Orthopaedics	NA	A	NA	NA	NA	A	NA
AYUSH	NA	NA	NA	NA	NA	NA	NA

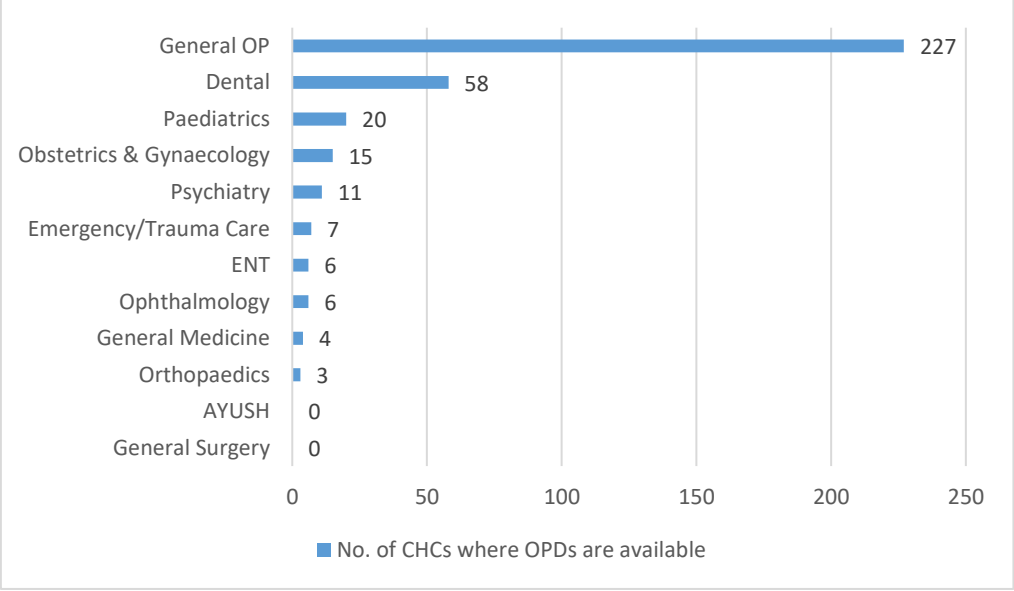
Colour code: Green colour/A = Available; Pink colour/NA = Not available
(Source: Information furnished by test-checked TH/ THQHs (March 2022))

OPD services under ENT and orthopaedic were not available in five out of seven test-checked TH/ THQHs and ophthalmology was provided only in three TH/ THQHs.

3.1.1.3. Community Health Centres

The IPHS requires that all the above seven OPD services are to be provided through CHCs. OPD services on AYUSH and General Surgery were not provided in any of the CHCs in the State and the remaining essential OPD services were provided only in a few hospitals as shown in the Chart. Instead, the CHCs provided services mainly through General OP. The details are given in **Chart 3.3**.

Chart 3.3: Availability of OPD services in the 227 CHCs in the State



(Source: Data furnished by the DHS (May 2023))

Availability of these essential services in the seven test-checked CHCs is shown in **Table 3.3**.

Table 3.3: Availability of OPD services in test-checked CHCs

Specialty Services (OPD)	Alappuzha		Wayanad	Thiruvananthapuram		Malappuram	
	Muhamma	Chunakkara	Nalloornad	Anchuthengu	Manamboor	Tanur	Edappal
General Medicine	NA	NA	NA	NA	NA	NA	NA
General Surgery	NA	NA	NA	NA	NA	NA	NA
Obstetrics and Gynaecology	NA	NA	NA	NA	NA	NA	NA
Paediatrics	NA	NA	A	NA	NA	NA	NA
Emergency care	NA	NA	NA	NA	NA	NA	NA
Dental	NA	NA	A	NA	NA	A	NA
AYUSH	NA	NA	NA	NA	NA	NA	NA

Colour code: Green colour/ A = Available; Pink colour/ NA = Not available
(Source: Information furnished by test-checked CHCs (March 2022))

None of the seven test-checked CHCs provided the essential OPD services except Dental and Paediatric services in Nalloornad and Dental services in Tanur.

3.1.2. Availability of OPD services in PHCs

3.1.2.1. Aardram Mission – Setting up of Family Health Centres

Government of Kerala launched (2017) Aardram Mission to make Government hospitals people friendly by improving their basic infrastructure and capacity and to provide services with a view to extend treatment at reasonable cost, time and satisfaction. Transforming Primary Health Centres (PHCs) into Family Health Centres (FHCs) by redefining the package of services offered and improving their quality was one of the prime strategies of the Mission. Service delivery of these institutions in terms of clinical care and public health activities was to be augmented and outpatient care was to be provided in two shifts upto 6 PM along with laboratory and pharmacy services. The Healthcare Policy document of GoK also emphasised the aim of the Government to convert all PHCs to FHCs. A total of 886 PHC/ CHCs[12] were selected for conversion as FHCs in three phases[13]; for which funds worth ₹139.15 crore including GoI share of ₹80.60 crore were released.

Audit examined the availability of facilities in the test-checked 32 FHCs[14] **(Appendix 3.1)** and the observations are as detailed below:

- Aardram scheme envisaged three medical officers, four nurses and one lab technician in each FHC for the smooth functioning. The stipulated staff strength was not available in all the above cadres in the test-checked FHCs as detailed in Chapter II of this Report.
- As per the guidelines issued by GoK (August 2017), outpatient care was to be available at FHCs seven days a week ie. from 9 am to 6 pm from Monday to Saturday in two shifts and from 9 am to 1.30 pm, on Sundays. Audit noticed that 10 FHCs worked only in one shift and 13 out of 32 FHCs did not provide service on Sundays due to shortage of staff/ lack of infrastructure.
- FHCs were to provide essential laboratory services on all six working days. However, it was noticed that eight out of 32 FHCs did not provide laboratory services due to non-setting up of lab/ absence of lab technician.

Of the 886 institutions, only 543 commenced functioning as FHCs as per information furnished by the Department (March 2022). Works relating to conversion of three out of 170 and 96 out of 504 institutions selected in first and second phases respectively did not commence due to want of land and infrastructure. Of the 212 institutions selected in third phase, 17 became functional. DHS stated (March 2022) that the works in respect of the remaining ones would be carried out in a phased manner and no stipulated time frame was prescribed for the completion of work in each phase (March 2022).

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[12] 844 PHCs; 42 CHCs
[13] Phase I - 170 (2017-18); Phase II - 504 (2018-19) and Phase III - 212 (2020-21)
[14] The FHCs include nine PHCs under upgradation as FHCs during the course of Audit

Thus, it could be seen that FHCs were not providing services as intended under Aardram Mission due to lack of infrastructure, required manpower, etc. and thus the aim to provide augmented services at reasonable cost, time and satisfaction had not been met.

3.1.3. Non-availability of AYUSH services in CHCs and PHCs

National AYUSH Mission (NAM) was formed in States by GoI during 12th Five Year Plan period. One of the objectives of the formation of NAM in States was to establish co-location of AYUSH facilities at every health centre and hospital.

Audit observed that AYUSH facilities were not co-located in any health centres/ hospitals in the State (March 2022). GoK replied (October 2023) that Kerala had a good network of AYUSH systems especially Ayurveda and Homoeopathy. Institutions under both streams were available in every local body under State Government or NHM. However, District Medical Officers under Department of ISM were directed to report the scope of including the institutions functioning in rented buildings in the premises of allopathy hospitals.

Co-locating AYUSH facilities at health centres and hospitals would have provided patients with more options regarding the system of treatment.

3.1.4. Average OPD cases per doctor per day against available OPD services

OPD cases per doctor is an indicator for measuring efficiency of OPD services in a hospital.

Audit observed that the average patient load per day per doctor was 55 patients[15] in 62 test-checked hospitals[16]. However, in seven hospitals[17], the average was above 100 patients per day per doctor of which, the daily average was 208 patients in PHC, Pallikkal in Malappuram district. Incidentally, Audit noticed that there was a shortage of 34 PHCs in the district. The average OPD cases per doctor per day in the test-checked DH/GH/TH/THQH/CHCs revealed over burdening of doctors in some hospitals as shown in **Chart 3.4**.

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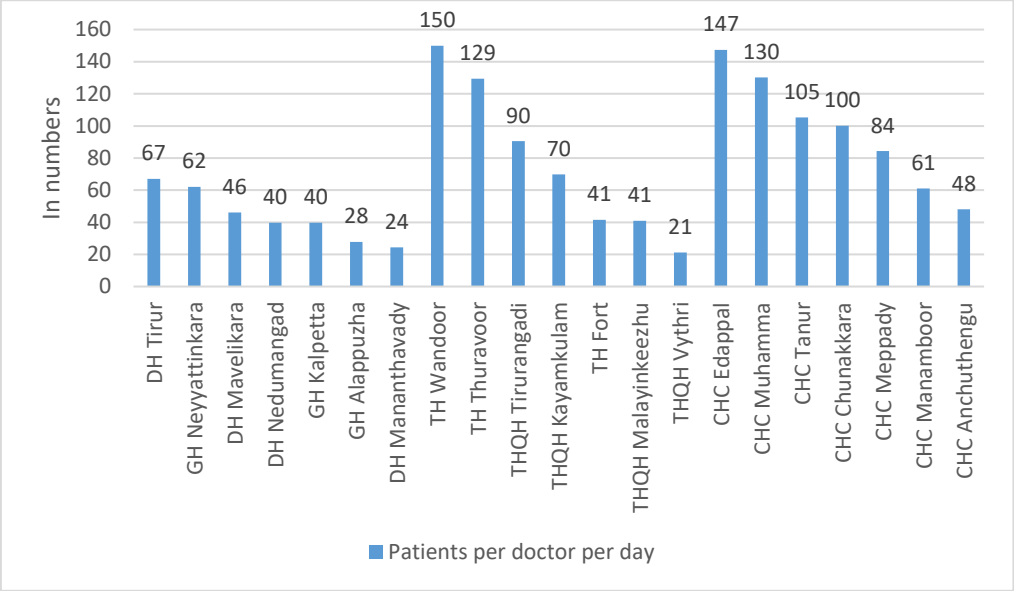
[15] Based on patient strength for the month February 2020 (taken as a sample month)

[16] Data on number of doctors in OPD was not furnished by MCH Alappuzha, MCH Thiruvananthapuram, SAT, Thiruvananthapuram, GH Neyyattinkara and Government Mental Health Centre, Thiruvananthapuram

[17] PHC Pallikkal, TH Wandoor, CHC Edappal, CHC Muhamma, TH Thuravoor, CHC Tanur, CHC Chunakkara

Chart 3.4: Average OPD cases per doctor per day in test-checked DH/GH/TH/THQH/CHCs



(Source: Information furnished (February 2023) by DHS)

This fact was further confirmed from the doctors' survey[18], where 85 out of 185 doctors surveyed stated that number of patients attended by them was in the range of 100 to 400/day.

Over burdening of health professionals would have a negative impact on the quality of healthcare services provided.

3.1.5. Availability of registration counter and average daily patient load per counter

Registration counter is the first point of contact with the hospital for a patient and is an important component of the hospital experience for patients and their attendants. The average daily patient load as well as load on a registration counter in the test-checked hospitals are as shown in **Appendix 3.2**. The daily patient load was above 750 in test-checked TH/ THQH/ DH/ GHs except in THQHs at Vythiri and Malayinkeezhu. Increased patient load in these hospitals could be attributable to the shortage of CHCs as detailed in paragraph 5.1 of the Report.

NHM Assessor's guidebook (Volume-l) estimates the average time required for registration to be three to five minutes per patient and so number of counters required would be worked on scale of 12 to 20 patient/ hour per counter. Considering the average OP registration time to be five hours per day[19] in the hospitals, the patient load would be 100 patients per counter per day assuming that the minimum time of three minutes is spent on each patient. Audit verified[20]

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18 Audit conducted (April 2022) a survey of 185 doctors in 67 test-checked hospitals.
19 The normal OP registration timing in hospitals is between 8AM and 1PM (five hours).
20 February 2020 was taken as the sample month

the patient load per counter through joint inspection/ patient survey/ scrutiny of records and observed the following:

- The average daily patient load on an OP registration counter was more than 100 patients in 44 out of 67 test-checked hospitals.
- The load per counter was over 500 patients in 13 test-checked hospitals of which four hospitals[21] had a patient load per counter of over 1,000.
- Further, in the 44 test-checked CHC/ FHC/ PHC/ UPHCs, the average daily patient load on a registration counter varied from 20 to 632 patients.
- 28 *per cent* of the outpatients who participated in the beneficiary survey opined that registration counters were not adequate.

Audit noticed long queues/ crowding at registration counters pointing to deficiencies in the patient management system of hospitals.

Figure 3.1: Long queue/ crowd at OP registration counters

During the Exit Conference, ACS stated (August 2022) that the issue could be resolved by introduction of online registration facility. E-health application when rolled out fully was expected to help significantly in the resolution of such issues.

3.1.6. Availability of basic patient amenities

Audit observed shortcomings in provisioning of basic patient amenities[22] such as seating facility, toilets, drinking water, ramp etc., as detailed in **Table 3.4.**

[21] DH Mananthavady (1,608), THQH Kayamkulam (1,188), GH Kalpetta (1,072) and TH Thuravoor (1,035)

[22] IPHS and Kerala Accreditation Standards for Hospitals (AYUSH)

Table 3.4: Non-availability of seating arrangement, toilet facility etc.

Facilities	Remarks
Suitable seating facility	In DH Nedumangad and THQH Kayamkulam, seating facility was not provided in OP counter (average daily patient load – 1,113 and 1,188 respectively) In six hospitals - THQH Malayinkeezhu, GH Kalpetta, DH Mananthavady, W and C Hospital, Ponnani, TH Fort and in TH Wandoor, the seating facility in the OP counter was inadequate compared to the daily patient load. 23 *per cent* of the OP patients surveyed opined that seating facility was not adequate near the registration counter.
Toilets	Toilet facility was not provided near the OP counter in five hospitals - MCH Alappuzha, TH Fort, TH Thuravoor, CHC Muhamma and THQH Kayamkulam
Separate toilets for male and female	Separate toilets for male and female were not provided in 16 out of 67 test-checked hospitals (24 *per cent*).
Toilet for differently abled	In 46 (69 *per cent*) out of the 67 hospitals test-checked, separate toilets were not provided for the differently abled. In 13 (72 *per cent*) out of the 18 AYUSH hospitals test-checked, separate toilet was not provided for the differently abled.
Drinking water	Drinking water facility in OP counter was not provided in seven hospitals – TH Fort, PHC Thennala, DH Nedumangad, THQH Tirurangadi, Dental College, Thiruvananthapuram, THQH Vythiri and CHC Muhamma.
Ramp and hand railing	Ramps were not provided in 16 hospitals and handrailing facility was not available in 31 hospitals. Ramps were not provided in 12 out of 18 AYUSH hospitals test-checked.
Display of directional and layout signage	Proper signage system is needed in each hospital so that patients and their attendants can move around in the hospital premises from one section to another in a trouble-free manner. Directional and layout signage was not displayed near the OP counter in 24 out of the 67 test-checked hospitals. Signages were displayed in bilingual form in 32 hospitals and directional layouts were in pictorial form in 26 hospitals. Directional and layout signage was not displayed in seven out of the 18 AYUSH hospitals.

(Source: Joint physical verification)

Figure 3.2: Long queue/ crowd in OP consultation area due to lack of seating facility - DH Mananthavady (29 November 2022)

DHS stated (November 2022) that lack of sufficient space and manpower were the major constraints which restricted the hospitals from providing the requisite basic amenities to patients. GoK replied (October 2023) that all the institutions under the Department of ISM were being upgraded to NABH (National Accreditation Board for Hospitals and Healthcare Providers) level step by step and on upgradation, all infrastructure would be facilitated to the institutions.

3.2. In-patient Department

In-patient Department (IPD) refers to the areas of the hospital where patients are accommodated after being admitted, based on doctor's/ specialist's assessment. In-patients require a higher level of care through nursing services, availability of drugs/ diagnostic facilities, observation by doctors, etc.

The IPHS prescribes the minimum essential services to be provided in each level of hospital. The availability of the prescribed essential IPD services in the hospitals across the State is given in **Table 3.5**.

Table 3.5: Availability of IPD services in hospitals

Services	No. of hospitals where IPDs are available		
	DH/ GH (36)	TH/ THQH (87)	CHC (227)
General Medicine	36	71	4
Paediatrics	32	71	10
General Surgery	36	45	1
Emergency care	36	25	1
Dental	25	29	3
O and G	32	58	4
AYUSH	Nil	Nil	Nil
Orthopaedics	36	48	
ENT	35	46	
Ophthalmology	36	37	
Psychiatry	24		

Shaded cells show services not covered under essential category in IPHS
(Source: Information furnished (May 2023) by DHS)

From the table, it can be seen that all the prescribed IPD services were not provided through all the hospitals. The availability of IPD services was better in DHs/ GHs but was grossly inadequate in CHCs.

The availability of eight essential services in test-checked DHs and six in THs as on the date of visit (in various spells from November 2021 to April 2022) are detailed in **Appendix 3.3**.

- Out of the test-checked DH/GHs, all the services were available only in DH Mananthavady.
- Of the eight essential services, only General Medicine, General Surgery, Paediatrics and Orthopaedics were available in all test-checked DH/ GHs.
- Trauma care facilities to provide immediate care to the injured and accident cases were not available in five DH/GHs.

- In THQH Malayinkeezhu, four out of the six essential services were not provided. It was replied that the infrastructure facilities were not available in the hospital and the posts were not created.
- In the test-checked TH/ THQHs, all the six services were provided only in THQHs Kayamkulam and Tirurangadi. The IP services for Orthopaedics were available only in three hospitals and General Surgery only in four hospitals.

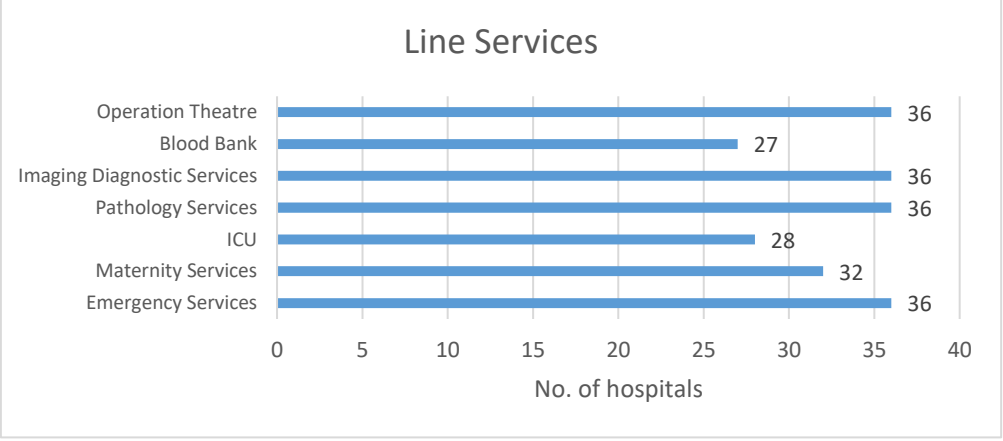
Further, it was observed that none of the seven essential IP services[23] to be provided by a CHC as per IPHS were available in the seven CHCs test-checked. IPD wards and beds were provided in the hospitals for General IP services.

The Comptroller and Auditor General of India, in the Audit Report (General and Social Sector) for the year ended 31 March 2013 had included a Performance Audit on Healthcare Services in Government Hospitals and had made recommendations to the GoK for setting up Trauma Care Centres in all hospitals in the State. The PAC (2016-19) in its 18th Report had expressed its astonishment that the Trauma Care Units were not available in all hospitals even though the number of persons seeking admission in the hospitals is increasing day by day and therefore directed to furnish report on the action plan for providing such facilities in all the DHs, THs and GHs. However, Audit noted that the trauma care units are yet to become functional in some hospitals as discussed above.

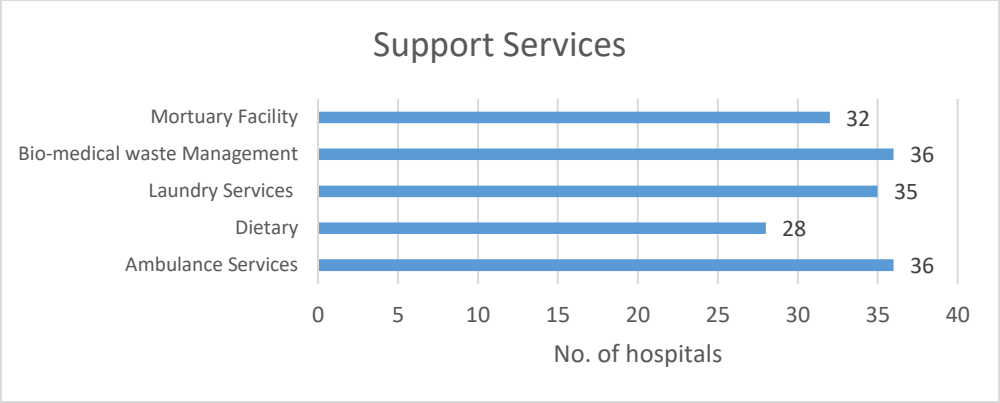
3.3. Availability of Line and Support services in DHs

District hospital is an essential component of the district health system and functions as a secondary level of healthcare which provides curative, preventive and promotive healthcare services to the people in the district. Audit examined the availability of line and support services as per norms in district level hospitals as shown in **Chart 3.5**.

Chart 3.5: Availability of Line and Support services in 36 GH/ DHs in Kerala



[23] General Medicine, General Surgery, O & G, Paediatrics, Emergency, Dental and AYUSH



(Source: Information furnished by DHS (February 2023))

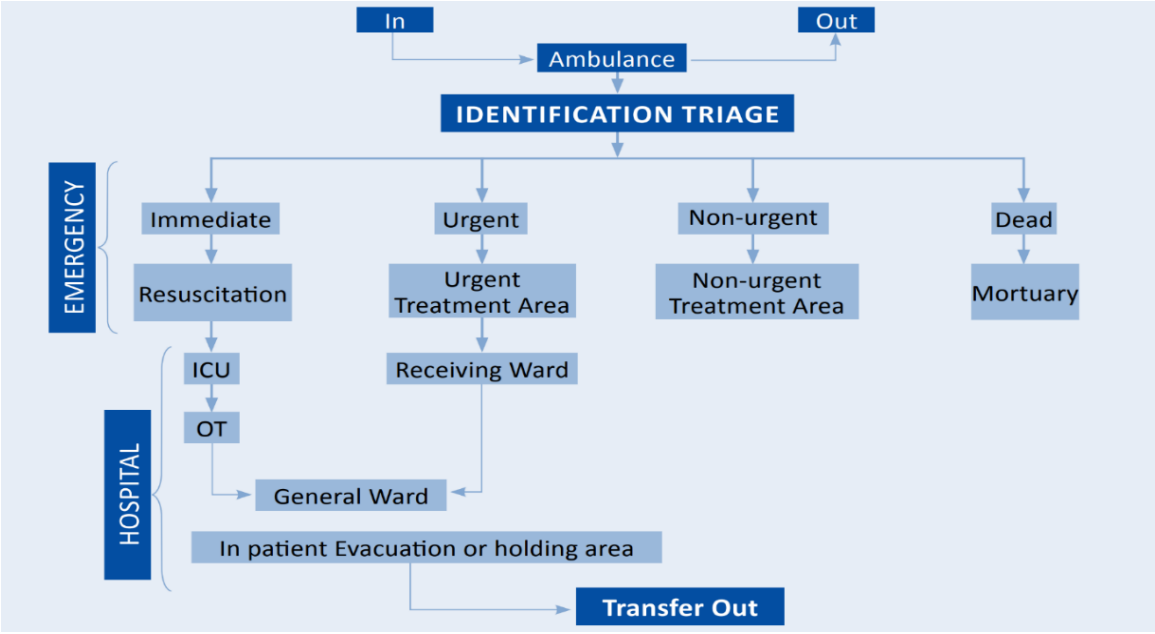
Only four out of the seven line services and two out of the five support services were available in all DH/ GHs.

Audit examined the availability of line and support services in the 14 test-checked TH/ THQH/ DH/ GHs as detailed in the following paragraphs:

3.4. Emergency services

As per IPHS for DHs and THs, 24x7 operational emergency care with dedicated emergency room shall be available with adequate manpower. Emergency services should have separate X-ray and basic laboratory facilities, mobile X-ray, plaster room, minor OT facilities, etc.

Chart 3.6: Flowchart of Emergency Department



3.4.1. Availability of emergency services

In the 14 test-checked DHs/ GHs/ TH/ THQHs, Audit noticed that emergency OT was available in three hospitals[24], Trauma ward was available only in DH Nedumangad, Mobile X-Ray units and separate side laboratory for emergency care were not provided in 10[25] and 11[26] hospitals respectively and plaster room was not available in eight[27] hospitals as detailed in **Table 3.6**.

Table 3.6: Availability of emergency services in test-checked hospitals

Name of emergency service	DH Mavelikkara	DH Tirur*	DH Nedumangad	DH Mananthavady	GH Alappuzha	GH Neyyattinkara	GH Kalpetta	TH Thuravoor	TH Wandoor	TH Fort	THQH Kayamkulam	THQH Tirurangadi	THQH Malayinkeezhu	THQH Vythiri
Emergency OT	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No
Emergency ward	Yes	No	Yes	Yes	No	Yes	No	Yes	No	No	Yes	No	No	No
Trauma ward	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No
Triage procedure	Yes	No	No	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes
Emergency laboratory	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No
Separate provision for examination of rape/ sexual assault victim	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
Disaster management plan in emergency ward	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No	No
Treatment of assault/ Bowel/Head/ Stab injuries	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Blood bank in close proximity to emergency	Yes	Yes	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Mobile X-ray for Emergency room	Yes	Yes	No	Yes	No	Yes	No	No	No	No	No	No	No	No
Laboratory, Side lab for Emergency services	Yes	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No
Plaster room for Emergency services	Yes	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No

* Casualty services available

Colour code: Green/Yes -available, Red/No- Not available

(Source: Data obtained from test-checked hospitals)

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24 DH Mananthavady, TH Fort and THQH Kayamkulam

25 DH Nedumangad, GH Alappuzha, GH Kalpetta, TH Fort, THQH Kayamkulam, THQH Tirurangadi, TH Wandoor, THQH Malayinkeezhu, THQH Vythiri, TH Thuravoor

26 DH Nedumangad, GH Neyyattinkara, GH Kalpetta, TH Wandoor, DH Mananthavady, TH Thuravoor, THQH Malayinkeezhu THQH Kayamkulam, TH Fort, THQH Tirurangadi, THQH Vythiri

27 TH Wandoor, DH Tirur, THQH Tirurangadi, THQH Vythiri, GH Kalpetta, TH Thuravoor, THQH Malayinkeezhu, GH Neyyattinkara

3.4.2. Availability of routine and emergency care in CHCs

Audit examined the availability of routine and emergency care services prescribed as essential for CHCs under IPHS. Audit observed that facilities for handling Dengue Haemorrhagic Fever, Cerebral Malaria, Snake bite cases, Poisonings, Meningoencephalitis and Obstetric Care were not available in any of the test-checked CHCs.

Table 3.7: Availability of routine and emergency cases in medicine in CHCs

Name of Routine and Emergency care service	Availability in seven test-checked CHCs
Dengue Haemorrhagic Fever	0
Cerebral Malaria	0
Dog bite cases	5
Snake bite cases	0
Poisonings	0
Congestive Heart Failure	1
Left Ventricular Failure	1
Pneumonia	5
Meningoencephalitis	0
Acute respiratory conditions	6
Status Epilepticus	1
Burns	5
Shock	3
Acute dehydration	7
Obstetric Care including surgical interventions like Caesarean Sections and other medical interventions	0

Scales determined by Audit	Good (6-7)	Moderate (4-5)	Poor (0-3)

(Source: Data obtained from test-checked CHCs)

3.4.3. Management of Emergency cases in PHC/ FHCs

The IPHS stipulate that every PHC should essentially provide 24 hours emergency services including normal delivery services and referral services. Audit examined the availability of emergency services in test-checked PHC/ FHCs as shown in **Table 3.8**.

Table 3.8: Availability of Emergency Services in PHC/ FHCs

Name of District	Number of test-checked PHCs/ FHCs	24 hours emergency services	24x7 Emergency referral and normal delivery services
Thiruvananthapuram	9	1	0
Alappuzha	8	1	0
Malappuram	11	0	0
Wayanad	4	0	0

(Source: Data obtained from DHS)

Audit observed that 24 hours emergency services were not available in 30 out of 32 PHC/ FHCs. Further, 24x7 referral service and normal delivery services were not available in any of the test-checked PHC/ FHCs.

3.5. Emergency response and health system preparedness package

3.5.1. Fund utilisation under COVID-19 in the State

GoI released funds under "COVID package"[28] as grants-in-aid during 2019-20 to 2021-22 to build resilient health systems to support preparedness and prevention related functions that would address not only the COVID-19 outbreak but also such outbreaks in future.

While the funds released in 2019-20 and 2021-22 were to be shared by GoI and GoK in 60:40 basis, the release for 2020-21 was 100 *per cent* central share. The funds were released to NHM. Further, NHM received GoI funds for COVID vaccination, State Disaster Response Funds (SDRF) for relief and response activities, etc. GoK released funds to KMSCL for effecting the procurements of drugs and equipment and for containment and mitigation activities entrusted with the Corporation in connection with COVID. The details of major allocation and expenditure incurred thereagainst (as on 31 March 2022) are furnished in **Table 3.9** below.

Table 3.9: Utilisation of funds under COVID-19

(₹ in crore)

Year	Package	Release of funds to NHM		Total receipt	Expenditure	Release of funds to KMSCL by GoK/ NHM	
		GoI	GoK			Receipt at KMSCL	Expenditure
2019-20	Emergency COVID Response Preparedness Package (ECRP)-Phase I	74.21	49.47	123.68	123.68	-	-
2020-21	ECRP Phase I	573.96	-	573.96	573.96	727.99[29]	730.98
	Uncommitted NHM funds	-	-	176.03	174.96		
	COVID vaccination	9.08	-	9.08	5.81		
	SDRF	-	50.69	50.69	50.69		
2021-22	ECRP Phase I	48.82[30]	-	48.82	-	478.68[31]	478.68
	ECRP Phase II	173.89	57.96[32]	231.85	128.40		
	SDRF	-	20.00	20.00	19.19		
Total		**879.96**	**178.12**	**1234.11**	**1076.69**	**1206.67**	**1209.66**

(Source: Details furnished by NHM and KMSCL)

Category-wise expenditure (as per NHM) under COVID-19 as of March 2022 is given in **Table 3.10**.

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28 COVID-19 Emergency response and health system preparedness package

29 SDMA - ₹7.19 crore; State budget - ₹393.46 crore; State contingency funds - ₹75 crore; NHM - ₹252.34 crore

30 Received at NHM on 28.03.2022 as 100 *per cent* CSS

31 GoK fund

32 Against a State share of ₹115.93 crore (60:40 share), the release was only ₹57.96 crore to NHM (2021-22), the balance pending to be released by the State was ₹57.97 crore.

Table 3.10: Category-wise expenditure incurred under ECRP on COVID-19

(₹ in crore)

Sl. No.	Activity head	Expenditure*
1	Diagnostics including sample transport	85.00
2	Drugs and supplies including PPE and masks	195.62
3	Equipment/ facilities for patient care including support for ventilators etc.	116.95
4	Temporary HR including incentives for Community Health volunteers	363.22
5	Mobility Support	25.23
6	IT systems including hardware and software etc.	3.78
7	Information, Education and Communication/ Behavioural Change Communication	17.21
8	Training	0.58
9	Miscellaneous (which could not be accounted under above items of expenditure)	65.00
10	COVID essential diagnostics and drugs (ECRP II)	15.32
11	Ramping up Health infrastructure with focus on paediatric units (ECRP II)	54.27
12	Enhancement of human resource for health (ECRP II)	56.36
13	IT interventions - HMIS and telecommunications (ECRP II)	2.27
14	Capacity building and training (ECRP II)	0.18
	Total	**1000.99**

* Does not include expenditure under COVID vaccination and SDRF

(Source: Data obtained from NHM)

3.6. Operation Theatre services

Operation Theatre (OT) is an essential service that is to be provided to the patients from the level of THs. Audit observed that the services were available at all the seven test-checked GHs/ DHs and the services were not available in three[33] out of the seven test-checked TH/ THQHs during the audit period.

Quality of surgical treatment may have been adversely impacted in these test-checked hospitals in view of the deficiencies pointed out in the following paragraphs:

3.6.1. Availability of prescribed types of OTs

IPHS prescribes that OTs have to be maintained in DHs and THs. **Table 3.11** shows the accessibility and upkeep of OT services in the test-checked hospitals.

[33] THQH Malayinkeezhu, TH Thuravoor, TH Wandoor

Table 3.11: Accessibility and upkeep of OT services in test-checked DH/ GH/ THs/ THQHs

Description	DH Mavelikkara	DH Tirur	DH Nedumangad	DH Mananthavady	GH Alappuzha	GH Neyyattinkara	GH Kalpetta	TH Thuravoor	TH Wandoor	TH Fort	THQH Kayamkulam	THQH Tirurangadi	THQH Malayinkeezhu	THQH Vythiri
Whether OT has convenient relationship with surgical ward, intensive care unit, radiology, pathology, blood bank and CSSD.	Yes	Yes	No	Yes	Yes	No	No	No Operation theatre	No Operation theatre	No	Yes	No	No Operation theatre	No
Whether access to facility is provided without any physical barrier and friendly to people with disabilities.	Yes	Yes	No	No	Yes	Yes	No			Yes	Yes	No		No
Whether OT has piped suction and medical gases, electric supply, heating, air-conditioning, ventilation.	Yes	Yes	No	Yes	Yes	No	Yes			Yes	No	Yes		Yes
Whether patient's records and clinical information is maintained.	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes		Yes
Whether a defined and established grievance redressal system was in place.	Yes	Yes	No	Yes	Yes	Yes	Yes			Yes	Yes	Yes		No
Whether all equipment are covered under AMC including preventive maintenance.	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes		Yes
Whether the facility has established procedure for internal and external calibration of measuring equipment	Yes	Yes	Yes	Yes	No	Yes	Yes			Yes	Yes	Yes		Yes

Colour code: Green/Yes - available, Red/No - Not available
(Source: Data obtained from test-checked hospitals)

It could be seen from the above table that OTs were not available in three out of 14 test-checked DHs/GHs/TH/THQHs. In six hospitals, OTs were not conveniently placed with surgical ward, intensive care unit, radiology, pathology, blood bank etc.

3.6.2. Availability of Surgical procedures

The care for routine and emergency cases in Surgery to be provided from the level of CHCs as per IPHS was examined in the test-checked hospitals and the availability is as shown in **Table 3.12** below.

Table 3.12: Availability of Surgical procedures in test-checked health institutions

Name of procedure	Availability in test-checked hospitals		
	DH/ GHs (7)	TH/ THQHs (7)	CHCs (7)
Hernia	7	4	0
Hydrocele	7	4	0
Appendicitis	7	4	0
Haemorrhoids	7	4	0
Fistula	7	4	0
Intestinal Obstruction	3	0	0
Haemorrhage	4	1	0
Nasal packing	7	3	0
Tracheostomy	3	1	0
Foreign body removal	7	3	0
Fracture reduction	7	3	0
Facility for putting splints/ plaster cast	7	4	0

Scales determined by Audit	Good (6-7)	Moderate (4-5)	Poor (0-3)

(Source: Information furnished (May 2023) by test-checked hospitals)

It can be seen that:

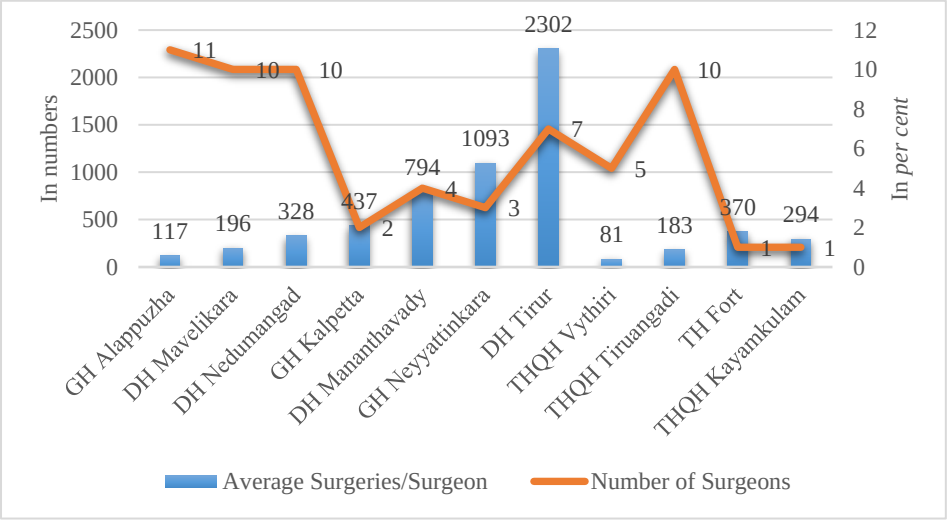
- None of the above mentioned surgical procedures were available in the test-checked CHCs and in three[34] out of seven TH/ THQHs.
- The procedure for handling the intestinal obstruction was not available in any of the test-checked TH/ THQHs and the management of Haemorrhage and Tracheostomy was done only in THQH Tirurangadi.
- In the test-checked DHs/ GHs all the above procedures were not available in DH Mavelikkara, GH Kalpetta, GH Alappuzha and GH Neyyattinkara.

3.6.3. Surgery load per Surgeon

Audit assessed the surgery load per surgeon in the test-checked hospitals during the audit period. The details are shown in **Chart 3.7**.

[34] THQH Malayinkeezhu, TH Thuravoor and TH Wandoor

Chart 3.7: Average number of surgeries done per surgeon per year



(Source: Information furnished (May 2023) by test-checked hospitals)

The surgery load per surgeon ranged from 81 in THQH Vythiri to 2,302 in DH Tirur. The huge variation in surgical load in test-checked hospitals depicts the need to perform a proper assessment of the work load and proper distribution of available surgeons for the efficient management of services.

3.7. Intensive Care Unit services

Intensive Care Unit (ICU) is essential for managing critically ill patients requiring highly skilled life-saving medical aid and nursing care. Intensive care service is a minimum assured service as per the IPHS for DHs.

Audit observed that out of the seven test-checked DHs/ GHs, ICU services were not available in GH Neyyattinkara. Thus, in the absence of ICU facility in the hospital, patients approaching the hospital despite being in an emergency condition, were referred/passed on to higher facility public[35]/private hospitals.

As per IPHS, the number of ICU beds should not be less than four and was desirable to be five to ten *per cent* of the available number of beds in DH. Out of the six DHs/ GHs where the ICU facility was available, Audit observed that the required percentage of beds to be maintained for ICU was available only in DH Tirur (9.1 *per cent*). In the remaining five hospitals, the ICU bed availability ranged from two to four *per cent*.

As per IPHS for DHs, each ICU bed is required to be equipped with High end monitor, ventilator, O_2 therapy devices, deep vein thrombosis prevention devices, infusion pumps and pipeline of O_2, suction and compressed air. Audit checked the availability of essential equipment in the ICUs in test-checked hospitals as detailed in **Table 3.13**.

[35] Nearest higher level Government hospital (Medical College) is 25 km away from GH Neyyattinkara.

