

Establishment of a satellite laboratory system in Base Hospital Meerigama under the purview of RDHS Gampaha

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Abstract- The case study was done with the intention of identifying gaps in the established referral laboratory at BH Meerigama when providing services for the satellite laboratory system in the area. Desk reviews and key informant interviews were used to gather data for the problem analysis, which was done using a fishbone diagram. Inadequate laboratory staff, lack of a continuous supply of reagents, and inadequate space inside the laboratory were identified as key issues that needed to be addressed urgently. Upgrading of the staff needed, procuring adequate stocks of reagents needed for the lab and expanding the laboratory space were recommended as urgent solutions. The lessons learned during the functioning of the satellite laboratory system, with the referral laboratory, the challenges faced, and the strategies developed to overcome them will undoubtedly improve the efficiency of laboratory services in the region.

I. INTRODUCTION

Base Hospital Meerigama is a type B base hospital in the Gampaha district that provides healthcare services for a population of nearly 190000 people in 149 Grama niladhari divisions. With a population of over two million, Gampaha District faces challenges in healthcare infrastructure and services. The Regional Directorate of Health Services (RDHS) Gampaha is responsible for coordinating healthcare services in the district. Base Hospital Meerigama is a prominent regional healthcare facility, facilitating growing healthcare demands. Recognizing the necessity to improve healthcare infrastructure, RDHS Gampaha established a satellite laboratory system with the apex at Base Hospital Meerigama. This laboratory functions as a level three referral laboratory for samples received from ten primary medical care units (PMCU).

These PMCUs are, Bokalagama, Pallewela, Muddaragama, Kaleliya, Nabuluwa, Maladeniya, Wewaldeniya, Halpe, Kotadeniyawa, and Ambepussa. Each PMCU has been given a weekday to sample collection as follows. Monday-kalaeliya and Pallewela
Tuesday-Nabuluwa, Wewaldeniya
Wednesday-Halpe, Maladeniya, Kotadeniyawa
Thursday-Ambepussa
Friday-Muddaragama, Bokalagama

Investigations done at the referral laboratory are FBC, S. Creatinine, Blood Glucose, Electrolytes, Total Cholesterol, and UFR. Point-of-care testing is defined as diagnostic testing at or near the site of patient care. It is inherently spatial, that is, performed at or near the points of need, and also intrinsically temporal because it produces fast, actionable results. The definition does not depend on the size or format of the handheld, portable or transportable instrument, test module or assay design (Kost,2019).

The Primary Sector Strengthening project focused primarily on establishing a laboratory service network to enable the state health system to offer localized laboratory testing services to patients. Through this network, PMCUs send samples for testing to the nearest referral hospital with laboratory facilities and treat patients based on the test results. This way, institutions do not need to request patients to arrange such tests independently, thereby reducing out-of-pocket expenses for patients. In addition, prevents patients from being unnecessarily referred to higher-level institutions. PMCUs are equipped with sample-collecting centres where blood samples and test results are transported back and forth between the PMCU and the designated apex hospital with laboratory facilities for analysis (Dr B.V.S.H. Beneragama et al., 2019).

