

Cost Analysis with Activity Based Costing Method on Coronary Heart Catheterization Treatment at RSUP Dr. Sardjito Yogyakarta

Nugroho Bayu Aji*, Rizal Yaya**, Wiwik Kusumawati***

*Correspondence Author : nugrohobayuai99@gmail.com

*Master of Hospital Management, Postgraduate Program, Universitas Muhammadiyah Yogyakarta, Indonesia

**Faculty of Economics and Business, Universitas Muhammadiyah Yogyakarta, Indonesia

***Faculty of Medical and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia

INDEXING

Keywords:

Unit cost;
Coronaryangiography;
Activity Based Costing;

ABSTRACT

The purpose of this study was to calculate unit cost coronary angiography with the ABC method and analyze the differences in the results of the calculation unit cost of the ABC method with the current rates at RSUP Dr. Sardjito Yogyakarta. The research method is qualitative with a descriptive design case study, this study uses primary data and secondary data. Primary data is in the form of interviews, while secondary data is obtained through financial data in 2016. Methods for analyzing costs using the method of Activity Based Costing (ABC). The study resulted that coronary angiography-guided by the SPO, the results of the calculation unit cost of the ABC method were Rp7.927.171,13 higher than the current fare. The unit cost of coronary angiography at RSUP Dr. Sardjito Yogyakarta by the ABC method is a unit cost for coronary angiography without difficulty which is calculated by charging all costs both direct costs and costs overhead. Hospital rates have not been recalculated since 2014, so it has not yet described the real conditions in 2016. In addition, personnel expenditure conditions that exceed the provisions of the proportion of a maximum of 44% as mandated in the Republic of Indonesia Minister of Health Regulation are the factors causing higher unit cost calculation ABC method rather than rates coronary-angiography hospital.

Kata kunci:

Biaya Satuan;
Koronariangiografi;
Pembebanan Berbasis
Aktivitas;

Tujuan penelitian ini adalah menghitung unit cost coronaryangiography dengan metode ABC dan menganalisis perbedaan hasil perhitungan unit cost metode ABC dengan tarif saat ini di RSUP Dr. Sardjito Yogyakarta. Metode penelitian adalah kualitatif dengan rancangan deskriptif studi kasus, Penelitian ini menggunakan data primer dan data sekunder. Data primer berupa hasil wawancara, sedangkan data sekunder diperoleh melalui data keuangan tahun 2016. Metode untuk menganalisis biaya menggunakan metode Activity Based Costing (ABC). Penelitian menghasilkan bahwa tindakan coronaryangiography berpedoman pada SPO hasil perhitungan unit cost metode ABC sebesar Rp7.927.171,13 lebih tinggi dari tarif saat ini. Unit cost tindakan coronaryangiography di RSUP Dr. Sardjito Yogyakarta dengan metode ABC merupakan unit cost atas tindakan coronaryangiography tanpa penyulitan yang dihitung dengan membebankan seluruh biaya baik biaya langsung maupun biaya overhead. Tarif rumah sakit sejak ditetapkan pada tahun 2014 belum dilakukan perhitungan ulang, sehingga belum menggambarkan kondisi riil tahun 2016. Selain itu kondisi belanja pegawai yang melebihi ketentuan batas proporsi maksimal 44% sebagaimana diamankan dalam Peraturan Menteri Kesehatan RI menjadi faktor penyebab lebih tingginya hasil perhitungan unit cost metode ABC daripada tarif coronaryangiography rumah sakit.

© 2018 JMMR. All rights reserved

Article history: Received 2018-Dec-11; Revised 2018-Dec-12; Accepted 2018-Dec-14

INTRODUCTION

Coronary heart disease (CHD) including Noncommunicable diseases (NCDs) which is *high cost, high risk and high volume* facing many countries in the world. Financial consequences are a burden that must be borne by the patient or guarantor, including the provider of health facilities when a person is diagnosed with CHD. The prevalence of CHD based on 2013 Basic Health Research results mostly occurred at the age of 65-74 years (3.6%)

followed by age > 75 years (3.2%), age 55-64 years (2.1%), age 35-44 years (1.3%). Where as according to its economic status, the prevalence of CHD was the lowest (2.1%) and lower middle (1.6%). Based on interviews, doctors diagnosed the prevalence of CHD by 0.5% with an estimated number of 883,447 sufferers, while based on doctor's diagnosis or symptoms by 1.5% with a number of 2,650,340 sufferers. Especially in the Special Region of Yogyakarta (DIY) based on interviews diagnosed with doctors the number of CHD was 16,663 people (0.6%) and