Table 3.13: Availability of equipment in ICU

Equipment	GH Alappuzha	DH Tirur	DH Nedumangad	DH Mananthavady	GH Kalpetta	DH Mavelikkara
No. of ICU Beds	8	15	6	9	6	15
High end monitor	8	9	3	9	6	15
Ventilator	3	8	2	7	6	8
O_2 therapy devices	8	10	6	9	3	15
Deep vein thrombosis prevention devices	0	0	0	0	0	1
Infusion pumps	8	1	0	4	6	13
Pipeline of O_2, suction and compressed air	8	14	0	9	6	15

(Source: Stock records of the test-checked hospitals)

It is seen from the above table that deep vein thrombosis prevention devices were not available in five of the six test-checked hospitals. In DH Nedumangad, infusion pumps, pipeline of O_2, suction and compressed air were not available for any of the ICU beds.

As per IPHS for DHs, the common facilities like ultrasound for invasive procedures, defibrillator and Arterial Blood Gas (ABG) analysis machine are required in ICUs. Audit observed that ultrasound for invasive procedures was not provided in any of the test-checked DHs/ GHs and ABG analysis machine was provided in DH Mavelikkara, DH Nedumangad and GH Alappuzha.

No remarks were furnished by GoK (November 2023).

3.8. Maternity Services

Maternity care refers to the health services provided to women throughout the pregnancy, during labour and birth, and after birth for up to six weeks and to babies and families. It can include monitoring the health and well-being of the mother and baby, health education and assistance during labour and birth. IPHS prescribes Obstetrics and Gynaecology as an essential service including in-patient facilities for a hospital from the CHC level to DH level. Further, IPHS stipulates that maternal and child healthcare services are essential for PHCs.

Audit test-checked availability of maternity services in seven CHCs, seven DH/ GHs and seven TH/ THQHs. It was observed that O and G services were not provided in any of the seven test-checked CHCs, THQH Malayinkeezhu and GH Alappuzha [36]. It was also observed that none of the test-checked PHCs provided labour services (March 2024).

[36] Gynaecology services provided by WCH Alappuzha

3.8.1. Achievement in Antenatal check-ups and distribution of Iron folic Acid tablets, Calcium tablets and Tetanus Toxoid among pregnant women

Achievement of required four Antenatal check-ups (ANC) and distribution of Iron folic Acids (IFA) tablets, Calcium tablets, Tetanus Toxoid (TT) to pregnant women in 2019-20 as compared to 2015-16 is given in **Table 3.14**.

Table 3.14: Indicators of Antenatal care, TT administration and distribution of IFA tablets in the State

(in per cent)

Indicators	2015-16	2019-20
ANC received in the first trimester	95.1	93.6
Pregnant women received at least four ANC	90.1	78.6
TT administration	96.4	95.2
IFA (180 days)	47.4	67.0

Scales determined by Audit	Good (91-100)	Moderate (51-90)	Poor (0-50)

(Source: NFHS-5)

Severe decline was noticed in the percentage of pregnant women who received at least four ANC.

3.8.2. Status of institutional deliveries

Status of institutional deliveries during 2015-16 and 2019-20 is given in **Table 3.15**.

Table 3.15: Indicators of institutional births and home births by skilled health personnel in the State

(in per cent)

Indicators	2015-16	2019-20
Institutional births	99.80	99.80
Institutional births in public health facility	38.30	34.10
Home birth by skilled health personnel	0.10	0.20

(Source: NFHS-5)

The above table indicates that institutional births in public health facility has declined from 38.30 *per cent* to 34.10 *per cent*.

3.8.2.1. Pathological investigations

Availability of pathological investigations for pregnant women in test-checked DH/GH/TH/THQHs is shown in **Table 3.16**.

Table 3.16: Availability of pathological investigations for pregnant women in test-checked DH/ GH/ TH/ THQHs

Name of test	DH/ GHs (7)	TH/ THQHs (7)
Blood group including Rh factor	7	7
Rapid Plasma Reagin (RPR)	5	5
Pregnancy Test	5	5
Malaria test	7	7
Blood Sugar testing	7	7

Scales determined by Audit	Good (6-7)	Moderate (4-5)	Poor (1-3)

(Source: Information collected from test-checked hospitals)

Facilities for RPR and Pregnancy Test were not available in four out of the 14 test-checked hospitals.

3.8.2.2. Caesarean deliveries

Status of caesarean deliveries (C-section) in the State in 2019-20 as compared to 2015-16 is given in **Table 3.17**.

Table 3.17: Status of caesarean deliveries (C-section) in the State

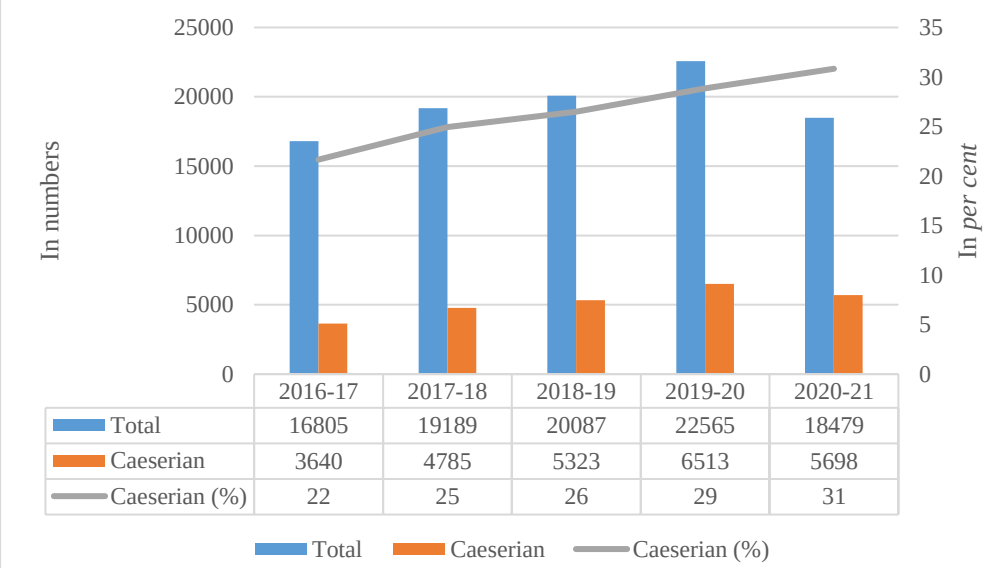
(in per cent)

Indicators	2015-16	2019-20
C-section deliveries	35.8	38.9
Private health facility C-section deliveries	38.6	39.9
Public health facility C-section deliveries	31.4	37.2

(Source: NFHS-5 for Kerala pertaining to 2019-20)

Audit collected the data of the caesarean deliveries for the period from 2016-17 to 2020-21 in the 12 test-checked hospitals having facility for delivery and noticed that the percentage of the caesarean deliveries increased year after year until 2019-20 as shown in the **Chart 3.8**.

Chart 3.8: Increase in percentage of C-section deliveries in test-checked hospitals



(Source: Data obtained from test-checked hospitals)

Among the hospitals test-checked, Audit found that DH Mavelikkara (59 *per cent*), THQH Kayamkulam (56 *per cent*) and DH Nedumangad (46 *per cent*) had the highest percentage of caesarean deliveries.

3.8.3. Vaccination of birth doses to new-born

Achievement of birth doses given to newborn in the selected districts during 2021-22 are as shown in the **Table 3.18**.

Table 3.18: Achievement of birth doses given to newborn during 2021-22

Name of Districts	Total Live Births	Achievement (in *per cent*)		
		Vitamin K	OPV	Hepatitis-B
Thiruvananthapuram	36930	97	98	89
Alappuzha	15811	99	100	98
Malappuram	87843	63	81	65
Wayanad	13024	99	97	99

Scales determined by Audit	Good (91-100)	Moderate (71-90)	Poor (0-70)

(Source: Data obtained from DHS)

Audit observed that achievement with respect to birth doses given to newborn was the least in Malappuram district.

3.8.4. Discharge before minimum stay post delivery

IPHS prescribes minimum 48 hours of stay after delivery as essential service under maternal health. The total number of women discharged within 48 hours after delivery during 2021-22 in selected districts is shown in **Table 3.19**.

Table 3.19: Number of women discharged within 48 hours of delivery during 2021-22

Name of Districts	Total number of Institutional deliveries	Number of women discharged within 48 hours of delivery	Percentage
Thiruvananthapuram	36290	755	2.08
Alappuzha	15658	381	2.43
Malappuram	87056	22053	25.33
Wayanad	12936	748	5.78

(Source: Data obtained from DHS)

Audit observed that the percentage of women discharged within 48 hours of delivery was the highest in Malappuram district.

3.8.5. Still births

WHO defines still birth as a baby who dies after 28 weeks of pregnancy, but before or during birth. The still birth rate in test-checked hospitals is given in **Table 3.20**.

Table 3.20: Still birth rate in test-checked hospitals

Hospitals	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
DH Mavelikkara	0	0	0	0	1.30	0
DH Tirur	0	0	0.78	0.42	0.82	1.46
DH Nedumangad	0	0	0.75	0	0	0.6
DH Mananthavady	0	0	0	0	0	0
GH Alappuzha	Delivery services not available					
GH Neyyattinkara	0	0	0	0	0	0
GH Kalpetta	0	1.85	0	0	0	1.96
TH Thuravoor	Delivery services not available					0
THQH Kayamkulam	0	0	0	0	0	0
TH Wandoor	0	0	0	0	0	0
THQH Tirurangadi	0	2.29	1.01	0	1.26	0
TH Fort	0	0	0	0	0	0
THQH Malayinkeezhu	Delivery services not available					
THQH Vythiri	0	0	0	0	0	0
MCH Manjeri	1.96	2.81	3.18	5.26	5.76	13.48
MCH Thiruvananthapuram	0.58	0.09	0.36	0.09	0	0.43

Scales determined by Audit	Good (0)	Moderate (0.1 – 5)	Poor (> 5)

(Source: Data obtained from test-checked hospitals)

Audit observed that there was a steady increase in the still birth rate in MCH Manjeri.

3.8.6. Availability of beds for Maternal and Childcare in District Hospitals

IPHS recommends allocation of 63 to 143 beds (28 to 32 *per cent*) for Maternal and Childcare services in DHs having bed strength in the range of 100 to 500.

Against the availability of 1,563 beds in six test-checked DH/ GHs providing maternal and childcare, only 16 *per cent* (244 beds) were allocated for maternal and childcare.

3.8.7. Availability of equipment

The IPHS prescribed 28 types of equipment for Labour Ward, Neonatal and Special Newborn Care Unit (SNCU) for DHs and 20 types for THs. Audit examined the availability of 28 types of equipment in six test-checked DHs/ GHs and 18 essential equipment in six THs/ THQHs having a labour room and neonatal unit or SNCU. The details are given in **Tables 4.14** and **4.15** of this Report.

3.9. Diagnostic services

Diagnostic services are the backbone of any hospital for extending evidence-based healthcare to the public. In the case of radiology services, availability of essential equipment, reagents and human resources are the main drivers for the delivery of quality pathology services through in-house laboratories. The related audit observations are discussed in the succeeding paragraphs.

3.9.1. Radiology services

The role of radiology is central to disease management for the detection, staging and treatment of diseases. Adequate availability of functional radiology equipment, skilled human resources and consumables are the key requirements for the delivery of quality radiology services.

The IPHS prescribed standards for equipment in DHs (X-ray, Ultrasonography and Mammography[37], etc.), THs (X-ray, Ultrasonography) and CHCs (X-ray).

Audit observed that all types of prescribed radiology services were not available in any of the test-checked hospitals except DH Tirur. The position of availability of essential radiology services is given in **Table 3.21**.

Table 3.21: Availability of various types of radiology services

Radiology services	No. of DH/ GHs (7)		No. of TH/ THQHs (7)		No. of CHCs (7)	
	Required as per IPHS	Available and functional	Required as per IPHS	Available and functional	Required as per IPHS	Available and functional
X-ray	7	7	7	6	7	1
Dental X-ray	7	4	7	2	Not applicable	
Ultrasonography (USG)	7	2	7	1	Not applicable	
Mammography	4	1	Not applicable			

Not applicable indicates that the services were not essential as per IPHS.
(Source: data obtained from Test-checked hospitals/ CHCs)

[37] Essential for the hospitals having bed strength of more than 300 beds

X-ray services were available in only one of the seven test-checked CHCs[38]. Audit also observed that in TH Fort, the X-ray facility was not functional due to lack of High Tension power connection. Dental X-ray units were available in 10 out of the 14 test-checked TH/ THQH/ DH/ GHs. However, the same was not functional in four hospitals due to repair of the machine, non-availability of dark room facility, etc. Ultrasonography machine was not available in 10 hospitals (out of 14 DH/ GH/ TH/ THQHs) and the machine available in GH Kalpetta was not being utilised due to non-availability of Sonologist. Mammography service was available only in DH Mananthavady out of the four DHs[39] having sanctioned bed strength exceeding 300.

Thus, there were serious gaps in the basic provision of radiology services in the test-checked DH/ GH/ TH/ THQH/ CHCs which limited the access of patients to evidence-based treatment facilities and quality care.

In the case of AYUSH institutions, only two out of eight hospitals (District Ayurveda Hospital Kalpetta and Government Ayurveda Marma Hospital Kanjiramkulam) and the selected Medical Colleges were provided with X-ray units.

3.9.2. Availability of pathology services

3.9.2.1. Modern Medicine institutions

Audit verified the availability of 67 types of facilities for investigations in DH/ GHs, 40 types in TH/ THQHs and 29 types in CHCs as prescribed in IPHS under five categories to be carried out in the CHCs to district-level hospitals.

Scrutiny of records disclosed that the full range of pathological investigation facilities was not available in any of the test-checked hospitals. Audit noticed that facility for 11 investigations was not available in any of the DH/ GHs, 13 in TH/ THQHs and four in CHCs (**Appendix 3.4**).

The IPHS prescribe basic laboratory services and diagnostic services for a PHC. On verification of the availability of laboratory services in 38 PHC/ FHCs, Audit noticed that the services were not provided in eight hospitals[40]. The shortage of lab technicians against IPHS norms in test-checked hospitals are detailed in Paragraph 2.2.4 of the Report.

3.9.2.2. AYUSH institutions

The pathology services in the hospitals as well as in dispensaries were provided through in-house laboratories only in eight out of 18 test-checked institutions (March 2021) (**Appendix 3.5**). No such facility was available in nine hospitals, whereas a collection facility was available in GAD Bharanikkavu.

Thus, pathology services were not available as prescribed in IPHS, depriving the public of evidence-based healthcare. Non-availability of essential equipment

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38 GTH, Nalloornad

39 DH Mananthavady, DH Mavelikkara, GH Alappuzha, GH Neyyattinkara

40 FHC Thalavadi, PHC Kannamangalam, PHC Kurumbalangode, PHC Thennala, PHC Othukkungal, FHC Cherukavu, PHC Varadoor, PHC Perumpazhuthoor

and short deployment of skilled human resources in the test-checked hospitals were amongst the reasons for the absence of desired investigation facilities.

GoK replied (October 2023) that Department of ISM would take necessary action to provide laboratory service in the institutions under it.

3.9.2.3. Pathology equipment

The IPHS prescribes 87 types of pathology (laboratory) equipment for the DHs and 33 for THs depending upon their bed strength. Audit verified the availability of 87 equipment in DH/ GHs and 28 equipment in TH/ THQHs as detailed in **Tables 4.14** and **4.15** of this Report.

3.10. Auxiliary and support services

3.10.1. Ambulance services

DHs and THs are required to have one to four ambulances according to its bed strength. In nine[41] hospitals, the required number of ambulances were not maintained during 2019 to 2021. In TH Fort, no ambulance was available for the entire period of audit.

3.10.2. Dietary services

The IPHS envisages dietary service as an important therapeutic tool which is an essential service for DH/ TH/ CHCs and desirable for PHCs.

Dietary service was provided only in six[42] out of the 67 hospitals test-checked in Audit. Specific kitchen facility was available only in Government Mental Health Centre (GMHC), Thiruvananthapuram, GH Neyyattinkara and in THQH Vythiri. Service of the dietician was available only in eight hospitals.

3.10.3. Blood Banks

As per IPHS, blood bank is one of the essential services that a DH has to provide. Blood banks should be in close proximity to pathology department and at an accessible distance to OT, ICU and emergency and accident departments. Test-check of seven DH/ GHs revealed the following:

- DH Nedumangad, GH Alappuzha, GH Neyyattinkara, and GH Kalpetta were not equipped with blood banks.
- In DH Tirur, the blood bank was not in close proximity with Pathology department and not within accessible distance to OT, ICU, etc.
- The blood bank sanctioned in 2012-13 to DH Mavelikkara received licence only in August 2021 and commenced functioning in March 2022

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[41] GH Kalpetta, DH Mavelikkara, THQH Kayamkulam, THQH Tirurangadi, DH Tirur, TH Fort, DH Nedumangad, GH Alappuzha, GH Neyyattinkara

[42] GH Neyyattinkara, DH Nedumangad, Government Mental Health Centre Thiruvananthapuram, THQH Vythiri, GH Alappuzha and DH Mavelikkara

due to shortcomings such as lack of adequate infrastructure, non-availability of trained manpower, etc.

- GoK sanctioned (July 2017) a blood bank to GH Alappuzha. The equipment were supplied (January 2019) by KMSCL. Audit observed (February 2022) that the equipment were idling for three years due to lack of sufficient infrastructure and delay in completing civil and electrical works.

3.10.4. Laundry services

The provision of clean linen is a fundamental requirement for patient care. Incorrect procedure for handling or processing of linen can present an infection risk both to staff and patients who subsequently use it.

As per the IPHS, laundry facilities should be available in the hospitals to provide linen to patients. Audit conducted a joint verification in the wards of the hospitals and the availability of the laundry and cleaning services in the wards are as detailed in **Table 3.22**.

Table 3.22: Availability of laundry/ cleaning services in test-checked DHs/ THs/ CHCs

Particulars	DH/ GHs (7)	TH/ THQHs (7)	CHCs (5)[43]
Whether bed linen is changed every day?	7	5	5
Whether bed linen is changed every time when got soiled?	7	7	5
Whether any officer visits to check the bed linen every day?	7	4	4
Whether mopping of floors is done every day?	7	7	5
Whether machines are used for mopping?	3	2	0
Whether garbage is removed from patient care area regularly?	7	7	5
Whether closed trolley is used for removal of garbage?	5	5	2

(Source:Joint verification in test-checked hospitals)

Ninety two out of 141 inpatients surveyed reported that clean, dry and ironed linen were provided by hospitals and 85 patients reported changing bed linen regularly. 92 *per cent* of patients reported that housecoat/ pyjamas were not provided by the hospitals.

3.10.5. Bio-Medical Waste Management

The Bio-Medical Waste Management Rules, 2016 (BMWM Rules, 2016) stipulates the procedure for collection, handling, transportation, disposal and monitoring of the bio-medical waste generated in hospitals with clear role for the waste generators and the operators. The observations on the scrutiny of records in test-checked hospitals with reference to BMWM Rules, 2016 are furnished in **Table 3.23**.

[43] Of the seven test-checked CHCs, inpatient services were not available in CHC Manamboor and GTH Nalloornad

Table 3.23: Bio-medical waste management in major test-checked institutions

Item	DH/ GH (7)	TH/ THQH (7)	GMC (3)
Whether the hospital received authorisation from SPCB	3	1	0
Whether bar code system for bags/ containers was implemented as per Rule 4	7	7	3
Whether annual training programmes were conducted as per Rule 4 and Guidelines for Management of Healthcare Waste as per BMWM Rules, 2016	7	3	1
Whether Annual report was submitted to SPCB and uploaded in Website as per Rules 4 and 13	1	0	0
Whether installation of in-house incinerator and on-site treatment and disposal facility was done	3	0	2
Whether Quality Team/ Infection Control Committee/ Bio-Medical Waste Management Committee was constituted (if there are more than 30 beds) or Bio-Medical Waste Supervisors have been appointed as per Paragraph 5.10 of Guidelines for Management of Healthcare Waste as per BMWM Rules, 2016	3	2	3
Whether single layered or double layered bags (using two bags) were used for collection of waste from COVID-19 isolation wards	7	6	3

(Source: Data obtained from test-checked hospitals)

The deficiencies in implementation of BMWM Rules, 2016 are furnished in Chapter VIII of this Report.

3.10.6. Mortuary services

As per IPHS, the DHs and THs are required to have a mortuary. Audit verified the availability of the facility in test-checked hospitals as detailed in **Table 3.24**.

Table 3.24: Availability of mortuary services in test-checked DH/ GH/ TH/ THQHs

Name of hospital	Mortuary available	Located in a separate building	Waiting area for relatives and a space for religious rites	Separate room for body storage with at least two deep freezers	Mortuary table (Stainless steel autopsy)
DH Mavelikkara	Yes	Yes	Yes	Yes	Yes
GH Alappuzha	Yes	Yes	No	Yes	No
GH Kalpetta	No	No	No	No	No
TH Fort	No	No	No	No	No
THQH Malayinkeezhu	No	No	No	No	No
TH Wandoor	No	No	No	No	No
DH Mananthavady	Yes	Yes	No	Yes	Yes
DH Nedumangad	Yes	Yes	Yes	Yes	Yes
GH Neyyattinkara	Yes	Yes	No	Yes	Yes
DH Tirur	Yes	Yes	Yes	Yes	Yes
TH Thuravoor	Yes	Yes	No	No	Yes
THQH Kayamkulam	Yes	Yes	Yes	Yes	Yes
THQH Tirurangadi	Yes	Yes	Yes	Yes	Yes
THQH Vythiri	Yes	Yes	No	No	No

Colour Code : Green/yes – Available, Red/no – Not available
(Source: Data obtained from test-checked hospitals)

Four of the 14 DH/ THs were functioning without a mortuary. Cold chamber for preservation of two dead bodies as prescribed in IPHS was not provided in TH Thuravoor and THQH Vythiri. Stainless steel autopsy table was not provided in THQH Vythiri.

3.10.7. Patient registration, grievance/ complaint redressal

IPHS prescribes that the hospital should display a citizen's charter indicating the services available, user fees charged, if any, and a grievance redressal system. Citizen's charter shall be displayed at OPD and entrance in local language including patient rights and responsibilities. During the field visit, Audit verified the availability of citizen's charter, OP counters and complaint redressal mechanism in test-checked hospitals as detailed in **Table 3.25**.

Table 3.25: Availability of services related to patient registration, grievance/ complaint redressal

Particulars	MCHs (3)	DH/ GHs (7)	TH/ THQHs (7)	CHCs (7)	PHC/ UPHCs (38)
Availability of adequate registration counters	0	0	0	0	20
Patient Satisfaction Survey (OPD)	0	5	0	1	8
Display of Citizen's charter in hospitals	0	3	3	5	21
Providing unique ID at the time of registration	3	5	6	5	24
Availability of complaint register and whether kept available for beneficiaries	0	5	3	4	20
Formation of Grievance Redressal Committee and redressal of complaints in a timely manner	2	1	2	3	11

Scales determined by Audit	Good MCH: (3) DH/TH/CHC: (7) PHC: (>31)	Moderate MCH: (2) DH/TH/CHC: (4-6) PHC: (16-30)	Poor MCH: (0-1) DH/TH/CHC: (0-3) PHC: (0-15)

(Source: Data obtained from test-checked hospitals)

Kerala Accreditation Standards for Hospitals (KASH) requires displaying the citizen's charter at a suitable place in the AYUSH hospitals. Citizen's charters were not displayed in nine out of 18 AYUSH institutions test-checked.

GoK stated (October 2023) that institutions under the Department of ISM were in the process of upgradation to KASH/ NABH accreditation standards which would assure facilities like citizen's charter, OP counter, complaint redressal mechanism etc. Homoeopathy department had issued instructions to hospitals and dispensaries for the display of citizen's charter and intimated that all the test-checked hospitals and dispensaries except GHD Thrikkalangode displayed citizen's charters.

3.10.8. Infection Control Management

The IPHS stipulates formation of infection control team and preparation of Standard Operating Procedure (SOP) for infection control in TH/ DHs.

SOPs were prepared by all test-checked TH/ THQH/ DH/ GHs except GH Kalpetta, TH Fort and THQH Malayinkeezhu. All hospitals managed bio-medical waste disposal through outsourcing and the other wastes were disposed internally through boiling, autoclaving, chemical sterilisation, etc. However, Audit noticed dumping of waste in premises of GMC, Thiruvananthapuram as detailed in Paragraph 4.7.1.3.

3.10.9. Patient safety

3.10.9.1. Availability of fire prevention facilities in test-checked Modern Medicine institutions and compliance with norms

The IPHS requires that fire extinguishers, sand buckets, etc., should be available and maintained to be readily available when needed. Staff should be trained in using firefighting equipment. Surprise mock drills should be conducted at regular intervals. No Objection Certificates (NOC) from the competent fire authority is a statutory requirement as per IPHS.

Out of the 67 hospitals inspected, Audit found that only six hospitals[44] had obtained NOCs from the Fire Department. Fire extinguisher facility was available only in 47 hospitals. Sand buckets used as absorbing agent on spilled flammable liquids were kept only in eight hospitals[45]. Evacuation plan routes for fire exit were displayed only in 11 hospitals[46]. Fifty to sixty *per cent* of the institutions reported that they had no plan for prevention of fire, adequate firefighting equipment, periodic training and regular mock drill for fire and other disaster situations.

3.10.9.2. Availability of firefighting equipment in test-checked AYUSH institutions

Audit observed that safety of patients, attendants, visitors and the hospital staff from fire was compromised in 11 institutions out of the 18 test-checked, as no fire extinguishers/ fire hydrants were available in these institutions.

GoK replied (October 2023) that during the financial year 2022-23, 120 institutions under ISM were provided with firefighting equipment. Homoeopathy Department also purchased fire extinguishers during 2022-23 with the available plan fund and distributed plan fund to all other dispensaries and hospitals during 2023-24 for the purchase.

Government may prioritise compliance with statutory fire safety norms, thereby ensuring the safety of patients and staff.

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[44] GH Alappuzha, FHC Punnapra (N), UPHC Biyyam, THQH Kayamkulam, DH Mananthavady, FHC Puliyoor

[45] TH Fort, GH Alappuzha, FHC Punnapra (N), TH Thuravoor, GTH Nalloornad, FHC Perumbalam, GMHC Thiruvananthapuram, CHC Chunakkara

[46] TH Fort, GH Alappuzha, FHC Punnapra (N), UPHC Biyyam, W & C Ponnani, DH Tirur, UPHC Ponnani, UPHC Mullathuvalappu, FHC Chokkad, GH Kalpetta, FHC Parappanangadi

3.11. Recommendations

- Government should ensure that minimum assured services as per IPHS norms, are available at all levels of hospitals alongwith prescribed patient amenity services.
- Government should ensure availability of pathological services, equipment and manpower in hospitals for timely and quality treatment of patients.

CHAPTER IV – AVAILABILITY OF DRUGS, MEDICINES, EQUIPMENT AND OTHER CONSUMABLES

CHAPTER IV

AVAILABILITY OF DRUGS, MEDICINES, EQUIPMENT AND OTHER CONSUMABLES

The main objective of formation of KMSCL was to avoid scarcity of drugs in hospitals at all times which can be realised only if indents are realistic and procurement of the indented quantity is effected. Audit observed that the above objective was not met resulting in stock out of drugs in hospitals during the period of Audit. The shortage of drugs in hospitals was attributable to inadequate indenting due to financial cap set, lack of response to bid, delay/ non-supply of drugs by the vendors, etc. Suppliers of around 82 *per cent* of the drugs delayed their consignment and in many instances, they were not penalised by KMSCL for the delay. The policy of subjecting only 10 *per cent* of drugs to quality check (QC) did not yield desired results as all the batches of 46 drugs and all supplies from 14 suppliers escaped QC during the audit period. Many vital medical equipment were not available in hospitals due to delay in purchase and non-maintenance of equipment. A mechanism for regular maintenance of equipment did not exist in the tertiary hospitals resulting in denial of services to patients.

Government of Kerala set up KMSCL as a fully owned Government Company in 2007 with the responsibility for procuring and distributing drugs, supplies and equipment to hospitals to meet the qualitative and quantitative needs of the end users, to avoid scarcity and losses and for optimal utilisation.

Drug Distribution and Management System (DDMS) is a web-based application used by KMSCL for managing the procurement and distribution of drugs and consumables for various health institutions. The procurement of drugs by KMSCL is effected with reference to an Essential Drug List[47] (EDL) comprising Anti-cancer drugs (ACD) and eight categories of products like generic drugs, surgical and medical supplies, X-ray films, etc. The EDL is updated every year by a high-level Technical Committee[48] and based on the updated EDL, the DHS, DME and NHM forward annual indents to KMSCL indicating requirement of drugs for effecting procurement.

4.1. Availability of essential drugs and consumables

The main objective of formation of KMSCL was to avoid scarcity of drugs in hospitals at all times which can be realised only if indents are realistic and procurement of the indented quantity is effected.

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[47] Based on the National List of Essential Medicines (NLEM)

[48] As directed (November 2007) by GoK, KMSCL constituted a technical committee with five members namely, DHS, DME, Drugs Controller, HoD of Government College of Pharmaceutical Sciences and MD, KMSCL.

Audit observed that the above objective was not met, as revealed from a micro level analysis of data for the period from 2016-17 to 2021-22 relating to test-checked hospitals, shown in the succeeding paragraphs:

4.1.1. Availability of essential drugs and consumables in the test-checked GH/DHs

Audit verified the availability of essential drugs and consumables in test-checked GH/DHs, as on 31 January 2022, with reference to the EDL 2021-22 as shown in **Table 4.1**.

Table 4.1: Availability of essential drugs and consumables in the test-checked GH/ DHs

	GH Neyyattinkara	DH Nedumangad	GH Alappuzha	DH Mavelikkara	DH Tirur	GH Kalpetta	DH Mananthavady
Number of drugs and consumables required	603	603	603	603	603	603	603
Drugs and consumables available as on 31.01.2022	344	263	290	328	337	328	350
Availability of drugs and consumables (in *per cent*)	57	44	48	54	56	54	58

(Source: DDMS data of KMSCL)

It was noticed that against the requirement of 603 essential drugs and consumables in district level hospitals, the availability ranged from 44 to 58 *per cent* only.

4.1.2. Stock-out of essential drugs and consumables in the test-checked institutions

Analysis of data for the period from 2016-17 to 2021-22 relating to 67 test-checked healthcare institutions revealed that many essential drugs were out of stock on various dates in these hospitals. There were 62,826 instances of stock out of drugs and the stock out period ranged upto 1,745 days, as detailed in **Table 4.2.**

Table 4.2: Details of stock out of drugs

Period of stock out of drugs	Number of instances	Name of the essential drugs stocked out frequently
366 to 1745 days	4126	Multi Vitamin Tab, Vitamin C Tab IP, Thyroxine Sodium Tab IP (used to treat underactive thyroid), Bisacodyl Tab (used to treat constipation), Hydrochlorothiazide Tab/ Telmisartan Tab IP (used to treat high blood pressure), Adrenaline Bitartrate Inj IP (used in the treatment of life-threatening emergencies like severe allergic reaction and cardiac arrest), Amoxicillin and Potassium Clavulanate Tab IP (used to treat a wide variety of bacterial infections), Insulin Injection Biphasic Isophane IP 30:70 (used in the treatment of diabetes mellitus) etc.
101 to 365 days	21943	
30 to 100 days	36757	
Total	**62826**	

(Source: DDMS data of KMSCL)

Audit examined the reasons for stock out of drugs through an analysis of DDMS data for the period from 2016-17 to 2021-22 which revealed inadequate indenting by hospitals, non/ short ordering of drugs against indent by KMSCL, default/ delay in supply by suppliers etc., as detailed in succeeding paragraphs:

4.2. Procurement of Drugs

GoK issued (October 2016) guidelines for streamlining the indenting process and introduced separate financial ceiling (financial cap) for each institution. Based on the grants and also taking into account the annual value of indents/ issue/ utility relating to the previous year and the current available stock of drugs, financial cap is fixed for each hospital. KMSCL initiates procurement process on obtaining the annual indents from the hospitals, which are scrutinised at District/ State level and finalised by DHS/ DME. The gap between actual requirement and the KMSCL supply is bridged by resorting to local purchases utilising the funds received from Local Self-Government Institutions. If the required drugs are not available at Karunya Community Pharmacy (KCP)[49] / Hospital Management Committees (HMC)[50] pharmacy/ Neethi Store (NS)[51], etc., they are purchased from open market. While the prices are uniform across the State in respect of the purchases through Karunya as there is a rate contract with them, purchases made from HMC, NS and open market may vary.

4.2.1. Non-availability of drugs in hospitals

4.2.1.1. Inadequate purchase of drugs against indents

Though the hospitals indented for 4,732 items of drugs, KMSCL proceeded with invitation of tenders in respect of only 4,720 items. No bids were received for 1,321 items (28 *per cent* of the tendered items). Only 536 items (11.33 *per cent*) were ordered in full quantities. In respect of 512 drugs, purchase orders (PO) were issued for less than 50 *per cent* of the indented quantity. 1,085 items of drugs were not ordered at all. Year-wise analysis of purchase orders against indents is shown in **Table 4.3**.

Table 4.3: Year-wise analysis of purchase orders against indents

Year	Total number of indented items	Total number of tendered items	No bid items	Total number of fully ordered items	Items ordered in less than 50 *per cent* of indented quantity	Items not ordered at all
2016-17	585	585	57	23	25	58
2017-18	830	830	218	130	78	231
2018-19	825	824	274	183	80	236
2019-20	828	817	259	41	84	210
2020-21	831	831	287	124	119	182
2021-22	833	833	226	35	126	168
Total	**4732**	**4720**	**1321**	**536**	**512**	**1085**

(Source: DDMS data of KMSCL)

[49] Karunya Community Pharmacy Services (Karunya) is the commercial division of KMSCL

[50] As per Section 173A of the Kerala Panchayat Raj Act, 1994, a Managing Committee shall be constituted consisting of not more than 15 members including the Chair for every public health institution.

[51] Neethi Scheme, started as per directions of GoK in 1997, is implemented through selected primary agricultural credit societies in all the districts of Kerala for sale of consumer goods and drugs at subsidised rates. Though the Kerala State Co-operatives Consumers' Federation Ltd. is not running NSs directly, they supply provisions to societies for running the NSs.

4.2.1.2. Inadequate supply against indents

The year-wise details of supply of drugs to hospitals against the quantity of drugs indented are as shown in **Table 4.4.** Though the hospitals indented for 4,732 items of drugs, only 1,036 items (21.89 *per cent*) were supplied in full quantities. While the supply of drugs in respect of 1,313 items was below 50 *per cent* of indented quantity, 307 items of drugs were not supplied at all.

Table 4.4: Year-wise analysis of supply against indents

Year	Total number of indented items	Total number of fully supplied items	Items for which supply was more than 50 *per cent* but less than 100 *per cent* of indented quantity	Items for which supply was below 50 *per cent* of indented quantity	Items not supplied at all
2016-17	585	162	347	53	23
2017-18	830	273	310	195	52
2018-19	825	286	270	194	75
2019-20	828	185	405	179	59
2020-21	831	99	464	213	55
2021-22	833	31	280	479	43
Total	**4732**	**1036**	**2076**	**1313**	**307**

(Source: DDMS data of KMSCL)

4.2.1.3. Delay in supply of drugs against purchase orders

As per the tender conditions, the entire ordered quantity should be supplied within 60 days of issue of PO during the period from 2016-17 to 2017-18 and within 70 days during the period from 2018-19 to 2021-22.

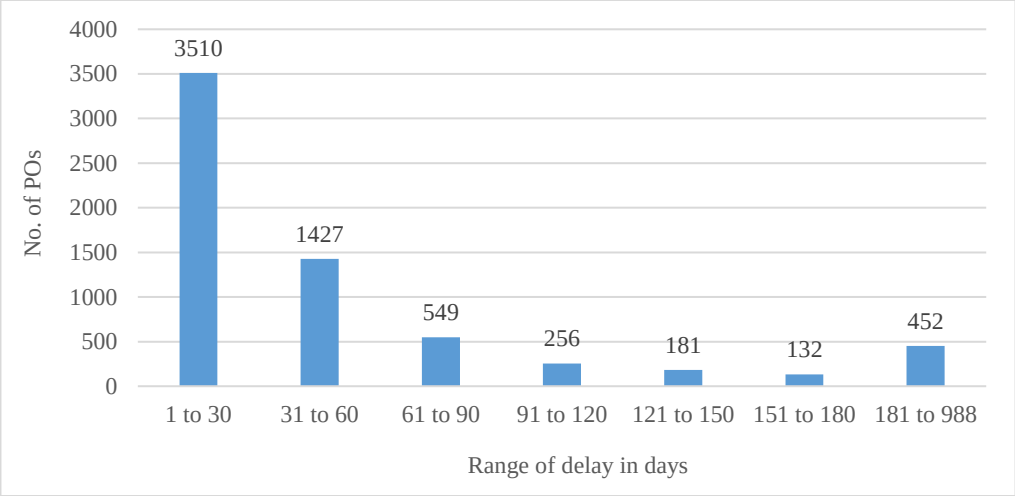
Analysis of data for the period from 2016-17 to 2021-22 revealed that 2,975 out of 3,635 ordered drugs (81.84 *per cent*) were not supplied within the stipulated delivery period. The delay ranged upto 988 days. Year-wise analysis is shown in **Table 4.5** and range of delay is shown in **Chart 4.1**.

Table 4.5: Year-wise analysis of delayed supply

Year	Total no. of POs	No of POs with delayed supply	No. of drugs ordered	No. of drugs supplied with delay	Stipulated delivery period	Delay range (in days)
2016-17	2012	1365	527	490	Within 60 days	1 to 867
2017-18	1962	1401	599	547	Within 60 days	1 to 988
2018-19	2331	1056	590	458	Within 70 days	1 to 656
2019-20	1782	1011	607	488	Within 70 days	1 to 493
2020-21	1897	960	648	549	Within 70 days	1 to 315
2021-22	1706	714	664	443	Within 70 days	1 to 209
Total	**11690**	**6507**	**3635**	**2975**		

(Source: DDMS data of KMSCL)

Chart 4.1: Range of delay in supply of drugs to warehouses by suppliers



The delay in supply adversely affected the availability of drugs, which resulted in stock out of drugs on various days as pointed out in **Table 4.2**.

4.2.1.4. Inadequate indenting

Audit compared quantities indented for each year that were less than 75 *per cent* of the quantity of the respective previous year's indents *vis-à-vis* the previous year's indents and the corresponding consumption in respect of each of the drugs.

The analysis revealed that there were 1,859 instances of stock out of drugs on various days directly attributable to short indenting on account of financial cap set. For instance, in one hospital as regards the indent for the drug Theophylline and Etophylline, stock out was for 212 days during 2019-20. During 2018-19, the hospital had indented 1.80 lakh numbers of this drug, of which 1.73 lakh was consumed. Due to financial cap, the hospital had to limit their indent to 18,000 during 2019-20 which resulted in the stock out. Similarly, in another hospital as regards Prednisolone Tab IP, stock out was for 128 days during 2019-20. The hospital could indent only 40,500 numbers of this drug during 2019-20 due to limited financial cap whereas it had indented and consumed 1.17 lakh and 1.12 lakh respectively during 2018-19.

Hospital authorities stated (November 2021 and February 2022) that they were compelled to restrict their indents based on the respective financial caps fixed for them, without regard to their actual requirement. Ninety *per cent* of the hospitals test-checked reported that financial cap was insufficient, which led to short indenting.

GoK stated (November 2023) that the data shown in Tables[52] did not match with the data available in DDMS. Further, KMSCL optimised the purchase order quantities by taking into account closing stock of the items at the warehouses and institutions, anomalies in indents pointed out by user departments, slow

[52] Under Paragraph 4.2 – Procurement of Drugs, of this Report

moving drugs etc. It was also stated that more than 28 *per cent* of items tendered was no-bidder items. KMSCL within the maximum limits, had delivered the medicines to the hospitals without wasting the public money. Regarding delay in supply against purchase orders, during 2018-19 and 2020-21, unexpected delay in the supply chain occurred due to flood and COVID 19. During 2020-21, the supply period of the purchase order was extended for a period of 40 days without any liquidated damages.

