

# Activity Based Costing Analysis of Dyspepsia, Viral Infection and Vertigo on INA-CBGs Rates at the Main Clinic of Wishnu Husada

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**Abstract.** Choosing an accounting system in hospital management is a challenge in the era of National Health Insurance in Indonesia. In order to support the health of Indonesian people, the Government of Indonesia issued a National Health Insurance (JKN) regulation, organized by the Social Insurance Administration Organization (BPJS). The Health BPJS uses Indonesian Case Based Groups (INA-CBGs) rates as a payment method. This is a problem in several Health Care Facilities because of the incompatibility between INA-CBGs rates and the rates issued by the Clinic or Hospital partners. There are 3 diagnoses, namely dyspepsia, viral infection and vertigo that are not suitable between the INA-CBGs rates and the operational rates of the Main Clinic of Wishnu Husada. These 3 diagnoses were the biggest contributor to the loss cost from BPJS claims. This study aims to analyze Activity Based Costing (ABC) against 3 diagnoses whose tariff claim is still below the operational rates and compare these rates with INA-CBGs rates. The method of this research uses a qualitative approach with case studies. The method of collecting data using primary data sources by conducting observations and interview and secondary data sources obtained from the financial statements of Wishnu Husada Main Clinic in 2018, 2018 INA-CBGs tariff data and verified BPJS claim data in 2018. Data analysis with Activity Based Costing method. The Results of this study showed the cost rates of diagnosis of dyspepsia using ABC method is higher compared to INA-CBGs rates, the cost rates of diagnosis of viral infection using ABC method is higher compared to INA-CBGs rates and the cost rates of diagnosis of vertigo using ABC method is higher compared to INA-CBGs rates. The conclusion of this study is using ABC method to calculate unit cost in Main Clinic of Whisnu Husada have negative difference compared to INA-CBGs rates.

**Keywords:** Activity Based Costing, Dyspepsia, Viral Infection, Vertigo, INA-CBGs.

## 1. INTRODUCTION

Choosing the right accounting system for hospitals is a challenge for hospital managers. Traditional cost system cause distortion of hospital cost and Activity Based Costing is new method more effective[1]. ABC method can provide information on an activity carried out and accurate cost and component calculation[2]. The use of ABC methods presents information more accurately and provides correct information on cost of hospitals[3].

The Government of Indonesia issued Law number 40 of 2004 concerning the National Implementation of Health Security System, then the Government of Indonesia established the Social Security Organizing Agency (BPJS) in financing the health tariffs of participant. BPJS in making payments to advanced health facilities using the Indonesia Case Based Groups (INA-CBGs) tariff in accordance with Presidential Regulation number 13 of 2003. According to the Minister of Health Regulation number 52 of 2016, article 17 states that the rates of hospitalization at the Main Clinic is 70% of the INA-CBGs tariff standard for Type D Hospitals. The Main Clinic of Wishnu Husada is an advanced health facility in collaboration with Health BPJS. According to the financial report data in 2018, there are 3 diagnoses that often suffer losses, namely Dyspepsia,

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Viral Infection and Vertigo because the INA-CBGs rates are not in accordance with the operational cost of the Main Clinic. There is a gap in the diagnosis rates for dyspepsia in the amount of IDR 1,155,550 based on the main clinical rates, while in INA-CBGs tariff IDR 837,450. There is a gap in the diagnosis rates for viral infection in the amount of IDR 1,033,050 based on the main clinical rates, while in INA-CBGs tariff IDR 808,875. There is a gap in the diagnosis rates for vertigo in the amount IDR 1,047,450 based on the main clinical rates, while in INA-CBGs tariff IDR 884,025. The gap between the operational rates and the rates of INA-CBGs can result in financial losses for the Main Clinic.

The purpose of this study was to analyze the rates of diagnosis of dyspepsia, viral infection and vertigo based on Activity Based Costing and compare the rates of INA-CBGs. The result of this study can provide input on the costs of the three diagnoses to The National Casemix Centre of the Ministry of Health Republic of Indonesia.

## 2. LITERATURE REVIEW

### 2.1. Activity Based Costing (ABC)

The ABC method is the answer to a system of financial problem in both private and government hospitals by providing reliable cost information to help manager identify expensive, unprofitable services and price increase politics[4]. ABC is method for measuring cost and work activity by determining the resources used in activity, then determining these activities for product costs[5]. The advantages of using ABC method are can recognize activity cause costs and product that consume activity[6].

