

# Awareness about the concept of Activity Based Costing (ABC) among medical laboratory professionals

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## Abstract

**Background:** Medical laboratories are an integral and essential component of the healthcare system. Information about costing and resource management is of paramount importance for providing services at a reasonable price and without quality compromise. Awareness of a scientific method of cost accounting- Activity Based Costing (ABC), may contribute significantly to enhance the laboratories capacity to manage its resources efficiently.

**Objective:** This study was done to know the awareness of Activity based costing.

**Materials & Methods:** A preformed validated questionnaire was sent to various laboratory professionals affiliated to private and teaching hospital laboratories. 121 responses were recorded, percentages of which were entered in EXCEL sheets, graphically represented and analysed.

**Results:** Majority of our participants were from medium sized laboratories (40%), working in private sectors, using a combination of automated & semi-automated technologies & not being accredited by regulating bodies. Activity based costing was being implemented in only 14 labs, with more than 70% of respondents not having an adequate knowledge about the same. Inadequate training (44.6%), not being involved in costing (46.3%) and assumed practical difficulties in implementing (9.1%) were some of the reasons cited.

**Conclusion:** Healthcare providers from the laboratory had limited awareness on costing methods like ABC. Efforts to implement and create awareness about the same if made can upscale quality, and sustainable service delivery in lab services at reasonable costs especially in developing country like ours.

**Key words:** costing, traditional costing, activity based costing, direct costs, indirect costs, laboratory

## Introduction

Medical laboratories are an integral and vital component of healthcare system worldwide<sup>[1,2]</sup>. They not only provide diagnostic support but also facilitate the initiation and monitoring of appropriate clinical and public health interventions. Laboratory results are an invaluable tool for many decisions contributing to the wellbeing of the patients. Clinical laboratories need to manage resources properly and scientifically to survive in today's highly competitive world. This necessitates the smart management of finances, at the same time ensuring quality services to its users<sup>[3]</sup>. Accurate cost information is of paramount importance for providing services at a reasonable price and for

estimating the amount of revenue collected from patients. In developing country like ours it is this category of people who have the highest out of pocket spending as a percentage of their income towards healthcare expenses<sup>[4]</sup>.

There are two approaches in costing system, Traditional costing system (TCS) and activity based costing (ABC)<sup>[5,6,7]</sup>. The Activity based costing method was developed to compensate for the deficiency of the traditional method, to allocate a cost driver suitable to any activity, and to calculate the cost price according to the assigned activity. The TCS allocates some costs incurred in departments and uses a few cost drivers to allocate per capita costs. In contrast,

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ABC assigns resource costs to cost objects such as products, services, or customers based on the performed activities. It also offers correct outcomes compared with the TCS. Moreover, the ABC method is a two-stage process, because it assigns total costs first to activities and then to services<sup>[8]</sup>.

According to Cooper and Kaplan<sup>[9]</sup>, the Harvard economists who developed ABC, costs are not driven by the product itself, but through the activities needed to receive, manufacture, and deliver it. Activity-based costing is a way to use activities to allocate indirect expenses to cost objects such as tests and samples. This method is based on the logic that not all tests or samples require an average use of laboratory resources. Under ABC, only those tests or samples that require a particular activity will have the expense allocated to it<sup>[10]</sup>.

The few steps involved in activity based costing are to determine the annual direct cost of tests, to determine the common laboratory costs towards a particular test and determine the annual indirect cost. Finally direct cost and proportionate share of indirect costs are added and divided by number of samples for that particular test. Per sample cost of each test is thus determined. There is paucity of studies on the awareness and implementation of ABC cost analysis in Indian laboratories in available literature<sup>[5]</sup>, hence this study was undertaken.