based on diagnosed doctors or symptoms as many as 36,104 people (1.3%)¹. The high morbidity (number of sufferers) and mortality (number of deaths) due to CHD, of course have an impact on the cost of treatment and care and investigations that are not small. The financing of Community Health Insurance (Jamkesmas) will increase along with public awareness of health, increase in PTM patients, economic development, high population mobility and an increase in population. On the other hand, hospitals as health care providers complained about the loss caused by the income from claims of Jamkesmas still lower than the hospital rates². CHD detection can be done by invasive or diagnostic invasive diagnostic techniques³. Coronary heart catheterization (*Coronaryangiography*), which is an invasive diagnostic procedure that aims to evaluate the anatomy of the coronary arteries, determine the percentage of oxygen bound to hemoglobin in the blood, find out the blockage in the coronary arteries ^{4,5,6}. The procedure is using a device called *Angiography* , by inserting contrast and x-ray substances to evaluate the coronary arteries⁷.

In financing health services the determination of fare is more complex than other commodities and becomes increasingly complicated because of the lack data needed. The medical record system in the hospital is not enough to support the fare determination process⁸. Determination of hospital fare using traditional methods is considered unable to overcome the difficulties in determining of fare⁹. So that all elements, both the hospital and *stakeholders are* required to be able to calculate the amount of *unit costs* needed and accountable for financing health services, until now the RSUP Dr. Sardjito Yogyakarta calculating and implementing *unit costs* still uses traditional calculations (*fee for service*) that way it has not produced accurate calculations

Based on the considerations of the data above , the researcher felt need to do a *unit cost* analysis using the ABC method on coronary heart catheterization. The advantages and superiority of the ABC method compared to other cost analysis methods are the reasons for choosing the ABC method in this study. This study aims to calculate *unit costs coronaryangiography* at DR.Sardjito using the ABC method, and analyze the differences between the calculation of *unit cost coronaryangiography* with ABC method and *unit cost* which is currently used at RSUP Dr. Sardjito Yogyakarta . From the theoretical aspects, the results of this study is expected to can be used as a reference or as a comparison in conducting similar research,

while the practical aspects for management considerations to used in policy making and decision making in determining the *unit cost* of service coronary heart catheterization more accurate and rational

RESEARCH METHODS

This study is a qualitative research with a descriptive design of case studies , the subjects of this study are the Head of Accounting and Verification, Head of Cardiac Care Installation, Cardiologist and Blood Vessel in the Cardiac Catheterization Laboratory who has cardiac catheterization action competencies , Administrative Staff consisting of medical record staff, staff of inventory matters, staff of human resources (HR), hospital facilities and infrastructure maintenance staff (IPSRS), fare team members, while the research object covers all activities and costs incurred in the service *coronaryangiography* at RSUP Dr. Sardjito Yogyakarta with a period of January 1, 2016 to December 31, 2016 with research variables covering *unit cost of coronaryangiography* and activities of catheterization laboratories, and supporting data. This study uses primary data and secondary data. Primary data is in the form of interviews result with the Head of Accounting and Verification, Head of Cardiac Care Installation, Cardiologist and Blood Vessel in the Cardiac Catheterization Laboratory who has cardiac catheterization action competencies , Fare team members, while secondary data were obtained through financial data in 2016. To ensure the validity of the data, an instrument quality test was carried out using triangulation¹⁰, namely interviews, observation and crosschecking data with facts from other sources.

The methods for analyzing costs using the method of *Activity Based Costing* (ABC). ABC method is a method of applying an accounting concept of activity that aims to produce a more accurate calculation of cost price. From a managerial perspective, the ABC method in addition to providing product cost information also provides performance information from activities and resources can also trace costs used to cost objects other than products accurately¹¹. ABC has two main elements, namely measuring costs (*cost measures*) and measuring performance (*performance measures*)¹². ABC is a method of measuring costs and performance of activities, resources and cost objects, by determining the resources used in activities and then assigning these activities to cost objects¹¹. All activities definitely need resources to produce an output¹². ABC has been successfully applied in health

care organizations in the United States since the 1990s, especially in hospitals¹³.

When the hospital will implement the ABC must consider the factors that are related and needed, including the service factors offered in the hospital, demographic factors such as size or type of hospital, location, education level of employees, and equipment. Factors as the basis of management make decisions¹⁴. ABC can be applied in the health care sector with patients as a unique product. This is because ABC calculates costs for activities that consume resources and then applies them to products (patients) on the basis of activities needed in production or treatment¹⁵. The ABC system assumes not products that consume resources but activities as consumers of resources¹⁶. To improve service quality and control service costs, clinical pathway is used¹⁷. CP goals include reducing service variations, making it easier to predict costs, standardized services, improving service quality, improving financing procedures, improving the quality of information that functions as a *check counter* incases *high cost, high volume*. Preparation of CP is prioritized for frequently encountered cases, most cases, cases with high costs, the course of the disease and the results can be known, there are medical service standards and standard operating procedures¹⁸.