The reply is not acceptable as Audit verified the variance in data pointed out in the reply and confirmed the correctness of data provided in the Report which was based on the replies and data (dump data of DDMS) provided by KMSCL to Audit. Further, analysis of the data clearly indicates that inadequate issue of purchase orders/no bidder items/inadequate supply against indents contributed to the stock out situation. The reply on delay in supply due to COVID and flood is not tenable, as Audit noticed delay in supply of drugs throughout the audit period from 2016-2022.

Audit observed that the stock out of drugs resulted in local purchases as detailed in **Table 4.6**.

Table 4.6: Year-wise analysis of local purchases and stock out of drugs

Year	Total no. of drugs issued to test-checked hospitals	No. of drugs stocked out	No. of drugs locally purchased
2016-17	585	531	82
2017-18	830	675	187
2018-19	821	668	248
2019-20	816	631	259
2020-21	820	575	278
2021-22	818	538	389

(Source: DDMS data of KMSCL)

Audit observed that these were the consequences of inadequate financial cap and consequent short indenting by hospitals, considerable number (28 *per cent*) of no bidder items, short supply against the indents and delay in supply of drugs pointed out in the above paragraphs.

4.2.2. Non-levy of penalty for short supply

As per the tender conditions, in the event of lowest bidder's (L1) failure in supply of the required quantity in full or in part within the stipulated time, KMSCL would cancel the unexecuted quantity of POs and place POs with the matched L1 bidder or to the next bidder(s) according to the bid ranking status at the risk and cost of defaulted bidder/ supplier. In such cases, the penalty attracted is 10 *per cent* of the value of unexecuted quantity or the extra expenditure incurred for alternate purchase of the same drugs, whichever is higher.

Data analysis revealed that penalty amounting to ₹1.64 crore in 82 instances was not levied, where supply was less than the ordered quantity.

GoK stated (November 2023) that penalty was not charged for the purchases made through Karunya Division of KMSCL (for no-bidder items), certain purchases made at the time of COVID pandemic, procurement from M/s Kerala State Drugs and Pharmaceuticals Limited (State PSU) etc, after obtaining approval from the Management/Government.

Audit, after excluding the aforementioned categories and the instances listed by GoK, found that penalty amounting to ₹69.25 lakh still remained to be levied in 48 cases.

4.2.3. Non-levy of liquidated damages for delay in supply

KMSCL may receive supply even after expiry of the date stipulated in the purchase order, at their discretion, considering the urgency of the essential item for the hospitals. In such cases, liquidated damages (LD) should be levied at 0.50 *per cent* per day of the value of the delayed supply subject to a maximum of 10 *per cent* of value of the delayed supply.

Out of 6,092 POs[53] with delayed supply during the period 2016-22, LDs were collected only in respect of 5,560 POs and LDs not collected in 532 instances amounting to ₹9.91 crore.

GoK stated (November 2023) that LD was not charged for the purchases made from Karunya Division of KMSCL (for no-bidder items), procurement from M/s. Kerala State Drugs and Pharmaceuticals Limited (State PSU), certain purchases made at the time of COVID, etc.

Audit subsequently analysed the data and found that only five cases under the above categories were included in the 532 cases of non-levy of LD pointed out by Audit. In the remaining 527 cases, LD amounting to ₹9.76 crore have not been collected.

4.2.4. Issue of drugs without following First Expiry First Out method

First Expiry First Out (FEFO) is a term used in inventory management to describe a way of dealing with the logistics of products that have a limited shelf life. These items include perishable products or consumer goods with a specified expiration date. The product which expires first has to be served first or removed from stock. During physical verification of stock of drugs in 67 test-checked hospitals, Audit noticed that in 30 hospitals, latter batches of drugs were issued before termination of former batches, which had earlier dates of expiry.

GoK concurred (November 2023) with Audit that FEFO was the best material management system. Further, during the training programme on DDMS software, KMSCL clearly mentioned that warehouses and institutions had to strictly follow FEFO method.

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[53] Out of 6,507 POs with delayed supply during the period 2016-22, invoices were received for 6,092 POs only.

4.2.5. Probable issue of expired drugs and supplies

Analysis of data for the period from 2016-17 to 2021-22 revealed that drugs and supplies issued to wards had already exceeded the date of expiry in 60 instances in 26 hospitals. Total value of expired drugs and supplies issued to wards comes to ₹0.89 lakh in respect of these 26 hospitals. Issue and usage of expired drugs is a serious matter of concern as the change in chemical composition consequent to the expiry of drugs may put the life of patients in danger.

In respect of 530 instances in 148 hospitals, items under stop memo[54] were issued to wards. Total value of such instances comes to ₹11.69 lakh.

GoK replied (November 2023) that in any circumstances, the stopped/expired drugs cannot be issued through the DDMS software, since the stock was moved from normal stock to stopped/expired items stock. DDMS permitted the issue of items to end user only from the normal stock. The reply is not acceptable since the data in DDMS clearly showed that expired/stopped medicines were issued to wards.

4.2.6. Undue favours to a supplier by granting 100 *per cent* of purchase value as advance in violation of norms

For managing the pandemic situation, State Level Crisis Management Group (SLCMG) for management of COVID-19 decided (March 2020) to authorise KMSCL to pay upto 50 *per cent* of the purchase value as advance payment to suppliers of items needed for COVID management. In violation of the above orders, 100 *per cent* advance was paid to a firm, *viz*., M/s San Pharma, which had offered to supply Personal Protective Equipment (PPE) kits at the highest rate of ₹1,550 per unit as stated in Paragraph 4.2.7. The firm was issued (March 2020) orders to supply 15,000 PPE kits at ₹1,550 per unit for which KMSCL paid advance amount of ₹2.32 crore (March 2020) which was the total value of the supply order and the supply was effected in May 2020.

GoK stated (November 2023) that the advance of ₹2.32 crore was paid against the Letter of Indent (LoI) quantity of 50,000 placed with the firm and that the advance amounted only to 29 *per cent* of total purchase value of the order (₹9.35 crore).

However, the contention is not acceptable as Audit observed that though the LoI quantity was for 50,000 PPE kits, orders were placed for immediate supply of 15,000 numbers only, as the company was new and the product had not been verified. Further, scrutiny of the purchase file also indicated that, on 31 March 2020, it was decided to purchase 15,000 PPE kits only. Hence, the reply of GoK that the advance was for 50,000 PPE kits is not tenable. Since it was decided to purchase only 15,000 PPE kits, the advance payment of ₹2.32 crore was for the full cost of the ordered quantity[55].

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[54] Batches of drugs which were declared 'Not of Standard quality' by empanelled labs and confirmed by Drug Testing Laboratory are stopped from issue to patients.

[55] 15,000 x ₹1,550 = ₹2.32 crore

4.2.7. Irregular procurement of PPE kits leading to additional expenditure to the tune of ₹10.23 crore

GoK accorded (March 2020) special sanction to KMSCL to procure PPE kits, N 95 Masks, and other similar commodities and equipment for equipping healthcare institutions in the State to manage COVID-19 pandemic effectively. Further, in the wake of emergency requirement and scarce availability, exemption was also granted from tender/ quotation formalities. However, GoK had prescribed (March 2020) unit rates for PPE kits at ₹545 with a view to effect price control of essential commodities. The purchases were also permitted to be effected through KCP, the commercial wing of KMSCL. Further, decisions were also made in State Level Crisis Management group to place purchase orders for COVID management based on demand and criticality of situation.

Four firms[56], which included three regular suppliers to KMSCL/ Karunya division had offered rates to supply PPE kits during March 2020 at rates falling within or slightly higher than Government approved rates. Despite the availability of offers at lower price ranges from regular suppliers as well as in local markets, procurements were also made from five firms during March and April 2020 at much higher rates, as high as 300 *per cent* above the unit rate or at higher rates, compared to previous purchases made. This resulted in additional expenditure of ₹10.23 crore on the PPE kits procured during the above period. Details are given in **Table 4.7**.

Table 4.7: Details of PPE kits procured during March to May 2020

Sl. No.	Supplier	Unit rate offered (in ₹)	Date of Letter of indent/ supply order	Ordered quantity	Total expenditure on purchases at offered rates (₹ in crore)	Total expenditure, if purchased at prescribed rates of ₹ 545/unit (₹ in crore)	Excess expenditure incurred (₹ in crore)
1	M/s. San Pharma	1550	30.03.2020	15000	2.33	0.82	1.51
2	A&A Trading Ventures Pvt. Ltd.	1185	02.04.2020	1000	0.12	0.05	0.06
3	M/s. Innov Quotient Pvt. Ltd.	1550	06.04.2020	15000	2.33	0.82	1.51
4	BNS Health Aids Ltd.	1295	06.04.2020	25000	3.24	1.36	1.88
5	M/s. Kitex Garments	830	15.04.2020	60000	4.98	3.27	1.71
		800	15.04.2020	140000	11.20	7.63	3.57
	Total			**256000**	**24.18**	**13.95**	**10.23**

(Source: Records of KMSCL)

In this context, Audit noticed that M/s Anitha Texcot (India) Pvt. Ltd. offered (28 March 2020) to supply PPE kits at the rate of ₹550 which was close to the unit rates (₹545) prescribed by GoK. Even though KMSCL offered to procure 25,000 PPE kits from this firm, purchase orders were issued (28 March 2020) for the supply of 10,000 numbers only while the ordered quantity ranged from 15,000 to two lakh in respect of other firms which quoted rates ranging from ₹800 to ₹1,550 per unit. On receipt of supply of 50 *per cent* of the ordered quantity within 18 days of issue of supply order, the supply order was cancelled (15 April 2020) stating the reason that receipt against supply order was less. However, Audit noticed that KMSCL had not included any clause in LoI

[56] M/s Careon Healthcare Solutions Pvt Ltd (₹425 to ₹445), M/s Biomedics (₹475 + GST), M/s Anitha Texcot (India) Pvt Ltd (₹550 +GST), M/s New Care Hygiene Solutions Pvt Ltd. (₹450)

stipulating supply period and no records were available to suggest that KMSCL had set a time frame for supplying the PPE kits ordered. Besides, the suppliers who had offered substantially higher unit prices (refer **Table 4.7**), had carried out the supply 23 to 33 days after the issue of supply orders which were accepted without any cancellation of orders. Thus, it is evident that KMSCL excluded a firm that was supplying PPE kits at a lower rate in order to purchase the item at higher rates from other vendors.

GoK replied (November 2023) that GoI had issued special instructions on 27 March 2020 in view of the urgency involved in the procurement of medical and other essential supplies, for permitting procurement from more than one source. Further, the SLCMG had authorised KMSCL to buy variants of PPE kits as available in the market, based on necessity and criticality of the situation.

Though procurement was made in emergency scenario, this does not justify cancelling POs which are economical to the Government. Thus, the purchases made from suppliers who were new in market, at significantly higher rates resulted in extra expenditure of ₹10.23 crore.

4.2.8. Availability of AYUSH essential medicines

Government of Kerala vide order dated 23 December 2019 approved 174 items of drugs in the Essential Drug List (EDL) for Ayurveda. Audit verified the availability of these drugs in the ISM hospitals test-checked, as detailed in **Table 4.8**.

Table 4.8: Availability of Essential Drugs in test-checked ISM hospitals

Sl. No.	Hospital	No. of Ayurveda drugs in EDL	Average availability of Ayurveda drugs during 2019-20 to 2021-22
1	District Ayurveda Hospital Kalpetta	174	71
2	Government Ayurveda Hospital Perinthalmanna		68
3	Government Ayurveda Marma Hospital Kanjiramkulam		41
4	Government Ayurveda Panchakarma Hospital Alappuzha		80

(Source: Information furnished by test-checked hospitals)

Audit observed that out of 174 drugs in the EDL for ISM, the availability of drugs ranged from 41 to 80 drugs in the test-checked hospitals.

4.3. Quality Control

Tender conditions issued by KMSCL required that all batches of drugs supplied should carry certificates of analysis from the in-house testing laboratory of the supplier firm and from NABL[57] accredited drug testing laboratory/ central drug testing laboratory. KMSCL reserved the right to get the drug tested at laboratories of their choice for further verifications and to subject 10 *per cent*

[57] National Accreditation Board for Testing and Calibration Laboratories (NABL) is an accreditation body (a constituent Board of Quality Council of India), with its accreditation system established in accordance with ISO/ IEC 17011.

of total batches supplied in a year to quality tests on random basis, at drug testing laboratories approved under the Drugs and Cosmetics Act, 1940. It was envisaged that the distribution of such items, which fail in the analysis of empanelled laboratories (lab) would be temporarily stopped and samples forwarded to Government Drug Testing Laboratory (DTL) at Thiruvananthapuram for confirmatory analysis. If any batches were declared as not of standard quality (NSQ) by DTL, orders were to be issued to stop distribution of that particular batch of the drug. In such cases, the bidder would be liable for appropriate action as per the tender conditions and also for legal action under the Drugs and Cosmetics Act, 1940 and Drugs and Cosmetics Rules, 1945. If any batch was declared as standard quality (SQ), then the same would be released for issue to patients.

4.3.1. Inappropriate exemption from subjecting to quality check

The prime objective of quality checking (QC) of drugs is to help assure that safe and effective drugs are supplied to hospitals.

However, it was observed that KMSCL exempted high value Anti-cancer drugs and specialty drugs[58] due to limited purchases, items required to be maintained in cold chain conditions due to lack of transportation facility[59], X-ray films and items for which no rates were quoted by empanelled labs,[60] etc., from quality tests.

GoK replied (November 2023) that considering the operational intricacy in testing all anti-cancer drugs and specialty drugs due to insufficient quantity of procurement/ insufficient laboratory facilities, KMSCL had taken all possible steps to strengthen procurement logistics and supply chain mechanism. Prequalification criteria for the manufacturers and suppliers were made very stringent. KMSCL had made the certificate of analysis from third party NABL accredited laboratory for each batch mandatory, in addition to in-house drug test report.

Audit noticed from details furnished by GoK that even after adopting such measures, one of the two specialty drugs and three of the 28 cold chain drugs tested on the basis of complaints received were found as NSQ, which underscores the need for quality check at Government level for protecting patients from potentially unsafe, non-effective or poor-quality drugs under the aforementioned categories.

4.3.2. Delays in quality checking of drugs at various stages

Expression of Interest stipulated that the labs have to furnish the test results within 15 days for non-sterile preparations and 30 days for sterile preparations.

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58 Anti-Cancer drugs and Specialty drugs were exempted from quality check being high value items purchased in limited quantity and consequent inability to maintain sufficient control samples

59 KMSCL did not have cold chain transport facility (For drugs requiring storage temp 2-8℃).

60 53 items were exempted from QC during 2014-17, 103 items during 2017-19 and 132 items during 2019-21.

Analysis of data for the period from 2016-17 to 2021-22 revealed that 9,766 samples of drugs were picked (selected) during this period for quality check. While the laboratories took more than 30 days to furnish the test results relating to sterile preparations to KMSCL from the date of receipt in respect of 37 *per cent* of samples (376 out of 1,028 sterile samples), the maximum delay was 331 days. Of these, 19 drugs turned out to be NSQ. While the labs took more than 15 days to furnish the test results relating to non-sterile preparations to KMSCL from the date of receipt in respect of 38 *per cent* of samples (719 out of 1,876 non-sterile samples), the maximum delay was 212 days. Of these, 26 drugs turned out to be NSQ. Inordinate delay in finalising the lab test reports by DTL was also noticed. The total number of lab test reports received after 60 days during the period was 789 and the time taken for receipt of lab test report ranged up to 326 days in one case during 2020-21.

Audit also noticed inordinate delay on the part of KMSCL in other stages as shown in **Table 4.9**.

Table 4.9: Delay in various stages of QC

Stages involved	Norms	Remarks
Producing samples at KMSCL by warehouses from the date of picking (selection) samples	In the absence of stipulation of time limit, Audit adopted 14 days as a reasonable benchmark for analysis	Warehouses took more than 14 days in respect of 66 *per cent* of samples. The maximum period taken was 314 days.
Producing samples at the empanelled Labs by KMSCL from the date of placing work order with the Labs		KMSCL took more than 14 days, in respect of six *per cent* of samples and the maximum time taken was 176 days.
Data capture of details of test results in DDMS by KMSCL from the date of receipt of results from the Labs		Exceeded 14 days from the date of receipt of results in respect of 48 *per cent* of samples. The maximum time taken was 702 days.

(Source: DDMS data of KMSCL)

The Drugs Controller attributed (April 2022) the delay in sample reporting to testing of high-priority samples, non-availability of analytical methods/ working reference standards/ instruments and COVID pandemic.

GoK replied (November 2023) that major delay in various stages of QC had occurred due to floods during 2018-19 and COVID outbreak.

The reply is not tenable as the delay in sampling at warehouses existed throughout the Audit period.

4.3.3. Batches of drugs and suppliers escaped quality checks

Audit examined the testing methodology adopted by KMSCL to assess whether the objective of ensuring 'qualitative needs of the end users' was achieved. Audit's view on inappropriate exemption is pointed out in paragraph 4.3.1. Nevertheless, analysis of data for the period from 2016-17 to 2021-22 relating to batch-wise samples, excluding exempted drugs, subjected to QC revealed that the stipulated percentage (10 *per cent*) of the total batches received in a year was subjected to QC as shown in **Table 4.10**.

Table 4.10: Details of batch-wise samples subjected to QC

Year	Total no. of batches received	No. of batches requiring QC (excluding exempted drugs)	No. of batches sent for QC	Sample check done on required batches *(in per cent)*
2016-17	9220	8604	1080	12.55
2017-18	8843	7889	1145	14.51
2018-19	10200	7926	1124	14.18
2019-20	8983	7688	1259	16.38
2020-21	8620	7313	920	12.58
2021-22	8183	6298	3172	50.37
Total / Average	**54049**	**45718**	**8700**	**19.03**

(Source: DDMS data of KMSCL)

The objective of subjecting 10 *per cent* of drugs to QC is to ensure that all the drugs issued to patients should be of standard quality. Adopting multi-stage sampling would ensure that samples from all the batches of drugs supplied by every supplier are subjected to QC, thereby guaranteeing that the samples represent the population (entire drugs).

Audit observed that the procedure adopted to select samples is simple random sampling method. Consequently, on the one hand, considerable number of drugs escaped quality checks and on the other, several suppliers escaped from the scanner of QC as shown in **Table 4.11** and **Table 4.12**.

Table 4.11: Number of drugs escaped from subjecting to QC

Year	No. of drugs received	Drugs qualified for QC (excluding exempted drugs)	No. of drugs sent for QC	No. of drugs escaped QC
2016-17	531	412	319	93
2017-18	586	384	295	89
2018-19	577	364	280	84
2019-20	610	374	329	45
2020-21	628	373	316	57
2021-22	674	363	306	57

(Source: DDMS data of KMSCL)

Table 4.12: Number of suppliers whose supplies escaped from subjecting to QC

Year	No. of suppliers	No. of suppliers qualified for QC (excluding exempted drugs)	No. of suppliers whose drugs were sent for normal QC	No. of suppliers whose supplies escaped from QC
2016-17	116	94	81	13
2017-18	124	97	78	19
2018-19	126	91	79	12
2019-20	123	88	75	13
2020-21	116	86	72	14
2021-22	140	97	81	16

(Source: DDMS data of KMSCL)

This included all the batches of 46 drugs, which were not subjected to QC in any of the years during the period 2016-17 to 2021-22. Further, all supplies from 14 suppliers escaped from the scanner of QC.

GoK accepted the audit observation and stated (November 2023) that KMSCL never prioritised the products or suppliers for QC random sampling. From 2021 onwards KMSCL selected 30 *per cent* of drugs for QC.

Audit however observed that though the percentage of sampling was enhanced during 2021-22, considerable number of suppliers and drugs escaped from the scanner of QC, as can be seen from **Tables 4.11 and 4.12**.

4.4. Deficiency in inventory control and improper storage of medicines

Audit conducted physical verification of the drug stores for verifying the availability of facilities in 67 test-checked hospitals as detailed in **Table 4.13.**

Table 4.13: Deficiencies in drugs stores

Description	Percentage of deficiencies	Probable impact of deficiencies
Air-conditioned pharmacy	55.22	Loss of efficacy and shelf life of drugs
Labelled shelves/ racks	28.36	High turnover time in the disbursement of drugs
Storage away from water and heat	5.97	Loss of efficacy and shelf life of drugs
Drugs stored above the floor	19.40	-do-
Drugs stored away from walls	22.39	-do-
24-hour temperature recording in cold storage	41.79	-do-
Display of instructions for storage of vaccines	29.85	-do-
Functional temperature monitoring device in freezers	19.40	-do-
Maintenance of temperature chart of deep freezers	17.91	-do-
Drugs kept under lock and key	17.91	Misuse of costly drugs
Poisons kept under lock and key	52.24	Unauthorised access to hazardous drugs
Expired drugs stored separately	22.39	Mixing of expired drugs with usable drugs

(Source: Physical verification conducted by Audit)

It could be seen from the above that the deficiencies ranged from 5.97 to 55.22 *per cent* in the above test-checked hospitals. This carries the risk of loss of efficacy and shelf life of drugs, misuse of costly drugs and unauthorised access to hazardous drugs.

4.5. Compliance of stipulations on prescriptions

The Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002 and amendment notification (October 2016) stipulate that every physician should prescribe drugs with generic names legibly and preferably in capital letters. GoK noticed violation of these stipulations and therefore issued (June 2014 and November 2015) periodical instructions to hospital authorities for strict compliance of the Regulations.

Audit conducted a test-check of prescriptions issued to outpatients which revealed persistent issue of prescriptions of branded drugs. In respect of 1,950 prescriptions issued by 65 test-checked hospitals, 15.42 *per cent* of the drugs prescribed were branded drugs. Further, 92 *per cent* of prescriptions were legible and 36 *per cent* were in capital letters. Audit also observed that the prescription of branded drugs was comparatively higher in Medical College hospitals. On scrutiny of 90 prescriptions in three Medical College hospitals

test-checked, 199 out of the 365 drugs prescribed (54.52 *per cent*) were branded drugs.

4.6. Deficiencies in IT management of DDMS

Drug Distribution and Management System (DDMS) was developed by M/s Karnataka State Electronics Development Corporation Limited and is hosted in the State Data Centre, Thiruvananthapuram. The application runs on one database server and two application servers.

The deficiencies noticed in IT management of DDMS are summarised in **Appendix 4.1**. Audit observed deficiencies in strategic IT planning at KMSCL which resulted in deficient development of DDMS, non-integration with e-procurement system of GoK, insufficiencies in operation controls, etc. Further, non-hosting of DDMS in a secure website exposed the system to possible sniffing attack.

4.7. Procurement and supply of medical equipment

Equipment for diagnostic/ therapeutic purposes, dialysis units, cath labs etc., were sanctioned to hospitals under the annual plan schemes by GoK and the funds were released through annual budget. GoK aims to standardise the services offered by each level of hospital through Aardram Mission and has also evolved a State level quality assurance program, the KASH to improve the quality of health care offered by the hospitals. No specific quantum of equipment required in each level of hospital has been specified under the Mission document and the accreditation standards. However, IPHS specifies the requirement of equipment in each department in each level of hospital. Hence, Audit examined the availability of equipment required under IPHS in the test-checked DH/ GHs and TH/ THQHs respectively and observed shortfall against requirement as detailed in **Table 4.14** and **Table 4.15**.

Table 4.14: Availability of equipment in test-checked DH/ GHs

Sl. No.	Type of Services	Equipment essential as per IPHS 2012	Availability of item							Scales determined by Audit		
			DH Mavelikkara	DH Tirur	DH Nedumangad	DH Mananthavady	GH Alappuzha	GH Neyyattinkara	GH Kalpetta	Good	Moderate	Poor
1	Imaging Equipment	12	7	7	3	9	10	4	5	> 9	6 to 9	< 6
2	X-Ray Room Accessories	8	6	5	4	3	7	3	3	> 6	4 to 6	< 4
3	Cardiopulmonary Equipment	16	12	12	8	14	12	10	11	> 12	8 to 12	< 8

Sl. No.	Type of Services	Equipment essential as per IPHS 2012	Availability of item							Scales determined by Audit		
			DH Mavelikkara	DH Tirur	DH Nedumangad	DH Mananthavady	GH Alappuzha	GH Neyyattinkara	GH Kalpetta	Good	Moderate	Poor
4	Labour ward (LW), Neo Natal and Special Newborn Care Unit Equipment	28	22	20	21	23	No LW	24	18	> 21	14 to 21	< 14
5	Special Newborn Care Unit	12	12	6	2	7	No LW	2	3	> 9	6 to 9	< 6
6	Disinfection of Special Newborn Care Unit	13	11	6	3	4	No LW	6	2	> 10	7 to 10	< 7
7	Immunization Equipment	15	14	13	12	12	12	15	13	> 11	8 to 11	< 8
8	Ear Nose Throat Equipment	23	17	17	10	19	20	11	19	> 17	11 to 17	< 11
9	Eye Equipment	27	23	21	26	26	25	21	20	> 20	13 to 20	< 13
10	Dental Equipment	42	36	30	34	36	31	30	36	> 32	21 to 32	< 21
11	Laboratory Equipment	87	54	43	41	33	50	37	26	> 65	43 to 65	< 43
12	Endoscopy Equipment	8	4	2	3	5	2	2	2	> 6	4 to 6	< 4
13	Anaesthesia Equipment	25	21	21	19	22	22	18	20	> 19	13 to 19	< 13
14	Postmortem Equipment	9	9	6	5	6	1	3	No Mortuary	> 7	5 to 7	< 5
15	Operation Theatre Equipment	29	14	10	9	16	14	13	9	> 22	15 to 22	< 15
16	ICU equipment	10	9	7	6	7	8	No ICU	7	> 7	5 to 7	< 5

(Source: Physical verification conducted by Audit)

Major shortfall in equipment was noticed in DH Nedumangad, GH Neyyattinkara and GH Kalpetta, where such shortfall was existing in six to eight services.

Table 4.15: Availability of equipment in test-checked TH/ THQHs

Sl. No.	Type of Services	Equipment essential as per IPHS 2012	Availability of item							Scales determined by Audit		
			TH Thuravoor	TH Wandoor	TH Fort	THQH Kayamkulam	THQH Tirurangadi	THQH Malayinkeezhu	THQH Vythiri	Good	Moderate	Poor
1	Imaging equipment	3	2	2	0	1	1	1	2	> 2	1 to 2	< 1
2	X-Ray Room Accessories	7	3	4	2	2	2	4	7	> 5	3 to 5	< 3
3	Cardiopulmonary Equipment	9	8	6	6	7	7	8	6	> 7	5 to 7	< 5
4	Labour ward and Neo Natal Equipment	18	14	15	14	15	12	No LW	14	> 14	9 to 14	< 9
5	Immunization Equipment	16	11	11	11	13	8	9	13	> 12	8 to 12	< 8
6	Ear Nose Throat Equipment	22	4	0	0	14	5	0	10	> 17	11 to 17	< 11
7	Eye Equipment	22	10	11	0	15	18	3	13	> 17	11 to 17	< 11
8	Dental equipment	4	4	4	4	4	4	4	4	> 3	2 to 3	< 2
9	Operation Theatre Equipment	24	7	6	10	15	10	No OT	9	> 16	12 to 16	< 12
10	Laboratory Equipment	28	15	19	15	13	24	17	16	> 21	14 to 21	< 14
11	Surgical Equipment Sets	34	16	15	16	24	24	4	26	> 26	17 to 26	< 17
12	Endoscopy Equipment	1	0	0	0	0	1	0	0	1	--	0
13	Anaesthesia Equipment	19	13	9	16	17	17	0	10	> 15	9 to 15	< 9
14	Postmortem equipment	10	6	No Mortuary	No Mortuary	8	6	No Mortuary	2	> 7	5 to 7	< 5

(Source: Physical verification conducted by Audit)

It was seen from the above that Endoscopy equipment was not available in six out of the seven test-checked TH/THQHs whereas shortfall in equipment was noticed in eight services in TH Fort and THQH Malayinkeezhu. Shortage of essential equipment in the above hospitals hampered the smooth delivery of health services.

Audit examined the purchase records of the major equipment in the test-checked hospitals and found instances of delay ranging from three to nine years in procurement, defective maintenance leading to underutilisation, idling of equipment due to lack of trained staff, pending repairs, etc. as discussed below:

4.7.1. Non-purchase of vital equipment

4.7.1.1. HDR Brachy Therapy with Treatment planning System in GMC, Thiruvananthapuram

The Director of Medical Education had submitted (June 2013) a proposal to GoK for setting up Oncology and Tertiary care centres in Medical Colleges. Government approved the proposal (August 2013) and allocated ₹ 1.75 crore to GMC, Thiruvananthapuram for the purchase of HDR Brachy Therapy with

treatment planning system[61]. The funds were transferred to KMSCL (January and February 2014). However, the purchase did not materialise and the amount was resumed by GoK in 2018. Though DME addressed (February 2020) GoK to sanction the revised amount of ₹ 2.73 crore, the same has not been released by GoK.

GoK replied (November 2023) that a bunker has been constructed for the machine and on availability of funds, equipment would be procured and installed after completing the civil and electrical works inside the bunker.

4.7.1.2. Non-procurement of Brachy Therapy in GMC, Alappuzha

Ministry of Health and Family Welfare, GoI had sanctioned (September 2012) ₹4.80 crore to GMC, Alappuzha for the purchase of HDR Brachy Therapy Unit with 3D Planning System and Conventional Simulator subject to the release of 20 *per cent* State share of ₹1.20 crore.

The 80 *per cent* GoI share of ₹4.80 crore and ₹2.45 crore of Additional Central Assistance were credited to the SB account of the Principal, GMC and State share of ₹ 1.20 crore was credited (March 2013) to his Personal Deposit account.

Accordingly, supply order for the purchase of the machines was issued (February 2014) to the L1 quoted company for an amount of ₹4.36 crore and the sanction for opening Letter of Credit for the amount for supply of machine was issued (August 2015) by GoK. However, the company declined to supply the equipment citing the reason that the techno commercial offer was valid only upto 28 February 2014. Audit noticed that the purchase had not been made (March 2022) and the amount remained unutilized. The Hospital stated (March 2022) that the main reason for delay in procurement was the inability to meet the price hike on exchange rate variation in the price bid after finalising tender procedures.

GoK stated (October 2022) that a proposal for revised administrative sanction was received in May 2022. Further, a proposal for revalidation of the scheme from GoI was under process.

However, the fact remains that due to procedural delays and GoK resuming funds, equipment meant for cancer treatment in two tertiary hospitals in the State were not purchased, which resulted in denial of advanced treatment facilities to cancer patients.

4.7.1.3. Incinerator in GMC Thiruvananthapuram

GoK accorded (September 2016) sanction of ₹20 lakh for installation of a new incinerator[62] in GMC Thiruvananthapuram. The amount was transferred to KMSCL (April 2017). Further, GoK sanctioned (September 2018) an amount of ₹120 lakh for construction of building to install the new incinerator. The PWD Buildings Division was requested (November 2018) to expedite the work

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[61] HDR Brachy Therapy with treatment planning system: High Dose Rate Brachy Therapy is a form of internal radio therapy where an oncologist places highly radioactive material inside the body for a short time and then retracts it using a remote control.

[62] An incinerator is a furnace for burning waste.

and complete the same before 31 March 2019. Assistant Engineer, Buildings Division, PWD informed (August 2021) GMC that the first phase of the building for housing the incinerator was completed and requested to take steps to install the incinerator which was communicated to KMSCL (August 2021). Audit observed that the incinerator was not installed (April 2022) at MCH Thiruvananthapuram. GMC informed (April 2022) that necessary directions had been given to the Assistant Engineer, PWD to obtain the statutory clearance for the installation from various agencies[63]. GMC stated (July 2022) that the waste dumped in the open area was disposed by deep burial method and in the absence of an incinerator the waste was disposed in bio-gas plants in the campus and incinerator at attached hospitals. However, Audit noticed large quantity of waste dumped in open area in hospital premises during the visit, which was detrimental to the environment as well as risky for the patients and the public in the premises.

Figure 4.1: Waste dumped in the premises of MCH, Thiruvananthapuram. Photograph taken on 07 December 2021

GoK stated (November 2023) that the incinerator was installed in October 2023. However, statutory clearances for the functioning of the incinerator were not obtained.

4.7.1.4. Delay in decommissioning of old Telecobalt machine and procurement of new Machine in GMC Alappuzha

GoK accorded (May 2017) administrative sanction (AS) for ₹2.50 crore for purchasing a new Telecobalt machine[64] for replacing the existing 27 year old one (1994) in GMC Alappuzha. The AS amount was finally revised (May 2019) to ₹3.63 crore, including the decommissioning charges of the old Telecobalt machine. The supply order was issued to the bidder (October 2019), but the supply did not materialise as vendor insisted (January 2020) for 50 *per cent* advance payment for its delivery which was not acceptable to DME.

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[63] Thiruvananthapuram Corporation, Airports Authority, Pollution Control Board

[64] Telecobalt machine is a radiotherapy machine which uses Cobalt-60 for treatment of cancer

Subsequently, the work for decommissioning of the existing machine was awarded (May 2021) to another firm for an amount of ₹26 lakh. However, this work also did not materialise as the firm demanded advance payment which was not acceptable to college authorities.

GoK stated (October 2022) that the decommissioning process was completed.

The reply does not explain the action taken to expedite the purchase. Even after five years from the date of sanction, the procurement of a new machine was not materialised and the patients were deprived of the services.

4.7.1.5. Delay in setting up Cath lab and Coronary Care Unit in General Hospital, Alappuzha

GoK sanctioned (August 2016) setting up of Cath Lab[65] and Coronary Care Unit (CCU) in GHs under Kerala Infrastructure Investment Fund Board (KIIFB) projects, one of which was for GH, Alappuzha. Though the site was handed over (March 2018) to the successful bidder, the work could not be commenced due to non-availability of required power supply of 250 KVA. GoK sanctioned (September 2018) an amount of ₹ two crore (₹50 lakh for civil works and ₹150 lakh for electrical works) and the work was entrusted to M/s HLL.

The site for the construction of high-tension power station was handed over to the constructing authority (January 2020). However, on a visit to the hospital (February 2022), it was seen that the installation agency found the first site inappropriate and hence an alternate site was subsequently identified, which was handed over for installation in October 2021 only. The installation works in the alternate site were in progress. Thus, the Cath lab sanctioned in 2016-17 is yet to be functional even after a period of over six years. It was also noticed that Cath lab available at GMC Alappuzha was not fully functional as detailed in Paragraph 4.7.2.2 of this Report.

GoK stated (November 2023) that the building identified for the installation of Cath lab and CCU was reported to be unfit by PWD and hence the Cath lab machine was transferred to DH Mananthavady to which Cath lab was sanctioned under plan funds. It was also stated that the Cath lab and CCU can be set up at GH Alappuzha on completion of construction of pay ward building.

4.7.2. Deficiencies in maintenance of equipment by Medical Colleges

The maintenance of all bio-medical equipment in various hospitals under the DHS is executed through a service provider since 2016 under the project Bio-Medical Equipment Maintenance Program (BEMP). In the Medical Colleges functioning under DME, instead of a third-party service provider, the Bio-Medical Engineering Department undertakes the maintenance and repairs of the equipment. Audit noticed deficiencies in proper maintenance of equipment in test-checked Medical Colleges. Annual Maintenance Contracts (AMC) for

[65] A Catheterisation laboratory, commonly referred to as a cath lab is an examination room in a hospital with diagnostic imaging equipment to visualize the arteries and chambers of heart for treatment of heart diseases.

major equipment were not maintained up-to-date and no regular repairs were done resulting in frequent breakdowns and consequent denial of services to patients. The major instances noticed are discussed below**:**

4.7.2.1. GMC Thiruvananthapuram

- In GMC, Thiruvananthapuram the Magnetic Resonance Imaging[66] (MRI) machine which was installed in June 2010 was providing services to an average of 5,000 patients per year during 2016-17 to 2020-21. Audit observed that the machine was frequently facing operational issues due to its age and lack of servicing and was out of comprehensive AMC with effect from September 2021. It was reported (June 2020) that the MRI scanner had reached the end of its life cycle, was technologically obsolescent and needed replacement or upgradation. Out of 60 to 70 requests of service per day, around 20 cases were being carried out daily and round the clock MRI services were not available to the patients. GoK accorded AS (December 2021) for upgradation of existing MRI machine at a cost of ₹6.10 crore. However, the same was not implemented and the hospital continues to function with an MRI scanner which has reached the end of its life cycle. In the absence of MRI services in the hospital, many patients have to depend on private establishments where the rates were comparatively higher.

  GoK stated that (October 2022) a decision was taken to purchase a new MRI machine. Though the decision to purchase a new equipment is a right step, a time bound action plan spelling out the source of fund is essential for implementing the project.

4.7.2.2. GMC Alappuzha

- An 800 mA Fluoroscopy machine[67] worth ₹18 lakh, necessary for diagnosing heart/ intestinal disease and to guide treatments, was idling at GMC Alappuzha for nine years. It was replied that the machine was installed in 2010 and stopped working in January 2013. Idling of the machine was reported to the Superintendent (November 2017) and the Principal (November 2018). No alternate arrangements were made (March 2022).

  GoK stated (October 2022) that there was no service support by the manufacturer or the supplier. The reply reaffirms the contention of Audit that equipment is idling due to lack of adequate maintenance.

- The Cath Lab of GMC, Alappuzha, which provided 3,000 lab procedures annually did not have AMC with effect from September 2021. Audit noticed (December 2021) that one of the machines used in Cath lab for imaging purposes *viz*. IVUS+FFR costing ₹56.29 lakh was idle since

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[66] MRI is a type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.

[67] Fluoroscopy is a type of medical imaging that shows a continuous X-ray image on a monitor, much like an X-ray movie

2020. The Principal replied (March 2022) that the machine was idling due to non-availability of a Catheter in the Cath Lab.

GoK stated (October 2022) that agreement for comprehensive AMC for Cath Lab was under active consideration. The institution had taken steps to purchase IVUS+FFR catheters in the upcoming tender procedures.

Idling of the machine worth ₹56.29 lakh due to non-availability of catheter is not justifiable.

- A Mammography Machine (₹29.61 lakh, July 2012) was idling over two years from January 2020 due to frequent repairs and was without AMC.

  GoK stated (October 2022) that the maintenance of the machine was delayed due to COVID situation and following frequent breakdowns, it was made functional in June 2022, July 2022 and August 2022. The CR system in which the mammogram images are digitally processed went out of order in August 2022, spare part replacement of which was awaited. From the reply, it is evident that the Mammography machine underwent frequent breakdowns during 2022 and the mammogram studies could not be conducted as CR system was non-functional.

  On an average, 500 cases per year were carried out with this machine previously. As there was no alternate machine available in the hospital, patients had to depend on private establishments.

4.7.3. Non/ underutilisation of PSA Oxygen plants

Utilising Prime Minister's Citizen Assistance and Relief in Emergency Situations fund (PM CARES fund), 26 hospitals in the State were provided with Pressure Swing Adsorption[68] (PSA) plants. Out of the five hospitals test-checked where the PSA plants were installed, Audit observed that in GH Neyyattinkara, the civil works of the plant room were completed and the plant was installed (July 2021) and inaugurated in October 2021 with a temporary LT connection. Audit noticed (January 2022) that the plant was not functional due to non-availability of generator and transformer. The hospital authorities stated (September 2022) that considering the high energy cost to be borne compared to the cost of oxygen usually procured, the operation of the PSA plant was not economical.

GoK stated (October 2022) that there was no hurdle for GH Neyyattinkara in utilising the Oxygen generator, but the hospital authorities are not showing any interest in making use of the equipment.

