

ORIGINAL ARTICLE

Analysis of the Determination of Hospital Tariff Rates for BPJS Patients Diagnosed with Typhoid Fever at Ananda Blitar General Hospital

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ABSTRACT

Background: The determination of hospital tariffs is a crucial aspect in the sustainability of healthcare facility operations, especially within the payment system of the Social Security Agency for Health (BPJS Kesehatan) based on Indonesian Case-Based Groups (INA-CBGs). This study aims to analyze the influence of the type of medical services provided by doctors, length of stay (LOS), medication costs, and laboratory costs on hospital rates for BPJS patients diagnosed with typhoid fever at Ananda Blitar General Hospital. **Methods:** This study uses a quantitative method with a cross-sectional approach. The sample consisted of 291 patients selected through stratified random sampling based on the class of care. Secondary data were obtained from the BPJS e-Claim and the Hospital Management Information System (SIMRS) for the period from August 1, 2021, to July 31, 2024. The analysis was conducted using dummy linear regression to identify the influence of each variable on hospital rates. **Results:** The research results show that the type of medical services provided by doctors, LOS, medication costs, and laboratory costs have a significant impact on hospital rates with a significance value of $0.000 < (\alpha=0.05)$. **Conclusions:** The results of the regression test show that the type of medical services provided by doctors has the greatest influence, followed by LOS, medication costs, and laboratory costs.

Keywords: BPJS Kesehatan, Hospital Rates, Typhoid Fever

INTRODUCTION

Hospitals need to pay special attention in determining rates for patients Badan Penyelenggara Jaminan Sosial Kesehatan (BPJS) (Dewi, R.S., & Wulandari, 2018). This tariff must not only meet the operational needs of the hospital but must also comply with the regulations set by the government and BPJS Kesehatan. The health payment system for BPJS Kesehatan participants is based on Indonesia Case-Based Groups (INACBGs) and capitation. The INACBGs tariff is the amount of claim payment by BPJS Kesehatan to Advanced Referral Health Facilities for service packages based on groupings of disease diagnoses and procedures, including all hospital

resources used in both medical and non-medical services (Kementerian Kesehatan RI, 2023). Under the capitation system, health care providers receive a fixed monthly payment for each enrolled participant, regardless of the number or type of services provided. This system is used for First Level Health Facilities. Hospitals face a major problem in determining appropriate tariffs for specific cases, such as typhoid fever patients, where many factors affect the cost of care.

The bacterium *Salmonella enterica* serovar Typhi causes typhoid fever, also known as enteric fever. Food and drink contaminated with the feces or urine of an infected individual is the most common way this bacteria spreads. High fever, headache, muscle aches, fatigue, abdominal pain,

constipation or diarrhea, and skin rash are symptoms of typhoid fever. In many countries around the world, especially in developing countries with poor access to clean water and sanitation, typhoid fever is a significant public health problem. The World Health Organization (WHO) says that about 11 to 21 million cases of typhoid fever arise each year, causing 126,000 to 161,000 deaths. With a prevalence of about 81.7 cases per 100,000 people, typhoid fever is still a common disease in Indonesia. Children aged 2-15 years are more susceptible to typhoid fever.

Financial imbalances can lead to hospital deficits, especially for hospitals that accept BPJS Kesehatan patients, if tariffs are set that do not match the actual operational costs of the hospital (Sutomo, A., & Hidayat, 2019). Hospitals may be forced to reduce resources allocated to patient care, such as reducing the number of medical personnel, the use of lower quality generic medicines, and limiting the use of some medical facilities. As a result, the quality of service received by patients may decrease. According to a study conducted by Dewi and Wulandari, hospitals that experience financial pressure due to tariff mismatches often experience a decline in the provision of quality services. This includes longer waiting times, lack of doctor visits, and lack of medical equipment (Dewi, R.S., & Wulandari, 2018).

Hospitals in Indonesia have faced many difficulties in setting healthcare tariffs since the National Health Insurance (JKN) was implemented in 2014 (Badan Penyelenggara Jaminan Sosial Kesehatan, 2015). At the start of implementation, many hospitals were not fully prepared in terms of administration and appropriate tariff setting. With the increasing number of BPJS participants and the variety of health services provided, such as typhoid fever treatment, the issue of tariff setting has become increasingly difficult. Ananda Blitar General Hospital, which also accepts BPJS patients, faces similar difficulties in determining the appropriate

tariff for typhoid fever patients. Ananda Blitar General Hospital is a fully accredited Type C hospital located on Mastrip Street No. 14, Srengat Village, Srengat Subdistrict, Blitar Regency.