RESULTS AND DISCUSSION

According to data on the number of *coronaryangiography* treatment at RSUP Dr. Sardjito Yogyakarta in 2014 was 1011 treatments, in 2015 was 1096, and in 2016 1044 treatments. Based on the interviews data primary and secondary data hospitals that the *coronaryangiography* treatment is in accordance with the standard operating procedure (SPO) that have been established and approved by the President Director not based on the *clinical pathway* ¹⁹. In this study, the SPO was also used to analyze activities on *coronaryangiography*. It is based on the the following statement of the Head of Cardiac Care Installation:

"The existing *clinical pathway* is for sterile coronary heart disease, we don't apply the clinical pathway to the non-fluids and vapors, but not all patients undergoing coronary heart catheterization are stemic, so only some of them use the *clinical pathway* . This is for the ones that have been there all this time (KIRJ Code. P2)".

"So I think there is already an SOP, if the patient wants an act of catheterization, in this case coronary

catheterization. The catheterization is 2, namely right heart catheterization and left heart catheterization. If the right heart catheterization is to see heart chambers, the pressure is usually in congenital heart diseases, sans diseases. But the left heart catheterization is to see coronary arteries, in general those who do the most are left heart catheterization. Patients are asked to fill out informed consent first, the procedure is how the side effects occur, then how long does it take, access to which, then we will prepare to enter the catheterization after he signs and then take treatment with lots of preparation, preparation for laboratory tests, diagnostic results then we just do aseptic statement in the crotch area or by hand after that we put on clean sterile linen cloth, we also use new linen, we do puncture radial artery then after entering we give contrast contrast material, see the condition of the left blood vessel and the right blood vessel. After that, we have just assessed the blockage or narrowing or we have not told the patient directly and to the family after we have determined it, if it normal, we will do nothing. For example there is a narrowing that we need to do the stent installation procedure, we immediately ask the patient and family for approval to take a treatment. After the installation of the stent is finished, then we let them know again. The time is depending on the anatomy of the patient's blood vessels, the level of difficulty is different, there are ½ hours, some are 3 hours. "(DSJP Code. P1)".

At RSUP Dr. Sardjito fare determination is carried out based on hospital proposals determined by the Ministry of Health and approved by Ministry of Finance²⁰. Based on the statement from the Head of the Accounting and Verification:

"So the fare in this hospital is determined by the Ministry of Health and it is approval by the Ministry of Finance that's we have done. Bottom up, top down, starting from the proposal the user who has an interest in the fare, for example, the doctor or what service is in the hospital, by the unit, is proposed. Later from the proposal is reviewed, reviewed by management and calculated by the unit cost and by the fare team compared with various factors like the ability factor of the community, the factors relating to the competitor of the hospital or other policy factors from the government that will appear whose name also must be proposed to the Ministry of Health and must be approved or get a stamp from the Ministry of Finance. "(Code KBAV.P1)

The statement from the Head of the Accounting and Verification was justified by the informant of the Member fare team RSUP Dr. Sardjito Yogyakarta:

"For the policies in this Sardjito hospital, we are based on PMK, we must propose to the finance ministry so that it can be ratified as one of the catheterization rates". (Code ATT.P1).

For the method of drafting price at RSUP Dr. Sardjito Yogyakarta still uses traditional methods or it is not exactly sure about what the method itself, is was based on the results of the following interview:

"About the fare itself, as far as I know, what method? clearly there are several criteria which the fare was set starting from the most basic is the unit cost, it is be the main consideration, then the factor is the ability of the community, competitors, market factors, and some government rules. So we don't know what method it's called. So there are some factors are used or considered for setting the rates, but what is clear is that we must know the unit costs must and know how much they cost". (KBAV Code. P2)

A similar statement was also conveyed by the Team Fare Member:

"In this moment Sardjito hospital, the method is still the mixture is more mixed with the ABC method, but with the calculation of unit cost is direct, we get proposals from the work unit here, especially from the heart unit, yes, the heart KSM must propose to the fare team about the unit costs, are the ingredients used in medical materials that are used by medical devices, for building, maintenance, investment, resources later from our fare team will calculates them". (Code ATT.P2).