#### Aims and objectives:

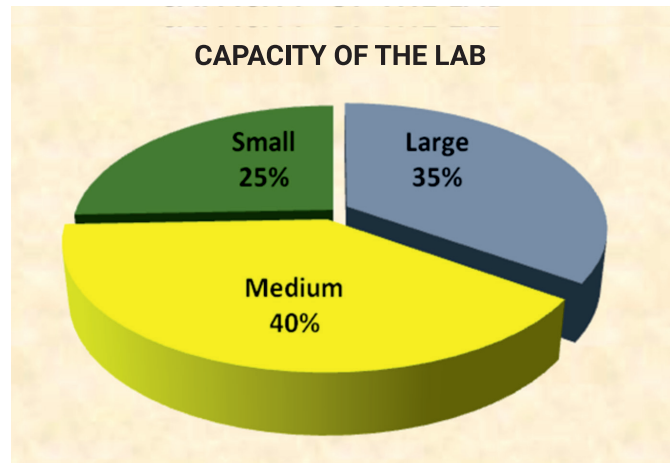
The study was an attempt to know the awareness of activity-based costing among laboratory professionals.

#### Materials and methods:

This was a descriptive cross-sectional study which was conducted over a period of three months (May-July 2020). The questionnaire was formulated by the department representatives from pathology, biochemistry & microbiology of the Central laboratory of our medical institute. The index of reliability was Cronbach's alpha (0.7). The questionnaire comprised of 15 closed ended questions and was sent to laboratory faculty affiliated to medical colleges and laboratory consultants working in private sector by a Google form through emails as the primary mode of communication. A brief introduction about the study was included at the beginning. Attempting all the questions was mandatory. The participant's identity, personal details and responses given were kept confidential throughout the study. The responses were documented on to excel sheet and analysed on a percentage scale of responses to a particular question which is presented in the results section.

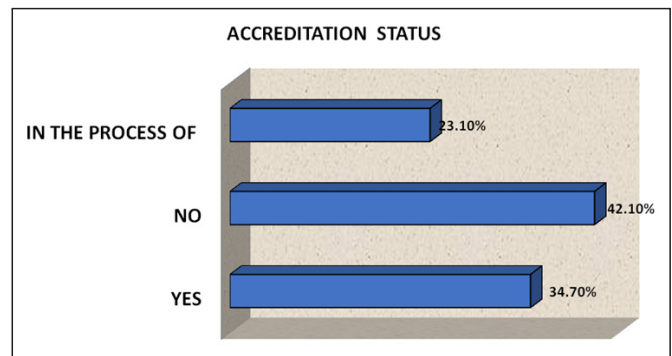
## Results

A total of 121 responses were recorded. Majority of our participants were from medium sized laboratories. Laboratory capacity was taken as per NABL ISO 15189:2012 standards. Small sized lab - catering to 100 or less samples a day, medium sized lab - catering to 101 to 300 samples a day and large sized lab catering to more than 300 samples a day.



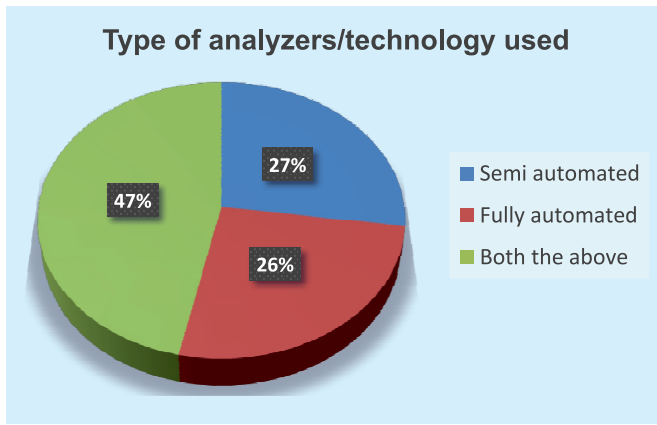
**Figure 1: Different capacities of the laboratories to which the respondents were affiliated.**

A major fraction of our participants worked for private sector labs, with relatively fewer working in government and quasi - government run labs. The average laboratory work experience of the respondents in our study was for more than 10 years.



**Figure 2: Accreditation status of the laboratories.**

Only 34.7% of the laboratories were accredited, with the remaining ones either not or in the process of applying for the same. NABL (National Accreditation Board for Laboratories) was the most common accreditation body, followed by JCI, (Joint Commission International,) NABH & ISO.