The reply of GoK fails in addressing the real issues behind non-functioning of the Oxygen generator, which has contributed to the idling of the plant since July 2021.

[68] The PSA plant is a source of medical grade oxygen which separates oxygen from compressed air and ensures continuous supply of oxygen.

4.7.4. Availability of ventilators for COVID-19 management

Under PM CARES fund, 480 ventilators were received and all the ventilators were distributed to different hospitals (January 2023).

4.7.5. Idling of equipment

One hundred seventy two equipment (₹7.28 crore[69]) were found idling in 21 hospitals for periods ranging from one to 107 months, due to lack of manpower for its operation, pending repairs, supplied without indenting by hospital, etc. Details are furnished in **Appendix 4.2**. In GMCs Thiruvananthapuram and Alappuzha and Dental College, Thiruvananthapuram, 59 equipment worth ₹4.94 crore were lying idle for one to 107 months of which 20 items valued at ₹0.89 crore were beyond repair. DHS and DME could have explored the possibility of distributing the equipment to other needy hospitals for effective utilisation of the items procured.

Figure 4.2: Idling Blood Bank equipment in DH Tirur. Photograph taken on 24 November 2021

Figure 4.3: Idling OT table and light in CHC Edappal. Photograph taken on 30 November 2021

DHS stated that (November 2022) eight equipment valued ₹14.09 lakh which were idling in three[70] hospitals were transferred to other hospitals/ put to use.

GoK stated (October 2022) that in the case of GMC Thiruvananthapuram, steps were taken to get the equipment ready to use in possible cases and for condemnation in other cases.

The reply of GoK is not tenable, as it does not set out an action plan or time frame for making the equipment functional or for condemnation. Further, the GoK reply is silent about the non-functional equipment of other hospitals.

4.7.6. Lack of infrastructure for installation of ventilators

To manage the crisis due to COVID pandemic, ICU ventilators were purchased by KMSCL and supplied to various hospitals across the State. On a visit (November 2021) to the test-checked hospitals, Audit noticed that two portable

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69 Value of 21 items are not available. It includes equipment received as donation, supplied by NHM without indent, very old items, etc.

70 GH Neyyattinkara (one out of two), CHC Edappal (six out of 29) and CHC Thrikkannapuram (one out of three)

ventilators valued at ₹12.20 lakh supplied (October 2020) to DH, Nedumangad were not installed along bedside in ICU due to lack of sufficient space (December 2021). Though this hospital was upgraded as a district hospital (2013), the hospital was not being able to provide services as required under IPHS. To improve the facility, a new building was proposed to be constructed, but the work was abandoned as stated in **Appendix 5.1** of this Report.

Failure to ensure the availability of infrastructure before transfer of portable ventilators resulted in idling of these ventilators for over one year (December 2021). Further, no efforts were made to transfer these ventilators to some other hospital where they could have been utilised to save the lives of critical patients.

GoK stated (October 2022) that KMSCL had received installation reports from the hospital authorities and idling of the ventilators was not reported. Further, it was informed that since the ventilators are portable, they could be moved and used in any department.

Audit reiterates the fact that during field visit to the hospital, it was observed that the equipment was not utilised citing space constraint as the reason for non-utilisation.

4.8. Recommendations

- Government should issue necessary directions to KMSCL to take action to ensure availability of drugs in hospitals and supply should be based on the actual requirement thereby ensuring that the drugs indented are purchased without delay.
- Government should issue guidelines to be followed for purchases made during crisis situation with emphasis on improved transparency and accountability so that a better equipped public procurement system capable of helping Government to respond effectively during such situation is in place.
- Government should ensure that vital medical equipment are available in the hospitals especially in tertiary hospitals and that a proper system for maintenance and upkeep of the available equipment and condemnation of obsolete equipment is in place.

CHAPTER V – HEALTHCARE INFRASTRUCTURE

CHAPTER V

HEALTHCARE INFRASTRUCTURE

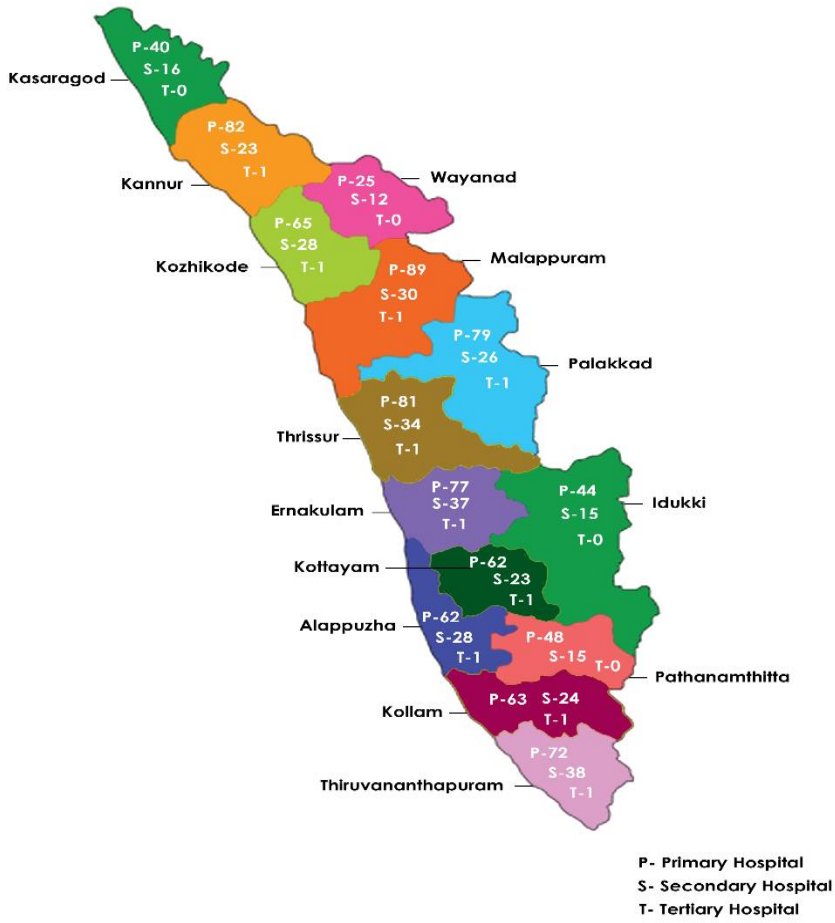
For strengthening the healthcare system in the State, creation of essential infrastructure and deployment of trained work force are essential. The shortage of PHCs and CHCs in the State when compared with IPHS was 14 and 35 *per cent* respectively. The progress in creation of planned infrastructure was slow. There was inordinate delay in commencement/ completion of infrastructure works mainly due to reasons such as delay in statutory clearances, defective planning, not identifying suitable sites, etc. Abandonment of works/ projects was also noticed due to lack of funds, change in plan, etc. The projects/ schemes meant to improve the tertiary care system in the State remained incomplete due to delay in issuing administrative sanction, release of funds, laxity in monitoring, etc., defeating the very objective of the projects/ schemes.

Health infrastructure is an important indicator for understanding the healthcare policy and welfare mechanism in a State. It signifies the investment priority with regard to the creation of healthcare facilities. Infrastructure has been described as the basic support for the delivery of public health activities. To deliver quality health services in the public health facilities, adequate and properly maintained building infrastructure is of critical importance. The focus of India's NHP, 2017 is to strengthen the trust of the common man in the public healthcare system by making it predictable, efficient, patient centric, affordable and effective with a comprehensive package of services and products that meet immediate healthcare needs of most people.

There are 6,662 public health institutions[71] under the modern system of medicine. The geographical distribution of primary, secondary and tertiary level hospitals under the modern system of medicine is shown in **Figure 5.1**.

[71] Excluding Dental Colleges, UPHCs and hospitals attached to Medical Colleges.

Figure 5.1: District-wise distribution of hospitals



(Source: Information furnished (2021-22) by DHS and DME)

The number of public healthcare facilities in the State as of 2021-22 (1,248)[72] when compared with the position as of 2016-17 (1,241) revealed that there has been only a negligible increase (seven)[73] in the number of public healthcare institutions. The sub-centres functioning under the PHC/ FHC increased from 5,408 (2016-17) to 5,414 (2021-22).

Examination of records disclosed inadequacies in infrastructure, as discussed in the succeeding paragraphs:

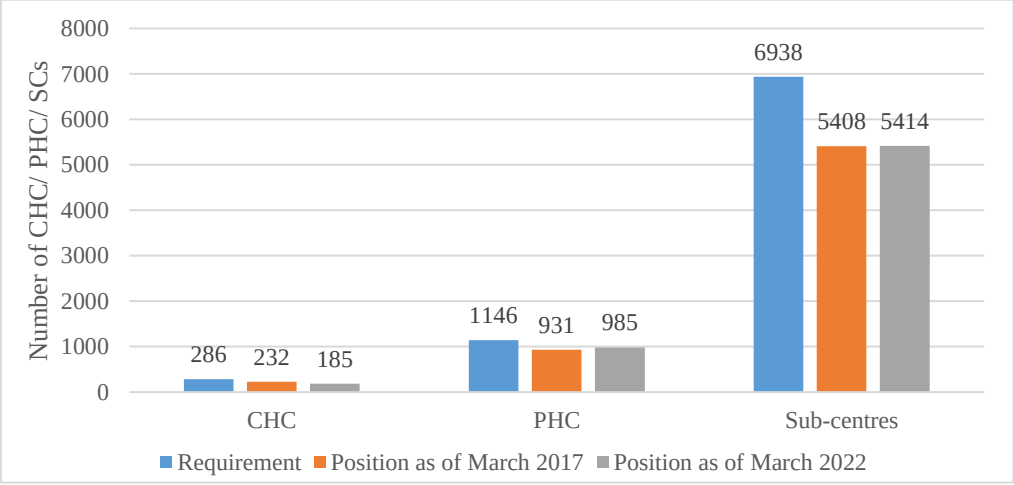
5.1. Inadequate availability of CHCs, PHCs, and SCs *vis-à-vis* prescribed norms

As per GoK Health Policy, 2019 and IPHS, there shall be one Sub-Centre (SC) for every 5,000 persons in plain areas and for every 3,000 persons in hilly and

[72] DHS - 1,238 healthcare institutions and DME - 10 Medical Colleges
[73] Two new tertiary level hospitals and five new specialty hospitals at secondary level

tribal areas and a PHC was to cover a population of 20,000 in hilly, tribal, or difficult areas and 30,000 persons in plain areas. Similarly, four PHCs were to function under every CHC thus covering approximately 80,000 and 1,20,000 population in hilly/ tribal and plain areas respectively. The details of availability of CHCs, PHCs and SCs with reference to norms are shown in **Chart 5.1**.

Chart 5.1: Requirement and availability of CHCs, PHCs and SCs



Audit observed that against the requirement of 6,938 SCs in the State, there were only 5,414 SCs, resulting in shortfall of 1,524 SCs (22 *per cent*). None of the 14 districts[74] except Pathanamthitta had the prescribed number of SCs. Being the most peripheral and first point of contact between the primary health care system and the community, the shortage of SCs would affect patient care. In respect of PHCs, 985 PHCs[75] were available against the requirement of 1,146 PHCs with a shortfall of 14 *per cent*. The required number of PHCs were available only in Kannur and Pathanamthitta districts.

The CHCs, which constitute the secondary level of health care, were designed to provide referral as well as specialist healthcare. The shortage of CHCs in the State was more acute at 35 *per cent*. Shortage of CHCs was more severe in Kannur, Kollam, Kozhikode, Idukki, Malappuram and Kasaragod districts. The district-wise coverage of population by each CHC/ PHC/ SC is given in **Table 5.1** below.

Table 5.1: District-wise coverage of population per CHC/ PHC/ SC

Sl. No.	Name of the district	Population as per 2011 Census	No. of CHCs	Population per CHC	No. of PHCs	Population per PHC	No. of SCs	Population per SC
1	Thiruvananthapuram	3,301,427	20	165071	90	36683	487	6779
2	Kollam	2,635,375	11	239580	67	39334	421	6260
3	Pathanamthitta	1,197,412	7	171059	50	23948	261	4588
4	Alappuzha	2,127,789	15	141853	66	32239	366	5814
5	Kottayam	1,974,551	13	151889	65	30378	333	5930
6	Idukki	1,108,974	8	138622	46	24108	309	3589
7	Ernakulam	3,282,388	21	156304	92	35678	410	8006

[74] including the hilly districts of Idukki and Wayanad
[75] including 96 UPHCs under NHM

Sl. No.	Name of the district	Population as per 2011 Census	No. of CHCs	Population per CHC	No. of PHCs	Population per PHC	No. of SCs	Population per SC
8	Thrissur	3,121,200	22	141873	88	35468	471	6627
9	Palakkad	2,809,934	16	175621	84	33452	504	5575
10	Malappuram	4,112,920	16	257058	103	39931	588	6995
11	Kozhikode	3,086,293	15	205753	77	40082	401	7696
12	Wayanad	817,420	7	116774	26	31439	200	4087
13	Kannur	2,523,003	8	315375	88	28670	416	6065
14	Kasaragod	1,307,375	6	217896	43	30404	247	5293
TOTAL		**33,406,061**	**185**	**180573**	**985**	**33,915**	**5,414**	**6,170**

			Population per CHC	Population per PHC	Population per SC
Scales determined by Audit	Least shortage	Plain areas Tribal areas	120001 to 150000 80001 to 100000	30001 to 32000 20001 to 23000	5001 to 5500 3001 to 3600
	Moderate shortage	Plain areas Tribal areas	150001 to 200000 100001 to 120000	32001 to 35000 23001 to 28000	5501 to 6000 3601 to 4200
	Severe shortage	Plain areas Tribal areas	>200000 >120000	>35000 >28000	> 6000 > 4200

(Source: Data obtained from DHS (2021-22) and Census 2011)

The shortfall would be more severe, if the analysis was carried out on the basis of the population for 2021.

No remarks were furnished by GoK (November 2023).

5.2. Availability of beds in the health institutions

5.2.1. Availability of beds in DHs/ THs across the State

The IPHS stipulates that the number of beds required for a sub-district (Taluk) having a population of five lakh was between 100 to 150 and for a district having a population of ten lakh was around 300 beds.

Audit scrutiny revealed that Taluk hospitals in Malappuram, Kozhikode and Kasaragod districts[76] and District hospitals in Malappuram, Kozhikode, Idukki, Kollam, Palakkad and Thrissur districts[77] did not have the required number of beds as detailed in the **Table 5.2** below.

Table 5.2 District-wise availability of beds in DHs/ THs

Sl. No.	District	Population as per 2011 Census	Beds required for DH as per IPHS	Total beds in DH/ GHs	Shortfall (-)/ Excess (+)	Beds required for TH as per IPHS	Total beds in TH/ THQHs	Shortfall (-)/ Excess (+)
1	Alappuzha	2,127,789	638	887	249	426	674	248
2	Ernakulam	3,282,388	985	1266	281	656	1453	797
3	Idukki	1,108,974	333	274	-59	222	290	68
4	Kannur	2,523,003	757	1157	400	505	744	239
5	Kasaragod	1,307,375	392	612	220	261	179	-82
6	Kollam	2,635,375	791	537	-254	527	972	445

[76] Shortage of beds in taluk level hospitals was 302, 40 and 82 respectively in Malappuram, Kozhikode and Kasaragod

[77] Shortage of beds in district level hospitals was 250, 166, 59, 254, 299 and 363 respectively in Malappuram, Kozhikode, Idukki, Kollam, Palakkad and Thrissur districts

Sl. No.	District	Population as per 2011 Census	Beds required for DH as per IPHS	Total beds in DH/ GHs	Shortfall (-)/ Excess (+)	Beds required for TH as per IPHS	Total beds in TH/ THQHs	Shortfall (-)/ Excess (+)
7	Kottayam	1,974,551	592	1064	472	395	551	156
8	Kozhikode	3,086,293	926	760	-166	617	577	-40
9	Malappuram	4,112,920	1234	984	-250	823	521	-302
10	Palakkad	2,809,934	843	544	-299	562	672	110
11	Pathanamthitta	1,197,412	359	948	589	239	431	192
12	Thiruvananthapuram	3,301,427	990	1767	777	660	746	86
13	Thrissur	3,121,200	936	573	-363	624	691	67
14	Wayanad	817,420	245	750	505	163	186	23
TOTAL		**33,406,061**	**10021**	**12123**	**2102**	**6680**	**8687**	**2007**

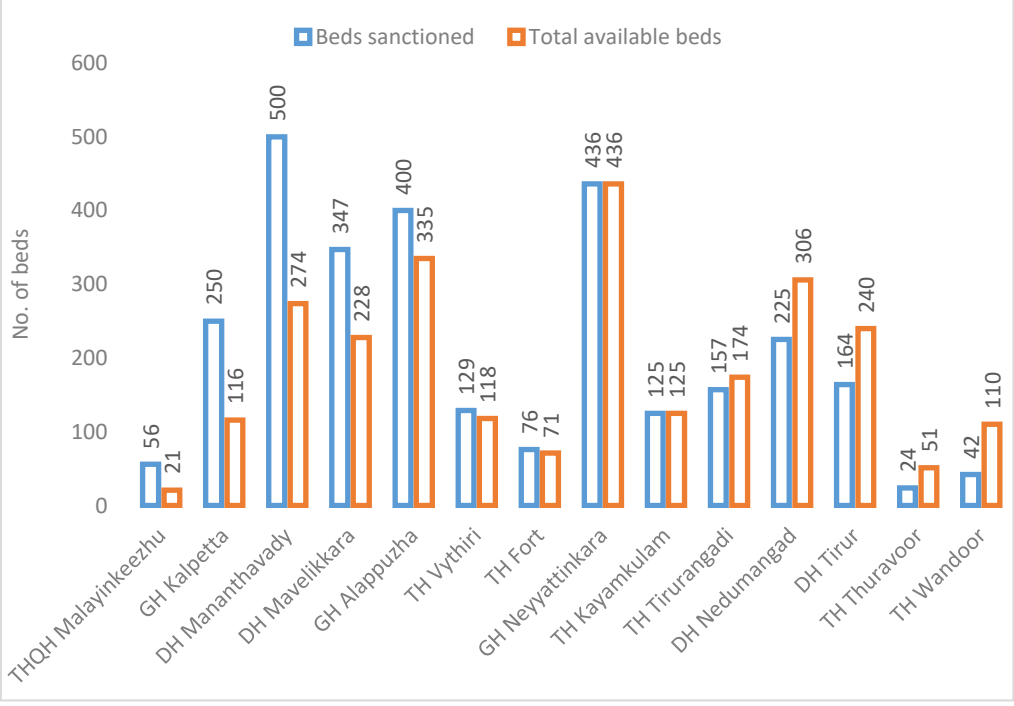
Scales determined by Audit	Good (>-10)	Moderate (Between – 10 and – 50)	Poor (< -50)

(Source: Data obtained from DHS (2021-22) and Census 2011)

5.2.2. Availability of beds in test-checked DH/ GH/ TH/ CHCs

The availability of sanctioned and functional bed strength in the test-checked DH/ GH/ THQH/ THs (14 hospitals) is as detailed in **Chart 5.2**.

Chart 5.2: Availability of beds in hospitals[78]



(Source: Records in test-checked hospitals)

Audit noticed that all the sanctioned beds were not available in seven hospitals. In THQH Malayinkeezhu and GH Kalpetta, the available beds were below 50 *per cent* of the sanctioned beds. At the same time, in five hospitals, the available

[78] As per reply of DHS (November 2022), at present the number of functional beds in DH Mananthavady is 346 and GH Kalpetta is 119.

beds were much higher than the sanctioned beds. In TH Thuravoor and TH Wandoor, the functional beds were more than 200 *per cent* of the sanctioned beds, indicating more pressure on the available resources.

The IPHS prescribes CHC to be a 30 bedded hospital. Audit noticed that this stipulation was met only in three CHCs[79] out of the seven test-checked hospitals. The bed availability in the remaining four CHCs[80] ranged from 12 to 25.

Facilities in hospitals are fixed based on sanctioned bed strength. As such variation in availability of functional beds results in underutilisation of services or overburdening of facilities.

DHS stated (November 2022) that the hospitals were constrained in providing the requisite IP services due to lack of sufficient infrastructure like space, manpower, equipment, etc.

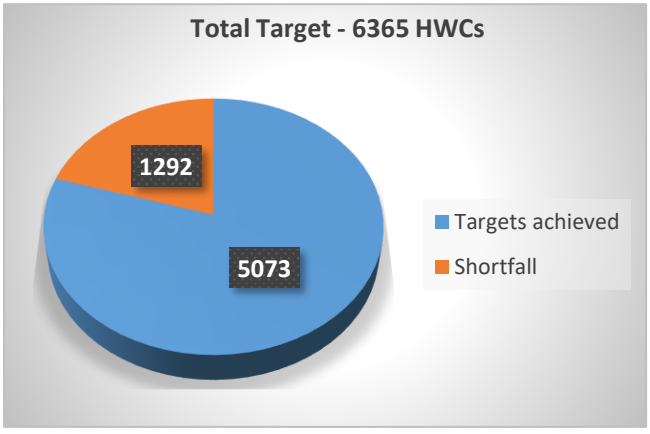
5.3. Health and Wellness Centres

Under Ayushman Bharat Scheme, HWCs are to be established by transforming the existing PHCs, UPHCs and SCs to ensure universal access to an expanded range of comprehensive primary health care services. The HWCs at SC level were to be equipped and staffed by an appropriately trained primary health care team led by a Community Health Officer (CHO) and comprising of multi-purpose workers (male and female) and Accredited Social Health Activists (ASHA). Scrutiny of establishment of HWCs in the State under Modern System of Medicine revealed the following:

5.3.1. Non-achievement of targets for HWCs

Against sanctioned 6,365 HWCs during the period 2019-20 to 2023-24, 1,292 (20 *per cent*) health institutions were not transformed into HWCs (May 2023) as shown in **Chart 5.3**.

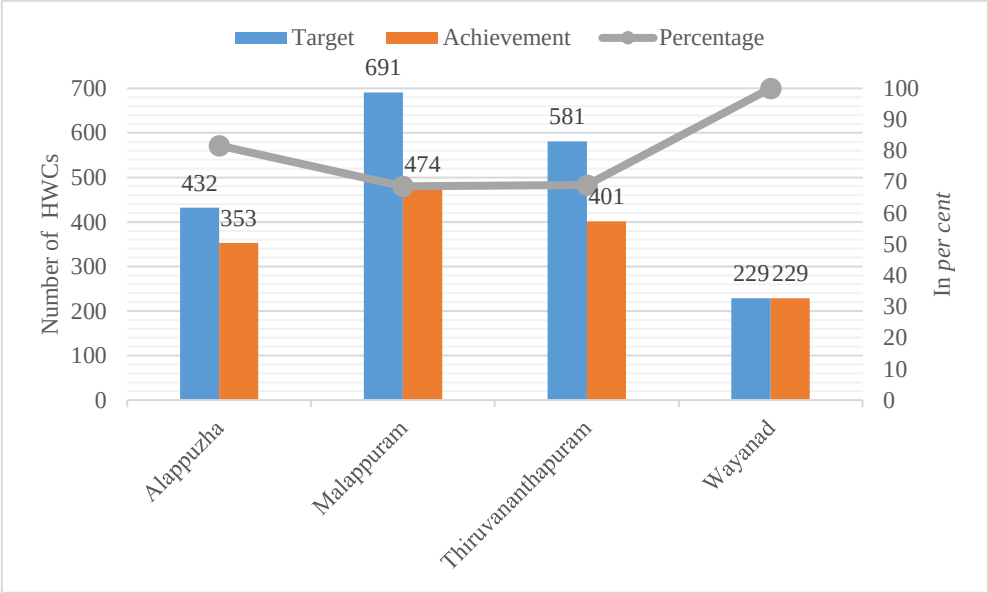
Chart 5.3: Target and achievement for HWCs



(Source: NHM, May 2023)

[79] Edappal, Tanur and Anchuthengu
[80] Muhamma, Chunakkara, Manamboor and Nalloornad

Chart 5.4: Status of HWCs in test-checked districts



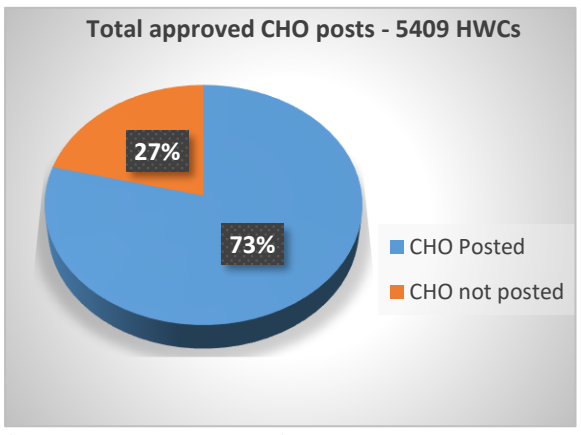
(Source: NHM, May 2023)

Among the test-checked districts, only Wayanad had upgraded all the targeted healthcare facilities to HWCs.

5.3.2. Operationalisation of HWCs

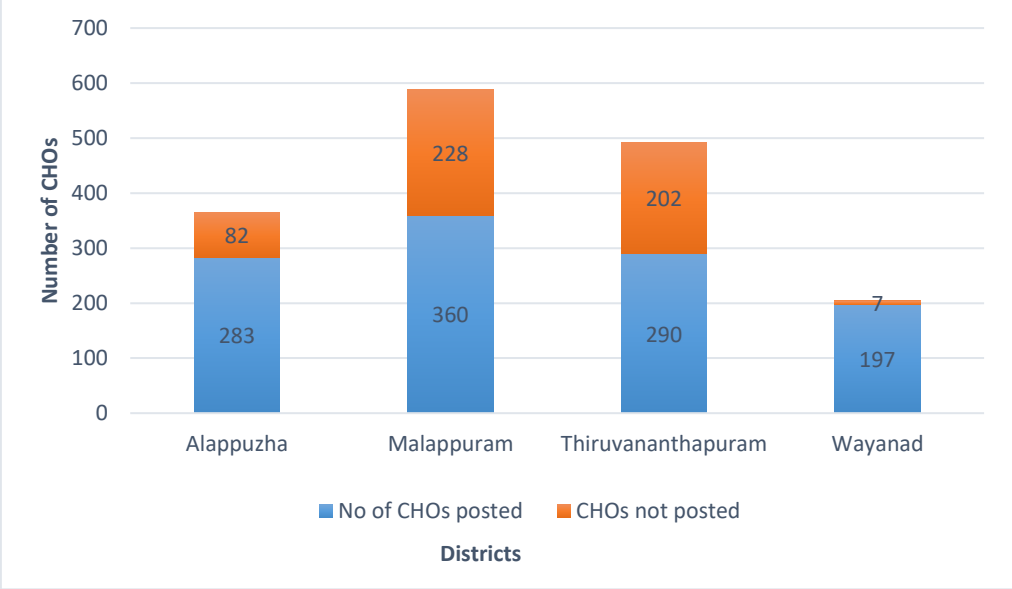
Against 5,409 posts of CHO sanctioned for operationalisation of HWCs, 3,964 postings, constituting 73 *per cent* of the total sanctioned posts, have been effected as of May 2023 and 1,445 posts (27 *per cent*) remained unfilled as shown in **Chart 5.5**.

Chart 5.5: Status of operationalisation of HWCs



(Source: NHM, May 2023)

Chart 5.6: Availability of CHOs in test-checked districts



(Source: NHM, May 2023)

It could be seen from the above that number of CHOs not posted ranged between 3.43 to 41.06 *per cent* in the test-checked districts. NHM stated (May 2023) that 1,148 SCs and posts of CHOs were sanctioned for the year 2023-24 and the recruitment was under process.

5.4. AYUSH Health and Wellness Centres

Under National AYUSH Mission, 334 out of 520 HWCs sanctioned during the period 2019-20 to 2022-23 became operational. The remaining 186 are yet to be operationalised (May 2023).

5.5. Status of new construction and upgradation works

Audit observed that out of 192 new constructions sanctioned during 2016-17 to 2020-21 in 40 test-checked hospitals, 121 works were completed at a cost of ₹29.39 crore and 71 works worth ₹1,081.53 crore were incomplete in different stages of execution. The incomplete construction works include renovation works, new building, Oxygen plant, establishment of Trauma care centre, Cath Lab etc. Summary of delay in completed works is given in **Table 5.3**.

Table 5.3: Summary of delay in completed works

Period of delay	No. of civil works	Expenditure incurred (*₹ in crore*)
No. of works completed in time	43	7.28
No. of works completed with a delay of one year	29	4.08
No. of works completed with a delay beyond one year but upto two years	9	4.72
No. of works completed with a delay beyond two years	1	1.07
Data not available	39	12.24
Total	**121**	**29.39**

(Source: Data obtained from test-checked hospitals)

5.6. Non-creation/ non-utilisation of infrastructure in test-checked health institutions

Government of Kerala provided funds for hospital infrastructure through the State budget. In addition, hospital infrastructure is also created utilising development funds of Local Self-Government Institutions (LSGIs), MP/ MLA Local Area development funds, CSR Funds, KIIFB, etc. The infrastructure works which included construction of new buildings, additional wards, renovation of existing buildings, improving facilities for installation of new equipment etc. were implemented through Public Works Department (PWD), NHM, NAM, etc.

One hundred and ninety-nine major works valued at ₹1,219.34 crore were ongoing/ sanctioned during the period 2016-17 to 2020-21 in the test-checked institutions under HFWD. Audit scrutinised 45 out of 199 works involving major construction activities estimated above ₹30 lakh. During scrutiny of records/ joint inspections in the hospitals, deficiencies were found in 10 works implemented in nine hospitals (**Appendix 5.1**).

- Civil works worth ₹44.15 crore meant to improve infrastructure by construction of new buildings in five hospitals had not commenced even after two to eight years from the date of sanction due to delay in site clearance, plan and estimate preparation, delay in statutory clearances, etc.
- The progress of implementation of civil works (₹72.37 crore) was very tardy in three hospitals. The works were found to be ongoing for periods up to eight years due to defective planning, shortage of funds, etc.
- On scrutiny of records/ joint inspection in test-checked hospitals, Audit noticed that two works sanctioned to two hospitals were abandoned. In Government Mental Health Centre, Thiruvananthapuram, the construction of a building was abandoned after incurring an amount of ₹1.26 crore due to lack of funds and change in plan. Thus, the entire amount of ₹1.26 crore expended on the work became infructuous. At DH Nedumangad, the sanctioned work (₹3.46 crore) was abandoned due to its non-commencement by the entrusted agency.

Figure 5.2: Abandoned Male Forensic Ward in GMHC, Thiruvananthapuram
Photograph taken on 08 February 2022

5.6.1. AYUSH Institutions

Under the AYUSH Department, 168 works valued at ₹83.72 crore were sanctioned to 18 test-checked hospitals. Of this, 48 works (29 *per cent*) with estimated value above ₹20 lakh were scrutinised and deficiencies were noticed in implementation and utilisation of infrastructure sanctioned under three works (₹564.10 lakh).

In one instance, GoI sanctioned grant-in-aid of ₹ five crore (January 2012) for developing Government Ayurveda Panchakarma Hospital, Alappuzha into a Centre of Excellence (CoE) with referral hospital and Advanced Research and Teaching facilities. As per GoI directions, Alappuzha Ayurveda Panchakarma Hospital Society (AAPHS) was formed (September 2010) for the construction of a hospital building. Funds were released through NHM in two instalments (₹ two crore each in January 2012 and January 2016). The work was awarded (May 2012) to a consultancy firm Hindustan Prefabs Limited, a GoI undertaking and was to be completed by March 2014. First instalment of ₹ two crore was transferred to Hindustan Prefabs Limited in January and May 2013[81]. Based on complaints received on poor quality of structural works, GoK conducted inspection and the complaint was found to be true. After completion of the first phase of construction, further works were stopped due to technical problems in construction and non-availability of second phase funds in time. GoK entrusted (November 2018) the balance work to the same consultant for ₹5.34 crore under the condition that the expenditure for strengthening the structural component would be met by the contractor/ consultant. Further, as per agreement, the consultant was liable to rectify the defects without any additional cost and was to be penalised for non-completion of the work as per the agreed specification and time schedule. However, the consultant did not take up the work and there has been no progress since then (February 2022).

[81] On 01.01.2013, 22.01.2013 and 29.05.2013.

Figure 5.3: Abandoned building at Government Ayurveda Panchakarma Hospital, Alappuzha. Photograph taken on 16 February 2022

No action has been initiated by the AAPHS as per the terms of the agreement with the consultant and the Department has taken no action on the GoI (January 2021) directions to refund the entire funds with interest (10 *per cent* per annum). The lapse on the part of consultant/ NHM/ AAPHS/ Department has resulted in wasteful expenditure and probable loss of central assistance of ₹ five crore to the State and non-upgradation of the hospital. The hospital is functioning in a rented building in a congested manner without sufficient infrastructure.

GoK replied (October 2023) that a governing body meeting was conducted (March 2022) under the chairmanship of Hon'ble Minister of Health and Women and Child Development and a notice was issued (July 2022) to Hindustan Prefabs Limited. Ministry of AYUSH was informed that the change in the scope of work was necessitated due to the nature of soil at the site and as a result, the works needed to be limited to construction of a single floor and requested to approve the change in the scope of the work.

Further, instances including idling of a building for 10 years (Siddha dispensary, Mannanchery) and non-functioning of a solar power plant in Government Homoeopathy Medical College Hospital, Thiruvananthapuram are given in **Appendix 5.1**.

5.6.2. Deficiencies in utilisation/construction of buildings

Instances of non-utilisation of buildings constructed for providing maternity, laboratory and canteen services, and defective constructions noticed in Audit are detailed in **Table 5.4**.

Table 5.4: Non-utilisation of constructed building/ improper construction

Details of work	Present status
NHM constructed a Women and Child Block at CHC Edappal and provided equipment for it. The construction of the building was completed for ₹1.12 crore in June 2015.	An Assistant Surgeon specialised in Obstetrics and Gynaecology was available from April 2016 to May 2018 and was attending to patients. The W and C Block constructed for improved maternity services has not been utilized for the purpose after May 2018 for want of Gynaecologist and supporting staff (November 2021).
A new building (Ground plus one floor) was constructed by NHM in the SAT Hospital, Thiruvananthapuram (sanctioned amount	Audit noticed that the first floor of the building remains unutilised for the last five years (December 2021) as the envisaged labour rooms, emergency operation theatre, etc. were not set up. Further, it was

Details of work	Present status
₹21.80 crore). The work was completed in April 2016.	noticed that though this floor remained unutilised, a new work for vertical extension of the building with two floors was sanctioned in January 2019 and the work was in progress. GoK stated (October 2022) that NHM had stopped funding the project. Therefore, a proposal for the remaining works submitted by College authorities to DME was under process.
A building was constructed (October 2020) by LSGI for housing the laboratory of PHC Perumpazhuthoor.	The building has not been put to use even after a period of 20 months (June 2022) due to non-posting of laboratory staff.
A canteen building was constructed (August 2021) in MCH Manjeri incurring an expenditure of ₹39 lakh.	As no service provider has responded to offer services to run the canteen, the building remained unutilised (February 2022). GoK stated (October 2022) that the possibility of starting the canteen as per prevailing Government orders was being explored.
MCH block constructed (2017) by NHM at a cost of ₹ five crore in Taluk Hospital, Fort Thiruvananthapuram.	Construction of building in deviation from approved plan (constructed flat roof against the approved slanting roof) resulted in building remaining as unauthorised construction.
Non-construction of ramps in five newly constructed hospital buildings	Ramp facility which is an essential requirement for hospitals was not constructed in the newly built hospital buildings in SAT Hospital, Thiruvananthapuram, CHC Manamboor, GH Neyyattinkara, TH Wandoor and CHC Muhamma.

(Source: Records of test-checked hospitals)

The fact that anomalies ranging from not commencing the work to abandoning of the projects after incurring expenditure on works indicate that the hospital infrastructure improvement projects were being undertaken without proper planning. Failure to commence planned projects, delay in completion of works and inability to put to use available infrastructure created hurdles in enhancing the facilities in Government hospitals. Further, incomplete projects were not just a drain of public exchequer, but also deprived the end user of the benefits that would have accrued had the project been completed.

5.7. General appearance and upkeep

In test-checked hospitals, Audit observed inadequacy of infrastructure facilities as follows:

- Inadequate number of beds for accommodating inpatients
- Shortage of storage facilities in drug stores
- Clogging up of wastewater in hospital premises
- Dampness and crack on walls
- Presence of stray dogs in the hospital premises

Figure 5.4: Patients lying on floor of the Ward – GH Neyyattinkara (04 January 2022)

Figure 5.5: Clogging of waste water in DH Tirur (25 November 2021)

Figure 5.6: Dampness in walls in the Labour room at THQH Vythiri (29 November 2022)

Figure 5.7: Stray dogs in DH Nedumangad (29 November 2021)

5.8. Establishment of Medical Colleges

Medical Colleges play a pivotal role in developing medical and para-medical personnel to cater to the health needs of the State and serve as the referral centres providing tertiary care to the patients with research and surveillance activities. In Kerala, 10 Medical Colleges[82] are functioning under the Modern System of Medicine. In addition, there are three Medical Colleges under ISM and two under the system of Homoeopathy (March 2022). The details of bed strength and annual student intake of the Medical Colleges are furnished in **Table 5.5**.

Table 5.5: Details of bed strength and annual student intake of the Medical Colleges under HFWD and AYUSH Department

System of Medicine	No. of Medical Colleges functioning (2021-22)	Annual student intake	Bed strength of Medical Colleges and attached hospitals
Modern Medicine	9	1455	14385
ISM	3	226	1363
Homoeopathy	2	126	214

(Source: Economic Review 2021, data furnished by DAME, P and CO)

On scrutiny of the records in the departments/ joint inspection in the test-checked Medical Colleges, Audit observed shortfall in availability of manpower in different cadres as per norms as well as sanctioned strength which is detailed in Paragraphs 2.3, 2.4.1 and 2.4.2 in Chapter II of this Report. Further,

[82] Nine colleges under HFWD and one under SC/ ST Department.

deficiencies were noticed in creation of infrastructure and sanctioning of manpower under schemes aimed at improving the tertiary care facilities, as detailed in the following paragraphs:

5.8.1. Non-establishment of a sanctioned Medical College due to abandonment of the project

In tune with the policy of GoI to convert district level hospitals to Medical Colleges, GoK announced in the budget speech (2013-14) the setting up of a new Medical College (Indira Gandhi Medical College) by converting the GH, Thiruvananthapuram and attaching the Women and Child Hospital at Thycaud, Thiruvananthapuram. AS was accorded (June 2013) for setting up the new GMC at an estimated cost of ₹190.54 crore which included construction of Academic Blocks I and II, lecture hall and library, hostel block, staff quarters block, auditorium and dining block in the existing GH.

The work of construction of academic block I was completed in June 2017 incurring an amount of ₹30.27 crore. GoK also paid ₹9.85 crore to the staff (108 posts) who were posted for the establishment of the college. Despite all these arrangements, GoK decided to close down the college indefinitely thereby shifting all the posts created and transferring the equipment purchased in this regard. At present, the constructed academic block is being used partially for training purpose.

5.8.2. Delay in establishment of new Medical Colleges

GoK sanctioned three Medical Colleges at Kasaragod, Idukki and Pathanamthitta in March 2012 and one at Wayanad in February 2021.

Academic activities were started in Idukki in 2014 and students for MBBS course were admitted in 2014 and 2015. However, the admissions were not allowed from 2017 by Medical Council of India[83] due to lack of required infrastructure. For the year 2022-23, National Medical Commission (NMC) granted approval for academic activities for GMC Idukki and GMC Pathanamthitta and admissions commenced in November 2022.