Based on fare magnitude of coronaryangiography that has been valid at RSUP Dr. Sardjito Yogyakarta in 2016 since set on 2014 distinguished between non-VIP and VIP fare comprises two components services, that is service of treatment and service of facilities without imposes AMHP and BMHP. Service of treatment counted based on percentage, which is 20% of the total fare, is right of hospital, while the remaining 80% is 60% for medical services and 40% for nursing services and non- medical

services. It was based on the Fare Team Member statements'

" So what is there on this billing is the total of treatment fare, this total of actions fare consists from service of facilities or JS and JP service of treatment. Therefore, here that is the total total of actions only. For AMHP and BMHP it inputed separate by pharmacy OB. "(Code ATT.P4)

" For the angiography with a total of 4.106.500 for example, the JS is 2.106.500 and the JP is 2.000.000., from this 2.000.000 20% for hospital 80% for medical JP and non- medical. For the medical that 60% of this 80% to 40% nurse and friends. "(Code ATT.P5)

In determined service of treatment especially medical services and nursing services, the amount proposed by the operator or executor action to the management as the final determinant, where the applicabled fare set 2014 still adopt old pattern, only raise a few percent without do the recalculation. It based on the statement of Cardiologist and blood Blood Vessel:

"we have ever been propose corresponding standard from the collegium. The collegium in this case is heart and vessels blood has standard medical services for each treatments. Standard that is what we are propose to the hospital. However, everything depends on the hospital. They want to use the standards from the collegium or have a separately policy. " (DSJP Code. P3)

That statement was similar witt the statement from Fare Team Member:

"From they proposal. From the proposal of operator. "(ATT Code. P6)

" For the services it was determined by the policy of hospital. Indeed, the applicabled fare still adopts old pattern which only raise a few percent without do the recalculation. At this Moment, we try do recalculation for determine the magnitude of fare. "(Code ATT.P7)

"The collegium should determined and that is should be agreed between management and collegium. " (Code ATT.P8)

The differences of treatment service fare in the coronaryangiography between doctors are happened if existence CITO treatment. The Hospital enforces fare 125% more high of the fare common treatment. Following the results Interview with Fare Team Member:

" The differences usually because CITO condition, the policy of hospital if the CITO condition JP was increased by 125% from the fare common treatment. "(ATT Code. P9)

The steps in *unit cost* calculations for *coronaryangiography* use the ABC method as follows :

1. Set the *activity center* was located on the catheterization laboratory installations and the *cost driver* for each cost category :

Table 1. Activity Centre Coronaryangiography

<i>Activity Centre</i>	<i>Cost Driver Time (minute)</i>
Examination of completeness of medical records and results of examination of support	5
Measure Veins Scale	2
Patient positioning and installation of the monitor	10
Prosedur <i>coronografi</i>	60
Post-action observation	30
Cleaning of tools and space	20
Total	127

2. Determine the Direct Costs on *Coraryangiography* treatment

Direct costs incurred during the coronary heart catheterization treatment carried out include medical services for one cardiologist and blood donor, three nurses, one radiographer, that has competence in the act of coronary heart catheterization, medicines and consumables used in treatment.

Table 2. Direct Cost at Coronaryangiography

<i>Cost Category</i>	<i>total (Rp.)</i>
Specialist Doctor Services	1,134,000
Lidocain HCL inj	1,687.50
Povidone Iodine sol	5.125
NaCl Inj	8,512.50
Omnipaque inj	189,617
Adult electrode	42,875

Table 2. (Continued) Direct Cost at Coronaryangiography

<i>Cost Category</i>	<i>total (Rp.)</i>
3 Ply Mask	3,000
Operation Hat	3,350
Non Sterile Gloves	4,975
Sterile Gloves	40,400
3 ml syringe	2,892.50
5 ml syringe	3,870
10 ml syringe	4,975
20 ml syringe	8,200
Mess Aesculap 11	4,250
3 Way S.Cock	59,487.50
Long Pressure Monitoring	62,375
Optitorque TIG	490,814
Avanti + Transrad kit	355,965
Wire Guide	181,395
TR Band	342,050
Hypafix	10.616
70% alcohol liquid,	1,453.13
Transofix	4,750
An alcohol swab	700
Total	2,967,336.13

According to the table above, there are direct costs of Rp. 2,967,336.13. The specialist services constitute 60% of the service after deducting the total of 20% services as a hospital right according to the policy of the Director of the hospital for acts of *coronaryangiography* without complications.