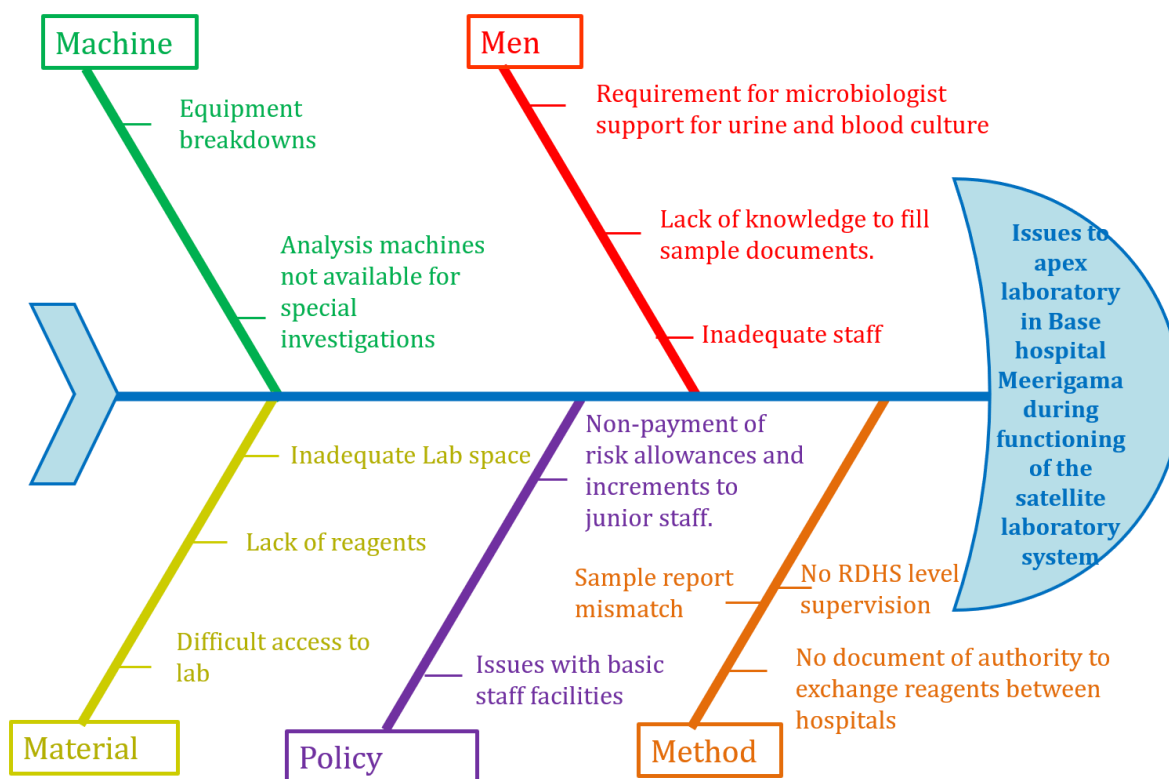
This case study aimed to identify the gaps during the service provision from the apex laboratory to the satellite laboratories.

II. PROBLEM ANALYSIS

Methodology for problem analysis

- i. Desk reviews were done and examined the investigation requests received from sample collecting centres
- ii. Key Informant Interview was conducted with the medical superintendent of BH Meerigama
- iii. Key Informant Interviews were done with the Senior Medical Laboratory Technologist (SMLT) and three other MLTs in BH Meerigama

Fishbone diagram for problem analysis



III. PROBLEM PRIORITIZATION

i. Inadequate number of MLTs

Currently, only four MLTs including the SMLT are attached to the BH Meerigama. To perform Urine culture and blood culture investigations, need at least six MLTs in the cadre. At present, these investigations are sent to District General Hospital Gampaha.

ii. Inadequate number of junior laboratory staff

Currently, one laboratory orderly (LO) and one Saukya Karya Sahayaka (SKS) are attached to the laboratory. However, there are two LOs in the approved cadre, and there is a requirement for one more SKS.

iii. Non-availability of RDHS-level supervision

Other than supervision from the head of the institution, no supervision from the RDHS level.

iv. Inadequate laboratory space

Even with the space being limited to place the laboratory equipment, part of the laboratory is used as storage space which has caused difficulty for the MLTs to perform their daily activities.

v. Lack of reagents

There is a delay in receiving reagents to the laboratory on time. Therefore, investigations get delayed some days.. When this occurs, SMLT has to discuss it with SMLT DGH Gampaha and get down the necessary reagents. This is done through the mutual understanding between the two SMLTs. There is no document of authorization or guideline regarding this activity. Therefore, issues could arise regarding the accountability of the actions.

vi. Mismatch between sample and report

Sometimes the sample sent to the apex lab does not match the report. Sometimes, clinic numbers in the request form and the

sample are not compatible, When this happens, a new repeat sample has to be collected from the patient, causing a delay in treating the patient and increased cost to the institution.

vii. Equipment non-functioning

The two air conditioners inside the apex laboratory have been inoperable for a considerable period. This may influence the quality of the laboratory investigations.

viii. Difficult access

The laboratory is situated at the far rear of BH Meerigama. There is no easy access to it. People who bring samples from satellite labs must carry them from the hospital entrance to the laboratory, which is a considerable distance. An investigation that needs to be done urgently and reported to the PMCU may get delayed.