In Kasaragod and Wayanad, academic activities are yet to commence. The status of creation of infrastructure in these GMCs are detailed in **Table 5.6**.

Table 5.6: Status of infrastructure as of July 2023

Name of GMC	Status of infrastructure
GMC Idukki	78 *per cent* of infrastructural works of hospital block and 60 *per cent* of residential facilities were completed. The road and protection works were not started.
GMC Pathanamthitta	Additional works under Phase-I (internal roads, fire water sump and pump room, entrance gate, etc.) were not started and Phase-II infrastructure works (hospital block, hostels, quarters, etc) were in progress.

[83] A statutory body with the responsibility of establishing and maintaining high standards of medical education and recognition of medical qualifications in India. Medical Council of India was dissolved when NMC was constituted in September 2020.

Name of GMC	Status of infrastructure
GMC Kasaragod	58 *per cent* of construction works of hospital block, 60 *per cent* of residential facilities etc. were completed. DME stated that works are expected to be completed by December 2024.
GMC Wayanad	The work has not started. The land proposed for the GMC Wayanad was under court litigation. The construction can be started only after the final verdict of the court.

(Source: Details furnished by DME)

Audit noticed that the establishment of sanctioned GMCs has been impacted adversely due to delay in creation of infrastructure facilities. Even though the academic activities commenced in two GMCs, the civil and infrastructural works were pending at different stages. As NMC grants permission[84] to establish a Medical College and admits students initially for a period of one year and renewal is given after physical verification of infrastructure, human resources and other facilities, delay in creation of required infrastructure may lead to discontinuance of approval and could impact the future of medical aspirants.

5.8.3. Establishment of Burns Unit under National Programme for Prevention and Management of Burn Injuries - GMC Thiruvananthapuram

Government of India sanctioned (November 2017) a Burns Unit for GMC Thiruvananthapuram. The objective of the scheme was to reduce incidence of mortality, morbidity and disability due to burn injuries and to establish adequate infrastructural facilities along with trained manpower for burn management and rehabilitation and the fund sharing was in the ratio of 60:40 between GoI and GoK. The first instalment amounting to ₹207.90 lakh was released (November 2017) by GoI. The proposal for AS was submitted by the hospital authorities to GoK after seven months (June 2018) and AS was issued in November 2018. However, Audit noticed that the GoI and GoK share amounting to ₹3.47 crore for the components of civil works and procurement of equipment was released by GoK only after 19 months (June 2019) from the date of GoI release. As the site identified for the construction was found to be not suitable, new site was identified (July 2019) and a revised AS for ₹90 lakh for Burns unit and ₹127.50 lakh for equipment was issued (January 2020) by GoK. Audit observed that only 50 *per cent* of civil works were completed and electrical works were in progress (September 2021). GoK attributed the delay in tendering process, civil works, equipment procurement, etc. to the pandemic situation and stated (October 2022) that 90 *per cent* of the civil works were completed and equipment procurement was in progress.

Burns unit was not set up even after a lapse of four years from the date of its sanction. The delay in turn leads to denying proper care to burn patients who are prone to quick infections, due to which isolation from other patients and utmost care is needed for their survival.

[84] As per Establishment of Medical College Regulations, (Amendment), 2020

5.8.4. Establishment of State Organ and Tissue Transplant Organisation

GoI formulated a programme 'National Organ Transplant Programme (NOTP)' under Transplantation of Human Organs and Tissues Act,1994 as a 100 *per cent* CSS in which a provision was made to set up State Organ and Tissue Transplant Organization (SOTTO). One of the objectives of the programme was to establish new and strengthen the existing organ and tissue retrieval and transplant infrastructure facilities in the State. Grant-in-aid amounting ₹59.60 lakh towards infrastructure support (₹33 lakh), manpower and other requirements (₹26.60 lakh) was sanctioned and released by GoI (November 2018) and an MoU was signed (February 2019) between GoI and GoK for setting up of SOTTO. The AS was issued (August 2020) only after 20 months from the date of sanction of funds by GoI.

The organ donation and transplantation process was being executed in the State by Kerala Network for Organ Sharing (KNOS). A high-level meeting on organ donation and transplantation observed (November 2020) that the administration of organ donation and transplantation was in a fragmented state and hence a decision was arrived at to have a single organisation to cater to all the requirements of organ transplant in the State.

Audit noticed that of the ₹59.60 lakh released, an amount of ₹11.37 lakh only (19 *per cent*) was expended (September 2021).

GoK stated (October 2022) that the K-SOTTO was registered under the Charitable Societies Act, 1955 by merging the existing KNOS office and its personnel into K-SOTTO. However, the reply is silent about the establishment or strengthening of organ and tissue retrieval and transplant infrastructure facilities.

5.8.5. Setting up of four station Temporal Bone Lab under National Programme for Prevention and Control of Deafness – GMC Thiruvananthapuram

Government Medical College (GMC) Thiruvananthapuram was selected (October 2014) for upgradation/ establishment of a four station Temporal Bone Lab with the objectives to strengthen Ear, Nose and Throat (ENT) department of GMC and designate it as State Training Centre for providing training to trainers of ENT surgeons.

An MoU was signed between GoI and GoK (February 2015) and ₹27.50 lakh (100 *per cent* CSS) was sanctioned and released by GoI in October 2015. The proposal for AS was submitted to GoK by DME (May 2018) for which AS was issued by GoK only after two years (June 2020) and the release of funds by GoK to college authorities were made after five years (January 2021) from the date of release by GoI. As such a State Training Centre for providing training to trainers was not fulfilled even after a lapse of more than six years. The audit observation has been accepted (April 2022) by the college authorities and it was stated that the procedures were in full swing. If the assistance received (2015) was timely utilised, the offer of GoI (March 2017) to submit proposals for

additional central assistance, if required, could have been availed. GoK stated (October 2022) that the procedures including procurement of equipment was going on in full swing and special care would be taken to achieve the declared objectives.

5.8.6. Implementation of National Mental Health Programme - GMC Thiruvananthapuram

GoI identified (June 2009) the GMC Thiruvananthapuram for upgradation under the Centre of Excellence (CoE) scheme of National Mental Health Programme (NMHP) and sanctioned an amount of ₹173.66 lakh as grant for enhancing seats/ starting new PG courses in Mental Health in Medical College. The first and second instalments of ₹56 lakh and ₹117.66 lakh were released by GoI (November 2010, January 2011), of which NHM transferred ₹56 lakh to the GMC (September 2011). The college authorities did not utilise the funds and refunded the amount to GoI after two years (September 2013). Subsequently, GoI returned (November 2013) the amount to NHM with directions to utilise the amount for the sanctioned purpose. NHM requested (December 2014) the Principal to submit a proposal for the utilisation of the amount which was submitted by the Principal after one year to NHM (January 2016). The funds, including the interest accrued thereon amounting to ₹176.28 lakh was released by the NHM to the Principal after five months (June 2016). As per the progress statement (October 2021), only 75 *per cent* of the capital works were completed and out of seven posts only two posts were created. The PG/ diploma courses had not commenced (December 2021).

In the absence of timely utilization of fund and lack of follow up from the side of the college authorities the envisaged benefit as per the scheme has not been attained even after 12 years.

GoK stated (October 2022) that the civil works were completed and the procedure for starting new courses was underway.

5.8.7. Establishment and infrastructure of medical education institutions

The Minimum Requirements for Annual MBBS Admissions Regulations, 2020 prescribe minimum requirement of accommodation in the Medical Colleges and its associated hospitals, staff and equipment in the College departments and hospitals. Audit noticed deficiencies in availability of facilities in test-checked GMCs as shown in **Table 5.7**.

Table 5.7: Non-availability of facilities in test-checked colleges

Facilities required	GMC Thiruvananthapuram		GMC Alappuzha		GMC Manjeri	
	Required	Available	Required	Available	Required	Available
Skill Lab	1	Not Available	1	Available	1	Available
Hostels	As per norms	Yes	As per norms	Yes	As per norms	Not Available. Construction of Hostel buildings in progress
Gymnasium	As per norms	Available. However, out of six equipment only three are working	As per norms	Yes	As per norms	No

(Source: Joint physical verification reports by Audit)

Thus, it could be seen that Skill Lab was not setup in one of the three test-checked Medical Colleges. Hostel facilities were not available in GMC Manjeri.

5.9. Recommendations

- Government should ensure that PHCs and CHCs proportional to population, required as per IPHS norms, are available in all districts.
- Government should identify and analyse the infrastructure works which are pending completion and take remedial action for their expeditious completion. Government should also ensure that only those works which satisfy conditions like availability of unhindered land, etc. are sanctioned and there is no delay in the process of issuing requisite sanctions and release of funds.

CHAPTER VI – FINANCIAL MANAGEMENT

CHAPTER VI
FINANCIAL MANAGEMENT

The percentage of health expenditure with reference to allocated funds declined from 97.64 *per cent* in 2016-17 to 93.28 *per cent* in 2020-21. However, the expenditure increased to 98.92 *per cent* of the outlay on health in the year 2021-22. The budgetary outlay on health services in the State during the six-year period from 2016-17 to 2021-22, showed an increase of 98.68 *per cent* from ₹6,146.69 crore in 2016-17 to ₹12,212.51 crore in 2021-22 except for the year 2019-20 wherein the allocation was less than the previous year. State sector health spending did not meet the target of more than eight *per cent* of the budget as envisaged in the NHP, 2017. Against the expenditure of ₹48,735.92 crore on health during the audit period, the capital expenditure was only 4.24 *per cent*. The allotment of funds to KMSCL for purchase of drugs was not based on requirement.

A key requirement for any health system is to ensure that the available public funds are directed to organizations in line with health system objectives. Such funding seeks to give Governments and health authorities, both the financial capacity and the incentive to fulfil their objectives. Examination of records disclosed deficiencies in planning and adequacy of funds for the healthcare sector as discussed in the succeeding paragraphs:

6.1. Planning and Financial Assessment

Government of Kerala (GoK) prepared long-term (five-year plan) as well as annual plans for all sectors. The thrust of the 13th Five Year Plan policy (2017-22) of GoK was to transform the quality of public health sector, to improve access and affordability with respect to healthcare, to expand insurance coverage, and in general, to put into place schemes and programmes that are intended to tackle the health issues that confront contemporary Kerala. The proposed initiatives included development of infrastructure, machineries and equipment for hospitals, developing super-speciality services in selected district level hospitals, patient friendly outpatient care in all hospitals, etc.

GoK also prepared a Healthcare Policy document (January 2019) in line with National Health Policy, 2017 (NHP) with a view to improve healthcare services in the State. The Policy aims to provide universal, affordable and quality healthcare for everyone.

6.2. Financial position and Management

The main sources of funds for the healthcare sector in the State are GoK funds and GoI funds (released by GoK with corresponding share of State Government (60:40) to National Health Mission (NHM) and National AYUSH Mission

(NAM)). GoK also utilises the funds under MP/ MLA development, from Corporate Social Responsibility (CSR) of PSUs, Local Self Governments, Hospital Management Committee and KIIFB.

The details of allocation in the budget and expenditure thereagainst w.r.t GoI and GoK funds are furnished in the **Table 6.1**.

Table 6.1: Details of allocation and expenditure in health sector (GoI and GoK)

(₹ in crore)

Year	Government of India#			Government of Kerala#		
	Total budget provision	Expenditure	Savings	Total budget provision	Expenditure	Savings
1	**2**	**3**	**4=(2-3)**	**5**	**6**	**7=(5-6)**
2016-17	648.22	591.92	56.30	5498.47	5409.94	88.53
2017-18	607.07	627.55	-20.48*	6544.70	6281.03	263.67
2018-19	655.56	630.86	24.70	7443.55	6636.32	807.23
2019-20	715.20	689.10	26.10	7108.37	6871.56	236.81
2020-21	1412.10	1125.60	286.50	8147.10	7791.22	355.88
2021-22	1594.25	1476.30	117.95	10618.26	10604.52	13.74
Total	**5632.40**	**5141.33**	**491.07**	**45360.45**	**43594.59**	**1765.86**

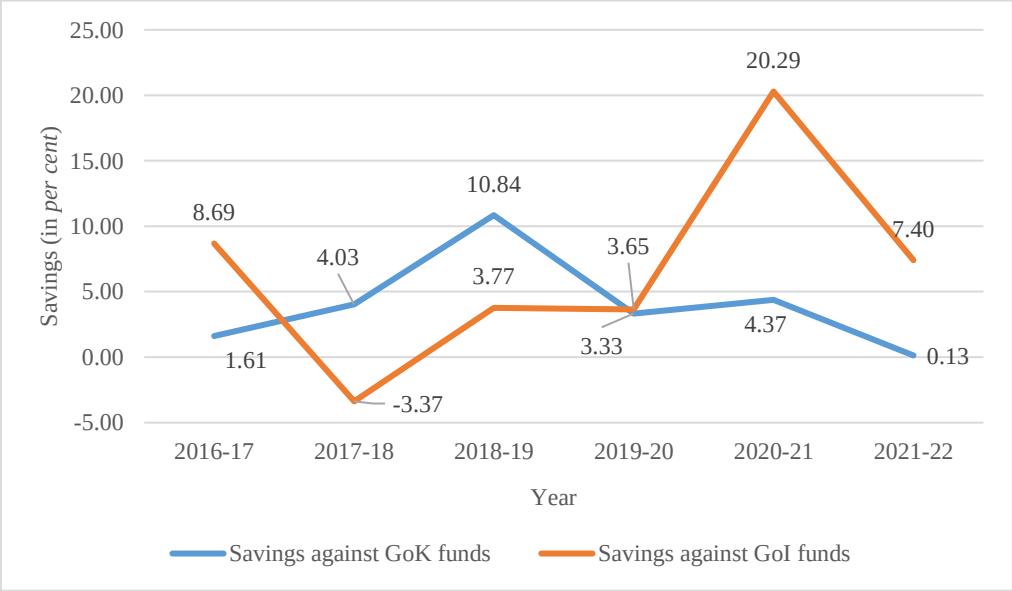
#Bifurcation as to GoI and GoK funds in respect of allocation and expenditure in State budget was available from 2022-23 onwards. The table was prepared reckoning the percentage of share of GoI and GoK prescribed for each case of GoI schemes.

** During 2017-18, the expenditure was in excess of provision.*

(Source: Appropriation accounts of GoK for the respective years)

From the above table, it is evident that 91.28 *per cent* of GoI funds and 96.11 *per cent* of GoK funds were utilised over the period from 2016-17 to 2021-22. The year-wise savings against GoI and GoK funds during 2016-17 to 2021-22 is as shown in **Chart 6.1**.

Chart 6.1: Savings against GoI and GoK funds (*per cent*)



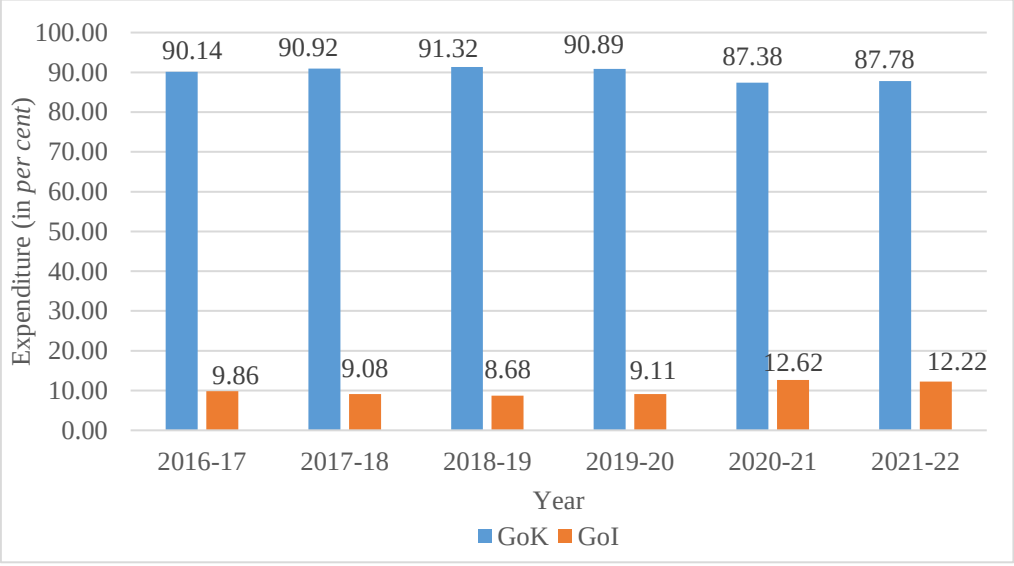
The savings against GoK funds ranged from ₹13.74 crore (0.13 *per cent*) in 2021-22 to ₹807.23 crore (10.84 *per cent*) in 2018-19. With reference to GoI funds, there was excess expenditure in 2017-18. The savings ranged from

₹26.10 crore (3.65 *per cent*) in 2019-20 to ₹286.50 crore (20.29 *per cent*) in 2020-21. In respect of CSS, over the years 2016-22, the highest saving of ₹284.26 crore (no savings in 2021-22) was observed in respect of NHM (60:40 share), followed by ₹235.03 crore (allocations made only in 2020-21 and 2021-22) in respect of Pradhanmantri Jan Aarogya Yojana/Karunya Aarogya Suraksha Padhathi (100 *per cent* CSS). Had the budgeting exercise been carried out more realistically, this amount could have been utilised for purchase of essential drugs and equipment.

6.2.1. Share of expenditure on health sector by GoI and GoK

The percentage of share of expenditure on health sector by GoI and GoK is as shown in **Chart 6.2**.

Chart 6.2: Percentage of expenditure on health sector under GoI and GoK funds



6.3. Expenditure on health sector by the State *vis-à-vis* National Health Policy norms

The expenditure on health compared with the overall budget allocation of the State during the audit period is as given in **Table 6.2**.

Table 6.2: Comparative analysis of health spending

(₹ in crore)

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total / Average
Overall budget allocation	132058.00	144881.93	160374.90	194462.61	208946.79	237016.12	1077740.35
Overall expenditure	111597.71	133456.97	143721.60	163815.80	184877.38	205451.40	942920.86
Outlay on health	6146.69	7151.76	8099.11	7823.57	9559.20	12212.51	50992.84
Expenditure on health	6001.86	6908.58	7267.18	7560.66	8916.82	12080.82	48735.92
Savings against health outlay	144.83	243.18	831.93	262.91	642.38	131.69	2256.92
Percentage of outlay on health to total budget	4.65	4.94	5.05	4.02	4.57	5.15	4.73
Percentage of expenditure on health to total budget	4.54	4.77	4.53	3.89	4.27	5.10	4.52

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total / Average
Percentage of expenditure on health to total expenditure	5.38	5.18	5.06	4.62	4.82	5.88	5.16
Percentage of health expenditure to outlay on health	97.64	96.60	89.73	96.64	93.28	98.92	95.57
Gross State Domestic Product (GSDP) (constant prices)	485301.54	516189.76	554228.31	559194.18	512076.08	573591.46	533430.22
Percentage of expenditure on health compared to GSDP of State	1.24	1.34	1.31	1.35	1.74	2.11	1.52

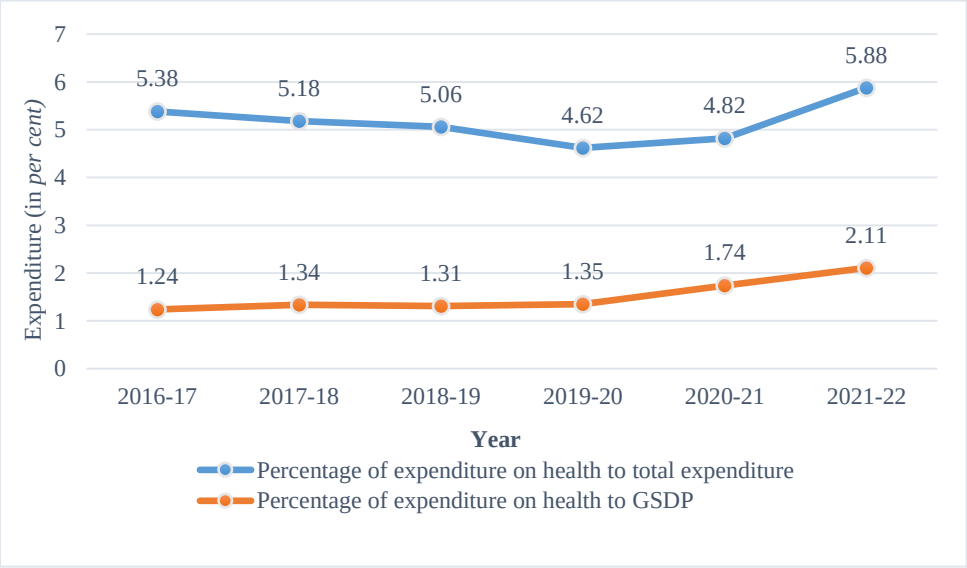
(Source: Data from Department of Economics and Statistics and Appropriation Accounts)

The budgetary outlay on health services in the State during the six-year period from 2016-17 to 2021-22, showed an increase of 98.68 *per cent* from ₹6,146.69 crore in 2016-17 to ₹12,212.51 crore in 2021-22 except for the year 2019-20 wherein the allocation was less by ₹275.54 crore compared to the previous year. However, the percentage of outlay on health was on an average 4.73 *per cent* of total budget during the audit period. The percentage of health expenditure with reference to allocated funds declined from 97.64 *per cent* in 2016-17 to 93.28 *per cent* in 2020-21. However, in the year 2021-22, the expenditure increased to 98.92 *per cent* of the outlay on health.

The NHP, 2017 envisaged an increase of State sector health spending to more than eight *per cent* of the budget by 2020.

- As seen from **Table 6.2**, the State sector health spending did not meet the targets. The expenditure on health ranged from 3.89 *per cent* to 5.10 *per cent* of the total budget during the period 2016-17 to 2021-22.
- To ensure adequate investment, the NHP, 2017 proposes a potentially achievable target of raising public health expenditure to 2.5 *per cent* of the Gross State Domestic Product (GSDP) in a time bound manner by 2025. Audit observed that in Kerala, the public health expenditure when compared to the GSDP, rose from 1.24 *per cent* in 2016-17 to 2.11 *per cent* in 2021-22, thus exhibiting a positive trend. A comparison of the State expenditure on health to the total expenditure of the State and to GSDP is shown in **Chart 6.3**.

Chart 6.3: Comparison of expenditure on health by GoK to the total expenditure of the State/ GSDP

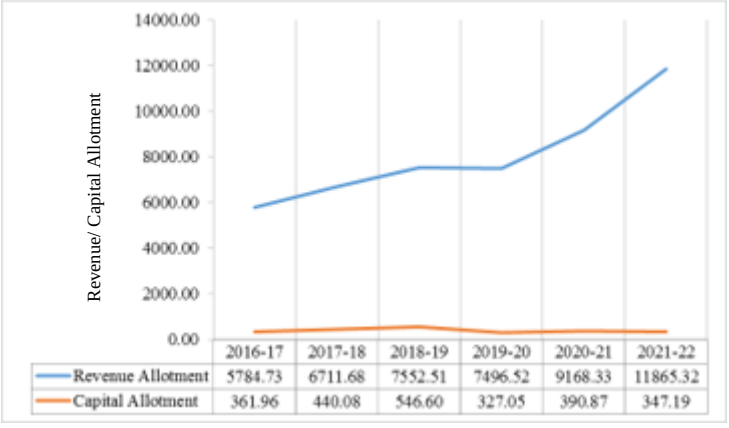


6.4. Revenue and capital allocation and expenditure

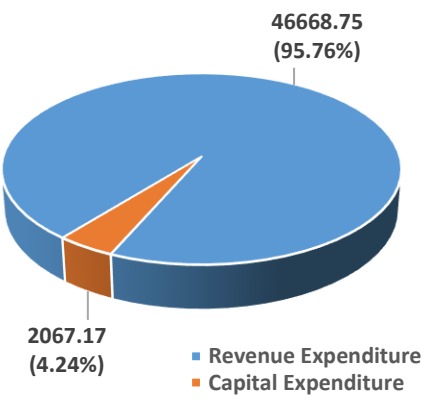
Against the budget allocation of ₹50,992.84 crore on health during 2016-22, revenue allotment constituted ₹48,579.09 crore (95.27 *per cent*) while capital allotment was only ₹2,413.75 crore (4.73 *per cent*). While the revenue allocation showed an upward trend, the capital allocation remained largely static throughout the audit period which revealed lapses in progressive allocation of funds for creation/ upgradation of infrastructure. Against the budget expenditure of ₹48,735.92 crore during the above period, the revenue expenditure and capital expenditure were ₹46,668.75 crore (95.76 *per cent*) and ₹2,067.17 crore (4.24 *per cent*) respectively. The allocation and expenditure under revenue and capital heads for the six-year period 2016-22 is shown in **Chart 6.4**.

Chart 6.4: Revenue and capital allocation and expenditure (2016-22)

(₹ in crore)



	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Revenue Allotment	5784.73	6711.68	7552.51	7496.52	9168.33	11865.32
Capital Allotment	361.96	440.08	546.60	327.05	390.87	347.19



The decrease in capital allocation which reflected in meagre capital expenditure needs to be seen in the context of infrastructure projects remaining incomplete as detailed in Chapter V of this Report.

6.5. Budget allocation and expenditure on important components under National Health Mission

Budget allocation and expenditure on important components under NHM for the period 2016-17 to 2021-22 and the year-wise percentage of utilisation are as shown in **Table 6.3**.

Table 6.3: Budget allocation and expenditure on important components under NHM

Name of Scheme	Total budget for 2016-17 to 2020-21 (₹ in lakh)	Total expenditure for 2016-17 to 2020-21 (₹ in lakh)	Percentage of total expenditure to budget	*Per cent* utilisation						Sparkline for six years from 2016-17 to 2021-22
				2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	
National Vector Borne Disease Control Programme	4611	2477	54	69	115	86	32	26	41	
Information Education and Communication/ Behaviour Change Communications	8751	5399	62	57	104	50	56	49	79	
Iodine Deficiency	302	98	32	33	16	10	295	100	10	
Procurement of equipment/ drugs funds	123513	85056	69	88	86	83	35	88	71	
New constructions/ renovation and setting up funds	50003	24815	50	106	69	10	22	100	79	
Innovation activity	5247	3768	72	70	164	117	26	64	47	
Infrastructure maintenance (reimbursement)	153490	153490	100	100	100	100	100	100	100	

(Source: Details furnished by NHM)

The total utilisation under various schemes for the period 2016-22 showed huge variations ranging from 32 to 100 *per cent.*

6.6. Inadequacy of funds for purchase of drugs

KMSCL was set up (2007) as a fully owned Government company for procuring and distributing drugs, supplies and equipment to hospitals. For the procurement of drugs GoK provides grants to KMSCL. Against an allocation of ₹2,573.35 crore during 2016-17 to 2021-22, GoK released ₹2,497.39 crore as grant for the procurement of drugs to KMSCL. Audit noticed that before inviting indent for a financial year, financial cap was fixed to each level of hospitals based on the expected budgetary allocation for the procurement of drugs. Further, the procurements were significantly lower than the actual requirement establishing the fact that budget allocation to KMSCL was not based on the actual requirement of drugs. Consequently, the financial cap fixed

for hospitals was not realistic. The impacts of unrealistic financial cap resulting in short procurement of drugs are detailed in Chapter IV of this Report.

6.7. Delay in release of funds to implementing agencies

Audit noticed delay in release of GoI/ GoK share of funds by Government of Kerala to NHM and NAM during the audit period as shown in **Table 6.4**.

Table 6.4: Delay in release of funds to implementing agencies

(₹ in crore)

Name of the implementing agency	Amount released with delay	Amount released with delay period within 15 days	Amount released with delay period within six months	Amount released with delay more than six months
NAM	176.37	Nil	37.81	138.56[85]
NHM	2002.28	265.78	1412.65	323.85

(Source:NAM and NHM)

Further in the test-checked hospitals, Audit observed delay in release of funds by GoK due to delays on the part of hospital authorities in identifying proper site, finalisation of proposals, etc. and on the part of GoK in issue of sanctions. GoI funds amounting to ₹4.09 crore sanctioned for the implementation of three schemes[86] in GMC, Thiruvananthapuram were released by GoK only after periods ranging from 19 months to over five years as detailed in Chapter V of this Report (Paragraphs 5.8.3, 5.8.5 and 5.8.6).

GoK stated (October 2022) that steps would be taken to avoid any delay in future.

6.7.1. Delay in release of matching share by GoK

The resource envelope of NHM included GoI share and matching State share for both cash and kind grants of GoI. As per GoI records, the State had not released the matching share against the GoI grant released amounting to ₹49.51 crore for 2019-20 and 2020-21. NHM stated that they had addressed (January 2022) GoK and the matter was pending with Government.

6.8. Monitoring of funds across entities related to health

Funds sanctioned for improvement in infrastructural facilities in hospitals remained blocked up with implementing agencies without timely/ proper utilisation which revealed deficiencies in monitoring of sanctioned funds.

GoK sanctioned ₹2.10 crore (₹1.40 crore in May 2017 and ₹0.70 crore in May 2018) for Standardisation of Homoeopathy dispensaries and hospitals under the Department of AYUSH. Director, Homoeopathy transferred (February and December 2018) the funds to NHM for its implementation. Since all the

[85] Except in 2016-17, the funds were released in the same and subsequent years

[86] Setting up of four station Temporal Bone Lab, Establishment of Burns Unit and Implementation of National Mental Health Programme

agreements executed between NHM and Project Management Consultants for NAM civil works were cancelled (October 2020), NAM requested (June 2021) Director of Homoeopathy to transfer the funds to NAM and the Director of Homoeopathy requested (June 2021) GoK to take necessary action to transfer funds from NHM to NAM. However, the entire amount released, remained unutilised with NHM for the last four years, resulting in non-commencement of works.

GoK stated (October 2023) that funds were transferred to NAM which would be utilised within the financial year 2023-24. However, the fact remains that the project has not materialised even after a lapse of four years.

6.9. Irregular retention of funds

Funds sanctioned for purchase of equipment and implementation of centrally sponsored schemes were found retained with the authorities of test-checked Medical Colleges without timely/ proper utilisation as detailed in Paragraphs 4.7.1.2 and 5.8.3 to 5.8.6 in Chapters IV and V of this Report respectively.

6.10. Recommendation

- Government should formulate an action plan to enhance State sector health spending in line with the target set by the National Health Policy.

CHAPTER VII – IMPLEMENTATION OF CENTRALLY SPONSORED SCHEMES

CHAPTER VII

IMPLEMENTATION OF CENTRALLY SPONSORED SCHEMES

Implementation of selected Centrally Sponsored Schemes in the health sector was not satisfactory. Under Pradhan Mantri Jan Arogya Yojana (PMJAY), inordinate delay in payment of insurance claims to beneficiaries was noticed. A District Implementation Unit to support the implementation of PMJAY and combined unit for anti-fraud, medical audit and vigilance at state level with district level officers were not formed. The number of beneficiaries covered under Janani Suraksha Yojana and Janani Shishu Suraksha Karyakram was low.

Health being a State subject, the GoI supplements the efforts of the State Governments in delivery of health services through various schemes of primary, secondary and tertiary care. Central Sector and Centrally Sponsored Schemes are extended by the Union Government to States under Article 282 of the Constitution. Centrally Sponsored Schemes are different from Central Sector Schemes in the sense that Central Sector Schemes are implemented by GoI directly while Centrally Sponsored Schemes are implemented by States. Observations based on examination of implementation of selected centrally sponsored schemes in the State are discussed in succeeding paragraphs.

7.1. National Urban Health Mission

The National Urban Health Mission (NUHM), a sub-mission of National Health Mission (NHM) was approved by the Cabinet on 01 May 2013. NUHM envisages to meet health care needs of the urban population with the focus on urban poor, by making available to them essential primary health care services and reducing their out-of-pocket expenses for treatment.

NUHM envisages undertaking 'Vulnerability Mapping and Assessment' in urban areas so that the location of the Urban PHCs/CHCs and sites for Outreach Services can be optimally planned and health care services can be organized as per the needs of these vulnerable groups.

7.1.1. Mapping and Vulnerability Assessment

NUHM was implemented in all the four test-checked districts and the city mapping and vulnerability assessment were done in all the test-checked districts. The city mapping was conducted through GIS mapping of health facilities in 2018.

7.1.2. Outreach services of NUHM

Status of outreach sessions held in the test-checked districts during the audit period is given in **Table 7.1**.

Table 7.1: Status of Outreach Sessions held in test-checked districts

Name of District	Target	Achievement	Shortfall	Shortfall (*per cent*)
Thiruvananthapuram	3110	4543	0	0.00
Alappuzha	932	1221	0	0.00
Malappuram	2456	4887	0	0.00
Wayanad	234	77	157	67.09

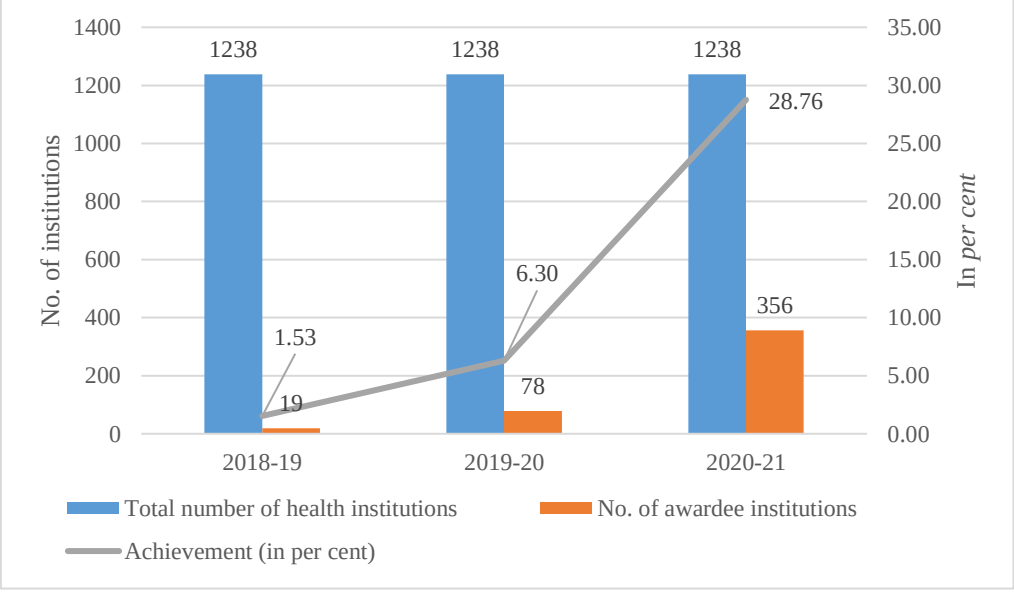
(Source: Data obtained from NHM)

Audit noticed that in Wayanad district there was a shortfall of 67 *per cent* in the conduct of outreach sessions.

7.2. Kayakalp Programme

Ministry of Health and Family Welfare (MoHFW), GoI, launched a national initiative on 15 May 2015 to promote cleanliness, hygiene and infection control practices in public healthcare facilities, enhance the quality of public health facilities and incentivise the exemplarily performing healthcare facilities. Initiated from DH in 2015, the scheme expanded upto PHC level (2016) and covered all urban health facilities by 2017. The purpose of this initiative is to appreciate and recognize their effort to create a healthy environment by giving awards to those public health facilities that demonstrate high levels of cleanliness, hygiene and infection control. Cash award will be given to those facilities that score 70 *per cent* or more in each level of assessment through Kayakalp assessment tool (checklist) formed by MoHFW. The status of achievers of the programme in the State is given in **Chart 7.1**.

Chart 7.1: Status of achievers under Kayakalp programme in the State



It was noticed that the percentage of awardee institutions has increased from 1.53 *per cent* in 2018 to 28.76 *per cent* in 2020-21. However, the fact remains that more than 70 *per cent* of the hospitals are yet to achieve the required level of healthy environment.

No remarks were furnished by GoK (November 2023).

7.3. Achievement under National Quality Assurance Programme

National Quality Assurance Standards (NQAS) have been developed keeping in view the specific requirements for public health facilities as well as global best practices. NQAS are currently available for DHs, CHCs, PHCs and UPHCs. Standards are primarily meant for providers to assess their own quality for improvement through pre-defined standards and to bring up their facilities for certification. In Kerala, out of the 1,238 public health institutions, 140 hospitals (11.31 *per cent*) acquired the standards under this programme as detailed in **Table 7.2**.

Table 7.2: Category-wise number of health institutions with NQAS certification in the State

Type of facility	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
DH/GH	0	0	2	1	0	1	4
TH/THQH	0	0	3	1	0	0	4
CHC	0	1	1	3	2	1	8
PHC	0	0	7	41	23	17	88
UPHC	0	0	1	5	16	14	36
Total		**1**	**14**	**51**	**41**	**33**	**140**

(Source: Data furnished by NHM)

The NQAS achieved hospitals in the test-checked districts were on an average below seven *per cent* as shown in **Table 7.3**.

Table 7.3: Number of health institutions which achieved NQAS in test-checked districts

Type of health institutions	Thiruvananthapuram		Alappuzha		Malappuram		Wayanad	
	Number of HIs	NQAS certified HIs	Number of HIs	NQAS certified HIs	Number of HIs	NQAS certified HIs	Number of HIs	NQAS certified HIs
DH/GH	4	0	3	0	4	0	2	0
TH/THQH	8	0	6	0	7	0	2	0
CHC	20	0	15	0	16	0	7	0
PHC	72	5	62	3	89	9	25	4
Total	**104**	**5**	**86**	**3**	**116**	**9**	**36**	**4**

Color code determined by Audit: Red colour depicting poor performance i.e., achievement below 50 per cent.
(Source: Data furnished by NHM)

7.4. Revised National TB Control Programme

The Revised National TB Control Programme (RNTCP) was launched in India in 1997. The year-wise performance of RNTCP in Kerala during the audit

period is shown in **Table 7.4** and performance of the programme during the year 2022 in the test-checked districts was as shown in **Table 7.5**.

Table 7.4: Performance of RNTCP - Kerala State – 2016 to 2022

Year	Total notified cases	Total annualized case detection rate/ lakh population	Micro-biologically confirmed TB cases	Total pulmonary TB cases	Microbiologically confirmed pulmonary TB cases out of total diagnosed pulmonary cases	Microbiologically confirmed pulmonary TB cases out of total diagnosed pulmonary cases (in *per cent)*	Success rate (in *per cent)*
2016	26324	77	13324	NA	NA	NA	88
2017	23259	68	13475	NA	NA	NA	84.49
2018	24647	72	15904	15753	12379	79	87
2019	25620	74	15719	16495	13802	84	89
2020	20892	61	13381	12487	10727	86	85
2021	21953	63	14323	12960	11310	87	81
2022	23389	67	14519	14588	12664	87	81

NA- Not available; Treatment success rates are calculated from cohort data (outcomes in registered patients) as the proportion of new smear positive TB cases registered in a given year that successfully completed treatment.
(Source: Data obtained from DHS)

Table 7.5: Performance of RNTCP during the year 2022 in test-checked districts

Districts	Total notified cases	Total annualized case detection rate/ lakh population	Micro-biologically confirmed TB cases	Total pulmonary TB cases	Micro-biologically confirmed pulmonary TB cases out of total pulmonary cases	Microbiologically confirmed Pulmonary TB cases out of total pulmonary cases (in *per cent*)	Success rate (in *per cent*) (2021 cohort)
Alappuzha	980	45	894	928	824	89	83
Malappuram	1,996	46	1322	1449	1172	81	87
Thiruvananthapuram	2,904	85	1480	1497	1276	85	80
Wayanad	479	53	365	355	324	91	85

(Source: Data obtained from DHS)

It was noticed that the success rate of the State dipped from 88 *per cent* in 2016 to 81 *per cent* in 2022 and the rate was least in Thiruvananthapuram (80 *per cent*).