3. Determine the *Overhead Cost* used by each activity, both *direct resource* and *indirect resource*

Cost of Direct Resource Overhead at the Laboratory of Catheterization

Table 3. Direct Resources Overhead Cost Coronaryangiography

<i>Cost Description</i>	<i>Amount (Rp)</i>	<i>%</i>
<i>Labor Related</i>		
Employee Costs	2,751,912,726	
Training Costs	52,092,893	
Sub-Total	2,803,942,619	57.65
<i>Space Related</i>		
Cost of depreciation	55,515,860	
Sub-Total	55,515,860	1.14
<i>Equipment related</i>		

Table 3 (Continued). Direct Resources Overhead Cost Coronaryangiography

Cost Description	Amount (Rp)	%
<i>Labor Related</i>		
Maintenance cost	1,587,302,123	
Sub-Total	1,946,659,738	40.02
<i>Service related</i>		
Official travel expenses	1,968,150	
Marketing Costs	1,550,000	
Office fees	11,787,500	
Electricity cost	42,209,510	
Sub-Total	57,515,160	1.18
Total	4,863,633,377	100

Coronary heart catheterization *direct hospital overhead* costs RSUP Dr. Sardjito Yogyakarta which will be charged to all patients *coronaryangiography* in the amount of Rp 4,863,633,377, these costs will be charged to each patient during 2016 based on the number of treatment *coronaryangiography* which amounted to 1044 patients or treatment. So each treatment gets a charge of Rp 4,658,653, - with calculations in the following table:

Table 4. Direct Resources Overhead Imposition on Patients Coronaryangiography Treatment

Description	total
Total <i>direct overhead</i> costs	Rp4,863,633,377
Amount of actions	1,044
Cost per action	Rp4,658,653

Indirect Resources Overhead Cost in Non Functional Units Is a cost generated by a non-functional unit and was charge to the heart catheterization installation.

Table 5. Indirect Resources Overhead Costs Non Functional Unit Coronaryangiography

Cost Description	Amount (Rp)	%
<i>Labor Related</i>		
Employee Costs	30,598,355,988	
Training Costs	2,174,594,077	
Sub-Total	32,772,950,065	68.79
<i>Space Related</i>		
Cost of depreciation	498,011,522	
Maintenance cost	85,773,769	
Sub-Total	583,785,291	1.23
<i>Equipment related</i>		
Cost of depreciation	6,758,592,747	
Maintenance cost	514,245,634	
Sub-Total	7,272,838,381	15.27
<i>Service related</i>		
Cost of improving quality	597,961,565	

Table 5. Indirect Resources Overhead Costs Non Functional Unit Coronaryangiography

Cost Description	Amount (Rp)	%
Official travel expenses	1,254,208,238	
Marketing Costs	222,788,902	
Supplies Costs	20,396,867	
Office fees	1,497,084,432	
Electricity cost	1,758,503,948	
Water Fee	71,656,072	
Telephone Charges	416,994,841	
Clening service fees	1,172,312,500	
Sub-Total	7,011,907,365	14.72
Total	47,641,481,103	100

Total *indirect resource overhead* costs subsequently charged the Cardiac catheterization installation based on proportion of total income. Use of the proportion of income as the basis of loading due to the formation of income triggered by a set of costs incurred to produce services to the patients. The table of the proportion income:

Table 6. Proportion Income Functional unit

Installation / Unit	Number of Patients	Income (Rp)	%
Outpatient	369,148	88,354,285,478	11.88
Emergency	33,047	23,644,918,848	3.18
Inpatient	43,910	149,811,680,909	20.14
<i>Coronaryangiography</i>	1,044	4,792,409,000	0.66
Support	519,522	454,675,964,511	63.04
Total	966,671	721,279,258,746	100

Based on the table of proportion of functional unit income, the calculation of *indirect costs overhead resources* at the catheterization laboratory installation is as follows:

Table 7. Calculation Charging Indirect Resources Overhead Catheterization Laboratory Instalation

Description	total
<i>Indirect Non Functional Overhead Resources</i>	Rp47,641,481,103
Proportion	0.66%
<i>Indirect Resources Overhead Installation of catheterization laboratories</i>	Rp314,433,775

If *indirect costs overhead resources* at the catheterization laboratory installation are charged to patients with coronaryangiography treatment with total 1,044 patients, then each patient gets a burden of Rp. 301,182,-

Table 8. Indirect Resources Overhead Imposition on Patients Coronaryangiography Treatment

Description	Total
Indirect costs overhead	Rp.314,433,775
Cardiac catheterization patient	1,044
Expenses per patient	Rp301,182

From the calculation of *direct overhead* and *indirect resources overhead* costs for cardiac catheterization, the overall *overhead* cost of laboratory installation for catheterization was Rp. 6,476,285 , -

Table 9. Total Overhead Cost Coronaryangiography

Description	Amount (Rp)	%
Direct overhead costs	4,658,653	93.82
Indirect costs overhead	301,182	6.18
Total overhead	4,959,835	100

Next is to charge *overhead* costs into each activity of the catheterization laboratory installation.

