

Unit Cost Calculation as a Role of Cost Containment at Central Surgery Installation of Hospital X

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Abstract: In regards to good health development services in terms of budgeting and financing, not all hospitals, such as hospital X, have data on the production cost of services as the basis for determining the tariffs, because this has not been calculated based on unit cost. The unit cost calculation of services in Central Surgery Installation (CSI) Hospital X is the main purpose in this research, which used a cross-sectional with descriptive observational approach and analysed using Activity-Based Costing (ABC) method. The results showed that the unit cost calculation was divided based on eight qualifications of operation in minimum and maximum unit cost intervals, as follows: (1) Minor: IDR 1.320.206 - IDR 2.805.815, (2) Moderate: IDR 2.057.070 - IDR 2.733.284, (3) Major: IDR 2.408.011 - IDR 3.995.652, (4) First Major: IDR 2,228,755 - IDR 4,759,747, (5) Second Major: IDR 1.727.593 - IDR 5,523,273, (6) Third Major: IDR 3,049,093 - IDR 7,099,322, (7) Fourth Major: IDR 6,176,461 - IDR 7,512,786, (8) Fifth Major: IDR 1,711,223 - IDR 9,439,909. The existence of the unit cost calculations assists management to make accurate decisions on budgeting and cost planning; hopefully, it can be developed in an integrated system for recording and reporting.

1 INTRODUCTION

In the course of the development of health services, the aspects of budgeting and financing of health are essential, because it focuses the hospital's attention and how the budget can be used for investment, operational purposes, improving the competence of human resources and improving the welfare of its employees. It should be considered in the implementation of Security Agency of Health (BPJS-Kesehatan) which has implemented tariffs in accordance with the existing policy, namely Permenkes Number 69 Year 2013 about Standard Rates on Primary Health Care and Advanced Health Facilities level in the Implementation of Health Insurance Programs, where the determination of the tariffs' policy caused problems in its implementation at this time⁷. In health care systems, hospitals provide primary care, serve as referral institutes for higher-level care, and train health care workers. Those benefits are costly (Baker, 1998).

General hospitals as health care organizations should adjust the tariffs immediately into a variety of management functions such as regulation, planning, guidance, and supervision. In addition, it

should be realized that the hospital has many unit production and supporting costs, whereby each unit has to generate revenue and there is not a must have list in terms of cost. Such diversity is sometimes likely to cause a lack of accuracy of the actual costs owned by the hospital. The unit cost as the basis for calculating the budget does not necessarily reflect the actual costs at the hospital. Therefore, a tally of *unit* cost, *actual* cost and expense management should be made in a normative order with respect to the tariff policy of being rational and accountable (Roztock et al, 2004). A company which has valuable information in comprehending and identifying customers who are more profitable or not will help advance the overall organizational profitability (Baker, 1998). Customer cost information is considered very helpful in maintaining the level of profits and retain customer relationship.

In general, there has not been accurate data of the hospital facilities and production costs of health and medical services for use as a basis of determining the tariff. This condition is not recommended because the basis of current rates has not been calculated as unit cost; basically, the hospital has

calculated *the unit* cost, but is still not rational. The rationality level of the tariffs has many viewpoints, such as the current rate being too expensive or too low. Both conditions lead to different consequences. If the current rate is too expensive, what the consumer pays is not comparable with *the output* obtained. Similarly, the lower rate could lead to the hospital as a healthcare provider not reaching the *break-even point* or even having a deficit (Mulyadi, 2015). This situation should sensitize health care providers to adopt a rational rate, in accordance with the service received by consumers.

2 METHODS

This study was an observational study descriptive and there was no treatment on the sample. Observational study emphasizes on activities in the field as a data source and a research approach in data collection in the form of primary and secondary data, such as financial reporting documents, the traffic data, annual reports, internal data and other data. Based on the time of the study, the study design was *cross-sectional* because of the timing of data collection and information research conducted at one particular time and then an analysis of data using *Activity-Based Costing*.

