

Original Article: **Improving the laboratory investigation price revising process at Sri Jayawardhanapura General Hospital**

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Abstract

Sri Jayawardhanapura General Hospital (SJGH) is a non-profit public enterprise that offers reasonable services. The hospital relies on government grants and revenue generated by patient care services for funding. One of its crucial departments is a laboratory, which serves as a vital support service and the main profit center. However, the frequent rise of consumable prices during economic crises significantly impacts the variable costs of laboratory tests, resulting in financial losses.

Calculating the cost incurred by laboratory investigations is essential for implementing a price revision strategy to address this issue. Given the absence of a recognized method for calculating investigation costs, adopting the World Health Organization's Laboratory Test Costing Tool (LTCT), a user-friendly Microsoft Excel-based tool, is recommended. This tool is specifically designed to assist in calculating laboratory test costs, ensuring a more accurate

understanding of expenses incurred.

Additionally, establishing key indicators to signal the need for price revision and assigning responsibility to initiate the price revision process when these indicators are triggered will streamline the process and improve its responsiveness to financial challenges. By employing such a system, SJGH can better manage its laboratory costs, maintain service quality, and ensure sustainable operations even during economic hardships.

Introduction

SJGH is a tertiary care health institution with more than a thousand beds. It is a gift given by the government of Japan in 1983. It is a not-for-profit-oriented government enterprise dedicated to providing patients with excellent quality patient care at an affordable price (1).

The hospital offers a broad spectrum of treatment modalities encompassing all four major specialities and various subspecialties, including, but not

limited to, cardiothoracic, ophthalmology, otolaryngology, rheumatology, neurology, orthopaedics, urology, and numerous others. Its facilities boast state-of-the-art diagnostic technologies, including CT scans, MRI scans, ultrasound scans, and a sophisticated laboratory, ensuring comprehensive and modern diagnostic capabilities for patients' needs.

The laboratory department is a pivotal area with modern equipment to conduct various investigations precisely and efficiently. Manned by a highly qualified and experienced team comprising medical consultants, medical officers, and medical laboratory technicians, the department is dedicated to conducting investigations that uphold stringent standards of quality and accuracy.

The laboratory is organized into four distinct sections based on the types of investigations conducted: the biochemistry section, the haematology section, the microbiology section, and the histopathology section. Each section specializes in specific areas of investigation, contributing to the comprehensive range of diagnostic services.

The laboratory extends its services to inward patients, clinic patients, individuals attending the outpatient department (OPD), and outsiders. The investigation price is decided by the pricing committee based on several concerns. The last price revision was in 2019. Laboratory investigation costs depend on many factors categorized into reagent and consumable costs, personal cost or salary, equipment costs, facility costs, service and maintenance costs, and cost for quality maintenance (2).

Since 2019, consumable prices have changed on many occasions. The last price

rise was in June, a blanket increase of 33% in all reagent and consumable prices. Service and maintenance costs rise annually with a new agreement. Despite changing the price of several items that the laboratory investigation directly depends on, laboratory investigation prices have remained the same since 2019. Performing an investigation at the current rate results in an economic loss.

The hospital's health financing is the grant received from the government and the income generated by providing patient care services. Due to the economic crisis, the number and amount of grants received have been reduced. Performing laboratory tests with loss directly affects the hospital's health financing and the laboratory's financing.

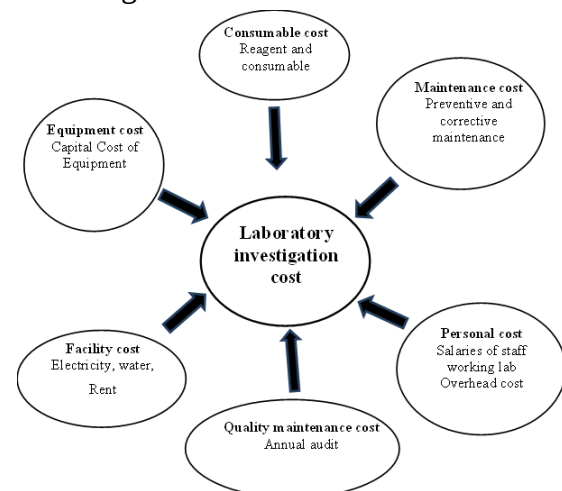


Figure 1 Factors affecting laboratory investigation cost

The health system comprises six building blocks: service delivery, health workforce, health care financing, information, medical products and technologies, leadership, and governance. Integrity among subsystems is essential for maintaining equilibrium among them. Reducing finance affects the whole system. Further reduction of financing to laboratory results in the unavailability of laboratory investigations,

ultimately reducing readiness for service delivery. The failure of a subsystem ultimately leads to the failure of the whole system (3).

Problem analysis

Problem identified

Laboratory investigation prices do not change with the price change of items essential for performing laboratory investigations, resulting in economic loss to the hospital.