### 2.2. Dyspepsia

Dyspepsia is medical term for digestive disorders, consisting of various symptoms in the upper abdomen such as feeling full, uncomfortable, nausea, bloating, heartburn, vomiting or pain. Dyspepsia can be divided into 2 categories, namely organic and functional dyspepsia. The cause of organic dyspepsia is peptic ulcer, gastroesophageal reflux disease, gastric or oesophageal cancer, food and drug intolerance and infectious disease[7]. Cause of functional dyspepsia including motility disorders, visceral hypersensitivity, increase mucosal permeability and impaired enteric autonomic nervous system[8].

### 2.3. Viral Infection

Viral Infection is a diagnosis of viral disease in the International Statistical Classification of Disease and Related Health Problem 10th Revision World Health Organization. Viruses are the smallest parasites with size ranging from 0,02 to 0,3  $\mu\text{m}$ . Viruses are classified primarily based on the nature and structure of the genome and its replication method. Some viral infection can be diagnosed clinically (such as: chicken pox, rubella, roseola infantum), epidemiology (such as: mumps, influenza) and laboratories (such as: HIV, Dengue)[9]. In coding ICD-10, disease caused by viruses and showing clinical symptoms were diagnosed as viral infection in claim of BPJS Health.

### 2.4. Vertigo

Vertigo is one of the cause of dizziness symptom, an illusion as if the object or room around rotates. The cause of vertigo is divided into 2 categories, namely peripheral vertigo and central vertigo. One of the cause of peripheral vertigo is Benign Paroxysmal Positional Vertigo (BPPV), BPPV is clinical disorder characterized by brief current vertigo which is often caused by chance in head position such looking up, turning around in bed and straightening after bending[10]. Based on population studies, vertigo affect 15-20% of adult every year[11].

## 2.5. Indonesia Case Based Groups (INA-CBGs)

According to the Regulation of Minister of Health of the Republic of Indonesia number 27 of 2014, INA-CBGs are the result of the development of a casemix (case based payment) system. The INA-CBGs tariff uses a coding system, namely ICD-10 for diagnosis and ICd-9 for surgical procedure. In accordance with Presidential Regulation number 12 of 2013, the implementation of National Health Insurance uses the INA-CBGs tariff. Research in Budhi Asih Regional Hospital in Jakarta has difference between hospital rates and INA-CBGs rates, a negative difference of 645 cases and positive difference of 1739 cases[12]. Research at Bethesda Hospital in Yogyakarta has loss of IDR 455,487,100 because the difference in real tariff rates with the INA-CBGs rate in the diagnosis of Ischemic Stroke[13].

## 3. RESEARCH METHOD

This type of research is a descriptive study with a qualitative approach to case study methods. The location of the study at the Main Clinic of Wishnu Husada, the number of samples studied were 3 diagnoses namely dyspepsia, viral infection and vertigo. The three diagnoses were chosen because they were included in the top 10 most disease in 2018, there were 173 cases of dyspepsia, 62 cases of vertigo, 84 cases of viral infection and all three of these diagnoses were the biggest contributors to the claim of Health BPJS. The method of collecting data using primary data sources is by conducting observation and interview and secondary data sources obtained from the financial statements of the Wishnu Husada Main Clinic data in 2018, 2018 INA-CBGs tariff data and verified Health BPJS Claim data in 2018. The Subject in this study were Department of Finance, Emergency Department Doctor, Internist Doctor, pharmacy officer, emergency room officer, inpatient officer, head of HRD and infrastructure facilities. The object of this study is all cost activities that occur in the emergency unit and inpatient with a diagnosis of dyspepsia, viral infection and vertigo. Data analysis by the Activity Based costing method and compared with the rates of INA-CBGs inpatient claims from BPJS Health.

## 4. RESULT AND DISCUSSION

From the result of data collection at the main clinic of Wishnu Husada, ABC analysis is made with several stages, there are: (1) Imposing direct cost to patient in emergency unit in accordance with the diagnosis; (2) Imposing direct cost to patient in inpatient unit in accordance with the diagnosis; (3) Determine the indirect resource overhead; (4) Determine the direct resource overhead; (5) Add direct cost and overhead resources to patient with dyspepsia, viral infection and vertigo.