The data analysis technique used was Activity-Based Costing, which is a method for calculating the cost of production used to provide cost information for managers as a basis for making strategic decisions and other actions that affect the capacity and fixed costs (Blocer et al, 2000). The stages of accounting by *Activity-Based Costing* are as follows: (1) identification of activities; (2) organize activities into cost centers; (3) identification element of main cost; (4) analysis of relationship between cost activities; and (5) identify cost drivers

3 RESULT

The effective working time in one year was calculated based on 2013, which determined the total of the number of effective days of each month. Effective days are work days which were already reduced by holidays and national holidays. Number of days effective in one year were then converted into units of minutes. The result of the calculation of time effective for one year, based on research, showed working hours per day for eight hours with a total time of 1,960 hours or 117,600 minutes. Throughout 2013, there were 6,809 medical actions

undertaken operative in Central Surgery Installation, which was divided into 12 rooms of CSI, so that at each CSI room could serve 2-3 patients per day. From the results of field observations, relevant data area of Central Surgery Installation of 518m² were obtained. Magnitude of spacious CSI rooms can be divided into 12 rooms, each of 42 m², except room 10. Direct costs related to the place of the medical action operative are the fees charged to patients when performing medical procedure operatives as cost replacement incurred by the hospital for procurement and the maintenance of buildings (Fauziah et al, 2014). The building is assumed to have a lifetime of 20 years, so the function of building was considered normally in 20 years of life. After knowing the entire procurement cost of space in CSI, the cost center of the main Central Surgery Installation (CSI) building will be delivered. Based on calculating the cost center of the Central Surgery Installation (CSI), obtained from Annual Investment Cost, and the the calculation of depreciation costs of buildings, we get the total cost center for Central Surgery Installation (CSI) of IDR 389,042,092.88. The costs of procurement for each operating room obtained from the calculation of the cost center of Central Surgery Installation (CSI) were divided by the effective working hours per operating room in minutes to obtain the cost per-minute on each operating room, which were then multiplied by the duration of action per operative medical treatment. The following is the calculation of the cost for medical treatment operative place.

Note:
 Effective : 245 days
 Working Hours effective : 245 days x 8 hours x 60 minutes = 117 600 min
 Cost center of the building : IDR 389,042,092.88
 Then the cost of space per : IDR 389,042,092.88 /117 600
 : IDR 3308.18

Furthermore, the cost will be multiplied by the length of each operative medical treatment in CSI. Human Resources (HR) is composed of medical personnel, both specialist doctors, general practitioners, nurses and other medical personnel, who perform operative medical procedures and non-medical personnel involved indirectly in Central Surgery Installation. Cost of Medical Consumables per operative action of the medical pharmacy depot parts were obtained from CSI. Consumable Cost fees in the pharmaceutical depot in CSI were different from the central pharmacy depot. In the central pharmacy depot, using a software that shows

pharmaceutical expenditure costs, as in the table below.

Table 1: Total Cost of Consumables

Month	Fees Consumable Cost (IDR)
January	449,181,603.00
February	449,181,603.00
March	449,181,603.00
April	449,181,603.00
May	449,181,603.00
June	449,181,603.00
July	449,181,603.00
Month	Fees Consumable Cost (IDR)
August	449,181,603.00
September	449,181,603.00
October	449,181,603.00
November	449,181,603.00
December	449,181,603.00
Total 1 year Consumable Cost	5,390,179,236.00
Consumable Cost Cost per action	791,625.6772

Source: Hospital pharmacy depot X

Furthermore, to obtain the value of consumable cost per category action then a score was made according to the category of the type of medical treatment operative. Here the results of calculation of the consumable cost were based on medical surgery category.

Table 2: Cost of Consumable Per Qualifying Operation

Qualification Operation	Score	Total Cost Consumable Cost
Minor	1	791.626
Moderate	2	1,583,251
Major	3	2,374,877
Major 1	4	3,166,503
Major 2	5	3,958,128
Major 3	6	4,749,754
Major 4	7	5,541,380
Major 5	8	6,333,005

Waste of CSI can be divided into medical waste and non-medical. The calculation of the unit cost of processing medical waste obtained a sewage treatment fee per kg of IDR 10111.09. Based on interviews and dealing with operating personnel in the CSI, the weight of solid waste for each action is not always the same, but can be searched by averaging suitably qualified operations, described as follows.

Table 3: Unit Cost Medical Waste

Qualifying Operating	Weight Solid Waste (g)
Minor	400
Moderate	500
Major	600
Major 1	1700
Major 2	2700
Major 3	3700
Major 4	4700
Major 5	5800

Activities of non-medical services in the installation of the Central Surgery entail management and administration activities performed at the Central Surgery. The room used to perform non-medical services has area of 1480m² with cost per m² of IDR 1,401,583.73 and then multiplied by the area. So, from the calculation of the above Annual Investment Cost, cost directly related to the site of management activities is IDR 50,373 per action. Based on the calculation of infrastructure maintenance costs, maintenance costs can be calculated by load per-action with the total action in 2013 as many as 6,809 by dividing the total cost of maintenance with the actions in 2013, so that it shows the burden of indirect costs for treatment as IDR 50,455.66. Furthermore, other costs include the operating costs consist of expenditure on electricity, water and telephone/ fax. In 2013 there already exists a recap of telephone charges, water and electricity by the hospital. By knowing the total area of the hospital as 82,381.01 m² and total action as many as 6,809, these are used to determine the costs of electricity, water and telephone per action and can be explained as follows. From the calculation of operating costs, total other costs per action is IDR 14,584.99, while the results of calculating costs for non-medical consumables are IDR 6,809.00 for one year, and total expenses per action is IDR 4,303.81. Below is a table of indirect costs in the Central Surgery installation and direct costs of each operative medical treatment activity.