ix. C-Reactive protein is done only for the apex hospital as reagents were unavailable.

x. Demotivated junior staff

The samples brought from the PMCUs are washed and prepared by the lab. orderly. However, no risk allowance has been paid to her for her duties. The SKS has also not been paid her increment for nine years.

xi. **No washrooms and changing rooms** for laboratory staff available from inside the laboratory. The majority are females. During on-call duties, pharmacists and MLTs use the same washroom that is located in the wards.

xii. **Special analysis machines such as PT/INR machine is not available**, therefore only basic investigations are performed

xiii. **No microbiologist coordination or support available** to the hospital laboratory to perform blood and urine cultures

IV. RECOMMENDATIONS

1. Upgrade laboratory cadre

Steps should be taken to upgrade the MLT cadre to at least six to increase the scope of the investigations that are done. Requests must be made to the management services through the RDHS, with the justification by the head of the institution. Similarly, supportive staff should also be increased to the required amount of at least two lab orderly's and two Sks to cope with the current increased workload.

2. Increase supervision activities from the RDHS level

Supervision and monitoring of the apex hospital and the satellite system is very important for evaluating its activities to improve the service quality and quality of laboratory investigations. The RDHS should delegate a person to monitor, supervise, and report the process regularly to the RDHS and make necessary arrangements to sustain the service quality and efficiency.

3. A continuous supply of reagents must be made available to the apex laboratory to provide the laboratory service to catering PMCUs. If not, the samples may have to be discarded, and repeat samples must be collected from patients disturbing them. It is an additional cost to the health sector and a waste of time for all healthcare workers. Procurement of necessary stocks of reagents must be made urgently according to usage estimates.

4. Space at the referral laboratory must be given priority to accommodate the analysis equipment. With the expansion of investigations, new equipment must be accommodated in the already limited space. Therefore, new space should be developed for storage facilities by extension of the already available laboratory building space.

5. Non-functioning laboratory equipment, such as the air conditioners, must be replaced or repaired as soon as possible so that the increased temperature within the building will not influence the durability of the analysers and the final report of the analysis.

6. Staff training at PMCU level

To overcome the mismatches that were identified in the sample request forms and the samples sent, the health staff labelling the samples at the PMCU level have to be trained on how to do it properly, and in the medical officer of the PMCU or the nursing officer must supervise this process.

7. Accessibility to the laboratory must be made easier for the health staff to bring the samples from the PMCUs

daily to avoid unnecessary delays and confusion and to supply reagents and other supplies, such as equipment, to the laboratory. The head of the institution must take the necessary action and identify a suitable access and get assistance from local government authorities to prepare a path with vehicle access to the lab for this purpose.

- 8. Without paying attention on staff's basic needs, it will be difficult to receive quality service from them.** Therefore, their requirements, such as washrooms and changing rooms, must be constructed close to the laboratory. The issues with the delays in increment payment and non-payment of risk allowances of the junior staff should also be looked into.
- 9. The services of a microbiologist permanently from a base hospital in the district**, such as BH Wathupitiwala, should be arranged to provide blood and urine culture facilities in the future. Moreover, the necessary equipment, such as incubators, must also be provided to the laboratory.

V. CONCLUSIONS

The objective of this case study was to identify the gaps during the service provision from the apex laboratory to the satellite laboratories. Desk reviews and key informant interviews were conducted, and based on their findings, a problem analysis was performed using a fishbone analysis. It was revealed that the apex laboratory was confronted with many obstacles. This included the inadequacy of MLTs and junior laboratory staff, non-availability of supervision from RDHS level, lack of a continuous supply of reagents, inadequate laboratory space, difficulty accessibility to the referral laboratory, lack of basic facilities to the laboratory staff and demotivated junior staff due to non-payment of allowances and increments as important issues. Important recommendations were provided based on their importance and urgency. An important limitation is that the gaps identified from this study may not apply to the district's other satellite laboratory systems and apex hospitals.

The lessons learned from establishing the satellite laboratory system, the challenges faced, and the strategies developed to overcome them will undoubtedly improve the efficiency of laboratory services in the region.