7.5. National Mental Health Programme

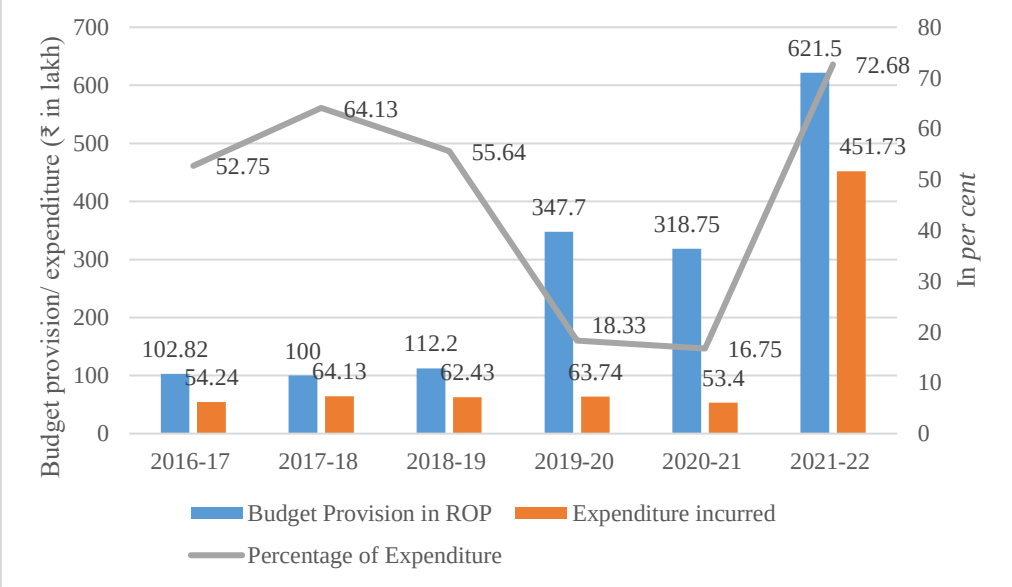
The Government of India launched the National Mental Health Programme (NMHP) in 1982, with the following objectives:

- To ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future, particularly to the most vulnerable and underprivileged sections of the population;
- To encourage the application of mental health knowledge in general healthcare and in social development; and
- To promote community participation in the mental health service development and to stimulate efforts towards self-help in the community.

7.5.1. Underutilisation of funds under National Mental Health Programme

The budget provision and expenditure under NMHP in Kerala is detailed in **Chart 7.2** below.

Chart 7.2: Budget provision and expenditure under NMHP in Kerala



(Source: Data obtained from NHM)

The utilisation of funds under NMHP ranged from 16.75 *per cent* to 72.68 *per cent* during the audit period.

7.5.2. Implementation of Mental Health Programme in selected districts

Audit checked the availability of Mental Health Services in the test-checked hospitals as detailed in **Table 7.6**.

Table 7.6: Availability of mental health services in test-checked health institutions

Sl. No.	Particulars	DH/GH (07)	TH/THQH (07)	CHCs (07)
1	Provisions of Outpatient services for walk-in-patients and patients referred by the PHC is provided by MO.	5	5	4
2	Early identification, diagnosis and treatment of common mental disorders (anxiety, depression, psychosis, schizophrenia, Manic Depressive Psychosis) are available.	5	4	3
3	In-patient services are available for emergency psychiatry illnesses.	4	1	0
4	Counselling services provided by the Clinical Psychologist/ Trained Psychologist.	3	2	4
5	Continuing care and support to persons with Severe Mental Disorder (SMD) is provided. (This includes referral to district hospital for SMD patients and follow up based on treatment plan drawn up by the Psychiatrist at the district hospital).	5	4	3

Scales determined by Audit	Good (6-7)	Moderate (4-5)	Poor (0-3)

(Source: Data obtained from test-checked health institutions)

7.5.3. Availability of Mental Health Programme drugs in test-checked health institutions

Audit examined the availability of 45 Mental Health Programme drugs in the test-checked health institutions and the shortfall in mental health drugs is shown in **Table 7.7**.

Table 7.7: Shortfall in mental health drugs in test-checked institutions

Type of health facility	Range of shortfall (in Nos)	Range of shortfall (in *per cent*)
DH/GHs	19 to 41	42 to 91
TH/THQHs	16 to 40	36 to 89
CHCs	14 to 43	31 to 96
PHC/FHCs	14 to 45	31 to 100

(Source: DDMS data of KMSCL)

Audit observed that none of the 45 mental health programme drugs were available in FHC, Parappanangadi and FHC, Punnapra North.

7.6. Janani Suraksha Yojana

Janani Suraksha Yojana (JSY) is a 100 *per cent* Centrally Sponsored Scheme for safe motherhood intervention under the National Health Mission (NHM). It is being implemented with the objective of reducing maternal and neonatal mortality by promoting institutional delivery among poor pregnant women. The scheme, launched on 12 April 2005, is under implementation in all States and Union Territories (UTs).

As per the guidelines, cash assistance of ₹700 was admissible to mothers belonging to BPL families who hailed from rural areas and ₹600 to those from urban areas in Kerala, being a high performing State. The hospitals met the payment through the advances received from NHM. Against a budget allocation of ₹48.29 crore, the expenditure incurred for the payment amounted to ₹45.87 crore (95 *per cent*) during the period 2016-22.

The following deficiencies were noticed in the implementation of the scheme:

- As per the guidelines for the implementation of the scheme, only BPL/ SC/ ST pregnant women were eligible for cash assistance in high performing States. Though Kerala was a high performing State, it was decided that the cash assistance should be extended to all women whose deliveries are handled by Government hospitals. CAG in the Report for the year ended 31 March 2017 [87] remarked on the extension of benefit to all women in the State without GoI approval. This being a 100 *per cent* CSS, the concurrence of GoI should have been obtained before modifying the criteria for selection of beneficiaries especially since it involves increase in expenditure.

[87] Performance Audit on National Health Mission - Reproductive and Child Health and Immunisation (NHM RCH) included in the Report of the CAG on General and Social Sector

- Though GoK widened the beneficiary net to include all pregnant women approaching public hospitals for delivery, Audit noticed that beneficiaries in test-checked hospitals did not receive assistance during the period of audit as detailed in **Table 7.8**.

Table 7.8: Details of payment of cash assistance

Year	Test-checked institutions		
	Total number of institutional deliveries	Number of beneficiaries to whom cash assistance not paid	Percentage of non-disbursement
2016-17	19651	5226	26.59
2017-18	22997	5982	26.01
2018-19	25348	6269	24.73
2019-20	29291	6714	22.92
2020-21	22569	7735	34.27
2021-22	26841	10371	38.64
Total	**146697**	**42297**	**28.83**

(Source: Data furnished by test-checked institutions)

In the case of 13[88] out of 14 test-checked institutions in the four selected districts, 42,297 (28.83 *per cent*) out of 1,46,697 beneficiaries were not paid the stipulated cash assistance. The reasons stated (November/ December 2022) for non-disbursement of JSY assistance were non-furnishing of documents by beneficiaries like application for JSY benefit and bank account details, beneficiaries rejecting the benefit, non-availability of funds, etc. The reply was not acceptable since incentives were being paid to ASHAs for assisting the beneficiaries. As such, availability of documents should have been ensured through ASHAs.

No remarks were furnished by GoK (November 2023).

7.7. Ayushman Bharat Pradhan Mantri Jan Arogya Yojana

Ayushman Bharat is a flagship health scheme of the GoI, launched in September 2018 to achieve universal health coverage as recommended in the National Health Policy, 2017 and comprises of two inter-related components i.e., HWCs and PMJAY.

7.7.1. Health and Wellness Centres

Under this component, 1,50,000 HWCs were to be created by the year 2022 to deliver comprehensive primary health care, that is universal and free to users, with a focus on wellness and the delivery of an expanded range of services closer to the community such as care for non-communicable diseases, palliative and rehabilitative care, oral, eye and ENT care, mental health and first level care

[88] GH Kalpetta, DH Mananthavady, THQH Vythiri, THQH Tirurangadi, GH Neyyattinkara, TH Fort, DH Nedumangadu, SAT Thiruvananthapuram, DH Mavelikkara, W and C Ponnani, THQH Kayamkulam, DH Tirur and MCH Manjeri. Records were not produced by MCH Alappuzha.

for emergencies and trauma, including free essential drugs and diagnostic services. The HWCs at the Sub Health Centre (SHC) level would be equipped and staffed by an appropriately trained primary health care team led by a Community Health Officer (CHO) and comprising of multi-purpose workers (male and female) and ASHA. The status of operationalisation of HWCs in the State is furnished in paragraph 5.3 of this Report.

7.7.2. Pradhan Mantri Jan Arogya Yojana

PMJAY aims to provide health insurance cover of ₹ five lakh per family per year for secondary and tertiary care hospitalisation to the bottom 40 *per cent* of poor and vulnerable population. The scheme has been rolled out based on the deprivation and occupational criteria of the Socio-Economic Caste Census, 2011 (SECC). In Kerala, a decision was taken (May 2018) to combine the existing health protection schemes namely, CHIS PLUS and Karunya Benevolent Fund into a common scheme, the Karunya Arogya Suraksha Padhadhi (KASP) which was converged with the Central scheme PMJAY and launched with effect from 01 April 2019. 41.60 lakh beneficiary families were registered under the scheme including 1.17 lakh families under SECC. The State Health Agency (SHA) was entrusted with (May 2020) the running of the Scheme. The scheme is implemented through a total of 742 empanelled hospitals[89].

7.7.2.1. Financial Outlay

As per the scheme guidelines, expenses under PMJAY were to be shared between GoI and GoK in the ratio 60:40. While State may cover greater number of families than those defined as per SECC data, the additional cost for these families would be borne by the State. The allocation and expenditure for the period 2019-20 to 2021-22 are given in **Table 7.9**.

Table 7.9: Financial Outlay

(₹ in crore)

Year	GoK share	GoI share	Total	Expenditure
2019-20	498.08	122.56	620.64	620.64
2020-21	356.57	138.11	494.68	494.68
2021-22	1002.50	138.89	1141.39	1141.39

(Source: Data furnished by SHA)

Scrutiny of records of SHA relating to the period September 2018 to July 2021 revealed the following:

- The GoI guidelines for release of administrative expenses under the scheme stipulate that the States could adopt either SECC database or existing RSBY enrolled beneficiary families for deciding the total number of eligible beneficiary families and if a different database is adopted, it should be mapped with the SECC database. In Kerala, the beneficiaries under the scheme include beneficiaries from three sources of data, namely, SECC, RSBY and CHIS data. However, the beneficiary

[89] GoI-five: public- 195: private -542

data has not been mapped with the SECC data, as stipulated in the guidelines.

The SHA stated (January 2022) that they were under the assumption that all SECC families will be covered in the existing RSBY-CHIS data set, as the criteria for both RSBY-CHIS and SECC were almost same. SHA further admitted (November 2022) that the data of the eligible families in case of SECC 2011 category families was not available since no mapping exercise was done. It was stated (March 2022) that the mapping exercise needed support of different departments and action was being initiated to do the SECC mapping with the help of National Health Authority (NHA).

- During the period 2019-20 to 2021-22, SHA approved 35.66 lakh claims amounting to ₹2,440.92 crore against a total of 36.99 lakh claims amounting to ₹2,999.81 crore. However, 3.43 lakh claims amounting ₹339.27 crore were pending settlement (November 2022).

  Claims Adjudication Manual, 2019 stipulates a turn-around time of 15 days and 30 days for settlement of claims of same State and portability cases respectively. Audit observed time taken in settlement of cases beyond the stipulated period ranging from 16 to 400 days for cases of same State. Analysis of data during the period 2021-22 revealed that though 13.45 lakh claims amounting to ₹1,205.57 crore were approved during the period, 16 days to more than 400 days[90] were taken to settle 11.82 lakh claims amounting to ₹1,087.61 crore.

  SHA attributed the reasons for the delay in settlement of claims to the performance issues faced in the TMS portal.

- The guidelines[91] stipulate that empanelled hospitals need to be encouraged to attain quality milestones by making National Accreditation Board for Hospitals and Healthcare Providers (NABH) pre-entry level accreditation mandatory for all the empanelled hospitals[92]. However, Audit noticed that only 112 out of 742 (15 *per cent*) empanelled hospitals had NABH accreditation.

  SHA replied (March 2022) that NHA was encouraging empanelled hospitals to participate in National Health Authority - Quality Council of India (NHA-QCI) certification and that SHA was only overseeing the facilitating of the certifications.

- A District Implementation Unit (DIU) is to be established consisting of a District Nodal Officer, District Programme Co-ordinator (DPC), District Information Systems Manager, District Grievance Manager and a District Medical Officer to support the implementation in every district

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[90] 16 to 30 days (for same State only) - two lakh; 31 to 100 days - 4.55 lakh; 101 to 200 days - 4.41 lakh; 201 to 300 days - 0.64 lakh; 301 to 400 days - 0.09 lakh; more than 400 days - 0.12 lakh

[91] Process of empanelment of hospitals - paragraph 1.3 (vii)

[92] to be attained within one year with two extensions of one year each

included under the scheme. In Kerala, DIUs were not established and DPCs appointed in the districts were executing the functions of DIU.

SHA replied (March 2022) that as per the suggestions of World Health Organisation which conducted a detailed analysis on the human resources of SHA and NHA guidelines, additional HR requirements had been submitted to the GoK.

- Guidelines proposes the SHA to have a combined unit for anti-fraud, medical audit and vigilance at the State level and to have vigilance and investigation officers at the district level. No such units were formed by the SHA.
- The Claims Review Committee (CRC) had not performed the prescribed duties as per guidelines. The Committee has reviewed neither 100 *per cent* of rejected claims nor two *per cent* of the pre-authorisations.
- The SHA had not conducted medical audits, beneficiary audit, pre-authorisation audit, claims audit and death audits as prescribed in guidelines. No audit under Claims Audit (rejected claims) was done by the SHA.

  SHA replied (March 2022) that deficiencies pointed out in Audit were noted and would be initiating action to rectify the issues.

No remarks were furnished by GoK (November 2023).

7.8. Janani Shishu Suraksha Karyakram

Government of India launched Janani Shishu Suraksha Karyakram (JSSK) on 01 June 2011. The scheme laid utmost emphasis on entitlements and elimination of out of pocket expenses for both pregnant women and sick neonates. The initiative entitles all pregnant women delivering in public health institutions to absolutely free and no-expense delivery, including caesarean section. The entitlements would include free drugs and consumables, diagnostics, blood wherever required, transport both ways and diet. The funds were shared between GoI and GoK in the ratio 60:40. The hospitals are responsible for the payment of all entitlements to the beneficiaries.

CAG of India in the Report of General and Social Sector for the year ended 31 March 2017 had observed that the patient transport ambulance system was not set up resulting in parking of ₹11.88 crore released to KMSCL for the purpose. The paragraph was included in sixth report of PAC (2021-23). GoK informed PAC that the amount which was allotted to implement the scheme was resumed by the Finance Department at the end of 2013 as it was not utilised. No specific remarks were made by PAC.

The State Mission Director, NHM accorded sanction (August 2012) to disburse cash assistance of ₹500 each to mothers until GoK established transport system

for the pregnant women under JSSK. In four[93] out of the 14[94] test-checked institutions, a free transport system for transport of pregnant women had commenced operation from 2019-21. The status of payment of cash assistance to the beneficiaries in 12 out of 14 test-checked institutions is furnished in **Table 7.10**.

Table 7.10: Details of payment of transportation charges

Year	Test-checked institutions			
	Total number of institutional deliveries	Total number of mothers paid JSSK incentives	Number of beneficiaries to whom cash assistance not paid	Percentage of non-disbursement
2016-17	18166	2690	14456	79.57
2017-18	22651	12196	9568	42.24
2018-19	24902	15952	8950	35.94
2019-20	20042	8788	11254	56.15
2020-21	16045	5909	10136	63.17
2021-22	16966	5382	11584	68.28
Total/ Average	**118772**	**50917**	**65948**	**55.52**

(Source: Data furnished by NHM and test-checked institutions)

Audit observed that on an average 55.52 *per cent* of the beneficiaries had not received the transportation charges under the scheme during the audit period in the test-checked institutions. The reasons for non-payment of assistance were stated to be non-receipt of application from beneficiaries, patient having own transportation and starting of free transport system in test-checked hospitals. Thus, it could be seen that GoK/ NHM had not established a free transport system for the use of pregnant women under JSSK in all the hospitals till date and had also not disbursed the transportation charges to all beneficiaries in the absence of free transport system as evident from the data in the test-checked hospitals.

7.9. Financial position of other central schemes

The details of budget provision and expenditure incurred under National Programme for Health Care of the Elderly (NPHCE), National Tobacco Control Programme (NTCP) and National Programme for Control of Blindness (NPCB) are given in **Appendix 7.1**. It could be seen from the Appendix that only 65.81, 35.86 and 53.82 *per cent* of the expenditure could be actually incurred against the budget provision under NPHCE, NTCP and NPCB respectively.

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93 MCH Manjeri, GH Neyyattinkara, DH Mananthavady and GH Kalpetta

94 GH Kalpetta, DH Mananthavady, THQH Vythiri, THQH Tirurangadi, GH Neyyattinkara, TH Fort, DH Nedumangad, SAT Thiruvananthapuram, W and C Ponnani, THQH Kayamkulam, DH Tirur, MCH Manjeri. Records were not produced by MCH Alappuzha and DH Mavelikkara. Data relating to four institutions, MCH Manjeri, GH Neyyattinkara and DH Mananthavady from 2019-20 and GH Kalpetta relating to the period from 2020-21 excluded from the table as the free transport system "*Mathruyanam*" had been implemented.

7.10. Recommendation

- Government should ensure that no eligible beneficiaries are deprived of the benefits envisaged under JSY and JSSK. This may be done by creating awareness of the projects among potential beneficiaries as well as by involving health workers / ASHAs.

CHAPTER VIII – ADEQUACY AND EFFECTIVENESS OF REGULATORY MECHANISMS

CHAPTER VIII

ADEQUACY AND EFFECTIVENESS OF REGULATORY MECHANISMS

A robust regulatory mechanism is essential for assurance that the healthcare system is complying with its statutory obligations and the interest of various stakeholders are protected. In several instances, the regulatory mechanism in the health sector was found to be inadequate. The implementation of Clinical Establishments Act and Rules which, *inter alia*, had the objective of prescribing standards of facilities and services had not progressed much and the objectives remain unachieved. Some blood banks in the State were found to be functioning without licences. The existing bio-medical waste treatment and disposal facilities in the State were under stress and there was an immediate requirement for establishing more such facilities. Radiographic equipment was being utilised in some hospitals without AERB licence.

Regulation is an important function in healthcare sector. The role of regulatory bodies is to protect healthcare consumers from health risks, provide a safe working environment for healthcare professionals and ensure that public health and welfare are served by health programmes.

Regulatory agencies thus monitor individual and corporate healthcare practitioners and facilities, inform the Government about changes in the way the healthcare industry operates, ensure higher safety standards, and endeavour to improve healthcare quality.

8.1. Implementation of the Clinical Establishments Act and Rules in the State

The Clinical Establishments Act was passed (August 2010) by GoI, to provide for registration and regulation of all clinical establishments in the country with a view to prescribe minimum standards of facilities and services.

In line with GoI Act, GoK framed the Kerala Clinical Establishments (Registration and Regulation) Act, 2018 and Rules, 2018 thereunder. The following observations are made with regard to enactment of the State Act and discharge of functions under the provisions of the Act:

8.1.1. Delay in effecting registration

GoK formed (December 2018) a State Council for Clinical Establishments for implementation of the Act and Rules. As per the Act, no person shall run a clinical establishment unless it has been duly registered in accordance with the provisions of the Act and Rules. A total of 6,856 institutions which included 3,748 public and 3,108 private institutions had registered with the Council (March 2022). Audit noticed that 17,122 and 16,922 healthcare facilities functioned in the State as per records of Kerala State Pollution Control Board

(KSPCB) (December 2020) and IMAGE[95] (March 2021) respectively. Thus, the coverage by the State Authority is only approximately 40 *per cent.*

Thus, 60 *per cent* of institutions were not covered even after three years of commencement of registration.

8.1.2. Delay in preparation of minimum standards and not granting permanent registration to clinical establishments

Section 13 of the Act stipulates that different standards shall be prescribed by the Government for clinical establishments of different categories[96] and the Council shall determine within a period of two years from the date of commencement of the Act, the first set of standards for ensuring proper healthcare. The State Authority stated (March 2022) that committees for standardisation of different categories were constituted (September 2019) and the minimum standards reports of four[97] categories of establishments were at notification stage.

Audit noticed that as against the provisions in the Act, GoK has not finalised the standards for any category of establishments even after a period of four years from the date of commencement of the Act. Audit observed that the Authority could grant only provisional registration to all units under its registry till date (March 2022) due to non-finalisation of standards for each category of establishments.

8.2. Drugs Controller of the State

The Drugs Control Department was formed in the year 1961 for the enforcement of the Drugs and Cosmetics Act, 1940 and Rules, 1945 framed thereunder. The Department is responsible for the enforcement of the said Act and Rules through licensing and inspection, drawal and testing of drug samples, and initiating prosecution against offenders. The Drugs Controller of Kerala (DC) has under his control 39 blood banks and 54 blood storage centres in Government sector alone (July 2022).

Scrutiny of records of the office of the DC revealed the following deficiencies in discharge of functions as per provisions of the Act and Rules:

8.2.1. Absence of centralized licensing system

There was no centralized database for monitoring the blood bank licensing process. The applications for grant/ renewal of licence were processed manually. Even though the Central Drugs Standard Control Organization (CDSCO) had launched (August 2021) an Online National Drug Licensing System (ONDLS) portal for the grant/ renewal of licence, it has not become operational due to technical issues (April 2022). In the absence of a centralised

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[95] IMAGE (Indian Medical Association Goes Eco-friendly) – One of the two agencies for collecting biomedical waste from healthcare facilities in the State.

[96] Modern Medicine, Dental, etc.

[97] Modern Medicine, Dental, Laboratories and Diagnostic centres

online system, monitoring of blood banks including the validity of licence, etc., was not effective as seen in the subsequent paragraph:

8.2.2. Functioning of blood banks without valid licence

The blood banks have to function with the prescribed requirements of infrastructure, technical staff, equipment, etc., as detailed[98] in the Drugs and Cosmetics Rules, 1945 and obtain valid licence[99] and licence once obtained is valid for five years. Blood banks are to be licenced and renewed jointly by the State Licensing Authority and Central Licence Approving Authority.

As per records in the office of the DC of the State, 27 out of 93 Government blood banks/ blood storage centres (29 *per cent*) were functioning without valid licence (March 2022) due to non-submission of documents for renewal of licence, delay in rectification of defects pointed out by DC, delay in conducting inspection by DC, etc. Scrutiny of files revealed that in TH Kottarakkara and DH Perinthalmanna, the delay in conducting joint inspection by the authorities was 10 months and 36 months respectively.

Drugs Controller stated (February 2022) that the blood centres in Government hospitals and Government Medical Colleges are functioning under DHS and DME. The ministerial staff in these offices were normally not aware of the importance of blood centre licensing system and hence the reporting of rectification did not reach the office of the DC in time. Further, shortage of staff in Department, delay in obtaining convenient dates of the Central Authority for joint inspection, travel restrictions due to COVID-19 pandemic, etc., caused delay in finalising renewal applications.

The reply is not tenable as both the HFWD and DC were responsible to enforce the provisions of Acts and Rules governing their activities. The fact that 27 blood banks/ blood storage centres were functioning without licence does not inspire confidence and there is no assurance that standards set under the Acts and Rules were attained/ maintained.

8.3. Bio-Medical Waste Management

Bio-Medical Waste Management Rules, 2016, (BMWM Rules, 2016) applies to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form. State Pollution Control Board **(**SPCB**)** is the prescribed Authority in the State to implement the BMWM Rules. The entrusted duties include inventorisation of Occupiers[100] and generation of data on bio-medical waste, treatment and disposal, submission of data to the Central Pollution Control Board (CPCB), grant and renewal, cancellation of

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98 Schedule F Part XII B of Drugs and Cosmetics Rules,1945

99 As per Rule 122-F of Drugs and Cosmetics Rules,1945

100 Occupier is a person having administrative control over the institution and the premises generating Bio-Medical waste which include a hospital, clinic, blood bank, etc.

authorisation[101], monitoring compliance of various provisions of authorisation, etc. Audit noticed monitoring lapses/ deficiencies in implementing the Rules and guidelines and ensuring its compliance as discussed below:

Every Occupier or Operator[102] handling bio-medical waste, irrespective of the quantity shall receive authorisation from SPCB[103]. Since the overall efficiency of authorisations in the country was far from satisfactory at 48 *per cent*, CPCB advised SPCBs[104] (2019) to expedite the process of authorising of healthcare facilities (HCFs) so that waste generated from facilities can be verified for proper collection and disposal.

The BMWM Rules, 2016 and guidelines issued by CPCB envisage display on the website, of Annual Reports with monthly records by HCFs and display of relevant information by the Common Bio-Medical Waste Treatment Facility (CBWTF) like environmental clearance obtained, list of all member healthcare facilities, charges levied on the member HCFs, copy of the annual report, list of HCFs which have not taken membership etc.

8.3.1. Healthcare facilities generating bio-medical waste without obtaining authorisation from KSPCB

The number of HCFs operating without authorisation and without submission of annual reports to KSPCB is shown in **Table 8.1**.

Table 8.1: Operation of unauthorised HCFs during calendar years 2017 to 2021

Year	Total number of HCFs in operation	Number of HCFs operating without authorization	Percentage of HCFs operating without authorization	Number of Occupiers who did not submit annual reports	Percentage of non-submission of annual reports
2017	9628	4865	50.53	7754	80.53
2018	12668	5916	46.70	9554	75.42
2019	13869	7134	51.44	10592	76.37
2020	17122	3774	22.04	14635	85.47
2021	17875	1083	6.06	13859	77.53

(Source: Data obtained from KSPCB)

- In Kerala, percentage of authorisation had increased from 49.47 in 2017 to 93.94 *per cent* in 2021. However, Audit noticed that 16[105] out of 20 major hospitals test-checked had not obtained authorization from SPCB (April and May 2022).

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[101] Authorisation means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, processing, disposal or any other form of handling of bio-medical waste in accordance with Rules and guidelines issued by GoI or Pollution Control Board.

[102] Operator of a common bio-medical waste treatment facility is a person who owns or controls a CBWTF

[103] Rule 10 of BMWM Rules, 2016

[104] In the Annual Report on BMWM for the year 2019 of CPCB

[105] THQH Kayamkulam, SAT Thiruvananthapuram, DH Nedumangad, GH Neyyattinkara, TH Fort, MCH Alappuzha, MC Thiruvananthapuram, Dental College Thiruvananthapuram, THQH Malayinkeezhu, DH Tirur, TH Wandoor, THQH Tirurangadi, WCH Ponnani, GH Kalpetta, THQH Vythiri, MC Manjeri.

- Audit also noticed that the compliance to the Rules by the HCFs and CBWTF was not ensured by the KSPCB as only two[106] out of 20 (10 *per cent*) taluk/ district level hospitals test-checked had submitted Annual Reports to KSPCB and uploaded Annual Reports in their websites. The CBWTF uploaded only the number of HCFs in each district and the charges levied on them.

  GoK stated (September 2023) that directions were given to bring all HCFs under the purview of the Board. The matter was also being taken up in the District Level Monitoring Committees constituted. GoK also attributed the deficiencies in monitoring to shortage of staff.

  Audit is of the opinion that critical requirements like display of environmental clearance of CBWTF, annual reports, healthcare facilities not covered by CBWTFs etc. are to be insisted upon by the Board.

8.3.2. Lack of adequate infrastructural facility and capacity for waste disposal

As per Annual Report on BMWM of CPCB for 2019, Kerala is one among the six States/ Union Territories where the capacity utilization of existing common infrastructure had exceeded 75 *per cent*. Therefore, CPCB had recommended that the State may examine the need for establishing additional facilities by conducting gap analysis.

As per the statistics of 35 States/ UTs (2019) published in the Annual Report of CPCB, 30 States/UTs were generating BMW in the range 0.10 to 41.60 tonnes/ day and 16 of them were operating two to 20 CBWTFs for its disposal. However, Kerala generated 42.90 tonnes per day and had only one CBWTF for its disposal till May 2021. CPCB also had observed that in Kerala, against 42.90 tonnes of BMW generated per day, the quantity treated and disposed was 40,270 kg/day[107]. Besides, the Chairman, KSPCB in State Level Advisory Committee meeting (September 2019) emphasized the need for establishment of at least four CBWTFs since the existing CBWTF was overloaded and inadequate. Audit noticed that though gap analysis revealed need for minimum four CBWTFs as early as in September 2019, only one CBWTF functioned till May 2021. Two CBWTFs were functioning in the State as of April 2022.

GoK replied (September 2023) that integrated Consent To Establish has been issued by the Board to another CBWTF at Adoor and hence the capacity of CBWTFs was adequate to treat biomedical waste generated in the State. Further, the Board entrusted National Institute for Interdisciplinary Science and Technology (NIIST CSIR) to conduct a gap analysis and based on the detailed study, all gaps noticed by Audit can be addressed.

However, Audit observes that since the third plant was not made operational, the issues of inadequacy of CBWTFs and saturation of capacity persist.

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[106] DH Mavelikkara, MCH Alappuzha

[107] 3,417 kg/day through captive treatment facility and 36,853 kg through CBWTF

8.3.3. Non-conducting of third-party inspection of the existing Common Bio-Medical Waste Treatment Facilities

Bio-medical Waste Management Rules, 2016 stipulates the SPCBs to undertake and support third party audits of the CBWTFs in their States.

Audit noticed that third party audit as prescribed in the BMWM Rules has not been conducted during the audit period. One agency (NIIST CSIR) was entrusted with the gap analysis study and inventory on Biomedical Waste Management in Kerala as per third party audit and MoU was entered into with the agency only on 29 September 2023.

8.4. Unauthorised operation of radiographic equipment

As per Rule 3 of Atomic Energy (Radiation Protection) Rules, 2004 issued by Department of Atomic Energy, GoI, no person shall, without a licence establish a radiation installation for siting, design, construction, commissioning and operation and decommission a radiation installation and handle any radioactive material or operate any radiation generating equipment, except in accordance with the terms and conditions of a licence.

Audit noticed that five radiographic equipment[108] were being operated in five hospitals without obtaining licence of Atomic Energy Regulatory Board which is in violation of the relevant norms thereby raising concern over the safety of the public as well as hospital staff operating the machines.

No remarks were furnished by GoK (November 2023).

8.5. Recommendations

- Government should ensure that the Clinical Establishments Act is implemented in the State in a time bound manner so that permanent registration is provided to those establishments which maintain prescribed minimum standards.
- Government should ensure that the Drugs Controller establishes a mechanism to monitor the validity of licences of blood banks and also ensures that the same are renewed without delay. Further, programmes may be conducted for Departmental staff to create awareness about the importance of adhering to relevant Acts and Rules.
- Government should ensure that urgent and time bound action is taken for establishment of new Bio-Medical Waste (BMW) Treatment Facility in the State and a mechanism established for assessing the BMW generated in the State, so as to ensure that all BMW is properly disposed of.

[108] X–ray unit in the Mental Health Centre, Thiruvananthapuram, X-ray units at GAMC and GHMC Thiruvananthapuram, Dental X-ray in TH Thuravoor and X-ray unit 60 mA in DH Tirur

CHAPTER IX – SUSTAINABLE DEVELOPMENT GOAL – 3

CHAPTER IX

SUSTAINABLE DEVELOPMENT GOAL – 3

Kerala has not yet formulated the action plan/ vision document for achieving the targets under SDGs. The assessment of the performance of the State with the inclusion of a few indicators *viz*. suicide rate, death rate due to road accidents and per capita out-of-pocket expenditure on health resulted in relegation of the State from first to ninth position in 2020-21. The per capita out-of-pocket expenditure on health in the State was second highest in the country. Similarly, the suicide rate per one lakh population and death rate due to road accidents exceeded the national average.

The SDGs are a universal set of 17 goals and 169 targets setup in 2015 by the United Nations General Assembly to help organise and streamline development actions for greater achievement of human wellbeing, while leaving no one behind by 2030[109]. SDG-3, "Good Health and Wellbeing" calls on countries to ensure healthy lives and promote wellbeing for all at all ages. Under the Goal, 13 global targets were fixed to be achieved by 2030 as shown in **Table 9.1**.

[109] adopted by 193 Member States at the United Nations General Assembly Summit (September 2015) with effect from 01 January 2016

Table 9.1: Global targets to be achieved by the year 2030

Target no.	Brief description
3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 1,00,000 live birth
3.2	By 2030, end preventable deaths of new borns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
3.3	By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
3.4	By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
3.5	Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
3.6	By 2030, halve the number of global deaths and injuries from road traffic accidents
3.7	By 2030, ensure universal access to sexual and reproductive healthcare services, including family planning, information and education, and the integration of reproductive health into national strategies and programmes
3.8	Achieve universal health coverage, including financial risk protection, access to quality essential healthcare services and access to safe, effective, quality and affordable essential medicines and vaccines for all
3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
3.a	Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate
3.b	Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.
3.c	Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States
3.d	Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

(Source: www.un.org)

9.1. Institutional framework

In India, Ministry of Statistics and Programme Implementation (MoSPI) is responsible for the development of National Indicator Framework (NIF) for

measuring the progress of SDGs and associated targets. National Institution for Transforming India (NITI Aayog) has the overall responsibility of programme implementation and alignment of Government schemes/ programmes to SDGs.

In Kerala, the Programme Implementation, Evaluation and Monitoring Department (PIEMD) is the Nodal Department for implementation and monitoring of SDGs. The State has designated Nodal Administrative Departments goal-wise, for coordinating various implementing Departments/ agencies. HFWD is the Nodal Administrative Department for Goal - 3.

9.2. Formulation of State Indicator Framework and District Indicator Framework

In order to achieve the 17 SDGs and associated targets, monitorable indicators in the State Indicator Framework (SIF) have to be developed and aligned with those included in the NIF by considering varied priorities and monitoring requirements at the State level. GoK stated (September 2023) that in Kerala, first version of SIF consisting of 191 indicators having reliable data out of 295 indicators in the NIF (version 3.1) was finalised and the development of second version of SIF was in progress. Efforts were also taken to develop District Indicator Framework.

9.3. Planning for achievement of targets under SDG - 3

9.3.1. Non-finalisation of vision document and action plan for achieving the targets

To develop a strategy for achievement of targets, the State has to prepare an effective action plan. The implementation of SDGs commenced in the State in the year 2016. Even after six years from the commencement of implementation, a vision document for attaining the targets based on a result-based monitoring framework was yet to be prepared. The Department stated that only after the finalisation of a vision document, the strategies and actions needed for implementation of SDG could be finalised. Hence, a time bound action plan was required to develop the vision document which was essential for attainment of targets as envisaged in global agenda.

GoK stated (September 2023) that the State Nodal Department had entrusted Centre for Management Development with the preparation of ‘SDG Vision Document 2030’ in September 2021. Goal-wise workshops were held from October 2022 to June 2023 for vetting the goal-wise draft vision documents prepared. A finalisation workshop needed to be held by the Centre for Management Development before the release of the vision document.

Despite nearing the halfway mark in implementation of SDGs, the State is yet to develop necessary guiding documents.

9.4. Performance of State under SDG - 3

9.4.1. Analysis of performance indicators meant for evaluation of progress of SDG - 3

SDG India Index for India and States for the period 2018 to 2021 provides an aggregate assessment of performance of all States and UTs. Under Goal - 3, the performance of the States was measured against five indicators (2018), eight indicators (2019) and 10 indicators (2020).

The overall status of Kerala and the performance of the State under Goal - 3 'Good health and well-being', as featured under the SDG India Index for the above three years is given in **Table 9.2**.

Table 9.2: Score of Kerala under SDG goals

SDG India Index for the year	Score of Kerala (overall)	Overall top scorer State	Score of Kerala under Goal – 3
2018	69	Kerala	92
2019-20	70	Kerala	82
2020-21	75	Kerala	72

(Source: SDG India Index)

A detailed analysis of the performance of Kerala under Goal - 3 indicators is given in **Appendix 9.1**. In the case of three indicators,[110] Kerala achieved the global targets. In respect of four[111] indicators, performance of Kerala was poor. Three of these indicators were introduced in 2020-21. The performance of the state on these indicators was poor, which lowered the performance of Kerala on the SDG-3 when compared with the previous two years.

Audit examined the performance of the State as regards four indicators of Goal - 3, in which its performance was poor. The details are as given below.

9.4.2. High out-of-pocket health expenditure

The high out-of-pocket expenditure (OOPE) on health indicates that individuals depending on private rather than public hospitals are high in the State. As per the targets fixed under global Goal - 3.8, monthly per capita OOPE on health as a share of monthly per capita consumption expenditure (MPCE) should be 7.83 by the year 2030. For the year 2020-21, the score of Kerala was 17 which was above the national average of 13. It was observed that out of the States/ UTs evaluated for this indicator, Kerala was in the second highest position. The findings on high OOPE on health in the State in SDG India Index 2020-21 is further substantiated by the National Health Accounts Estimates for India 2018-19. The Total Health Expenditure (THE) of Kerala in 2018-19 was ₹34,548

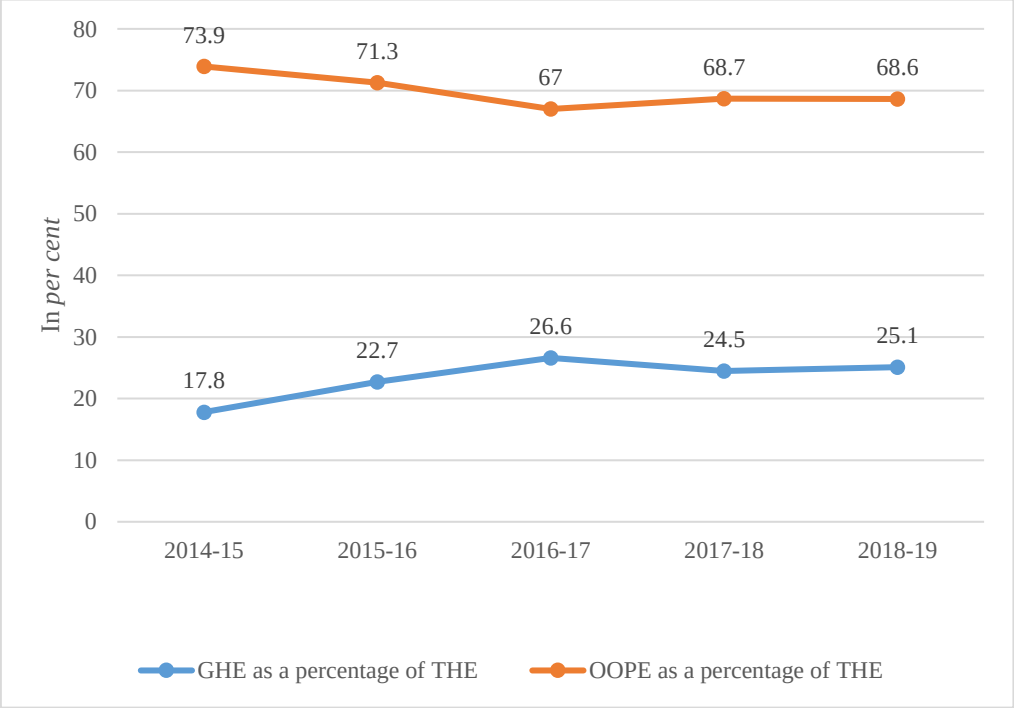
[110] MMR (Kerala 43, target 70), U5MR/1,000 live birth (Kerala 10, target- 25), total physicians, nurses, midwives per one lakh population (Kerala 115, target 45)

[111] Total case notification rate of Tuberculosis, suicide rate per one lakh population, death rate due to road traffic accident per lakh population and monthly per capita out-of-pocket expenditure on health as a share of monthly per capita consumption

crore (4.40 *per cent* of GSDP) of which Government expenditure contributed only ₹8,676 crore (25.10 *per cent)* and the per capita expenditure by Government was only ₹2,479. The OOPE was ₹23,702 crore (68.60 *per cent* of THE).