Table 4: Indirect Costs

Components Indirect Costs	Total Costs
Place	50,373
HR Non-Medical	161,797
Maintenance	50,456
Operations (electricity, water, telephone)	14,585
Consumable Cost	4,304
Total	281,514

4 DISCUSSION

Based on this study it can be seen that the results calculation of *Unit Cost* in the Central Surgery Installation is divided based on operation qualification. *Cost drivers* used are old minimum and maximum actions that ultimately produce intervals of *unit cost* minimal and *unit cost* maximum. The following summary table calculates minimal and maximal unit cost.

Table 5: Unit Cost Result

Operations Qualification	Unit Cost Minimum (IDR)	Cost Unit Maximum (IDR)
Minor	1,320,206	2,805,815
Moderate	2,057,070	2,733,284
Major	2,408,011	3,995,652
Major 1	2,228,755	4,759,747
Major 2	1,727. 593	5,523,273
Major3	3,049,093	7,099,322
Major 4	6,176,461	7,512,786
Major 5	1,711,223	9,439,909

Based on the table, the calculation of unit cost uses Activity-Based Costing, generating minimal and maximum unit cost divided by operation qualification. The idea concepts of Activity-Based costing is a cost accounting system that focuses on activities performed to produce a product / service. Activity is any activity which is the trigger of the cost (cost driver) and acts as a causal factor in spending in a production process. Activity-Based Costing is able to present more accurate product cost and information, and is a direct measurement of the profitability of products that more accurately reflects strategic decisions on the selling price, market product lines and expenditure models. It also obtained a more accurate measurement of the costs triggered by activity, thus helping management improve the product value and the value of the process, thereby helping the information on costs for decision making (Carter et al, 2012). The weakness of *Activity-Based Costing* is that some costs were allocated at random due to limitations in finding the cost of the activity. It also ignores the cost of analysis and requires extensive time and cost. The Activity-Based Costing method can help to reduce unnecessary cost effectively and reduce costs that do not have added value and can even remove the cost of unnecessary activity through activity analysis. Analysis of activity should result in: (1) what activities are carried out; (2) how many people are doing the activity; (3) the time and resources required to perform the activity; and (4) the calculation of the value of the activity

5 CONCLUSION

Based on this study, it could be concluded that the calculation of unit cost can be used in controlling costs in health services provided by health agencies. The results showed that the unit cost calculation in CSI Hospital X was divided into eight qualifications based of operation, which resulted in minimum and maximum unit cost intervals as follows: (1) *Minor*: IDR 1,320,206 and IDR 2,805,815; (2) *Moderate*: IDR 2.05707 million and IDR 2,733,284; (3) *Major*: IDR 2,408,011 and IDR 3,995,652; (4) *1stMajor*: IDR 2,228,755 and IDR 4,759,747; (5) *2ndMajor*: IDR 1,727,593 and IDR 5,523,273; (6) *3rdMajor*: IDR 3,049,093 and IDR 7,099,322; (7) *4thMajor*: IDR 6,176,461 and IDR 7,512,786; (8) *5thMajor*: IDR 1,711,223 and IDR 9,439,909. Calculation of unit cost is analyzed using many approaches and methods, one of which is Activity-Based Costing.

Therefore, the recommendations can be given as follows. (1) There should be improvement in the inventory records of medical devices and non-medical, either in the form of soft files or hardfiles; (2) improvement in the recording and reporting of activities of medical in Central Surgery Installation by developing an integrated system for recording and reporting; (3) provision of services of medical personnel according to their competencies, thus incorporating elements of clinical pathways becoming absolute in recording employee data; (4) registration of consumables per action should be through clear mechanisms ranging from pharmacy depot or warehouse pharmacy to the pharmacy that provides services; therefore it is necessary for the manufacture and development of integrated information systems; (5) the development and strengthening of the integrated management information system in any installation; and (6) provide training to Human Resources to run the new information technologies

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