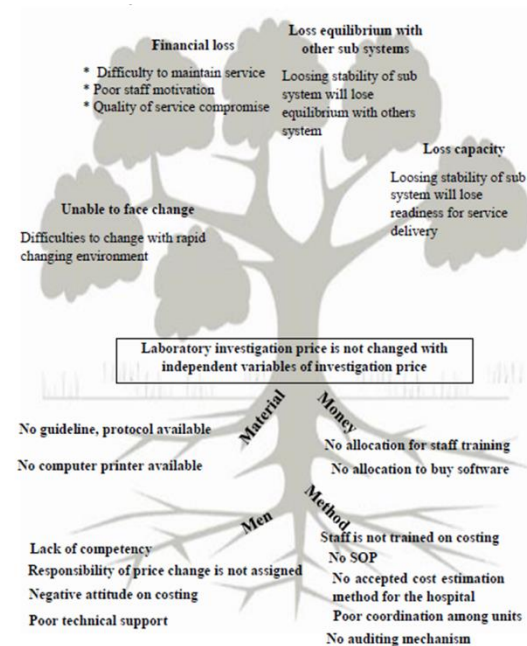
Price revision starts with identifying the need for it. The current practice is that when the hospital administration is sensitized to increasing reagent costs, the price revision process is initiated. The price revision committee calculates the investigation cost. An expected profit is added to the calculated price, and the final price is decided upon. After granting board approval for the decided price, the hospital's billing system (Systolic System) is fed the new price.

Problem analysis

Methods

No accepted cost calculation method adapted by the hospital

Investigation cost calculation is a technical process. It is the most challenging part of the investigation price revision process. Different methods, such as activity-based costing, cost per request, and cost per investigation, are being practised for laboratory investigation cost calculation by laboratories worldwide (4). There has yet to be an established method for cost calculation at SJGH. The technique practised during the last price revision was based only on reagent cost. It was a manual



method, time-consuming, and associated with many assumptions.

Figure 2: Root causes for relatively fixed investigation price that is poorly sensitive for rapidly changing variable investigation cost

Nonavailability of staff training program on cost calculation

The costing committee calculates laboratory costs. This committee comprises a deputy director, relevant medical consultant, medical officer planning, medical laboratory technician, and assistant accountant. Most of the committee members are medical professionals who don't have good knowledge of cost accounting. In addition to committee members, different staff officers may have to participate in the process. Updating costing knowledge is essential, but no training program, reading material, or guidelines are available.

Poor coordination among units

Price revision is a complex process requiring much effort and involvement by

various divisions. Data must be gathered from hospital sections such as the supply division, stores, laboratory, IT department, planning unit, and account section. These units are independently functioning, and poor coordination among them makes the process much more difficult.

Guidelines, manuals, or SOPs developed for hospitals are not available

Price revision is a complex process that needs a lot of technical knowledge and experience. Furthermore, it is a continuous process. It needs to be done regularly when the need arises. A standard operation procedure, guideline, and manual will make the process easier and standardized.

Nonavailability of auditing mechanism

An audit is a systematic assessment of a process against defined criteria that provides feedback. Due to the non-availability of a laboratory-centred regular financial auditing mechanism, profit and loss cannot be assessed. Feedback following an audit is an essential trigger for initiating price revision (5).

Men

Responsibility for price revision is not assigned.

Indications for price revision need to be regularly assessed, thereby promptly identifying and initiating the process. This will essentially prevent loss. This responsibility needs to be assigned to a staff officer who can suggest to the administration that the price revision process begins (4).

Lack of competency on price revision among price revision committee members

Investigation cost calculation requires knowledge, skills, and experience in

costing. The committee used incomplete methods with many assumptions. Providing adequate knowledge and skills will rectify the gaps in the process.

Negative attitude toward costing

Most of the staff, except the hospital administration, have a negative attitude toward cost. They feel it is unnecessary and not important and would increase workload (6). This negative attitude makes staff deviate from the price revision process.

Poor technical support

Cost estimation is a technical process that needs experts' assistance. Less involvement from the accounting department and IT section makes the process difficult. Furthermore, there is no outsourced mechanism to assist with the price revision.

Material

No software available

There are Management Information Systems (MISs) that can detect and provide profit and loss details accurately and quickly. Furthermore, they identify losses and provide suggestions to overcome those. This software makes it easy for hospital administration to pick up and correct the problem.

Money

There is no allocation to buy software.

MISs and accounting software are expensive. The existing "Systolic System" cannot provide details of profit and loss to the administration for decision-making. Due to the economic crisis, the hospital faces difficulties investing in software to overcome such problems.

No allocation for staff training

Staff training should be ongoing until they are familiar with their duties.