To solve this problem, it is necessary to conduct a thorough analysis of the factors that influence hospital tariff setting for BPJS patients with typhoid fever diagnoses. This analysis should consider various things, such as BPJS Kesehatan policies, hospital operational costs, and epidemiological factors associated with typhoid fever. Therefore, a sustainable, equitable, and financially adequate solution should be found for both hospitals and BPJS Kesehatan.

Hospital tariffs are fees charged by hospitals to patients for medical and non-medical services, such as outpatient care, medical procedures, medicines, use of medical facilities, and medical personnel. The main factors affecting hospital rates are salaries of medical personnel, purchase of medicines, maintenance of facilities, and utility costs (Dewi, R.S., & Wulandari, 2018). According to Saragih's study, regulations can affect hospital rates, with BPJS tariff policies impacting hospital finances and operations (Saragih, 2020). Hospital rates are also affected by how severe a patient's illness is. Patients with more serious conditions may require intensive care, the use of more advanced medical devices, and more expensive medications, all of which make treatment more expensive (Mahendradhata et al., 2017). The cost of laboratory services in hospitals contributes to hospital tariff setting (Halim, A., & Widyastuti, 2020). Longer length of stay (LOS) increases the cost of care, which impacts hospital rates (Lee, J. H., & Lee, 2020). In this study, the determinants that will be studied by the author are the type of doctor's medical services, length of stay, drug costs and laboratory costs.

Physician medical services are medical services provided by physicians to patients in the course of diagnosing, treating, and monitoring

their health conditions including a variety of activities, such as medical consultation, physical examination, diagnosis of disease, management of medical conditions, creation of treatment plans, and implementation of medical procedures and therapies (Baker, L. C., & Brown, 2016). Some types of payment methods for physician medical services for health services that are commonly used are Fee for service, Capitation, Diagnosis-Related Groups (DRGs), Bundled Payments, Global Budget. In this study, the author wants to analyze the type of medical services on hospital rates. Where there are two types of medical services that have been applied, namely fee for service and a percentage of the claim or Bundlet payment.

Length of stay (LOS) is the number of days a patient is hospitalized from admission to discharge. Hospitals measure LOS as an indicator of service (Hosizah, 2018). Before the BPJS Health era, the longer the patient was treated, the greater the potential hospital income, this was inversely proportional to the payment system in the BPJS Health era where the longer the patient was treated, the greater the burden the hospital had to spend. The longer the LOS, the higher the hospital's operational costs for patient care, including room costs, medical personnel, and additional services (Schaeffer, J., & Petersen, 2017).

Drug costs vary depending on the type of hospital and the type of patient's illness, but in general, drug costs are the second largest cost after medical personnel costs (Suharmiati et al., 2019). This is due to the high cost of medicines, especially branded medicines. Drug costs can also vary depending on the type of disease, severity, length of treatment, and type of drug used. The number of days a patient is hospitalized is another factor that affects the cost of medicines. The longer a patient is hospitalized, the more drugs are required and the more expensive the drugs are. A 2018 study found a positive and significant relationship between

drug costs and length of stay at RSUD Dr. H. Abdul Moeloek Lampung Province. In other words, the longer the patient is treated, the more expensive the drug costs (Diana Sari, Rini Mutia Sari, 2018).

Laboratory costs are included in the consumables category, which is one of the largest variable operating cost components in hospitals (Heryana, 2019). Diagnosis, monitoring, and treatment of various diseases depend on laboratory tests. Laboratory costs contribute significantly to the gap between INA-CBGs rates and real costs. This can lead to inequity and inefficiency in the INA-CBG system (Diah Ekawardhani, 2021). It is important to remember that laboratory expenditure is only one aspect of the total cost of healthcare. Efforts to control laboratory expenditure should be made in conjunction with efforts to control other health system expenditures.

This study aims to analyze the determination of hospital rates for BPJS patients with a diagnosis of typhoid fever at Ananda Blitar General Hospital. The results of this study are expected to provide recommendations that can be applied to improve the hospital tariff setting system, so as to achieve a balance between service quality and financial sustainability.

METHODS

The research design used in this study is a quantitative method with a cross-sectional approach. The population in this study were all BPJS patients with a diagnosis of typhoid fever who were admitted to Ananda Blitar General Hospital during the period August 1, 2021 to July 31, 2024. The sample in this study was determined using the Krejcie and Morgan table, resulting in 291 patients consisting of 36 class I patients, 61 class II patients, and 194 class III patients.

