

Chapter-3

Diagnostic Services

3 Diagnostic Services

Efficient and effective diagnostic services, both radiological and pathological, are amongst the most essential health care facilities for delivering quality treatment to the public based on accurate diagnosis.

Audit observed that many of the significant radiology and pathology tests were not performed in the test-checked hospitals¹⁸ and Community Health Centres (CHCs) due to lack of required equipment and skilled manpower. Significant audit findings are discussed in the succeeding paragraphs:

3.1. 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.

Positive feature

District hospitals Gorakhpur and Lucknow had all types of radiology services.

3.1.1. Availability of radiology services

Indian Public Health Standards (IPHS) 2012 prescribed services for the hospitals (X-ray, Ultrasonography and CT scan¹⁹) and for CHCs (X-ray and Ultrasonography). The Department also prescribed (January 2014 and September 2015) the facilities of X-ray and Ultrasonography (USG), free of cost, in the hospitals and CHCs.

Audit, however, observed that in none of the test-checked hospitals/CHCs except DHs Gorakhpur and Lucknow, all types of prescribed radiology services were available during 2013-18. The position of availability of radiology services is given in **Table 9**.

Table 9: Availability of various types of radiology services

Radiology services	No. of DHs		No. of DWHs		No. of CHCs	
	Service required	Service available	Service required	Service available	Service required	Service available
X-ray	11	11	08	02	22	14
Dental X-ray	11	04	08	00	22	01
Ultrasonography (USG)	11	10	08	05	22	04
CT scan	08	04	05	00	00	00

(Source: Test-checked hospitals/CHCs)

Thus, the DWHs except Agra and Lucknow did not have X-ray facility while most of the CHCs did not have ultrasonography facility. Similarly, CT scan

¹⁸ District Hospitals (DHs), Joint Hospitals (JHs) and District Women Hospitals (DWHs)

¹⁹ Desired for the hospitals having bed strength of more than 100 beds

service was available in only 04 out of the 13 eligible hospitals²⁰. Also, analysis indicated that if the required X-ray machines would have been provided in the concerned DWHs/CHCs, approximately 2.50 lakh IPD and OPD patients²¹ would not have been left without X-ray investigations during 2013-18.

Absence of radiology services in the above-mentioned hospitals/CHCs was mainly due to non-availability of required radiology equipment and/or skilled human resources, as detailed in **Table 10**.

Table 10: Reasons for non-availability of radiology services

Radiology service	Type of hospital	No. of hospitals/CHCs lacking services		
		Total	For want of equipment	For want of technician
X-ray	DWH	06	06	00
	CHC	08	08	00
Dental X-ray	DH/JH	07	07	00
	DWH	08	08	00
	CHC	21	21	00
Ultrasonography	DH/JH	01	01	00
	DWH	03	02	01
	CHC	18	18	00
CT Scan	DH	04	02	02
	DWH	05	05	00

(Source: Test-checked hospitals/CHCs)

Thus, the CT scan machines in DHs Banda and Saharanpur and Ultrasonography machine in DWH Banda were non-functional for want of technician.

Further, IPHS prescribe two to three types of X-ray machines of varying penetration and radiation levels²² for different radiological investigations. Audit, however, observed that out of the 13 hospitals having X-ray services, only DHs Agra, Balrampur, Gorakhpur and DH-II Allahabad had all the prescribed X-ray machines available.

Also, 15 radiology equipment, out of the available radiology equipment in the hospitals, were lying unutilised for want of repair, manpower and accessories in the test-checked hospitals/CHCs (*Appendix-III*). Short availability of the full range of X-ray equipment and non-functionality of the available radiology equipment impacted the efficiency and appropriateness of level of care to be offered in different types of hospitals.

The Government replied (May 2019) that efforts had been made to ensure radiology services through the State Plan as well as through NHM, maintenance of bio-medical equipment was being outsourced under NHM and CT scan in DH Banda and Saharanpur would be made functional.