Table 10. Charging overhead costs into each activity of the catheterization laboratory installation

Activity Center	Cost Driver Time (Minutes)	Charge overhead (Rp)
Examination of completeness of medical records and results of examination of support	5	195,269
Measure Veins Scale	2	78.108
Patient positioning and installation of the monitor	10	390,538
Coronography procedure	60	2,343,229
Post-action observation	30	1,171,615
Cleaning of tools and space	20	781,076
Total	127	4,959,835

The last state of the *Activity Based Costing* in calculating the *unit cost* by summing the total *overhead* costs with direct costs

Table 11. Unit Cost Coronaryangiography

Description	Amount (Rp)	%
Direct cost	2,967,336 , 13	37.43
Overhead costs	4,959,835	62.57
Total	7,927,171 , 13	100

Based on these calculations, *unit cost* for *coronaryangiography* action with ABC method is Rp. 7.927, 171.13,-

Services *coronaryangiography* treatment in RSUP Dr. sardjito Yogyakarta is guided by the SPO of Coronary Angiography. The taken treatment generally is left heart catheterization with a *radial artery puncture*. In the act of *coronaryangiography*, SPO used to identify, describe and evaluate actions, while the calculation of *unit cost* functions to analyze action activities.

In calculating the fare, RSUP Dr. Sardjito Yogyakarta refers to the Regulation of the Minister of Health of the Republic of Indonesia Number 12 of 2013 concerning the Pattern of Hospital Public Service Agency Fare at the Ministry of Health. Where service fare are set on the basis of mutual cooperation, justice by prioritizing the interests of low-income communities and not prioritizing profits. The imposition of fare was grouped based on the service location and type of service, in the fare there are components of treatment and facilities. The service of treatment component is the reward received for services provided to patients in the context of medical services and medical support services by the service provider, which consists of medical services (services of all medical personnel who perform medical services), nursing services and other health personnel services. Whereas the service of facilities are compensation received for the use of accommodation, non-medical materials, medicines, consumables / medical devices used directly in the context of medical services and hospital medical support services by calculating investment costs.

The results of the calculations carried out, it is known the *unit cost* of *coronaryangiography* by the ABC method at RSUP Dr. Sardjito Yogyakarta in 2016 amounting to Rp.7,927,171.13. The direct cost of *coronaryangiography* is Rp.2,967,336.13 or 37.43% of the total *unit cost* of Rp7,927,171.13, - The highest factor of direct costs is doctor's services, which amounted to Rp1,134,000 or 38.22%. while the remaining Rp1,833,336.13 or 61.78% are AMHP and BMHP. In this study, information was obtained from the Fare Team Member that doctor services are medical services for general actions not CITO actions, if CITO actions must be carried out then medical services

will be charged 125% higher than general actions in accordance with the provisions in force in hospital. The hospital fare also does not count AMHP and BMHP, because the AMHP and BMHP are not included in the action package. that there is a difference between one patient and another patient because of the many variations of each doctor, so there are components that have not been counted on the *real cost* in this study.

The *coronaryangiography* treatment overhead is Rp.4,959,835, or 62.57% of the total *unit cost* of Rp7,927,171.13, -. Overhead costs consist of *direct overhead* and *indirect resources overhead*. The burden of *direct resource overhead* in this study amounted to IDR 4,863,633,377, - is a burden of indirect costs between existing activities and resources consumed. After being charged to 1044 patients with *coronaryangiography* in 2016, each patient received a charge of Rp.4,658,653. The amount of *direct overhead* costs is influenced by *labor related* 57.65% or as much as Rp. 803,942,619, - *related space* 1.14% or Rp. 55,515,860, - *related equipment* 40.02% or Rp. 1,946,659,738, - and *related services* 1.18% or amounting to Rp57,515,160, - found in the catheterization laboratory installation. Whereas *indirect resource costs overheads* amounted to Rp.47,641,481,103, - consisting of *related labor* 68.79% or Rp32,772,950,065, - *related space* 1.23% or Rp.583,785,291, - *equipment related* 15, 27% or in the amount of Rp.7,272,838,381, - *service related* 14.72% or amounting to Rp.7,011,907,365. Furthermore *indirect cost overhead costs* are calculated based on the cost of non-functional units based on the proportion of income of functional units, where *coronaryangiography* contributes 0.66% to obtain *indirect costs of overhead costs* of Rp314,433,775. The proportion of income used is because the income is from the amount of *indirect overhead costs*, then it is charged to each *coronaryangiography* patient in 2016, amounting to 1044 patients so that each patient gets a charge of Rp301,182, - or 6.07% of the total *overhead costs*. RSUP Dr. Sardjito Yogyakarta as a government hospital Public Service Agency (BLU) manages funds sourced from the allocation of the State Revenue and Expenditure Budget (APBN) and BLU Non-Tax State Revenues (PNBP), so that all costs incurred come from the BLU APBN and PNBP, specifically for employee costs for employees with the status of the State Civil Apparatus (ASN) in this study did not calculate the burden of costs originating from the APBN because the employee costs were paid by the government not from the BLU PNBP.