### 4.1. Imposing direct cost to patient in emergency unit in accordance with the diagnosis

Table 1. Direct costs for dyspepsia in Emergency Unit

Cost Category	Unit	Number	Amount in IDR
Patient registration	Activities	1	50.000
Patient examination	Action	1	30.000
Blood laboratory check	Action	1	90.000
Put up an IV	Action	1	10.000
Ringer lactate infuse	Plabot	1	12.500
Infuse set	Pieces	1	9000
Abotach no. 22	Pieces	1	20.000
Consumables	Set	1	10.000

Ranitidine injection 50mg	Ampule	1	11.500
Ondansentron injection 4mg	Ampule	1	17.100
Ketorolac injection 30mg	Ampule	1	17.800
Sput 3cc	Pieces	3	9000
Drug injection action	Activities	3	7500
Sucralfat syrup 100ml	Bottle	1	18.600
Total			370.000

Table 2. Direct costs for viral infection in emergency unit

Cost Category	Unit	Number	Amount in IDR
Patient registration	Activities	1	50.000
Patient examination	Action	1	30.000
Blood laboratory check	Action	1	90.000
Put up an IV	Action	1	10.000
Ringer lactate infuse	Plabot	1	12.500
Infuse set	Pieces	1	9000
Abotach no. 22	Pieces	1	20.000
Consumables	Set	1	10.000
Paracetamol 500mg tablet	Tablet	1	850
Metamizol injection	Ampule	1	6700
Sput 3cc	Pieces	1	3000
Drug injection action	Activites	1	2500
Total			255.750

Table 3. Direct costs for vertigo in emergency unit

Cost Category	Unit	Number	Amount in IDR
Patient registration	Activities	1	50.000
Patient examination	Action	1	30.000
Blood laboratory check	Action	1	90.000
Put up an IV	Action	1	10.000
Ringer lactate infuse	Plabot	1	12.500
Infuse set	Pieces	1	9000
Abotach no. 22	Pieces	1	20.000
Consumables	Set	1	10.000
Flunarizin	Tablet	1	1200
Betahistin	Tablet	1	800

Ranitidine injection 50mg	Ampule	1	11.500
Sput 3cc	Pcs	1	3000
Drug injection action	Activities	1	2500
Total			246.700

#### 4.2. Imposing direct cost to patient in inpatient unit in accordance with the diagnosis

Table 4. Direct cost for dyspepsia in inpatient ward

Cost Category	Unit	Number	Amount in IDR
Price of class 3 room per day	Day	3	270.000
Medical services per day	Day	3	150.000
Consumables per day	Day	3	67.500
Nutrition services per day	Day	3	90.000
Visit of Specialist Doctor	Activities	3	225.000
Visit of General practitioner	Activities	3	60.000
Ringer lactate infusion	Plabot	5	75.000
Drug injection services	Action	15	37.500
Ketorolac injection 30mg	Ampule	5	89.000
Ranitidine injection 50mg	Ampule	5	57.500
Ondansentron injection 4mg	Ampule	5	85.500
Handscoen non-sterile	Pieces	9	16.200
Sput 3 cc	Pieces	3	9.000
Masker	Pieces	9	10.800
Ranitidine tablet 50mg	Tablet	10	5000
Domperidon tablet	Tablet	15	12.000
Prescription services	Activities	4	8000
Total			1.268.000

Table 5. Direct cost for viral infection in inpatient ward

Cost Category	Unit	Number	Amount in IDR
Price of class 3 room per day	Day	3	270.000
Medical services per day	Day	3	150.000
Consumables per day	Day	3	67.500
Nutrition services per day	Day	3	90.000
Visit of Specialist Doctor	Activities	3	225.000
Visit of General practitioner	Activities	3	60.000
Ringer lactate infusion	Plabot	6	75.000
Drug injection services	Action	10	25.000

Ceftriaxone injection 1gr	Ampul	5	57.500
Ranitidine injection 50mg	Ampul	5	57.500
Paracetamol 500 mg tablet	Tablet	20	17.000
Handsoen non-sterile	Pieces	9	16.200
Sput 10 cc	Pieces	1	3000
Sput 3 cc	Pieces	2	6000
Aquabidest 25ml	Bottle	3	28.950
Masker	Pieces	9	10.800
Levofloxacin 500mg	Tablet	5	14.500
Prescription services	Activities	4	8000
Blood laboratory check	Action	2	180.000
Total			1.361.950

Table 6. Direct cost for vertigo in inpatient ward

Cost Category	Unit	Number	Amount in IDR
Price of class 3 room per day	Day	3	270.000
Medical services per day	Day	3	150.000
Consumables per day	Day	3	67.500
Nutrition services per day	Day	3	90.000
Visit of Specialist Doctor	Activities	3	225.000
Visit of General practitioner	Activities	3	60.000
Ringer lactate infusion	Plabot	6	75.000
Drug injection services	Action	5	12.500
Ranitidine injection 50mg	Ampule	5	57.500
Handsoen non-sterile	Pieces	9	16.200
Sput 3 cc	Pieces	1	3000
Masker	Pieces	9	10.800
Antacid syrup	Bottle	1	35.700
Flunarizin 10mg	Tablet	5	9000
Betahisitine tablet	Tablet	10	10.000
Prescription services	Activities	4	8000
Total			1.100.200