²⁰ DHs Agra, Gorakhpur, Lucknow, DH-II Allahabad

²¹ Based on the proportion of patients availing X-ray services in 13 test-checked hospitals and 14 CHCs

²² 100 M.A. X-ray machine, 300 M.A. X-ray machine and 500 M.A. X-ray machine for more than 200 bedded hospitals; 100 M.A. X-ray machine and 300 M.A. X-ray machine for less than 200 bedded hospitals

Notwithstanding the measures taken by Government, the fact remains that serious gaps in the basic provision of radiology services, viz. X-ray, Ultrasonography, etc., in the test-checked hospitals/CHCs limited the access of patients to evidence based treatment facilities and quality care.

3.1.2. AERB licences for radiology machines

As per Atomic Energy (Radiation Protection) Rules 2004, for establishing X-ray and CT scan unit, a license from the Atomic Energy Regulatory Board (AERB) is necessary.

Contrary to the provisions of the said Rules, in 09 out of the 13 hospitals where X-ray and/or CT scan facilities were available and 14 CHCs where X-ray services were provided, the requisite licence from AERB was not obtained.

The Government stated that the process for obtaining licences in the concerned test-checked hospitals was underway, but did not elucidate the reasons for non-compliance with Rules, which has implications for safety of patients as well as staff *vis-à-vis* potential exposure to excess radiation.

3.2. Pathology services

Pathology services are the backbone of any hospital for extending evidence based health care to the public. As 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:

3.2.1. Institutional arrangements for pathology services

The pathology services in the hospitals as well as in CHCs were provided through in-house laboratories up to October 2015. However, due to non-availability of facilities in hospitals for providing the full range of pathology services, the Department started (November 2015) engaging private service vendors for providing high-end diagnostic services in the hospitals and CHCs. Under this arrangement, certain high-end pathological services were outsourced²³ in 52 hospitals during November 2015 to October 2016. Further, in February 2017 pathology services in 95 hospitals and 822 CHCs for a period of three years were outsourced²⁴.

3.2.2. Availability of pathology services

IPHS prescribed 29 to 70 types of pathological investigations under five categories, viz., Clinical pathology (18 to 29 tests), Pathology (01 to 08 tests), Microbiology (02 to 7 tests), Serology (03 to 07 tests) and Biochemistry (05 to 19 tests) to be carried out in the district-level hospitals and CHCs.

²³ Under UP Health System Strengthening Project

²⁴ The private outsourcing partner provided services only in 210 out of the 822 CHCs during 2017-18 and in none of the earmarked hospitals.

Scrutiny of records disclosed that the full range of desired pathological investigations were not available in any of the test-checked hospitals/CHCs. The position of availability of investigation facility in the hospitals and CHCs is summarised in **Table 11**.

Table 11: Availability of pathology services as on 31 March 2018

Types of pathology services (no. of tests prescribed)	Hospitals without any shortfall	Hospitals with Shortfall (<i>per cent</i>)				
		1 to 25%	26 to 50%	51 to 75%	76 to 99%	100 %
DHs						
Clinical pathology (24 to 29)	00	05	04	02	00	00
Pathology (01 to 08)	02	01	00	02	02	04
Microbiology (04 to 07)	00	01	02	03	00	05
Serology (04 to 07)	02	02	05	02	00	00
Biochemistry (06 to 19)	00	04	05	02	00	00
DWHs						
Clinical pathology (24 to 29)	00	00	06	02	00	00
Pathology (01 to 08)	00	00	00	02	01	05
Microbiology (04 to 07)	00	00	00	01	01	06
Serology (04 to 07)	02	01	04	01	00	00
Biochemistry (06 to 19)	00	00	05	02	01	00
CHCs						
Clinical pathology (18)	00	00	12	09	01	00
Pathology (01)	08	00	00	00	00	14
Microbiology (02)	03	00	19	00	00	00
Serology (03)	16	00	04	01	00	01
Biochemistry (05)	01	01	01	01	15	03

(Source: Test-checked hospitals/CHCs)

It can be seen from Table 11 above that every hospital/CHC test-checked lacked investigations under one or more DH sub-categories. Further, none of the desired investigations under the microbiology and pathology sub-categories were carried out in 11 and 09 hospitals respectively.