The Fare of *coronaryangiography* treatment at RSUP Dr. Sardjito Yogyakarta is distinguished between VIP class patients and Non VIP classes, namely for non VIP classes Rp.4,780,375, - and VIP classes Rp.6,158,063, -. When compared the *unit cost* calculated by the ABC method of Rp. 7,927,171.13 the prevailing fare at RSUP Dr. Sardjito Yogyakarta is lower.

Table 12. Comparison of Fare of Treatment for Coronaryangiography

Tariff of RSUP Dr. Sardjito Yogyakarta		ABC Unit Cost Method (Baker)
Non VIP	VIP	
Rp.4,780,375, -	Rp 6,158,063, -.	Rp.7,927,171.13

By not calculating AMHP and BMHP as well as charging fees originating from state budget funds, influencing hospital fare is smaller than the results of *unit cost* calculations using the ABC method. The fare that applicabled at RSUP Dr. Sardjito Yogyakarta was calculated based on *unit costs* resulting from the calculation of total service operational costs divided by the total results of activities by taking into account continuity and development of services, public purchasing power, fairness and propriety principles and healthy competition. Operational costs consist of employee costs, goods costs, maintenance costs, travel costs and investment costs whose funds sourced from PNBPN have not calculated marketing costs, quality improvement costs, *cleaning service costs*.

In addition, from the calculation results, it is known that the highest cost burden on employees is 57.65% for *direct resources overhead* and 68.79% for *indirect resources overhead*. This is contrary to the regulations set by the Minister of Health of Indonesia where the expenditure is determined by the hospital leadership with a maximum proportion of employee costs of 44% and a minimum operating and investment cost of 56%²⁰. Management can use information from the ABC method to calculate costs without causing negative impacts on service quality. *Unit cost* research using the ABC method was first conducted at RSUP Dr. Sardjito Yogyakarta. Calculation of *unit cost* by ABC method can provide more accurate cost calculation information, so that management can use it in determining fare also used in budgeting and cost planning. This study is expected to be applied to installations or other units.

CONCLUSION

The results of the calculation of *unit cost* for *coronaryangiography* at RSUP Dr. Sardjito using the ABC method was Rp 7,927,171.13 for 1044 *coronaryangiography* patients without trouble in 2016, that *unit cost* is higher than right with *the unit cost* of the currently. The Fare of *coronaryangiography* treatment at RSUP Dr. Sardjito Yogyakarta that applies is authorized fare by Ministry Finance, calculated still use method traditional with charge cost from source PNPB funds only because of existence subsidy from the APBN. Where services service by director Main set at 20% of fare service *coronaryangiography* treatment is right Hospital, while the remaining 80% 60% are right of medical services and 40% right of nursing services and non- medical services. If CITO actions must be carried out then medical services will be charged 125% higher than general actions in accordance with the provisions in force in hospital. The fare of facilities services hospital was not calculated AMHP and BMHP due to separate pricing. Since set from 2014 the fare of hospital not yet do the recalculation, therefore it was yet describe the real condition real 2016.

This study calculated *unit cost* treatment of *coronaryangiography* or *catheterization heart left* with the general actions not CITO and used the ABC method with cost directly and cost *overhead* from 2 sources funds managed hospital namely the PNPB and BLU, specifically cost for the employee with Apparatus Civil State (ASN) predicated in this study are not calculated cost employees and the state budget too imposes AMHP and BMHP on nature the standard. The condition of shopping employees who exceed proportion 44% maximum as in the Regulations Minister of Health RI becomes factor that caused more height the results of calculation *unit cost* with ABC method than the fare of hospital.