#### 4.3. Determine Indirect Resource Overhead

Table 7. Actual Cost of the Main Clinic Wishnu Husada in 2018

Type of Cost	Actual Cost in IDR
<b>Labour Related Cost</b>	
Salary of all employees	1.823.410.257
<b>Equipment Related Cost</b>	
Medical and non-medical equipment depreciation cost	179.370.146
<b>Space Related Cost</b>	
Equipment and building maintenance costs	57.194.000
Building depreciation costs	67.152.695
<b>Service Related Cost</b>	
Electricity, water and telephone costs	185.178.838
Cleaning costs	20.352.293
The cost of office stationery and household appliances	68.051.200
Drug costs	561.900.036
Other costs	363.791.954
<b>Total</b>	<b>3.326.401.419</b>

Table 8. Cost of revenue per unit

Unit	Amount of Income per year in IDR	Percentage	Unit cost in IDR
Emergency unit	129.499.105	4,89%	162.585.050
Outpatient	258.998.209	9,78%	325.170.098
Inpatient	769.658.277	29,05%	966.299.569
Pharmacy	941.913.900	35,55%	1.182.565.072
Laboratory	222.041.687	8,38%	278.771.492
Radiology	85.125.658	3,21%	106.874.556
Nutrition	111.503.459	4,21%	139.991.666
Medical record	130.740.743	4,93%	164.143.916
<b>Total</b>	<b>2.649.481.038</b>	<b>100%</b>	<b>3.326.401.419</b>

The calculation of costs in emergency unit get a charge of IDR 162,585,050. The cost burden is shared with the number of patients in 2018 as many as 3964. Then for 1 patient get indirect resource overhead of IDR 41,015 per one time activity.

The calculation of costs in inpatient unit the fee is IDR 966,299,569. The cost burden is shared with the number of inpatient days as many as 2950 days inpatient care in 2018. Then for 1 patient with 1 day of care obtain indirect resource overhead of IDR 327,559.

#### 4.4. Determine Direct Resource Overhead

Table 9. Direct cost of Resource Overhead in Emergency and Inpatient Unit

Type of Cost	Emergency Unit Cost in IDR	Inpatient Unit Cost in IDR
<b>Labour Related Cost</b>		
Salary of employees	429.615.129	429.527.886
<b>Equipment Related Cost</b>		
Medical and non-medical equipment depreciation cost	43.496.372	47.856.902
<b>Space Related Cost</b>		
Equipment and building maintenance costs	13.869.262	15.259.661
Building depreciation costs	16.284.196	17.916.694
<b>Service Related Cost</b>		
Electricity, water and telephone costs	44.904.951	49.406.692
Cleaning costs	4.935.330	5.430.099
Office stationery and household appliances	16.502.079	18.156.420
<b>Total</b>	<b>569.607.321</b>	<b>583.554.354</b>

The calculation of the direct costs incurred by the emergency unit in 2018 is IDR 569,607,321. The total cost is charged to emergency patient in 2018 as many as 3964, the per 1 patient will be burdened with direct resource overhead cost of IDR 143,695

The calculation of direct costs incurred by the inpatient unit in 2018 is IDR 583,554,354. The total cost is charged to all patients in 2018 as many as 1305, the per 1 patient will be burdened with direct resource overhead of IDR 447,168

#### 4.5. Add direct and indirect costs to patients with dyspepsia, viral infection and vertigo

##### Dyspepsia

Table 10. Total direct costs and overheads of dyspepsia

Type of Cost	Emergency Unit	Inpatient Unit
Direct cost	IDR 370,000	IDR 1,268,000
Indirect resource overhead cost	IDR 41,015	IDR 327,559
Direct resource overhead cost	IDR 143,695	IDR 447,168
<b>Total</b>	<b>IDR 2,597,437</b>	

##### Viral Infection

Table 11. Total direct cost and overheads of viral infection

Type of Cost	Emergency Unit	Inpatient Unit
Direct cost	IDR 255,750	IDR 1,361,950



Indirect resource overhead cost	IDR 41,015	IDR 327,559
Direct resource overhead cost	IDR 143,695	IDR 447,168
<b>Total</b>	<b>IDR 2,577,137</b>	