The objective of the study

To suggest an effective laboratory investigation price calculation mechanism rectifying gaps in the price revision process at SJGH.

Proposal

The main problem identified is that a system for price revision needs to be established. This process needs to be sensitized to indicators of price revision and an accurate, user-friendly, and accepted method for investigation cost calculation.

The existing price revision mechanism was initiated after the hospital administration was sensitized to changes in consumable prices, which depended on its knowledge and attitude. Objectively recognizable indicators for price revision, such as variables on which the investigation price depends, need to be identified. Price revision should be initiated following the designated personnel's recognition of indicator changes.

The method used to investigate cost calculation was not acceptable. It is associated with many assumptions, considering only consumable costs, and is time-consuming. This should be changed to an accepted, user-friendly method. Staff knowledge of costing, skills, and attitude toward cost accounting should be improved.

Solutions

Identifying investigation cost calculation method

WHO designed a laboratory test costing tool

The laboratory test costing tool (LTCT) is a simple, Microsoft Excel-based tool designed by WHO in line with the theme "Better lab for better health initiative". The tool uses six variables for cost calculation. Those are reagent and consumable cost, equipment cost, personal cost, facility cost, maintenance cost, and cost for quality maintenance. It can be used to calculate single-test costs as well as annual costs. LTCT can be obtained free of charge, and the user manual is also available on the WHO website for training purposes.

The SJGH laboratory performs more than four hundred different types of tests. The tool calculates the cost for a single test at a time by feeding details. This process is time-consuming at its initiation. Only a few variables must be changed when details are fed to calculate the new cost.

Customized and designed manual methods for the hospital.

Most of the laboratory analyzers and equipment were obtained through government grants. The laboratory building is a gift from the Government of Japan. A government grant pays an employee's salary. Only the hospital bears reagent and consumable costs, maintenance costs, electricity, water, telephone, and some overhead costs. Therefore, considering only recurrent costs and designing a suitable method is more justifiable for patients.

Designing a customized method is time-consuming and needs expert knowledge. Regular manual updating and calculation processes are complex.

Purchasing suitable software for investigation cost calculation

The software will provide accurate, efficient, and fast results. Further, it will be more customer friendly. Software is usually expensive. It needs a specific platform to run, and data security needs to be ensured before installation. Also, most software may not be customized according to the hospital's needs.

Rectify the initiation of the process.

Identification of indicators for price revision and delegating the responsibility for monitoring and initiation of the process to a staff officer

Investigation cost depends on many variables, such as reagents, salaries, maintenance, etc. The formation of objectively verifiable indicators will rectify the process initiation. The monitoring process should be delegated. Delegating this to an existing officer is economically more favourable but may be associated with human error.

Installation of MIS that is capable of suggesting the need for investigation price revision

MIS provides accurate and timely results. A quick decision can be taken depending on it. Further, it might support the decision.

MIS is expensive and needs access to existing data. It requires equipment such as computers and printers.

Recommendations and implementation

The external macro environment is unstable politically and economically, so investing in high-cost solutions such as purchasing MIS, decision support systems, or suitable software is not practicable.

Custom design of the solution is a time-consuming process. Due to the prevailing economic crises inside the country, variable costs change frequently. Time-consuming solutions may economically damage the hospital, leading to instability. A further manual process may not be suitable for this rapidly changing environment.

It is essential to develop indicators to identify the need for price change, assign the duty to monitor those indicators, and suggest that the administration initiate the price revision process.

WHO laboratory test costing tool is an easy, customer-friendly solution for cost estimation. It is a free Microsoft Excel-based tool. The hardware requirement is only a computer compatible with Microsoft Excel version 10 or newer. The training manual is available on the WHO website. Further staff training, preparation guidelines, and the translation to Sinhala can be done.

Implementation

LTCT calculates the cost of a single investigation at a time. The SJGH laboratory performs more than four hundred different types of investigations. Feeding to LTCT and obtaining results for all investigations will take an extended period. Prioritizing investigations, which need results first, is a suitable option to prevent delay.

According to the prioritized list, data can be fed to WHO LTCT. A trained MLT can do it. Available laboratory computers can be used.

Price revision is a continuing process. A suitable employer should be appointed to identify the need for price revision.

Guideline manual and training sessions can be arranged during the process.

Conclusion

The laboratory of SJGH is an essential supportive service and a profit centre. Due to economic crises, most items contributing to the variable cost of laboratory investigation have changed, indicating the need for price revision. Price revision starts with investigation cost estimation. The hospital practices no identified cost calculation method. Cost estimation is done many times using different techniques that were not standard methods, were associated with assumptions, and were time-consuming.

LTCT is a free, Microsoft Excel-based tool introduced by WHO for calculating laboratory test costs. It can be introduced to the hospital. Further, a suitable staff officer should be appointed to recognize the need for the price change and initiate the price revision process.

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