Thus, despite engaging private service providers, pathology services were not available as prescribed in IPHS, depriving the public from availing evidence based health care. Non-availability of essential equipment and short deployment of skilled human resources in the test-checked hospitals were amongst the reasons for the absence of desired investigation facilities.

The Government responded that all efforts had been made to ensure all types of pathology services in the hospitals and that in-house pathology of the hospitals was also being strengthened.

Notwithstanding the above, the provision of evidence-based treatment remained largely unachieved, especially in respect of diseases requiring clinical, serological and biochemistry investigations during 2013-18.

3.2.3. Essential resources- equipment and human resources

Equipment: IPHS prescribe 21 to 51 types of pathology equipment for the hospitals²⁵ depending upon their bed capacity. Besides, the Department prescribed 06 types of equipment for each CHC.

Audit observed that the full range of prescribed pathology equipment was not available in the test-checked hospitals (shortfalls: 19 to 77 *per cent*) and in CHCs (shortfalls: 17 to 83 *per cent*). Shortfall of more than 60 *per cent* in the number of equipment was noticed in DHs Agra, Balrampur, Banda, Budaun, Lucknow, Saharanpur, DH-II Allahabad and DWHs Agra, Banda and Lucknow. Similarly, there was a major shortfall of equipment in CHCs Nagal, Saharanpur (100 *per cent*), Baroli Ahir, Agra (83 *per cent*), Asafpur, Budaun (67 *per cent*) and Campiarganj, Gorakhpur (67 *per cent*).

Audit also observed that in 05 test-checked hospitals, 09 pathological equipment were lying unutilised for a period ranging between 12 and 30 months for want of repair (06 equipment) and for want of reagents (03 haematology analysers). This further aggravated the shortfall in functional equipment in the hospitals (*Appendix-IV*).

The Government replied that the Department was building in-house capacity of pathological services and budget had been allotted for the same. However, fact remains that test-checked hospitals/CHCs did not have prescribed pathological equipment which affected the quality of patient care offered by these hospitals/CHCs.

Human resources: Lab Technicians (LTs) are the key personnel for in-house laboratories and are responsible for taking samples and carrying out all prescribed pathological investigations. However, out of the 19 test-checked hospitals, 10 hospitals had no shortfall in LT cadre, while in 05 hospitals²⁶ shortfall in the number of LTs against the sanctioned strength ranged between 11 and 43 *per cent*. In the remaining 04 hospitals²⁷, LTs were deployed over and above the sanctioned strength.

When compared against the IPHS, the shortfall in the number of LTs ranged between 11 and 89 *per cent* in 15 test-checked hospitals while there was an excess of LTs in the remaining 04 test-checked hospitals²⁸.

Similarly, out of the 22 test-checked CHCs, in three CHCs²⁹ no LTs were deployed; in 18 CHCs, LTs were deployed as per sanctioned strength and in CHC Gosaiganj, Lucknow only one LT was deployed against the sanctioned strength of two LTs. Further, as in the case of hospitals, shortages of LTs were higher when compared to the IPHS.

²⁵ The Department did not prescribe any norms for district hospitals.

²⁶ DH Agra (43 *per cent*), DH-II Allahabad (11 *per cent*), DH Banda (25 *per cent*), DH Lucknow (11 *per cent*) and DH Saharanpur (40 *per cent*)

²⁷ DHs Budaun, Gorakhpur, DWH Lucknow and JH Lucknow

²⁸ DH-II Allahabad, JH Balrampur, DH Gorakhpur and JH Lucknow

²⁹ CHCs- Jaitpur Kalan and Kheragarh, Agra and Samrer, Budaun

Thus, pathological investigations were hindered in the hospitals and CHCs wherever LTs were not deployed as per sanctioned strength and/or IPHS.