REFERENCE

1. Kementerian Kesehatan RI, 2013. *Riset Kesehatan Dasar 2013*. Ministry of Health Republic of Indonesia 1–303. doi:10.1007/s13398-014-0173-7.2
2. Budiarto, W., Sugiharto, M., 2013. Biaya Klaim INA CBGs Dan Biaya Riil Penyakit Katastropik Rawat Inap Peserta Jamkesmas Di Rumah Sakit: Studi Di 10 Rumah Sakit Milik Kementerian Kesehatan. *Buletin Penelitian Sistem Kesehatan* 16, 58–65.
3. Hall, G., & Guyton, A. C., 1997. *Buku ajar fisiologi kedokteran*. (Setiawan, I., penerjemah). Terjemahan dari: Textbook of medical physiology Jakarta: Penerbit Buku Kedokteran EGC.
4. Gray, H.H., Dawkins, K.D., Simpson, I. A., & Morgan, J. M., 2002. *Kardiologi*, Edisi 4. Jakarta: Erlangga medical series.
5. Hada, M., Chakravarty, A., Mukherjee, P., 2014. Activity based costing of diagnostic procedures at a nuclear medicine center of a tertiary care hospital. *Indian Journal of Nuclear Medicine* 29, 241. doi:10.4103/0972-3919.142627
6. Libby, P., Bonow, R.O., Mann, D.L., Zipes, D.P., 2011, 'Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine', *Jama The Journal Of The American Medical Association*. doi:10.1001/jama.294.3.376-a
7. Smeltzer, S. C., Bare, B. G., Hinkle, J. L., Cheever, K. H., Townsend, M. C., & Gould, B. (2008). *Brunner and Suddarth's textbook of medicalsurgical nursing 10th edition*. Philadelphia: Lipincott Williams & Wilkins
8. Kaplan, R.S., Anderson, S.R., 2004. Time-Driven Activity- Based Costing. *Harvard business review* 82, 131–138. doi:10.2139/ssrn.485443.
9. Chan, Y.-C.L., 1993. Improving hospital cost accounting with activity-based costing. *Health Care Management Review* 18, 71–77. doi:10.1097/00004010-199324000-00008
10. Rahardjo, M., 2010. Triangulasi dalam penelitian kualitatif. Diakses 16 Desember 2018, dari <http://repository.uin-malang.ac.id/1133/1/triangulasi.pdf>
11. Kuchta, D., Zabek, S., 2011. Activity-based costing for health care institutions. *8th International Conference on Enterprise Systems, Accounting and Logistics* (8th ICESAL 2011)
12. Baker, J. J., 1998. *Activity-based costing and activity-based management for health care*. Jones & Bartlett Learning.
13. Yereeli, A.N., 2009. Activity-based costing and its application in a Turkish university hospital. *AORN journal* 89, 573-576, 579-591. doi:10.1016/j.aorn.2008.09.002
14. Aldogan, M., Austill, A.D., Kocakulâh, M.C., 2014. The excellence of Activity-Based Costing in Cost Calculation: Case Study of A Private Hospital in Turkey. *Journal of Health Care Finance* 41, 27.
15. Chan, Y.-C.L., 1993. Improving hospital cost accounting with activity-based costing. *Health Care*

- Management Review* 18, 71–77.
doi:10.1097/00004010-199324000-00008
16. Marismiati, 2011, 'Penerapan metode activity based costing system dalam menentukan harga', *Jurnal Ekonomi dan Informasi Akuntansi*, vol. 1, no. 1, hh 22-36.
 17. Sunarto, E. E., & Dewi, A., 2016. Membangun Tata Kelola Klinis Melalui Clinical Pathway Demam Berdarah Dengue RSUD Rizki Amalia Medika. *Jurnal Medicoeticoilegal dan Manajemen Rumah Sakit*, 5(2), 1.
 18. Devitra, A., 2011. Analisis Implementasi Clinical Pathway Kasus Stroke Berdasarkan INA-CBGs di RS. Stroke Nasional Bukittinggi Tahun 2011. Padang: Universitas Andalas Padang.
 19. Standar Prosedur Operasional RSUP Dr. Sardjito Nomor Dokumen 04.0231.408.2-17, *Angiografi Koroner*, 14 Maret 2014, RSUP Dr. Sardjito, Yogyakarta
 20. Peraturan Menteri Kesehatan Republik Indonesia Nomor 12 Tahun 2013, *Pola Tarif Badan Layanan Umum Rumah Sakit Di Lingkungan Kementerian Kesehatan*, 14 Februari 2013, Berita Negara Republik Indonesia Tahun 2013 Nomor 266, Jakarta