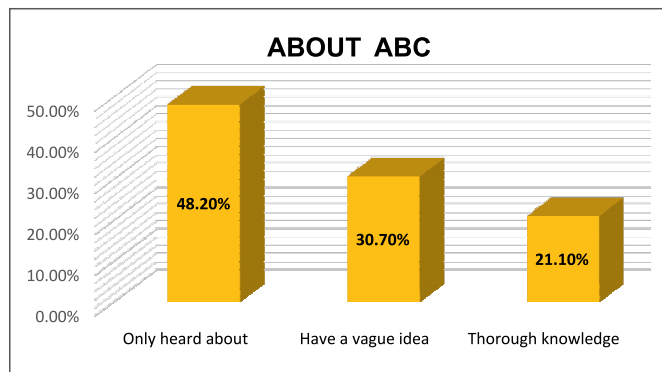


**Figure 3 :Type of analysers/ technology used in labs**  
When asked about the type of technology used for diagnostic testing, complete automation was implemented in 27% of the laboratories, a large proportion of labs used both automated and semi-automated technologies (48%), while the remaining labs (25%) were using only the semi-automated analysers. (Figure 3).

**Table 1: Distribution of the various costing methods being implemented**

Type of Costing	Number	%
Conventional	37	30.6
Activity Based Costing (ABC)	17	14
Not Sure About Costing	67	55.4

Activity based costing (ABC) was the least type of costing implemented (14%).

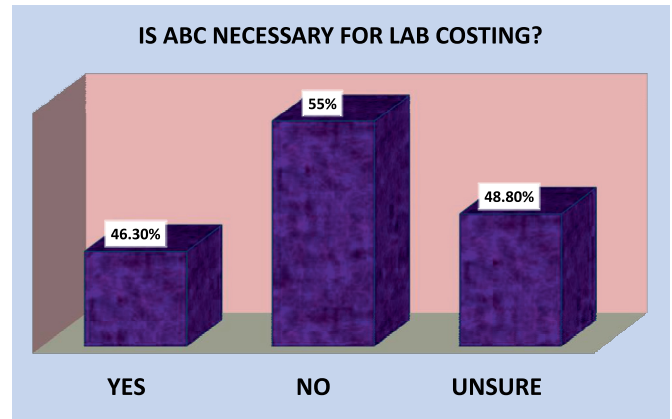


**Figure 4: Awareness about activity-based costing.**  
When asked about the type of costing adopted by the lab 48.2% of the study participants had only heard about ABC, 30.7% had a vague idea and only 21.1% had a thorough knowledge about the same.

**Figure 5: Response on necessity for introducing ABC**

When asked about the necessity of applying ABC in lab costing 46.3% felt that ABC is necessary, 5% felt it was not while the remaining 48.8% were unsure of

the same.



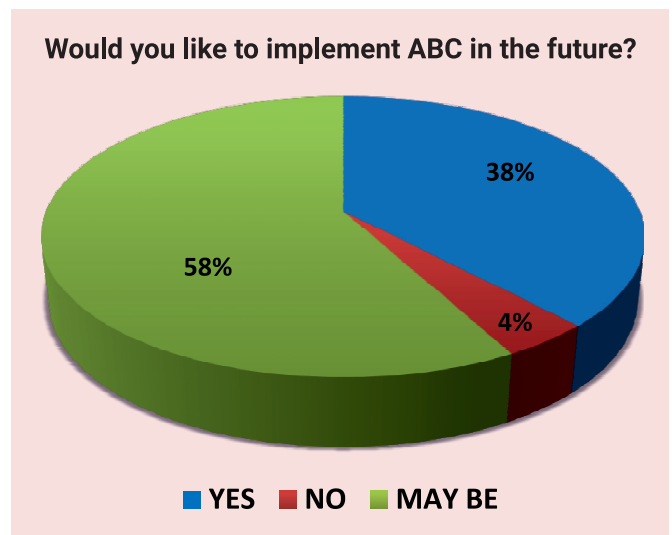
**Table 2: Type of laboratories**

24 hours functioning laboratory	Yes (74.4%)	No (25.4%)
Attached to a medical college	Yes (54%)	No (46%)

54% of the laboratories were attached to a medical college, while the rest were not. 74.4% of the laboratories the faculty were affiliated to were 24 hours functioning

**Table 3: Possible reasons for not implementing ABC**

Likely reason for not implementing ABC	Number	Percentage
No adequate knowledge / training	54	44.6%
Practical difficulties in implementing	11	9.1%
Not involved in deciding costs	56	46.3%



**Figure 6: Responses on implementation of laboratory costing**

Majority of the participants were not sure if they wanted to implement ABC in the near future. Thirty eight percent (38%) were positive of implementing ABC in the laboratories attached to medical colleges (Figure 6).