#### Vertigo

Table 12. Total direct costs and overheads of vertigo

Type of Cost	Emergency Unit	Inpatient Unit
Direct cost	IDR 246,700	IDR 1,100,200
Indirect resource overhead cost	IDR 41,015	IDR 327,559
Direct resource overhead cost	IDR 143,695	IDR 447,168
<b>Total</b>	<b>IDR 2,306,337</b>	

The calculation using activity based costing for patient with dyspepsia in inpatient class 3 for 3 days at the main clinic found a cost of IDR 2,597,437 compared to INA-CBGs tariff of IDR 837,450, for patient with viral infection diagnosis in inpatient class 3 for 3 days found a cost of IDR 2,577,137 compared to the INA-CBGs tariff of IDR 808,875 and patient with diagnosis of vertigo in inpatient class 3 for 3 days found a cost of IDR 2,306,337 compared to INA-CBGs rates of IDR 884,025.

#### 4.6 Discussion

Based on the result of the research conducted, it is known that there is a gap between the INA-CBGs rates and the tariff using ABC method. The researcher cannot know the details of the breakdown of INA-CBGs rates, because it is a package tariff system paid by Health BPJS per episode of patient health services. The package tariff include the cost of hospitalization, nutritional intake, doctor's consultation, medical examination and medicine or medical device administration. Based on data at the main clinic Wishnu Husada the INA-CBGs rates for inpatients diagnosis of dyspepsia is IDR 837,450, the diagnosis of viral infection is IDR 808,875 and the diagnosis of vertigo is IDR 884,025. The cost of claim is 70% of the costs of the Type D Hospital inpatient claim.

There is a negative difference between the rates with the ABC method and the INA-CBGs tariff for the diagnosis dyspepsia is IDR 1,759,987, the cause of which are: (1) High direct cost to inpatient unit of IDR 1,268,000, this needs to be reviewed because of the length of stay (LOS) is 3 days. (2) The burden of indirect resource overhead on the inpatient unit is quiet large at IDR 327,559, it is necessary to have cost efficiency in all activities at the main clinic. (3) The burden of direct resources overhead on the emergency unit of IDR 143,695 and inpatient unit IDR 447,168, this is very large and effect the high rate of the ABC method, it needs to be reviewed including building maintenance, the number and salaries of employees and medical and non-medical devices that are not in accordance with needs. There is a negative difference in viral infection diagnosis of IDR 1,768,262, the cause is the high direct resource overhead costs in the inpatient unit of IDR 327,559 and indirect resources overhead costs in the emergency unit of IDR 143,695 and inpatient unit of IDR 447,168. The high cost due to building maintenance, the number of employees and some medical and non-medical device that are not in accordance with needs. Length of stay viral infection patient cannot be reduced to 2 days because patient need a laboratory support examination until the results of the patient's blood examination are normal. There is negative difference in the diagnosis of vertigo of IDR 1,422,312, the cause is high direct resources overhead costs in the inpatient unit of IDR 327,559 and indirect resource overhead costs in emergency unit of IDR 143,695 and inpatient unit of IDR 447,168. The high costs is also due to building maintenance, the number of employees and some medical and non-medical devices that are not in

accordance with needs. Length of stay vertigo patient cannot be reduced to 2 days because patient need to practice sitting, standing and walking so they do not fall.

## 5. CONCLUSIONS AND SUGGESSTION

Based on the results of the study were obtained:

Table 13. Result of ABC rates and INA-CBGs rates

Diagnosis	ABC Rates	INA-CBGs Rates
Dyspepsia	IDR 2.597.437	IDR 837.450
Viral Infection	IDR 2.577.137	IDR 808.875
Vertigo	IDR 2.306.337	IDR 884.025

There is a gap between tariff using the activity based costing with the INA-CBGs rates. The cause of this gap is due to the regulation of Health BPJS that the rate inpatient claims for main clinic is 70% of the claim rate for Type D Hospital. In addition, the main clinic overhead costs both direct resource and indirect resource are too large for capacity as the main clinic. Suggestion from researchers for The National Casemix Centre that the value of main clinic inpatient claims is equated with the rates for inpatient hospital claim type D and the need for evaluation of tariff for diagnosis of dyspepsia, viral infection and vertigo. Researcher's suggestion for the main clinic to reduce overhead cost from direct resource and indirect resource. If this tariff gap is not corrected, it will have an impact on financial losses at the main clinic of Wishnu Husada, in the initial stages of disrupting the operation of the clinic at the final stage can result in the closure of the clinic.

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