The Government replied that only 56 *per cent* of the sanctioned posts of laboratory technicians were filled due to pendency of recruitment of 729 posts with UPSSSC³⁰ since 2016. It also stated that for seamless functioning of routine laboratory services, the Department had engaged 403 laboratory technicians on contractual basis all across the State.

The reply of Government underscores the Government's failure to take timely effective action for recruitment of the vacant posts of LTs. Further proactive steps are needed to rationalise the deployment of LTs in the hospitals and CHCs.

3.2.4. Quality assurance of pathology services

Quality testing of in-house pathological services was not done during 2013-18 in any of the test-checked hospitals/CHCs which was in contravention of IPHS.

Further, as discussed in paragraph 3.2.1, private service providers were engaged (November 2015 to October 2016) to provide high-end pathological services in 52 district hospitals. As per the terms of the contracts, one *per cent* pathological test results performed by the service providers were to be validated by an External Quality Agency (EQA).

Scrutiny of records revealed that against 31.14 lakh pathological investigations performed by the service providers in 52 district hospitals (including 12 hospitals test-checked) in the State during December 2015 to March 2018, validation of results through EQA was carried out in respect of 59,511 (1.91 *per cent*) test results. Of these, 3,861 results (6 *per cent*) were found unsatisfactory and 5,792 test results (10 *per cent*) were rejected by EQAs. Hospital-wise details of EQA validation were, however, not furnished to audit. Further, ₹ 5.41 crore penalty was imposed and recovered from the service providers for carrying out sub-standard investigations as per EQA validation.

The Government replied that direction for ensuring quality assurance of the test results through EQA was issued, in-house pathology in all hospitals and CHCs was being strengthened and Standard Operating Procedures were issued to all peripheral offices.

The reply is not acceptable, as Standard Operating Procedures or related directions was not issued by the State Government for EQA validation of in-house pathology services. As a result, none of the test-checked hospitals and CHCs sent sample of test results of in-house pathology services for external assessment and validation during 2013-18. Thus, building minimum quality standards into the health system remains a challenge.

³⁰ Uttar Pradesh Subordinate Services Selection Commission

3.2.5. Waiting time and turn-around time

Time taken in receiving samples from the patients after being prescribed by the doctors, for investigations *i.e.*, Waiting Time (WT) and time taken in getting the investigation done and reporting the results to the patients *i.e.* Turn-around Time (TAT) reflect overall efficiency of the diagnostic services in terms of patient's satisfaction. The doctors issue the test indent forms to the patients prescribing the radiology and pathology investigations after which the patients register themselves in the concerned department/section for giving of the required samples/tests.

Audit observed that the test-checked hospitals/CHCs neither preserved the test indent forms nor recorded the date of issue of test indents in the registration registers during 2013-18. Therefore, the time lag between the two events *viz.* recommendation for investigation by the doctor and taking out of the sample was not ascertainable in audit. Further, in the absence of the test indent forms, it was not ascertainable whether all investigations were performed by the hospitals/CHCs.

Besides, no records were maintained in any of the test-checked hospitals/CHCs regarding TAT in respect of radiological and pathological investigations performed during 2013-18.

The Government assured in reply that necessary instructions would be issued to the hospitals and CHCs for recording the waiting time and turn-around time in the prescribed records.

To sum up, the provisioning of diagnostic services in the test-checked hospitals was sub-optimal, marred by inadequacy of prescribed equipment and shortage of human resources, thus depriving patients of evidence-based treatment procedures. Further, the lack of monitoring of waiting time and turn-around time negatively affected the ability of hospitals to measure and improve the efficiency of diagnostic services.