#### Discussion:

'Better labs for better health' builds on the promise that sustainable laboratory services require a rational approach to laboratory system strengthening. A crucial component of an efficient laboratory system is having a comprehensive overview on laboratory expenditures and actual cost of tests<sup>[11]</sup>. Unfortunately accounting and costing systems of health care organizations have never been a central focus of reform.

Medical laboratories worldwide are crunched between the availability of limited resources, increasing costs and greater demand for customer services<sup>[12]</sup>. Increasing the expenses on healthcare negatively affects the economic measures taken by healthcare organizations, negating their beneficial effects especially in a developing country like ours<sup>[4]</sup>.

The present study was undertaken to know the awareness of Activity Based Costing which is a more scientific cost accounting system among laboratory professionals. It was found that around 46.3% people were not involved in costing at all and only about 21% of lab professionals had a thorough knowledge of ABC. In today's challenging health care environment, administrators are often faced with a situation where the customer demands and workload are inversely proportional to funding. This is particularly true in hospital laboratories, where increased volumes are expanding workloads, while at the same time, rising labour costs are putting the squeeze on laboratory budgets. Laboratory managers are always searching for ways to help them run their laboratories in the most efficient and cost-effective manner possible<sup>[10]</sup>. One of the common ways of tackling this problem is the labs increase the user cost. Also among our study participants 56% were from a teaching institution whose aim is to primarily cater to the economically underprivileged section of the society. A good knowledge of costing would help provide lab services at a reasonable cost to the patients.

Crude methods of cost budgeting would tilt the balance between quality test and cost effectiveness and the burden would be either on patients or at a cost of heavy losses to the management, thus benefitting neither of them. In spite of this the traditional costing methods are still frequently used in practice (30.6% of labs) in our study, mostly because of their simplicity and minimal data input requirements.

To circumvent this problem, involvement of laboratory professionals in costing and training them in a more scientific methodology of cost accounting like the ABC is the need of the hour. Surprisingly 46.3% of our study respondents were not even involved in lab costing, highlighting the fact that importance of the knowledge of costing is still an under looked upon parameter by lab professionals.

Though it is a well-known fact that costing provides robust data that accurately reflects how resources are consumed more than half our respondents had only a vague idea about the same. ABC solves this problem by estimating the cost of the work activities that consume resources and by linking these costs to the services that are provided<sup>[5,13,14]</sup>. ABC was being implemented to use only in 14% of the laboratories. When asked about the reason for not using this costing method those involved cited practical difficulties in implementing and lack of knowledge about the ABC. This implies that Activity-based costing (ABC) has been slowly gaining traction among hospital financial controllers, yet has not been widely adopted as a method to improve the value cycle.

Accreditation in its simplest form is a system of standard procedures with an aim to improve quality. It also implies the laboratory competency and promises high standard customer care.<sup>[15,16]</sup> In our study more than 50% of the laboratories were yet to be accredited. This highlights the need for improved focus for quality, which a majority of the labs are yet to focus on.

One of the main responses of not having implemented the ABC method was that the participants lacked adequate knowledge/training on the same. This undermines the fact that the laboratory professionals must look and learn beyond their normal comfort zone of reporting and documentation in their respective specialities. An idea about good costing methods like ABC and implementing it in the place of work will help balance the fine lines between available funds, resources and patient care, find and rectify areas of excess capacity and wasteful spending.

#### Recommendations of the study:

Health care providers from the laboratory front must be aware or exposed to the tariff setting processes, make an effort to know about and use validated costing methods like activity based costing (ABC) for effective utilization of the resources to improve the value cycle and ensure affordable healthcare.

**Conclusion:**

Awareness of costing methods like Activity-based costing (ABC) is limited and is yet to gain traction among laboratory physicians affiliated to medical and private laboratories.

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