

Cost Pricing of Private versus Government Biochemistry Laboratory Tests in Sri Lanka

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Introduction

Previous studies have shown that laboratory services play a major role in the health care and that laboratory services account for about 10% of the total expenditure on the health care (Mouseli et. al., 2017). Presently, total health care expenditure is continually increasing around the world as well as Sri Lanka. From the ever increasing total expenditure about 10% of it will always be for laboratory services. In this context, it is a timely need to determine the true cost of government and private laboratory tests in Sri Lanka. Therefore, this study will primarily study the cost pricing of private versus government biochemistry laboratory tests in Sri Lanka.

According to the 2018, Annual Report of the Central Bank of Sri Lanka, the total expenditure on government health services is 13.7% of the total government consumption expenditure and the private sector expenditure on health services is 2.5% of the total private consumption expenditure. Furthermore, the National Health Report (2013) states that the 2013 total health expenditure of Sri Lanka was Rs.260 billion, which is 3.24% as a percentage of Gross Domestic Production and per capita health expenditure was Rs.12,636. According to the Sri Lanka Health Account, National Health Expenditure Report 1990-2016, the total health expenditure in 2016 was Rs. 398 billion and the per capita health expenditure was Rs.18,880 (Institute for health policy, 2018). This data reveals that over time health expenditure on healthcare in Sri Lanka has been steadily increasing.

As noted earlier, many foreign studies have identified that laboratory services play a major role in a health care and about 10% of the total health care expenditure is spent on laboratory services. Furthermore, 70% or more of medical decisions are based on the result of laboratory tests (Mouseli et. al., 2017). As a result, there is a trend of increasing demand for laboratory services in future. Especially, when a pandemic like Covid-19 necessitates continuous laboratory testing which are highly expensive. In the United State alone, over 7 billion laboratory tests are performed annually (Jackson, 2015).

When the price of a product is determined by balancing the demand and supply of the product, one of the ways that a producer sets the price by determining the price based on the cost of production. Therefore, it is important to identify the cost of laboratory tests. Barker and Huang (1983) identify the importance of the true cost of a laboratory service as “A better knowledge of the actual costs is required for the promotion of more rational utilization and better appreciation of health laboratory services by medical and public health workers”.

The above statement shows the importance by determining the true cost of laboratory tests. The cost of production of a good or service is calculated by adding the cost of inputs required to produce the goods or services. But from an economic point of view, costs should include opportunity costs such as time cost of patients, in addition to direct and indirect costs for inputs. Therefore, there is a timely need to determine the true cost of government and private laboratory tests in Sri Lanka.

Objectives

The main objective of the study is to calculate the cost pricing of private versus government biochemistry laboratory tests in Sri Lanka.

Methodology

The sample selected for this study were all Biochemistry laboratory tests⁸ conducted in a government laboratory and a private laboratory during the six month period from January 1st to June 30th, 2019. The Peradeniya Teaching

⁸ The biochemical profile is a series of blood tests used to evaluate the functional capacity of several critical organs and systems, such as the liver and kidneys.

Hospital laboratory was selected as the government laboratory and a private laboratory located in Kurunegala district was selected as the private laboratory based on convenient sampling method. 40 patients from each laboratory were randomly selected for the study sample to calculate patients time cost. Primary data was collected using an ethical committee approved questionnaire using face to face interview and telephone interview methods. Secondary data was collected from selected laboratory financial reports of the respective accounting departments, annual reports of the Central Bank of Sri Lanka, national health reports, articles and magazines.

Data analysis was performed under two stages. In the first stage, the total cost and per unit cost were calculated based on the Biochemistry laboratory tests related to the both laboratories. The total cost is defined as:

$$TC = LC + CGC + TMC + UC + TRC + BOC \quad (1)$$

Where, TC: total cost, LC: labor cost, CGC: consumable goods cost, TMC: time cost, UC: utility cost, TRC: transport cost, and BOC: building opportunity cost. Average cost (AC) or per unit cost (PUC) is give by:

$$PUC = \frac{TC}{\# \text{ of Laboratory Tests}} \quad (2)$$

In the second stage, a statistical hypothesis test is performed to examine the difference between cost pricing of government laboratory and private laboratory tests. The Wilcoxon Signed Rank test was used for this analysis and it was done by using SPSS software. The following hypotheses were tested.

H₀: There is no difference between cost pricing of both laboratories

H₁: There is a difference between cost pricing of both laboratories

Results and discussion

According to the sample information, the number of biochemistry laboratory tests performed in the selected two laboratories over a period of six month is as follows:

Table 1: Number of Biochemistry Laboratory Tests Performed in Both Laboratories

Labo ratory	Month						TLT (6 Month)	ALT Per month	TLT Per Year
	January	February	March	April	May	June			
Govt.	49515	60925	67500	67704	69341	71269	386254	64376	772508
Private	9549	8859	9725	8192	10125	10123	56573	9429	113146

Note: TLT denotes the Total Laboratory Tests, ALT represent Average Laboratory Tests

As shown in table 1 above, the number of laboratory tests performed in private laboratory is about six times the number of laboratory tests performed in government hospital laboratory in each month.

Table 2: Per unit cost of Biochemistry Laboratory Tests in Two Laboratories in Terms of Cost Components

Cost Type	Cost Per Biochemistry Laboratory Test		Difference
	Government (Rs.)	Private (Rs.)	
LC	18.73	262.01	-243.28
CGC	42.49	217.03	-174.54
TMC	142.8	151.7	-8.9
UC	0.72	21.92	-21.2
TRC	0.20	20.19	-20.19
BOC	2.42	42.11	-42.11
AC Per Test	207.40	714.98	-507.58

Separate total cost of biochemistry laboratory tests for government and private laboratories are Rs. 160,218,159.00 and Rs. 80,897,127.00 per year. Average cost per test of biochemistry laboratory tests in government laboratory is around Rs. 207.40 and per unit cost of private laboratory is around Rs. 714.98. All average cost types for biochemistry laboratory tests in private laboratory are higher than government laboratory. It is about Three times compared to the Government hospital laboratory.

According to Wilcoxon Signed Rank Test results (see Table 3), at 5% level of significance, there exists enough evidence to conclude that there is a difference between the government and private cost.

Table 3: Results of the Wilcoxon Signed Rank Test

Difference	Description	Rank	Mean Rank	Sum of Rank	Tail Test	Probability
Private-Govt	Negative Rank	6 ^a	3.50	21.00	Two Tail	0.031
					One Tail	0.016
	Positive Rank	0 ^b	0.00	0.00		
	Ties	0 ^c				
	Total	6				

Note: 'a' private < government; 'b' private > government; 'c' private = government

Conclusion

Based on the Wilcoxon Signed Rank Test results, this study can conclude that, there is a difference between costs pricing of the two laboratories. One of the major Government Teaching Hospital in the country incurs an annual total cost of Rs. 160,218,159.00 on biochemistry laboratory tests only compared to a total cost value of Rs. 80,897,127.00 at a leading private sector laboratory. And also, separate average cost per biochemistry laboratory tests for government and private laboratories are Rs. 207.40 and Rs. 714.98. Although the total cost value is in the government hospital high, the average cost per test in the private laboratory is three times higher than the government laboratory. This notable difference between the annual total cost is due to high patient turnover rates in the government hospital than the private sector in the country. Therefore, can conclude that, the cost of non-medical factors has exacerbated the unit cost of providing laboratory services in the private sector compared to the public sector. Enormous number of laboratory tests in the government hospitals decrease per unit cost of a test.

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