A comparison of the Government Health Expenditure (GHE) and the OOPE with THE is given in **Chart 9.1** below:

Chart 9.1: Comparison of the GHE and the OOPE with THE



(Source: National Health Accounts of respective years)

An analysis of the reasons for high OOPE on health prevailing in the State revealed the following:

- The health facilities offered in the Government sector were not in compliance with IPHS as pointed out in Chapter III of this Report.
- Data furnished by the DHS indicates a huge divide in the proportion of deliveries in the Government and private sector. During the period 2016-22, while 8.16 lakh deliveries (30 *per cent*) were carried out in Government hospitals, the number of deliveries in private sector was 18.71 lakh (70 *per cent*). According to the reports from National Family Health Survey (NFHS) 2015-16, institutional delivery in a public hospital in the State was 38.30 *per cent* and it decreased to 34.10 *per cent* as per NFHS (2019-20) whereas at national level, the rate improved from 52.10 *per cent* (2015-16) to 61.90 *per cent* (2019-21).
- GoK in Kerala Health policy, 2019 had identified the increasing trend in OOPE as one of the vital issues faced by the health sector. The reasons identified include deficiencies in strengthening and modernisation of

public healthcare facilities in the State. Audit noticed that deficiencies in public health facilities are still persisting which included non-functioning/ non-availability of blood banks/ ambulances for transportation of patients, lack of specialist doctors in hospitals, shortage in posts of nurses, pharmacists, etc., which forced the public to approach private hospitals for quality treatment, thereby increasing the OOPE.

GoK stated (September 2023) that the OOPE was considered as a negative indicator and the value is high for Kerala owing to the quality of treatment and facilities provided by the hospitals in Kerala, both public and private. The reply is not tenable as the high OOPE value itself signals the reliance of people in the State on private than public healthcare institutions, which can be attributed to the deficiencies in the public healthcare system in the State as pointed out in the previous chapters of this Report.

9.4.3. Higher incidence of Suicide

The SDG India index 2020-21, also shows that the suicide rate in Kerala per one lakh population was 24.3 whereas the national average was 10.4 and the target to be attained by 2030 was as low as 3.5. GoK set a target for reducing the number of suicide cases to less than 20 per one lakh population by the year 2020. However, according to National Crime Records Bureau (NCRB), Kerala recorded 24 in the year 2020 and was at the fifth position in the country. Rate of suicides in the State increased to 26.9 in 2021 and 28.5 in 2022. Kerala was in fourth position in 2022.

On pointing out the poor performance of Kerala, DHS enlisted the various activities undertaken by HFWD for improving mental health of various sections of the society such as School Mental Health Programme, *Aswasam* scheme for imparting training to health workers and staff nurses in screening public for cases of depression to reduce high suicide rate, *Jeevaraksha* programme for imparting training in suicide prevention to elected representatives, doctors, health workers, police personnel, etc., programmes such as *Amma manasu*[112] and *Sampoorna Manasikarogyam*[113].

The fact remains that Governmental efforts need to be intensified, particularly, in these specific areas.

9.4.4. Road traffic accidents

SDG Goal - 3 aims to reduce death rate due to road traffic accidents to 5.81 per lakh by the year 2030. As per SDG India Index 2020-21, death rate in Kerala was 12.42 per lakh while the national average was 11.56 per lakh.

[112] Programme to prevent suicidal tendency in women during ante and post-natal period.
[113] A programme to reduce treatment gap and dropout of mental health patients.

According to NCRB, in Kerala, out of 3,178 cases of death reported due to traffic accidents[114], 2,977 cases (94 *per cent*) related to road accidents in 2020. Analysis of total number of road accident cases reported in the country shows that 39,944 out of 4,37,396 cases (nine *per cent*) were reported from Kerala in 2019 and 27,799 out of 3,54,796 (eight *per cent*) in 2020. Though Kerala covers only 1.18 *per cent* of the total area of the country and support 2.76 *per cent* of the total population, it accounts for about eight to nine *per cent* of road accident cases in the country.

In order to reduce mortality due to accidents, especially due to internal bleeding, surgical interventions are required and the time between injury and treatment should ideally be kept to a bare minimum for which the hospitals should be provided with facilities as prescribed by IPHS. Audit noticed inadequacy of infrastructure for handling emergency care. Emergency OT was available only in three out of 14 district/ taluk hospitals test-checked. Out of the 14 hospitals, Mobile X-ray units and separate Laboratory for Emergency care were not provided in 10 and 11 hospitals respectively. As per IPHS, blood storage units were to be available in taluk level hospitals and blood banks in district level hospitals. Audit noticed that blood banks were not setup in four out of seven district hospitals test-checked.

GoK stated (September 2023) that since there is an efficient reporting system in the State, each case gets notified and this efficacy in proper reporting has turned out to be disadvantageous to the State in SDG India Index ranking on the indicators suicide rate and death rate due to road traffic accidents.

However, the fact remains that more efforts are needed to ensure that the health facilities are well-equipped to attend to accident and emergency related cases.

9.4.5. Performance relating to eradication of Tuberculosis

As against the indicator 'Total case notification of TB per one lakh population', the target for 2030 was set as 242. While the national score was 177, the score of Kerala was 75 (2020-21).

GoK stated (September 2022) that SDG India Index since 2020 was giving points for increase in TB case detection. As the State is implementing TB Elimination Mission with active surveillance and infection control, TB cases in the State is expected to continue a decreasing trend. Kerala was losing its points since the Index was calculated as a positive index. The same was communicated to GoI and NITI Aayog intimated that the indicator was modified and the State is awaiting the release of the next version of SDG India Index.

[114] Traffic accidents include road traffic accidents, railway crossing accidents

9.5. Recommendation

- Government should ensure that urgent steps are taken to formulate an Action Plan to achieve the targets under SDG -3 and improve performance against National level indicators relating to reduction of out-of-pocket expenditure on health etc.

(ATOORVA SINHA)
Accountant General
(Audit I), Kerala

Thiruvananthapuram,
The 23 October 2024

Countersigned

New Delhi,
The 24 October 2024

(GIRISH CHANDRA MURMU)
Comptroller and Auditor General of India

APPENDICES

Appendix 1.1

Category-wise number of healthcare institutions in the State

(Reference: Paragraph 1.7; Page: 5)

Category	Total Hospitals
Modern Medicine	
Medical Colleges and attached Hospitals	19
Dental Colleges	6
DH/ GH	36
TH/ THQH	87
Speciality/ DTBC	41
CHC	185
FHC/PHC	889
UPHC	96
Sub Centres	5414
AYUSH - ISM	
Medical Colleges	3
Hospitals	130
Dispensaries	818
Sub Centres	60
NHM dispensaries	257
AYUSH - Homoeo	
Medical Colleges	2
Hospitals	34
Dispensaries	669
NHM dispensaries	407
Total	**9153**

Appendix 1.2

List of institutions covered in audit

(Reference: Paragraph 1.7; Page: 6)

Sl. No.	Name of District	Name of Institutions covered in Audit
MODERN MEDICINE		
1.	Alappuzha (22 nos.)	FHC - Aryad, Cheruthana, Kadampoor, Puliyoor, Punnapra North, Thalavady, Nooranad, Perumpalam.
		UPHC - Mullathu Valappu
		CHC - Chunakkara, Muhamma
		TH/THQH - Thuravoor, Kayamkulam
		DH – Mavelikkara
		GH – Alappuzha
		TBC – Karuvatta
		MCH – Alappuzha
		Five sub-centres
2.	Malappuram (25 nos.)	PHC - Kannamangalam, Keezhattur, Pallickal, Kurumbalangode, Othukkungal, Thennala
		UPHC - Biyyam, Ponnani.
		FHC - Cherukavu, Chokkad, Thevarkadapuram, Thrikkannapuram, Parappanangadi
		CHC - Edappal, Tanur
		TH/THQH - Wandoor, Tirurangadi.
		DH – Tirur
		W and CH – Ponnani
		MCH – Manjeri
		Five sub-centres
3.	Thiruvananthapuram (26 nos.)	PHC – Perumpazhuthoor
		UPHC - Attukal, Kannammoola
		FHC - Amboori, Kuttichal, Mudakkal, Pallichal, Pullampara, Vettur, Pozhiyoor, Kattakkada
		CHC - Anchuthengu, Manamboor
		TH/THQH - Fort, Malayinkeezhu
		DH – Nedumangad
		GH – Neyyattinkara
		Mental HC – Peroorkada
		Dental CH - Thiruvananthapuram
		SAT – Thiruvananthapuram
		MCH – Thiruvananthapuram
		Five sub-centres
4.	Wayanad (14 nos.)	PHC – Varadoor
		UPHC – Kalpetta
		FHC - Thondernad, Vellamunda, Meppadi
		Tribal Hospital – Nalloornad (categorised under CHC by DHS)
		TH/THQH – Vythiri
		DH – Mananthavady
		GH – Kalpetta
		Five sub-centres
	TOTAL	**87 Institutions**
AYUSH		
5.	Thiruvananthapuram (6 nos.)	Government Homoeo Dispensary, Beemapally
		Government Ayurveda Dispensary, Karakulam
		Government Yoga Naturopathy Hospital, Varkala
		Government Ayurveda Marma Hospital, Kanjiramkulam

Sl. No.	Name of District	Name of Institutions covered in Audit
		Government Homoeo Medical College, Thiruvananthapuram
		Government Ayurveda Medical College, Thiruvananthapuram
6.	Malappuram (4 nos.)	Government Homoeo Dispensary, Thrikkalangode
		Government Ayurveda Dispensary, Valluvambram
		Government Ayurveda Hospital, Perinthalmanna
		Government Ayurveda Institute for Mental Diseases, Kottakkal
7.	Alappuzha (4 nos.)	Government Ayurveda Dispensary, Bharanikkavu
		Government Siddha Dispensary, Mannancherry
		Government Homoeo Hospital, Cherthala
		Government Ayurveda Panchakarma Hospital, Alappuzha
8.	Wayanad (4 nos.)	Government Homoeo Dispensary, Meppadi
		Government Ayurveda Dispensary, Meenangadi
		Government Homoeo Hospital, Mananthavady
		District Ayurveda Hospital, Kalpetta
	TOTAL	**18 Institutions**

Appendix 1.3

Audit Criteria

(Reference: Paragraph 1.10; Page: 8)

The Audit criteria adopted to achieve the audit objectives are:

1. National Health Policy, 2017
2. Sustainable Development Goals, National indicators, State specific programmes and activities
3. Indian Medical Council Act, 1956 replaced by National Medical Commission Act, 2019
4. Indian Public Health Standards, 2012
5. Indian Medical Degrees Act, 1916
6. Clinical Establishments Act, 2010 and The Kerala Clinical Establishments (Registration and Regulation) Act, 2018
7. Professional Conduct, Etiquette and Ethics Regulations, 2002
8. Drugs and Cosmetics Act 1940 and Rules, 1945
9. NHM Assessor's guidebook
10. Indian Nursing Council Act, 1947
11. Bio-Medical Waste Management Rules, 1998 and 2016
12. Atomic Energy (Radiation Protection) Rules, 2004
13. World Health Organisation norms
14. Establishment of Medical College Regulations,1999
15. Minimum Standards Requirement Regulations, 1999, replaced by Minimum requirement for annual MBBS admissions Regulations, 2020
16. National Accreditation Board for Testing and Calibration Laboratories - Accreditation Programmes for Testing Laboratories as per ISO/ IEC 17025, Calibration Laboratories as per ISO/ IEC 17025, Medical Laboratories as per ISO 15189, etc.
17. National Accreditation Board for Hospitals and Healthcare Providers - Accreditation Programmes for various Healthcare providers such as Hospitals, Blood Banks, Allopathic Clinics, AYUSH Hospitals, etc.
18. Indian Medicine Central Council Regulations, 2016
19. Homoeopathy Central Council (Minimum Standards Requirement of Homoeopathic Colleges and attached Hospitals) Regulations, 2013.
20. Homoeopathy Medical Colleges Teaching Service Special Rule, 2019
21. The National Commission for Indian System of Medicine Act, 2020
22. The National Commission for Homoeopathy Act, 2020
23. KASH (Kerala Accreditation Standards for Healthcare) AYUSH
24. Government of India/ GoK policies, norms, orders, circulars, annual/ administration reports, etc. related to healthcare.
25. IT Act 2000 and IT (Amendment) Act, 2008
26. Information Technology (IT) Policy, 2012 of Government of Kerala
27. Circulars issued by KMSCL
28. Terms of e-tenders
29. Regulatory Mechanism for AYUSH

Appendix 3.1

Status of FHCs under Aardram Mission

(Reference: Paragraph 3.1.2.1; Page: 33)

Sl. No.	Name of Institution	No. of shifts	Whether service provided on Sundays	Whether laboratory service provided
1.	FHC Amboori	2	Yes	Yes
2.	FHC Aryad	2	Yes	Yes
3.	FHC Cherukavu	**1**	Yes	**No**
4.	FHC Cheruthana	2	Yes	Yes
5.	FHC Chokkad	2	Yes	Yes
6.	FHC Kadampoor	**1**	Yes	Yes
7.	FHC Kattakkada	2	Yes	Yes
8.	FHC Kuttichal	2	Yes	Yes
9.	FHC Meppadi	2	Yes	Yes
10.	FHC Mudakkal	2	Yes	Yes
11.	FHC Nooranad	**1**	**No**	Yes
12.	FHC Pallichal	2	Yes	Yes
13.	FHC Parappanangadi	2	**No**	Yes
14.	FHC Perumpalam	**1**	Yes	Yes
15.	FHC Pozhiyoor	2	Yes	Yes
16.	FHC Puliyoor	**1**	Yes	Yes
17.	FHC Punnapra North	2	**No**	Yes
18.	FHC Thalavadi	**1**	Yes	**No**
19.	FHC Thevarkadappuram	2	**No**	Yes
20.	FHC Thondernad	2	Yes	Yes
21.	FHC Thrikkannapuram	2	Yes	Yes
22.	PHC Varadoor	**1**	**No**	**No**
23.	FHC Vellamunda	2	**No**	Yes
24.	FHC Vettoor	2	Yes	Yes
25.	PHC Kannamangalam	2	**No**	**No**
26.	PHC Keezhattur	**1**	**No**	Yes
27.	PHC Kurumbalangode	2	**No**	**No**
28.	PHC Othukkungal	2	**No**	**No**
29.	PHC Pallikkal	2	**No**	Yes
30.	PHC Perumpazhuthoor	**1**	**No**	**No**
31.	PHC Pullampara	**1**	**No**	Yes
32.	PHC Thennala	2	Yes	**No**
		Total Services Available	**19**	**24**

Appendix 3.2

Daily average patient load/ counter in test-checked hospitals

(Reference: Paragraph 3.1.5; Page: 35)

Sl. No.	Hospital	Patient strength (as of February 2020)	Daily average number of OP patients (column (2) ÷ 29 days)	No. of registration counters	Daily average number of patients/ counter (column (3)/column (4))
	1	2	3	4	5
1	DH Mananthavady	46626	1608	1	**1608**
2	THQH Kayamkulam	34442	1188	1	**1188**
3	GH Kalpetta	31082	1072	1	**1072**
4	TH Thuravoor	30017	1035	1	**1035**
5	GH Neyyattinkara	57546	1984	2	**992**
6	TH Wandoor	26080	899	1	**899**
7	DH Tirur	48603	1676	2	**838**
8	W and CH Ponnani	21894	755	1	**755**
9	MCH Thiruvananthapuram	98535	3398	5	**680**
10	CHC Tanur	18326	632	1	**632**
11	MCH Manjeri	66323	2287	4	**572**
12	THQH Tirurangadi	47239	1629	3	**543**
13	DH Mavelikkara	29465	1016	2	**508**
14	THQH Malayinkeezhu	13053	450	1	**450**
15	CHC Edappal	12816	442	1	**442**
16	MCH Alappuzha	62696	2162	5	**432**
17	TH Fort	22850	788	2	**394**
18	THQH Vythiri	11088	382	1	**382**
19	UPHC Mullathu valappu	10886	375	1	**375**
20	DH Nedumangad	32275	1113	3	**371**
21	FHC Meppadi	9781	337	1	**337**
22	FHC Kuttichal	7423	256	1	**256**
23	CHC Manamboor	7092	245	1	**245**
24	FHC Pozhiyoor	6488	224	1	**224**
25	FHC Vellamunda	6261	216	1	**216**
26	PHC Pallikkal	6023	208	1	**208**
27	CHC Chunakkara	11617	401	2	**200**
28	FHC Perumpalam	5765	199	1	**199**
29	CHC Muhamma	11335	391	2	**195**
30	CHC Anchuthengu	5584	193	1	**193**
31	FHC Pallichal	4787	165	1	**165**
32	PHC Othukkungal	4787	165	1	**165**
33	GMHC Thiruvananthapuram	4779	165	1	**165**
34	FHC Parappanangadi	4629	160	1	**160**
35	UPHC Kalpetta	4411	152	1	**152**
36	GH Alappuzha	42781	1475	10	**148**
37	PHC Kannamangalam	3701	128	1	**128**

Sl. No.	Hospital	Patient strength (as of February 2020)	Daily average number of OP patients (column (2) ÷ 29 days)	No. of registration counters	Daily average number of patients/ counter (column (3)/column (4))
38	FHC Punnapra North	3585	124	1	**124**
39	FHC Thondernad	3443	119	1	**119**
40	PHC Keezhattur	3243	112	1	**112**
41	GTH Nalloornad	3074	106	1	**106**
42	PHC Thennala	3038	105	1	**105**
43	FHC Nooranad	3034	105	1	**105**
44	FHC Cheruthana	2925	101	1	**101**
45	FHC Thrikkannapuram	2669	92	1	**92**
46	PHC Pullampara	2560	88	1	**88**
47	TBC Karuvatta	2064	71	1	**71**
48	PHC Varadoor	2030	70	1	**70**
49	PHC Kurumbalangode	1905	66	1	**66**
50	FHC Chokkad	3796	131	2	**65**
51	FHC Kattakkada	1856	64	1	**64**
52	UPHC Ponnani	1768	61	1	**61**
53	FHC Puliyoor	1714	59	1	**59**
54	FHC Thevarkadappuram	1656	57	1	**57**
55	UPHC Biyyam	1640	57	1	**57**
56	FHC Mudakkal	1627	56	1	**56**
57	FHC Cherukavu	1535	53	1	**53**
58	FHC Thalavadi	1519	52	1	**52**
59	FHC Vettoor	1473	51	1	**51**
60	UPHC Kannamoola	1394	48	1	**48**
61	UPHC Attukal	1247	43	1	**43**
62	PHC Perumpazhuthoor	1041	36	1	**36**
63	FHC Kadampoor	987	34	1	**34**
64	Dental College, Thiruvananthapuram	882	30	1	**30**
65	FHC Aryad	1209	42	2	**21**
66	FHC Amboori	577	20	1	**20**
67	SAT Thiruvananthapuram	MCH Thiruvananthapuram furnished combined OP data of MCH and SAT Thiruvananthapuram. Hence, no separate data available for SAT Thiruvananthapuram			

Appendix 3.3

Availability of IPD services

(Reference: Paragraph 3.2; Page: 38)

I. District/ General hospitals

Test-checked GH/DHs	Availability of essential IPD services							
	General Medicine	General Surgery	O and G	Trauma care	Paediatrics	Orthopaedics	Psychiatry	Physiotherapy
GH Neyyattinkara	Yes	Yes	Yes	No	Yes	Yes	No	Yes
GH Alappuzha	Yes	Yes	No	No	Yes	Yes	No	Yes
DH Tirur	Yes	Yes	Yes	No	Yes	Yes	No	Yes
DH Nedumangad	Yes	Yes	Yes	No	Yes	Yes	No	Yes
DH Mananthavady	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GH Kalpetta	Yes	Yes	Yes	No	Yes	Yes	Yes	No
DH Mavelikkara	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
IP Services available (out of 7)	7	7	6	2	7	7	3	5

II. Taluk/ Taluk HQ hospitals

Test-checked TH/ THQHs	Availability of essential IPD services					
	General Medicine	General Surgery	O and G	Emergency care	Paediatrics	Orthopaedics
THQH Kayamkulam	Yes	Yes	Yes	Yes	Yes	Yes
TH Thuravoor	Yes	No	Yes	Yes	No	No
TH Wandoor	No	No	Yes	Yes	Yes	No
THQH Tirurangadi	Yes	Yes	Yes	Yes	Yes	Yes
TH Fort	Yes	Yes	Yes	Yes	Yes	No
THQH Malayinkeezhu	Yes	No	No	Yes	No	No
THQH Vythiri	Yes	Yes	Yes	Yes	No	Yes
IP Services available (out of 7)	6	4	6	7	4	3

Appendix 3.4

Availability of pathology services in test-checked hospitals

(Reference: Paragraph 3.9.2.1; Page: 54)

District/ General Hospitals

Sl. No.	Department	Laboratory Services	GH Neyyatinkara	GH Alappuzha	DH Tirur	DH Nedumangad	DH Mananthavady	GH Kalpetta	DH Mavelikkara
			(Availability: 1 indicates Yes/ 0 indicates No)						
1.	**Clinical Pathology**	Haemoglobin estimation	1	1	1	1	1	1	1
2.	a. Haematology	Total Leukocytes count	1	1	1	1	1	1	1
3.		Differential Leukocytes count	1	1	1	1	1	1	1
4.		Absolute Eosinophil count	1	1	0	1	1	0	1
5.		Reticulocyte count	0	0	0	0	1	1	0
6.		Total RBC count	1	1	0	1	1	1	1
7.		E. S. R.	1	1	1	1	1	1	1
8.	Immunoglobin Profile (IGM, IGG, IGE, IGA)	Bleeding time	1	1	0	1	1	1	1
9.	Fibrinogen Degradation Product	Clotting time	1	1	1	1	1	1	1
10.		Prothrombin time	0	0	1	0	0	0	1
11.		Peripheral Blood Smear	0	0	1	0	1	0	0
12.		Malaria/Filaria Parasite	1	1	1	1	1	1	1
13.		Platelet count	1	1	1	1	1	1	1
14.		Packed Cell volume	1	1	1	1	1	1	1
15.		Blood grouping	1	1	1	1	1	1	1
16.		Rh typing	1	1	1	1	1	1	1
17.		Blood Cross matching	0	0	1	1	1	0	0
18.		ELISA for HIV, HCV, HBs Ag	0	0	0	0	1	0	1
19.		ELISA for TB	1	0	0	1	0	0	0
20.		APtt	0	0	1	0	0	0	1
21.		ANA/ANF, Rheumatoid Factor	0	0	1	1	1	1	0
22.	b. Urine Analysis	Urine for Albumin, Sugar, Deposits, bile salts, bile pigments, acetone, specific gravity, Reaction (pH)	1	1	1	1	1	1	1
23.	c. Stool Analysis	Stool for Ovacyst (pH),	1	1	0	1	1	1	1
24.		Hanging drop for V. Cholera	1	0	0	1	1	1	0
25.		occult blood	1	0	0	0	1	0	0
26.		Bacterial culture and sensitivity	1	0	0	0	0	0	0
27.	d. Semen Analysis	Morphology, count	0	0	0	1	0	0	1
28.	e. CSF Analysis	Analysis, Cell count, etc.	0	0	0	0	1	0	0
29.	f. Aspirated fluids	Cell count cytology	0	0	0	0	1	0	0
30.	**Pathology** a. PAP smear	Cytology	0	1	0	0	0	0	0
31.	b. Sputum	Sputum cytology	0	1	0	0	0	0	0
32.	c. Haematology	Bone Marrow Aspiration	0	1	0	0	0	0	0
33.		Immuno haematology	0	0	0	0	0	0	0
34.		Coagulation disorders	0	0	0	0	0	0	1
35.		Sickle cell anaemia	0	0	0	0	1	1	0
36.		Thalassemia	0	0	0	0	1	0	0
37.	d. Histopathology	All types of specimens, Biopsies	0	0	0	0	0	0	0
38.	**Microbiology**	KOH study for fungus	0	0	0	0	0	0	0
39.		Smear for AFB, KLB (Diphtheria)	0	0	0	1	0	0	0
40.		Culture and sensitivity for blood, sputum, pus, urine, etc.	0	0	0	0	0	0	0

Sl. No.	Department	Laboratory Services	GH Neyyattinkara	GH Alappuzha	DH Tirur	DH Nedumangad	DH Mananthavady	GH Kalpetta	DH Mavelikkara
41.		Bacteriological analysis of water by H_2S based test	0	0	0	0	0	0	0
42.		Stool culture for Vibrio Cholera and other bacterial enteropathogene	0	0	0	0	0	0	0
43.		Supply of different media for peripheral Laboratories	0	0	0	0	0	0	0
44.		Grams Stain for Throat swab, sputum, etc.	0	0	0	0	0	0	0
45.	**Serology**	RPR Card test for Syphillis	1	0	0	1	1	1	1
46.		Pregnancy test (Urine gravindex) ELISA for Beta HCG	1	0	1	1	1	0	1
47.		Leptospirosis, Brucellosis	1	1	1	1	1	1	1
48.		WIDAl test	1	1	0	1	1	1	1
49.		Elisa test for HIV, HBsAg, HCV	0	0	0	0	1	0	1
50.		DCT/ICT with Titre	0	0	0	0	1	0	0
51.		RA factor	1	0	1	1	1	1	1
52.	**Biochemistry**	Icteric index	1	0	0	0	0	0	0
53.		Liver function tests	1	1	1	1	1	1	1
54.		Kidney function tests	1	1	1	1	1	1	1
55.		Lipid Profile	1	1	1	1	1	1	1
56.		Blood uric acid	1	1	1	1	1	1	1
57.		Serum calcium	1	1	0	1	1	1	1
58.		Serum Phosphorous	1	1	0	1	1	1	1
59.		Serum Magnesium	0	0	0	0	1	0	0
60.		CSF for protein, sugar	0	0	0	0	1	0	0
61.		Blood gas analysis	0	0	0	0	1	0	1
62.		Estimation of residual chlorine in water	0	0	0	0	0	0	0
63.		Thyroid T3 T4 TSH	1	1	0	0	1	1	1
64.		CPK	0	0	0	0	1	0	0
65.		Chloride	0	1	0	0	1	0	0
66.		Salt and Urine for Iodine	0	0	0	0	0	0	0
67.		Iodometry Titration	0	0	0	0	0	0	0
	Total Lab Services available		**32**	**28**	**23**	**32**	**45**	**29**	**34**

Taluk Hospitals / THQHs

Sl. No.	Department	Laboratory Services	THQH Tirurangadi	TH Thuravoor	TH Fort	THQH Kayamkulam	THQH Malayinkeezhu	THQH Vythiri	TH Wandoor
			(Availability: 1 indicates Yes/ 0 indicates No)						
1.	**Clinical Pathology**	Haemoglobin estimation	1	1	1	1	1	1	1
2.	a. Haematology	Total Leukocytes count	1	1	1	1	1	1	1
3.		Differential Leukocytes count	1	1	1	1	1	1	1
4.		Absolute Eosinophil count	1	0	0	1	1	0	1
5.		Reticulocyte count	0	0	0	0	0	0	0
6.		Total RBC count	1	1	1	1	1	1	1
7.		E. S. R.	1	1	1	1	1	1	1
8.		Bleeding time	1	1	1	1	1	1	1
9.		Clotting time	1	1	1	1	1	1	1
10.		Prothrombin time	0	0	0	0	0	0	0
11.		Peripheral Blood Smear	0	1	0	0	0	0	0

Sl. No.	Department	Laboratory Services	THQH Tirurangadi	TH Thuravoor	TH Fort	THQH Kayamkulam	THQH Malayinkeezhu	THQH Vythiri	TH Wandoor
12.		Malaria/ Filaria Parasite	1	1	1	1	1	1	1
13.		Platelet count	1	1	1	1	1	1	1
14.		Packed Cell volume	1	1	1	1	1	1	1
15.		Blood grouping	1	1	1	1	1	1	1
16.		Rh typing	1	1	1	1	1	1	1
17.		Blood Cross matching	0	0	0	0	0	0	0
18.	b. Urine Analysis	Urine for Albumin, Sugar, Deposits, bile salts, bile pigments, acetone, specific gravity, Reaction (pH)	1	1	1	1	1	1	1
19.	c. Stool Analysis	Stool for Ovacyst (pH)	1	0	0	1	1	1	0
20.		Hanging drop for V. Cholera	0	0	0	0	0	0	0
21.		Occult blood	0	0	0	0	0	1	0
22.	d. Semen Analysis	Morphology, Count, Motility etc.	0	0	0	0	0	0	0
23.	e. CSF Analysis	Analysis, Cell count etc.	0	0	0	0	0	0	0
24.	f. Aspirated fluids	Cell count cytology	0	0	0	0	0	0	0
25.	**Pathology**	Sputum cytology	0	0	0	0	0	0	0
26.	**Microbiology**	Smear for AFB, KLB (Diphtheria)	1	1	0	0	1	1	1
27.		Grams Stain for Meningococci	0	0	0	0	0	0	0
28.		KOH study for fungus	0	0	0	0	0	0	0
29.		Grams Stain for Throat swab, sputum etc.	0	0	0	0	0	0	0
30.	**Serology**	RPR Card test for Syphillis	1	1	0	1	1	1	1
31.		Pregnancy test (Urine gravindex)	1	1	0	0	1	1	1
32.		WIDAl test	1	0	0	1	1	1	1
33.		Rapid test for HIV, HBs Ag, HCV, stocking of rapid H_2S based test for bacteriological examination of water	1	1	0	1	1	1	1
34.	**Biochemistry**	Blood Sugar	1	1	1	1	1	1	1
35.		Liver function tests	1	1	1	1	1	1	1
36.		Kidney function tests	1	1	1	1	1	1	1
37.		Lipid Profile	1	1	1	1	1	1	0
38.		Blood urea, blood cholesterol, Lipid Profile	1	1	1	1	1	1	1
39.		Stocking of OT test for residual chlorine in water	0	0	0	0	0	0	0
40.		CSF for protein, sugar	0	0	0	0	0	0	0
	Total Lab Services available		**25**	**23**	**18**	**23**	**25**	**25**	**23**

Community Health Centres

Sl. No.	Department	Laboratory Services	CHC Chunakkara	CHC Edappal	CHC Tanur	CHC Anchuthengu	CHC Muhamma	Tribal Hospital Nalloornad	CHC Manamboor
			(Availability: 1 indicates Yes/ 0 indicates No)						
1.	**Clinical Pathology**	Haemoglobin estimation	1	1	1	1	1	1	1
2.	a. Haematology	Total Leukocytes count	1	1	1	1	1	1	1
3.		Differential Leukocytes count	1	1	1	1	1	1	1
4.		Absolute Eosinophil count	0	1	0	1	0	1	1
5.		Reticulocyte count	0	0	0	0	0	0	0
6.		Total RBC count	0	1	0	1	1	1	1
7.		E. S. R.	1	1	1	1	1	1	1

Sl. No.	Department	Laboratory Services	CHC Chunakkara	CHC Edappal	CHC Tanur	CHC Anchuthengu	CHC Muhamma	Tribal Hospital Nalloornad	CHC Manamboor
8.		Peripheral Blood Smear	0	1	0	0	0	1	0
9.		Malaria/ Filaria Parasite	1	1	1	1	1	1	1
10.		Platelet count	1	1	1	1	1	1	1
11.		Packed Cell volume	1	1	0	1	1	1	1
12.		Blood grouping	1	1	0	1	0	1	0
13.		Rh typing	1	1	0	1	0	1	0
14.		Blood Cross matching	0	0	0	0	0	0	0
15.	b. Urine Analysis	Urine for Albumin, Sugar, Deposits, bile salts, bile pigments, acetone	1	1	1	1	1	1	1
16.	c. Stool Analysis	Stool for Ovacyst (Ph)	1	0	0	0	1	1	0
17.		Hanging drop for V. Cholera	0	0	0	0	1	1	0
18.		Occult blood	0	0	0	0	0	1	0
19.	**Pathology Sputum**	Sputum cytology	0	0	0	0	0	0	0
20.	**Microbiology**	Smear for AFB, KLB (Diphtheria)	1	1	1	1	1	0	0
21.		Grams Stain for Throat swab, sputum etc.	0	0	0	0	0	0	0
22.	**Serology**	VDRL	0	1	0	0	0	1	1
23.		Pregnancy test (Urine gravindex)	1	1	0	1	0	1	1
24.		WIDAl test	1	0	0	1	0	0	1
25.	**Biochemistry**	Blood Sugar	1	1	1	1	1	1	1
26.		Blood urea	1	1	0	1	1	1	1
27.		Liver function tests	1	1	0	1	0	1	1
28.		Kidney function tests	1	1	0	1	1	1	1
29.		Lipid Profile	1	1	0	1	1	0	1
	Total Lab Services available		**19**	**21**	**9**	**20**	**16**	**22**	**18**

Appendix 3.5

Availability of pathology services in test-checked AYUSH hospitals

(Reference: Paragraph 3.9.2.2; Page: 54)

Sl. No.	Name of the hospital/ dispensary	Laboratory services including pathology and microbiology
1.	Government Siddha Dispensary, Mannanchery	No
2.	Government Ayurveda Dispensary, Bharanikkavu	No
3.	Government Ayurveda Panchakarma Hospital, Alappuzha	No
4.	Government Homoeo Hospital, Cherthala	Yes
5.	Government Ayurveda Research Institute for Mental Diseases, Kottakkal	Yes
6.	Government Ayurveda Hospital, Perinthalmanna	No
7.	Government Ayurveda Dispensary, Valluvambram	No
8.	Government Homoeo Dispensary, Thrikkalangode	No
9.	Government Homoeo Hospital, Mananthavady	Yes
10.	District Ayurveda Hospital, Kalpetta	Yes
11.	Government Ayurveda Dispensary, Meenangadi	No
12.	Government Homoeo Dispensary, Meppadi	No
13.	Government Homoeo Dispensary, Beemapally	No
14.	Government Ayurveda Dispensary, Karakulam	No
15.	Government Ayurveda Marma Hospital, Kanjiramkulam	Yes
16.	Government Yoga Naturopathy Hospital, Varkala	Yes
17.	Government Homoeopathic Medical College Hospital, Thiruvananthapuram	Yes
18.	Government Ayurveda Medical College Hospital, Thiruvananthapuram	Yes

Appendix 4.1

Deficiencies in IT management of DDMS

(Reference: Paragraph 4.6; Page: 75)

Sl. No.	Indicators	Audit Observations	Remarks of KMSCL
1	**IT Governance:** Information Technology Strategy represents the mutual alignment between IT strategy and business strategic objectives. The strategy should consider the existing IT infrastructure and architecture, investments, delivery model, resourcing including staffing, and lay out a strategy that integrates these into a common approach to support the business objectives	**Absence of IT Strategy and Planning** 1. Vision document comprising among other things the objectives of the system, problem statement, business needs/ requirements, product/ solution overview and process details was not prepared. 2. Without formally assessing and documenting the functional requirements, the management proceeded with adopting application system functioning elsewhere. 3. IT governing, steering, monitoring and operation committees were not constituted. 4. There was no Information Security Officer to look into the information security breaches and incidents. 5. DDMS is not integrated with e-Procurement system of Government of Kerala, depriving system automation and audit trail. 6. There were inadequate provisions of grants to KMSCL during all the years covered under audit, compelling them to delay payments to their vendors.	KMSCL stated (June 2022) that they have an Information Technology (IT) division with technically qualified officers who are looking after the IT related operations of the Corporation. The DDMS application is not integrated with the e-Procurement system as NIC[115] has not yielded to the proposal for integrating the systems through API. The reply is not acceptable as one of the mandates of NIC is to explore and advise on use of emerging technologies. Hence, the impediments in integration of the systems are the lack of decision making and direction at appropriate level. The reply further indicates that there is little involvement of Governing Body in the design, development and operation of the IT system.
2	**Documentation** User Requirement Specifications (URS) document obtained from users and System Requirement Specifications (SRS) document developed by the software development team ensure that the needs of the users of the system have been taken care of and the software developed will meet the business requirements.	**Documentation Deficiencies** URS document was not prepared. The absence of well documented URS deprived a benchmark both for the developer and KMSCL. This led to ad-hoc system development and design deficiencies. In the absence of URS, Audit could not assess precisely whether full functionality of the software and the intended benefits of computerisation were achieved. Though SRS document was prepared by the developer, the same was not formally accepted by the Governing Body. In addition, there was no signing-off of the project.	KMSCL stated (June 2022) that the SRS document prepared in consultation with the various divisions of KMSCL was accepted and put forward for developing the application. The reply is not acceptable as no evidences of acceptance of the Governing Body and signing-off of the project were produced to Audit.
3	**IT Security policy** The IT security policy should define organisational assets (data, equipment, business processes) that need protection and link to procedures, tools, and physical access control that protect such assets.	**Absence of specifically laid down IT Security policy** KMSCL did not have a specifically laid down IT security and password policy. During interaction with end-users, it was disclosed that though system accepts only strong passwords, it does not enforce periodical change of passwords.	
4	**System design** System design is concerned with how the functional requirements will actually be provided and provides the definition of how the	**System design deficiency** DDMS is not integrated with e-Procurement system. In its absence, when the tender quantity is finalised in DDMS, the details are required to be manually entered in the e-Procurement system. After opening the bids, the details need to be manually entered in DDMS for further processing. This process not only accounts for	GoK replied (November 2023) that since Kerala State IT Mission had not provided Application Programming Interface, DDMS could not be integrated with e-procurement.

[115] National Informatics Centre (NIC) under the Ministry of Electronics and Information Technology (MeitY) is the technology partner of the Government of India. NIC was established in the year 1976 with the objective to provide technology-driven solutions to Central and State Governments.

Sl. No.	Indicators	Audit Observations	Remarks of KMSCL
	programmers will go on to build the system.	wastage of time, but also leads to non-capture of essential technical bid documents for audit trail.	
5	**Operation control**	**Inefficiencies in maintenance of master table designed for hospitals** Analysis of data revealed that the master table designed for storing data relating to drugs and other objects procured by hospitals locally did not follow any of the principles required for a master table as narrated below. Instead of adopting the control of single-point data entry, all the users are permitted to enter data. Table is devoid of deduplication and unique keys. Multiple codes are assigned to same items/ drugs. There are 17,493 duplicate values in item codes. Even 296 codes are assigned to a single item. This lapse would deprive the management of an efficient system control for ensuring the genuineness and economy of expenditure regarding local purchase.	Accepting the observation, KMSCL stated (June 2022) that unique centralised table for maintaining the items procured by the institutions would be customised.
6	**Validation controls**	**Mistakes in data capture caused by lack of validation controls** Analysis of data in respect of local purchases revealed that the unit rate of same drug purchased by the same facility varied extremely, which brought out possibility of mistakes in the data capture caused by lack of both systemic and supervisory validation controls	
7	**Contract management**	**Insufficient clauses in service level agreements (SLA) with developer and annual maintenance contractor (AMC)** SLA is the most critical element of outsourcing and is a legally binding agreement, which enables effective management of vendors. Typical areas of even a simple SLA would include among other things, types of services, allocation of responsibilities between the organisation and the vendor, the services that will be measured, measurement period, duration, location, and reporting timelines, penalty clauses, termination/ 'material breach' clauses, etc. Audit observed that SLA with developer and AMC did not include any clauses on penalty and termination. There was no SLA for data backup.	KMSCL accepted (June 2022) the observation.
8	**Business continuity planning**	**Lapses in business continuity planning and disaster recovery planning** Business continuity planning is the process an organisation uses to plan and test the recovery of its business processes after a disruption and how an organisation will continue to function under adverse conditions like natural or other disasters. Disaster recovery planning is a subset of business continuity planning. It is the process of planning and testing for recovery of information technology infrastructure after a natural or other disaster. Audit noticed with appreciation that adequate measures were adopted for backup of data as the backup is done at the State Data Centre. However, there was no prescribed procedure for regular disaster recovery testing. Evidence of data recovery testing was not available on record.	KMSCL accepted (June 2022) the observation.

Sl. No.	Indicators	Audit Observations	Remarks of KMSCL
9	**Information security**	**Information security issues: Flaws in web security** DDMS has not undergone STQC[116] audit. But, a certification completed in January 2017 by CERT-K[117] was produced to Audit. As per the report (February 2017), there were three vulnerabilities with low severity under the OWASP[118] Top 10 vulnerabilities[119] 2013, which needed fixing. As per the report, the vulnerabilities had the following impacts: 1.Error message on page: The error messages may disclose sensitive information. This information can be used to launch further attacks. 2.User credentials are sent in clear text: A third party can read the user credentials by intercepting an unencrypted HTTP connection. 3.Login page password-guessing attack: An attacker can attempt to discover a weak password by systematically trying every possible combination of letters, numbers, and symbols until it discovers the one correct combination that works. Audit noticed that DDMS was not hosted in a secure website,[120] causing transmission of information in plain text, with the high risk of sniffing attack[121]. Thus, it is evident that the vulnerabilities pointed out in the report of CERT-K certification were not fixed. The risk of interception of passwords sent over the Internet can be reduced by using cryptographic protection.	KMSCL accepted the observation (June 2022) and further stated that actions were since initiated to audit the system and host the system in secure website.

[116] Standardisation Testing and Quality Certification (STQC) Directorate is an attached office of the Ministry of Electronics and Information Technology, Government of India, which provides quality assurance services in the area of Electronics and IT through countrywide network of laboratories and centres.

[117] Government of Kerala set up Computer Emergency Response Team for Kerala (CERT-K) in line with the Indian CERT (CERT-In), the national nodal agency, to develop expertise in Government and Government Agencies in Kerala for handling cyber attacks and for preparing adequate sectoral contingency plans for handling crisis that may happen due to cyber attack or cyber terrorism. CERT-K operates on behalf and in conjunction with CERT-In.

[118] The Open Web Application Security Project (OWASP) is an online community that produces freely available articles, methodologies, documentation, tools and technologies in the field of web application security.

[119] OWASP Top Ten: first published in 2003, is regularly updated. It aims to raise awareness about application security by identifying some of the most critical risks facing organizations.

[120] Hypertext Transfer Protocol Secure (HTTPS) is used for secure communication on the Internet. In HTTPS, the communication protocol is encrypted using Transport Layer Security (TLS) or, formerly, Secure Sockets Layer (SSL).

[121] Sniffing attack corresponds to theft or interception of data by capturing the network traffic using a packet sniffer (an application aimed at capturing network packets).

Appendix 4.2

Details of equipment found idling in test-checked institutions

(Reference: Paragraph 4.7.5; Page: 83)

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
1.	GH Neyyattinkara	Pure tone Audiometer	2019	61425	November 2019	Lack of staff	January 2022	26
2.		Blood Gas Analyser	2014	384511	March 2016	High cost of Reagents	January 2022	70
3.		-do-	2015	380627	August 2016		January 2022	65
4.	FHC Kadampoor	Water Bath serological-1	2020-21	7599	July 2020	Not specified	February 2022	19
5.		Oxygen Concentrator	2021-22	NA	July 2021	Not needed	February 2022	7
6.		-do-		37581	July 2021	Not needed	February 2022	7
7.	CHC Edappal	Horizontal Rectangular Autoclave	2018	859040	October 2018	Lack of staff in Gynaecology wing	November 2021	37
8.		Multifunctional Labour Cot (type-2)	2018	38078	November 2018		November 2021	36
9.		Multifunctional Labour Cot (type-2)	2018	76157	April 2018		November 2021	43
10.		Multiparameter Monitor	2018	199920	November 2018		November 2021	36
11.		Suction Apparatus	2018	37296	December 2018		November 2021	35
12.		Laryngoscope (1 Adult and 1 Paediatric)	2019	16464	March 2019		November 2021	32
13.		Oxygen Cylinder with FM and stand	2019	9489	February 2021		November 2021	9
14.		OT Light Shadow	2019	192640	January 2019		November 2021	34
15.		Pulse Oxymeter	2019	75936	August 2019		November 2021	27
16.		Needle Burner cum Syringe Cutter	2018	17248	August 2018		November 2021	39
17.		Weighing Machine (Adult)	2018	3069	November 2018		November 2021	36
18.		Suction Low pressure	2019	6216	February 2019		November 2021	35
19.		Oxygen Concentrator	2021	26700	January 2019		November 2021	34
20.		X-Ray film Lobby	2021	25424	October 2021		November 2021	1
21.		Digital BP apparatus	2018	12998	August 2018		November 2021	39
22.		OT Table Manual Hydraulic	2019	164020	February 2019		November 2021	33

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
23.		Fumigation Dispenser	2018	46666	March 2018		November 2021	44
24.		Foetal Doppler	2018	16800	February 2018		November 2021	45
25.		Defibrillator with cardiac monitor	2018	167423	June 2018		November 2021	41
26.		Foetal Monitor Model- A CTG machine	2018	80528	September 2018		November 2021	38
27.		Baby Weighing Machine	2019	17664	April 2019		November 2021	31
28.		Anaesthesia Machine	2018	716184	May 2018		November 2021	42
29.		Ambu Bag (2 Adult and 2 Paediatric)	2018	8960	January 2018		November 2021	46
30.		Ultrasound Machine		781000	Bill not received		November 2021	
31.		Suction Apparatus	2019	11088	February 2019		November 2021	33
32.		Nebulizer	2018	8647	May 2018		November 2021	42
33.		Crash Cart	2019	19800	August 2019		November 2021	27
34.		Ventilator CPAP	2019	66640	February 2019		November 2021	33
35.		Infusion Pump with IV set	2019	22950	February 2019		November 2021	33
36.	PHC Thennala	Micropipette 1000 microlitres (fixed)	2019	663	November 2019	No Lab in the PHC	November 2021	24
37.		Micropipette 10 ml microlitres (fixed-ss-us)	2019	663	November 2019		November 2021	24
38.		Micropipette 10-100 microlitres	2019	1511	November 2019		November 2021	24
39.		Micropipette 100-1000 microlitres	2019	1511	November 2019		November 2021	24
40.		ESR Stand ss (6-tube-H-LIFECARE) with Tube (6 Nos.)	2019	464	November 2019		November 2021	24
41.		Haemometer Round Tube	2019	1339	November 2019		November 2021	24
42.		Mini Spirometer	2021	9309	May 2021		November 2021	6
43.		Mouth Piece for Spirometry	2021	1637	May 2021		November 2021	6
44.		Oxygen Concentrator-Single Chamber	2021	31250	May 2021		November 2021	6
45.		Haemometer Test Strips	2021	17100	May 2021		November 2021	6
46.	PHC Perumpazhuthoor	Lab Equipment	2019	51269	March 2019	No staff	January 2022	34

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
47.	CHC Thrikkannapuram	ECG machine	2020	3780	July 2020	Not needed	January 2022	18
48.		Ear Care Kit	2020	15500	August 2020		January 2022	17
49.		HBA1C Analyser	2019	48262	April 2019		January 2022	33
50.		Oxygen Concentrator (5 L)	2021	Donation	June 2021		January 2022	7
51.	GH Kalpetta	Ultra Sound Scanner	2018	1350000	November 2019	No Staff posted	January 2022	26
52.	TBC Karuvatta	X-Ray Machine	almost 30 years	NA	August 2017	Lack of radiation safety in the X-ray room	February 2022	54
53.	TH Thuravoor	Incinerator 10 kg		97000	April 2021	Under repair	February 2022	10
54.	FHC Amboori	Pulse Oxymeter with NELLCOR SSPO2 and NELLCOR Oximax Reusable Oxymetry Sensor	2020	68906	June 2020	Non-installation	December 2021	18
55.	DH Nedumangad	Dialysis beds -2	NA	NA	March 2021	False ceiling of mini unit needs repairs	November 2021	8
56.		Portable ventilators –(2 nos X 610400)	2020	1220800	October 2020	No space to place on bedside	November 2021	13
57.		Two body mortuary units	2021	295000	October 2021	Awaiting installation	November 2021	1
58.		Polishing lathe 2800 RPM	2021	12880	June 2021	NA	November 2021	5
59.		Surgical laser clean cut	2021	313600	April 2021	NA	November 2021	7
60.	PHC Mudakkal	Ophthalmoscope	2021	26490	December 2021	Substitute available	January 2022	1
61.		Oxygen concentrator	2020	46010	December 2021	Lack of space	January 2022	1
62.	TH Fort	Horizontal Rectangular Auto clave 300L	2019	706000	January 2019	Space shortage	November 2021	34
63.		X Ray Machine and CRS	2020	1106400	June 2020	Infrastructure deficiency	November 2021	17
64.		Instrument for Hemiarthroplasts	2019	331504	August 2019	No Ortho Surgeon available	November 2021	27
65.	THQH Malayinkeezhu	Autoclave Vertical	2020	117300	December 2020	Lack of space	January 2022	13
66.		Oxygen Concentrator	2021	Donation	September 2021	Lack of Space	January 2022	4
67.		Dental X ray	2019	36766	August 2019	Site not ready	January 2022	29

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
68.	DH Tirur	Thermo Heraeus Centrifuge	2018	3510972	October 2018	Blood bank site not ready	November 2021	37
69.		Vertical Plasma Freezer	2018	204800	March 2018		November 2021	44
70.		Platelet Agitator Incubator	2018	201600	March 2018		November 2021	44
71.		Plasma Expressor	2019	17470	March 2019		November 2021	32
72.		Blood bank refrigerator	2018	318600	March 2018		November 2021	44
73.		Air Conditioner	2019	145080	April 2019		November 2021	31
74.		Vertical Plasma Freezer	2018	729600	March 2018		November 2021	44
75.		Plasma Thawing Bath	2018	82880	March 2018		November 2021	44
76.		Electronic Weighing Scale	2018	22980	March 2018		November 2021	44
77.		DG set	2019	236550	February 2019		November 2021	33
78.	THQH, Tirurangadi	Centrifuge	NA	11242	June 2021	Lack of trained Blood Bank Technician	December 2021	6
79.		Electronic Weighing Scale	NA	NA	June 2021		December 2021	6
80.		Binocular microscope	NA	NA	June 2021		December 2021	6
81.		Ice Box	NA	NA	June 2021		December 2021	6
82.		Freezer	NA	NA	June 2021		December 2021	6
83.		Water Bath	NA	NA	June 2021		December 2021	6
84.		Refrigerator	NA	NA	June 2021		December 2021	6
85.		Blood bank refrigerator	NA	NA	June 2021		December 2021	6
86.		Air Conditioner	NA	NA	June 2021		December 2021	6
87.	GH Alappuzha	Refrigerated Centrifuge	2018	3510972	December 2018	Site not ready for blood bank	February 2022	38
88.		Water Bath	2019	12036	January 2019		February 2022	37
89.		Multifunctional couch and accessory	2018	283920	December 2018	Site not ready	February 2022	38
90.		Imark Elisa Reader & Microplate washer	2018	474360	September 2018		February 2022	41
91.		Hot air oven	2018	19942	September 2018		February 2022	41
92.		Vertical Plasma freezer (40 degree)	2018	188800	August 2018		February 2022	42
93.		Blood Bank Refrigerator	2018	637200	August 2018		February 2022	42

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
94.		Plasma thawing Bath	2018	82880	August 2018		February 2022	42
95.		Vertical Plasma Freezer (80 degree)	2018	729600	July 2018		February 2022	43
96.		Platelet Agitator Incubator	2018	201600	August 2018		February 2022	42
97.		Electronic Weighing Scale	2018	22981	September 2018		February 2022	41
98.		Crash Cart	2018	18526	July 2018		February 2022	43
99.		Digital BP Apparatus	2018	5199	August 2018		February 2022	42
100.		Binocular microscope	2018	19712	August 2018		February 2022	42
101.		Terumo tube sealer	2018	170836	July 2018		February 2022	43
102.		Incubator	2018	19352	July 2018		February 2022	43
103.		Vertical Plasma freezer with charter recorder	2018	672600	August 2018		February 2022	42
104.		VDRL Rotator	2019	6903	May 2019		February 2022	33
105.		AC (Split) accessories	2019	208550	April 2019		February 2022	34
106.	DH Mavelikkara	Dental X ray	2012	92268	2020	Lack of space	November 2021	11
107.		VDRL Rotator	2013	NA	July 2013	Site not ready for blood bank	November 2021	100
108.		Hot air oven	2013	NA	November 2013	Site not ready	November 2021	96
109.		Incubator	2013	NA	October 2013		November 2021	97
110.		Water Bath	2013	NA	October 2013		November 2021	97
111.		Hicare Donor Couch	2013	NA	June 2013		November 2021	101
112.		Blood collection Monitor	2013	NA	July 2013		November 2021	100
113.		Blood Bank Refrigerator	2014	NA	March 2014		November 2021	92
114.	MCH Thiruvananthapuram	Mammography machine	2011	3550000	January 2020	Cost of replacement of spare parts was around ₹28 lakh which was forwarded to Government as TC decision.	April 2022	27

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
115.		Ventilator 2 nos	2021-22	Not mentioned	March 2021	System not starting. Compressor not working. Already reported to the company through Principal on 08 March 2021.	April 2022	13
116.		Multi parameter Monitor	2010	USD 7150	August 2019	Due to non-repair of the machine by the Company, the 11-year-old machine is requested for condemn-ation.	April 2022	32
117.		Ventilator 2 nos	2011	687276	March 2022	Not working due to need of spares	April 2022	1
118.		Sleep Machine	2016	712425	November 2018	Cost of repair is ₹70,000	April 2022	41
119.		Immune analyser	2019	299274	February 2020	Working, but cartridge is not available	April 2022	26
120.		Ventilator-mek 2 nos	2017	1788000	November 2021	Not functioning	April 2022	5
121.		Oxygen concentrator-8 nos	2021	Donated	February 2022	Not working	April 2022	2
122.		Ventilator macquet-2	2013	1882400	January 2022	Air compressor not working	April 2022	3
123.		CPET (Cardio Pulmonary Exercise Test) Machine	2013	1450000	2018	Oxygen sensor needs replacement	April 2022	40
124.		Esaote Mylab Class-C	2012	3500000	January 2018	Not properly functioning	April 2022	51
125.		Pulse Oxymeter	2019	92050	2021	Warranty over, CMC applied, not sanctioned	April 2022	4
126.		Bronchoscope-Pentax EB 1970 K	2010	1400000	2016	Damaged	April 2022	64
127.		Body plethysmography with DLCO machine (1)	2013	2440000	May 2019	Needs maintenance worth ₹2.70 lakh for functioning	April 2022	35
128.	Dental College, Thiruvananthapuram	Dental Chair 3	1997	74250	July 2021	Continuous use and non-	March 2022	8

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
						availability of spare parts		
129.		Dental Chair 1	2009	48059	July 2021	Continuous use	March 2022	8
130.		Dental Chair with compressor and Suction 1	2010	107000	Aug 2021	Continuous use	March 2022	7
131.		LCD Projector	2012	32580	September 2021	Price for repair more than actual cost of equipment	March 2022	6
132.	MCH Alappuzha	Joy YAG LASER	2008	1500000	2015	Spare parts not available	December 2021	72
133.		ECG Machine	2011	176000	Not available	Not repairable	December 2021	
134.		Blood gas Analyser	2012	296163		Unreasonable repair cost	December 2021	
135.		-do-	2011	278739		Not repairable	December 2021	
136.		Portable X-ray Machine	2011	475779		Not repairable as board not available	December 2021	
137.		Patient warming system	2011	460000		Not repairable	December 2021	
138.		Low temperature sterilizer	2011	3000000		Unreasonable repair cost	December 2021	
139.		Adult Warmer (2 Nos)	2015	213150		AMC not available	December 2021	
140.		Dual Chamber pacemaker (2 Nos)	2011	202807		AMC not available	December 2021	
141.		Rigid Uretero renoscope 8FR 6 1 step	2008	150000	November 2018	Irrepairable	December 2021	37
142.		Telescope0, 33cm,4mm	2009	94785	November 2018	Irrepairable	December 2021	37
143.		Resectoscope Sheath with working element	2011	141937	January 2019	Irrepairable	December 2021	35
144.		Flexible Uretero renoscope 67cm 7.5Fr Karl Storz	2013	818806	November 2018	Irrepairable	December 2021	37
145.		Stone punch with visual obturator	2013	175201	December 2018	Irrepairable	December 2021	36
146.		Rigid Uretero renoscope 7.5 Fr,42.5 cm	2013	271800	December 2018	Irrepairable	December 2021	36
147.		Rigid compact Uretero renoscope 6/7.5	2013	251385	December 2018	Irrepairable	December 2021	36
148.		Telescope 30 33 cm	2017	199178	June 2019	Irrepairable	December 2021	30

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
149.		Paediatric Telescope 0	2011	187000	March 2021	Irrepairable	December 2021	9
150.		Pneumatic Lithoclast with accessories	2013	149172	March 2021	Irrepairable	December 2021	9
151.		Nephroscope with accessories	2016	397152	April 2021	Irrepairable	December 2021	8
152.		EMG/ NCV/ EP machine I	2012	990000	February 2019	Beyond repair as the software is outdated.	December 2021	34
153.		Ventilator (PRICOL)	2012	575000	April 2018	Irrepairable	December 2021	44
154.		Ventilator (DRAGGER)	2011	489426	February 2020	Irrepairable	December 2021	22
155.		Cold light LED unit with fibre optic cable	2013	150000	August 2018	Irrepairable	December 2021	40
156.		KARLKAPS Microscope attachments	2009	930000	2020	Circuit board damage	December 2021	12
157.		2 channel intra operative nerve monitoring system	2009	967000	2020		December 2021	12
158.		Anaesthesia work station WATO EX 20	2014	1500000	2019	Upper cover leak	December 2021	24
159.		Anaesthesia work station WATO EX 20	2015	1500000	2019	Upper cover leak	December 2021	24
160.		Anaesthesia work station WATO EX 20	2016	1500000	2020	Lower cover leak	December 2021	12
161.		Anaesthesia work station Drager Fabius Plus	2011	1500000	2020	Internal air leak	December 2021	12
162.		Multipara Monitor Mindray IMEC 10	2015	300000	2020	Power supply unit failure	December 2021	12
163.		Centrifuges (2 Nos)	2016	47784	April and June 2019	Bush not working	December 2021	30
164.		Centrifuges Rotek (6 Nos)	2017	85380	March 2019, April 2019, May 2019, February 2020, August 2020 and September 2020	Bush not working	December 2021	15
165.		Defibrillator (BPL) (2 Nos)	2014	252000	June and July 2021	Uneconomical for repair	December 2021	5
166.		Defibrillator (Mindray) (2 Nos)	2015	274500	December 2020	Uneconomical for repair	December 2021	11

Sl. No.	Hospital Name	Name of equipment	Year of receipt	Amount (in ₹)	Month from which idling	Reasons for idling	Date on which found idling (Month of audit visit)	Number of months for which equipment was idling
					January 2021			
167.		CPET	2013	2440000	June 2016	Irrepairable. Submitted for condemnation.	December 2021	66
168.		Mammography unit	2012	2961420	January 2020	AMC pending	December 2021	23
169.		800mA X-ray machine	2010	1800000	January 2013	Medtronic stopped functioning. Philips took over, but not able to repair	December 2021	107
170.		Computerised radiography	2012	1500000	August 2021	AMC pending	December 2021	4
171.		Computerised radiography	2013	1140298	October 2019	Service pending	December 2021	26
172.		Computerised radiography	2016	1037190	September 2021	AMC pending	December 2021	3
	Total			**72812079**				

Appendix 5.1

Details of Civil works

(Reference: Paragraph 5.6; Page: 93, 95)

Sl. No.	Name of work	Status of work
I	**Works pending commencement from the date of sanction**	
1.	Construction of a building in Taluk hospital, Fort, Thiruvananthapuram	Administrative Sanction (AS) (₹5.86 crore) was provided in August 2015 and March 2017. PWD had prepared final estimate and plans 23 months after issue of AS (June 2017). Defective plan submission resulted in revision of plan (February 2018) and there was delay of 16 months in issuing statutory approvals by the LSGI. The work is yet to commence. Due to non-construction of new building, the hospital is functioning in an old building which lacks adequate space and facilities.
2.	Construction of a new administrative block at GH Alappuzha	General Hospital, Alappuzha was accorded (March 2017) AS for ₹1.17 crore for construction of a new administrative block. The non-commencement of the work was on account of delay in identification of project site (March 2018), delay in preparation of plan and estimate by PWD (February 2020). As the estimate prepared by PWD was for ₹ five crore, a revised proposal was sent to Government in February 2020. There has been no further progress (February 2022).
3.	Construction of a building at THQH, Malayinkeezhu	AS for construction of a building at an estimated cost of ₹19.81crore was accorded in December 2019. Audit observed that the work had not commenced (January 2022) even after two years due to the failure of hospital authorities to demolish the existing building and hand over hindrance free site for construction. Superintendent, THQH Malayinkeezhu stated (April 2022) that site was handed over for demolishing the building.
4.	Land acquisition for development of MCH, Manjeri	Sanction was accorded (February 2019 and December 2021) for acquiring 2.81 hectares of land (₹13.81 crore) for the construction of well-equipped casualty block, super specialty block, modern centre for cancer care, new surgical block, effluent treatment plant, approach roads etc. Audit observed that the works were pending due to non-remittance of mandatory contingent charges for land acquisition. The matter was pending with Government for 20 months (February 2022). GoK stated (October 2022) that ₹50 lakh was sanctioned (March 2022) as a preliminary step for land acquisition.
5.	Multi storey building for Dental College, Thiruvananthapuram	Construction of a multi-storied (Ground+seven floors) building for Dental college, Thiruvananthapuram was to be completed in four phases. The first phase (AS for ₹7.00 crore, February 2012) was completed in 2019, which included structural work of first three floors. The remaining works for which AS was issued in 2014, 2015 and 2019 (₹3.50 crore) are yet to commence (March 2022). No reason for non-commencement of work was available on record. GoK replied (October 2022) that a proposal to accord comprehensive AS for an amount of ₹9.20 crore was pending with the Government.
II	**Tardy progress in commencement and completion of works**	
6	Construction of Psychiatric Ward at Government Mental Health Centre, Thiruvananthapuram	AS was accorded (August 2014) for construction of psychiatric ward at an estimated cost of ₹ four crore. Even after seven years, only the structure of the building was completed. The hospital authorities intimated (June 2022) that the works could not be completed as the allotted funds had been exhausted. The hospital which commenced functioning in 1870 has cell rooms/wards in scattered locations across an area of 36 acres. The institution caters to 600 to 700 patients with sanctioned bed strength of 531.
7	Implementation of Master Plan, MCH, Thiruvananthapuram	AS was accorded (April 2018) for implementation of a master plan for Medical College, Thiruvananthapuram. The fund for the project was to be provided by KIIFB which approved an amount of ₹58.37 crore. The project was to be completed in three phases. The first phase works included improvement of external infrastructure (roads, corridors, parking facility, etc.). The works were to be completed in August 2020. Audit noticed that out of eight road works sanctioned in this phase, only five works were completed (December 2021).
8	MCH Alappuzha Setting up of trauma care unit	AS was provided (December 2013) to MCH, Alappuzha for construction of a building for setting up of a trauma centre[122] at an estimated cost of ₹10 crore. The construction work was to be completed by December 2015. Joint site verification by Audit along with departmental officials revealed (December 2021) that even after six years, the civil works were yet to be completed. The original plan was to construct basement plus two floors. In a meeting in June 2016, GoK directed to revise the plan from three to five storey building and sanction for the same was accorded in March 2017. Even though eight years have elapsed since the sanction, project for establishing a trauma care in MCH, Alappuzha is yet to materialise. GoK stated (October 2022) that the structural work of ground and first floor was nearing completion. The reasons for the delay were stated to be change of design, repeated revision of estimate and delay in obtaining design.

[122] Presently, there is an emergency care unit

Sl. No.	Name of work	Status of work
III	**Abandoned works**	
9	Construction of Male Forensic Ward at Government Mental Health Centre, Thiruvananthapuram	The work of construction of the building (**Figure 5.2**) received AS in November 2013. The estimated cost of the work was ₹1.26 crore and on Joint inspection conducted by the Audit team (February 2022) along with the officials of the institution, it was noticed that the building was in an abandoned stage with only the structure constructed even after eight years from the date of sanction. Hospital authorities informed (June 2022) Audit that the available fund was utilised for construction of the structure of the building and proposal for completion of work was pending with PWD.
10	Construction of new building for DH Nedumangad.	The work of construction of a new building for DH, Nedumangad was awarded to WAPCOS Limited[123] in July 2019 at an estimated cost of ₹3.45 crore. However, the site was handed over to the implementing agency only in January 2020. Scrutiny of records revealed that the entrusted agency did not commence the work and the work was abandoned. Audit observed lack of infrastructure for OPD registration in this hospital as detailed in Chapter III of this Report. Construction of the building would have improved the facilities provided to the patients.
IV	**Deficiencies in AYUSH department works**	
11	Idling of building constructed for Government Siddha Dispensary, Mannancherry, Alappuzha	Based on an AS (August 2009) for ₹30 lakh, a new building was constructed for Government Siddha Dispensary using MLA fund and was handed over to the hospital authorities in 2012. The Mannancherry Panchayat supplied required furniture for a 20 bedded hospital. Though a proposal was forwarded (November 2012) by the DMO (ISM), Alappuzha for the upgradation of the dispensary into a 20 bedded hospital, the proposal was rejected by GoK (November 2017). Due to lack of approval from the GoK for upgradation, the building remained unutilised for the last 10 years. GoK replied (October 2023) that the entire infrastructure would be utilised for Siddha varma therapy unit and care unit which was approved in the annual plan 2023-24.
12	Non-functioning of Roof Top Solar Plant at Government Homoeopathic Medical College Hospital, Thiruvananthapuram	A Solar power plant was installed (January 2021) in Government Homoeopathic Medical College, Thiruvananthapuram at a cost of ₹34.10 lakh. Audit noticed that the solar power plant was not functional as of March 2022. The non-functioning of the solar plant was attributed to non-completion of load segregation process and Main Service Panel alteration works. GoK stated (October 2023) that the work was completed and formal sanction from Electrical Inspectorate and Kerala State Electricity Board was awaited.

[123] A Central Public Sector enterprise wholly owned by GoI under the administrative control of the Ministry of Jal Shakti, GoI.

Appendix 7.1

Budget provision and expenditure incurred under three important Centrally Sponsored schemes during 2016-17 to 2021-22

(Reference: Paragraph 7.9; Page: 121)

1. National Programme for Health Care of the Elderly (NPHCE)

(₹ in lakh)

Year	Budget Provision	Expenditure	Expenditure (*per cent*)
2016-17	223.54	128.57	57.52
2017-18	278.00	436.99	157.19
2018-19	196.00	106.35	54.26
2019-20	421.00	35.62	8.46
2020-21	128.50	163.97	127.60
2021-22	363.50	188.09	51.74
Total	**1610.54**	**1059.59**	**65.79**

(Source: Data obtained from NHM)

2. National Tobacco Control Programme (NTCP)

(₹ in lakh)

Year	Budget Provision in ROP	Expenditure incurred	Expenditure (*per cent*)
2016-17	37.31	9.98	26.75
2017-18	95.02	42.99	45.25
2018-19	143.61	117.94	82.13
2019-20	240.15	56.56	23.55
2020-21	217.70	65.78	30.22
2021-22	336.43	90.35	26.86
Total	**1070.22**	**383.60**	**35.84**

(Source: Data obtained from NHM)

3. National Programme for Control of Blindness (NPCB)

(₹ in lakh)

Year	Budget Provision in ROP	Expenditure incurred	Expenditure (*per cent*)
2016-17	554.07	419.21	75.66
2017-18	668.61	670.51	100.28
2018-19	1382.19	720.48	52.13
2019-20	2200.10	722.63	32.85
2020-21	1155.55	858.46	74.29
2021-22	1303.38	518.31	39.77
Total	**7263.90**	**3909.60**	**53.82**

(Source: Data obtained from NHM)

Appendix 9.1

Comparison of achievement of Kerala with India under Goal - 3 in SDG India Index during 2018 to 2021

(Reference: Paragraph 9.4.1; Page: 132)

Target	Indicator	Target 2030	2018		2019-20		2020-21	
			India	Kerala	India	Kerala	India	Kerala
3.1	MMR (per one lakh live birth)	70	130	46	122	42	113	43
	Proportion of institutional deliveries	100	NA	NA	54.70	74	NA	NA
3.2	U5MR/ 1,000 live birth	11	50	7	NA	NA	NA	NA
		25	NA	NA	50	7	36	10
	Percentage of children in age group 12-23 months fully immunised	100	62	82.10	NA	NA	NA	NA
	Percentage of children in age group 0-5 years fully immunised	100	NA	NA	59.20	72.80	NA	NA
	Percentage of children in age group 9-11 months fully immunised	100	NA	NA	NA	NA	91	92
3.3	Total case notification of TB per one lakh population	0	138.33	67	160	71	NA	NA
		242	NA	NA	NA	NA	177	75
	HIV incidence per 1,000 uninfected population	0	NA	NA	0.07	0.03	0.05	0.02
3.4	Suicide rate per one lakh population	3.5	NA	NA	NA	NA	10.40	24.30
3.6	Death rate due to road traffic accident per lakh population	5.81	NA	NA	NA	NA	11.56	12.42
3.7	Percentage of currently married women aged 15-49 years who use any modern method of family planning	100	NA	NA	47.80	50.30	NA	NA
	Percentage of institutional deliveries out of the total deliveries reported	100	NA	NA	NA	NA	94.40	99.90
3.8	Monthly per capita out-of-pocket expenditure on health as a share of monthly per capita consumption (MPCE)	7.83	NA	NA	NA	NA	13	17
3c	Total physicians, nurses, midwives per one lakh population	549.96	220.96	762.13	NA	NA	NA	NA
	Total physicians, nurses, midwives per 10,000 population	45	NA	NA	38	112	37	115

NA - Not applicable

(Source: SDG India Index Reports for the years from 2018 to 2020-21)

Glossary of abbreviations

Glossary of abbreviations used in the report

Abbreviation	Full Form
AAPHS	Alappuzha Ayurveda Panchakarma Hospital Society
ABG	Arterial Blood Gas
ACD	Anti-Cancer Drugs
ACS	Additional Chief Secretary
AERB	Atomic Energy Regulatory Board
AFB	Acid Fast Bacteria
AIDS	Acquired Immunodeficiency Syndrome
AMC	Annual Maintenance Contract
ANA	Antinuclear Antibody
ANC	Antenatal Check-ups
ANF	Atrial Natriuretic Factor
ANM	Auxiliary Nurse and Midwife
API	Application Programming Interface
APTT	Activated Partial Thromboplastin Time
AS	Administrative Sanction
ASHA	Accredited Social Health Activist
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy
BAMS	Bachelor of Ayurvedic Medicine and Surgery
BEMP	Bio Medical Equipment Maintenance Program
Beta HCG	Beta Human Chorionic Gonadotropin
BHMS	Bachelor of Homoeopathic Medicine and Surgery
BMW	Bio-Medical Waste
BMWM Rules	Bio-Medical Waste Management Rules, 2016
BPL	Below Poverty Line
CAG	Comptroller and Auditor General
CBWTF	Common Bio-Medical Waste Treatment Facility
CDSCO	Central Drugs Standard Control Organization
CERT-In	Computer Emergency Response Team for India
CERT-K	Computer Emergency Response Team for Kerala
CHC	Community Health Centre
CHIS PLUS	Comprehensive Health Insurance Scheme PLUS
CHO	Community Health Officer
CMSS	Central Medical Services Society
CO	Carbon Monoxide
CoE	Centre of Excellence
CPCB	Central Pollution Control Board
CPHC	Comprehensive Primary Health Care
CPK	Creatine Phosphokinase
CRC	Claims Review Committee
CR System	Computed Radiography
CSR	Corporate Social Responsibility
CSS	Centrally Sponsored Scheme
CSSD	Central Sterile Supply Department
CSF Analysis	Cerebrospinal Fluid Analysis
DAME	Director of Ayurveda Medical Education

Abbreviation	Full Form
DC	Drugs Controller of Kerala
DCT	Distal Convoluted Tubule
DDMS	Drug Distribution and Management System
DH	District Hospital
DHS	Director of Health Services
DISM	Director of Indian Systems of Medicine
DIU	District Implementation Unit
DME	Director of Medical Education
DPC	District Programme Co-ordinator
DRDO	Defence Research and Development Organisation
DTBC	District Tuberculosis Centre
DTL	Drug Testing Laboratory
ECRP	Emergency COVID Response Preparedness Package
EDL	Essential Drug List
ELISA	Enzyme-linked Immunoassay
ENT	Ear, Nose and Throat
ESR	Erythrocyte Sedimentation Rate
FEFO	First Expiry First Out
FFR	Fractional Flow Reserve
FHC	Family Health Centre
GAD	Government Ayurveda Dispensary
GH	General Hospital
GHD	Government Homoeo Dispensary
GHE	Government Health Expenditure
GHMC	Government Homoeopathic Medical College
GIS	Geographic Information System
GMC	Government Medical College
GMHC	Government Mental Health Centre
GoI	Government of India
GoK	Government of Kerala
GSDP	Gross State Domestic Product
GTH	Government Tribal Hospital
HBs AG	Hepatitis B Surface antigen
HCF	Healthcare Facilities
HCV	Hepatitis C Virus
HDR Brachy Therapy	High Dose Rate Brachy Therapy
HFWD	Health and Family Welfare Department
HITES	HLL Infra Tech Services Ltd
HIV	Human Immunodeficiency Virus
HOMCO	Kerala State Homoeopathic Co-operative Pharmacy
HR	Human resource
HTTPS	Hypertext Transfer Protocol Secure
HWC	Health and Wellness Centre
ICT	Indirect Coomb's Test
ICU	Intensive Care Unit
IFA	Iron Folic Acids
IGA	Immunoglobulin A

Abbreviation	Full Form
IGE	Immunoglobulin E
IGG	Immunoglobulin G
IGM	Immunoglobulin M
IMAGE	Indian Medical Association Goes Eco-friendly
IMR	Infant Mortality Rate
IPD	In-Patient Department
IPHS	Indian Public Health Standards
ISM	Indian Systems of Medicine
IT	Information Technology
IVUS	Intravascular Ultrasound
JSSK	Janani Shishu Suraksha Karyakram
JSY	Janani Suraksha Yojana
KASH	Kerala Accreditation Standards for Hospitals
KASP	Karunya Arogya Suraksha Padhadhi
KCP	Karunya Community Pharmacy
KIIFB	Kerala Infrastructure Investment Fund Board
KLB	Klebs Loffier's Bacillus
KMSCL	Kerala Medical Services Corporation Limited
KNOS	Kerala Network for Organ Sharing
KPSC	Kerala Public Service Commission
K-SOTTO	Kerala State Organ and Tissue Transplant Organization
KSPCB	Kerala State Pollution Control Board
LD	Liquidated Damages
LHV	Lady Health Visitor
LoI	Letter of Indent
LSGI	Local Self-Government Institution
LT	Low Tension
LW	Labour Ward
MBBS	Bachelor of Medicine, Bachelor of Surgery
MCH	Medical College Hospital
MCP	Mother and Child Protection
MD	Managing Director
MeitY	Ministry of Electronics and Information Technology
MLA	Member of Legislative Assembly
MMR	Maternal Mortality Ratio
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
MoSPI	Ministry of Statistics and Programme Implementation
MoU	Memorandum of Understanding
MP	Member of Parliament
MPCE	Monthly Per capita Consumption Expenditure
MRI	Magnetic Resonance Imaging
NABH	National Accreditation Board for Hospitals and Healthcare Providers
NABL	National Accreditation Board for Testing and Calibration Laboratories
NAM	National Ayush Mission
NCRB	National Crime Records Bureau

Abbreviation	Full Form
NFHS	National Family Health Survey
NHA	National Health Authority
NHM	National Health Mission
NHP	National Health Policy
NIC	National Informatics Centre
NIF	National Indicator Framework
NIIST CSIR	National Institute for Interdisciplinary Science and Technology
NITI Aayog	National Institution for Transforming India
NMC	National Medical Commission
NMHP	National Mental Health Programme
NNMR	Neonatal Mortality Rate
NOC	No Objection Certificate
NOTP	National Organ Transplant Programme
NPCB	National Programme for Control of Blindness
NPHCE	National Programme for Health Care of the Elderly
NQAS	National Quality Assurance Standards
NSQ	Not of Standard Quality
NTCP	National Tobacco Control Programme
NUHM	National Urban Health Mission
O and G	Obstetrics and Gynaecology
ONDLS	Online National Drug Licensing System
OOPE	Out-of-Pocket Expenditure
OPD	Out Patient Department
OT	Operation Theatre
Oushadi	Pharmaceutical Corporation (IM) Kerala Limited
OWASP	Open Web Application Security Project
P and CO	Principal and Controlling Officer
PAC	Public Accounts Committee
PAP Test	Papanicolaou Test
PD	Personal Deposit
PG	Post Graduation
PHC	Primary Health Centre
PIEMD	Programme Implementation Evaluation and Monitoring Department
PM CARES	Prime Minister's Citizen Assistance and Relief in Emergency Situations
PMJAY	Pradhan Mantri Jan Arogya Yojana
PO	Purchase Order
PPE	Personal Protective Equipment
PSA	Pressure Swing Adsorption
PSU	Public Sector Undertaking
PWD	Public Works Department
QC	Quality Check
QCI	Quality Council of India
RA Factor	Rheumatoid Arthritis Factor
RBC	Red Blood Cell
RCH	Reproductive and Child Health
RNTCP	Revised National Tuberculosis Control Programme

Abbreviation	Full Form
RPR	Rapid Plasma Reagin
RSBY	Rashtriya Swasthya Bima Yojana
SAT hospital	Sree Avittam Thirunal Hospital
SC	Sub Centres
SC/ST	Scheduled Castes/Scheduled Tribes
SDG	Sustainable Development Goal
SDRF	State Disaster Response Fund
SECC	Socio-Economic Caste Census, 2011
SHA	State Health Agency
SHC	Sub Health Centre
SIF	State Indicator Framework
SLA	Service Level Agreement
SLCMG	State Level Crisis Management Group
SMD	Severe Mental Disorder
SNCU	Special Newborn Care Unit
SOP	Standard Operating Procedure
SOTTO	State Organ and Tissue Transplant Organization
SPCB	State Pollution Control Board
SRS	System Requirement Specification
SSL	Secure Sockets Layer
STQC	Standardisation Testing and Quality Certification
TB	Tuberculosis
TCDC	Total Count Differential Count
TH	Taluk Hospital
THE	Total Health Expenditure
THQH	Taluk Headquarters Hospital
TLS	Transport Layer Security
TMS	Transaction Management System
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TSH	Thyroid Stimulating Hormone
TT	Tetanus Toxoid
U5MR	Under – Five Mortality Rate
UPHC	Urban Primary Health Centre
URS	User Requirement Specification
UT	Union Territory
WCH	Women and Children Hospital
WHO	World Health Organisation

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