The sampling technique used was stratified random sampling, with division based on inpatient class to ensure representation of each

category of patients in the study. The variables studied in this study consisted of dependent and independent variables. The dependent variable in this study is the hospital tariff, which is the fee charged by the hospital to BPJS patients with a diagnosis of typhoid fever. Independent variables include the type of doctor's medical services, length of stay, drug costs, and laboratory costs. This research was conducted in February 2025 at Ananda Blitar General Hospital. The data analysis method used is dummy linear regression.

RESULTS AND DISCUSSION

The normality test results for the data can be found in Table 1. The results show that the p value of 0.213 is greater than 0.05, it can be concluded that the data is normally distributed.

Multicollinearity test results can be seen in table 2. The results show that all variables of Dummy Fee For Service (X1), Length Of Stay (X2), Drug Costs (X3) and Laboratory Costs (X4) have a tolerance value > 0.1 or 10%, as well as a VIF value < 10, this finding indicates that there are no multicollinearity symptoms in this regression model so that the data is considered good and ready to be used in further testing

Heteroscedasticity test results can be seen in table 3. The results show that all the variables of Dummy Fee For Service (X1), Length Of Stay (X2), Drug Costs (X3) and Laboratory Costs (X4) have a probability value of > 0.05 which means that there is no heteroscedasticity problem, so it can be concluded that the regression model in this study is feasible to use and heteroscedasticity does not occur.

The results of the Linearity test can be seen in table 4. The results show that the linearity test can be seen that the Sig value. > 0.05, it concludes that the linearity test assumption has been met. The results of the dummy linear regression test can be seen in table 5. Based on the regression analysis results, the type of doctor's medical services has a significant effect

on hospital rates with a significance value of 0.001 (<0.05). The Fee for Service (FFS) medical service system has a negative coefficient of 194,773.021, which indicates that every 1 unit increase in Fee for Service will reduce hospital tariffs by 194,773.021, assuming other variables remain constant.

This means that the type of medical service with a percentage system will result in a higher tariff than the Fee for Service medical service type. The coefficient β_2 for Length of Stay (X2) of 189,111.971 means that every additional 1 day of patient length of stay will increase the hospital tariff by 189,111.971, assuming other variables remain constant. The coefficient β_3 for Drug Costs (X3) of 1.314 indicates that each increase of 1 unit in drug costs will increase hospital rates by 1.314, assuming other variables remain constant. The coefficient β_4 for Laboratory Costs (X4) of 1.156 means that any increase of 1 unit in laboratory costs will increase hospital tariffs by 1.156, assuming other variables remain constant..

The type of physician medical services, length of stay (LOS), drug costs, and laboratory costs have a significant effect on hospital tariffs. The Fee for Service (FFS) system tends to lower hospital tariffs compared to the percentage-based system, while LOS has a positive influence, with each additional 1 day of hospitalization significantly increasing tariffs. Drug and laboratory costs also contribute significantly to rates, with each increase in drug and laboratory costs increasing hospital rates. Efficient management of these factors, such as the implementation of clinical pathways, use of standardized generic drugs, and targeted laboratory tests, are key to balancing cost efficiency and quality of care. In the context of BPJS payments and the INA-CBGs system, these strategies are important to avoid financial losses and ensure the sustainability of health services. The use of technology and regular evaluation are also necessary to optimize cost management and improve hospital efficiency.

Table 1. Normality Test Results (One-Sample Kolmogrov-Smirnov Test)

		Unstandardized Residual
N		291
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.00000009
Most Extreme Differences	Absolute	.062
	Positive	.044
	Negative	-.062
Kolmogorov-Smirnov Z		1.058
Asymp. Sig. (2-tailed)		.213

a. Test distribution is Normal
 b. Calculated from data

Table 2. Multicollinearity Test Result Coefficients^a

	Tolerance	VIF
Dummy FFS	.859	1.165
Length Of Stay	.742	1.347
Drug Costs	.784	1.276
Laboratory Costs	.907	1.103

a. Dependent Variable : Tarif RS

Table 4. Linearity Test Results

Ramsey RESET test for omitted variables	
Omitted : Power of fitted values of Y	
H0 : Model has no omitted variables	
F (3,283)	= 1.69
Prob > F	= 0.1697

Table 3. Heteroscedasticity Test Results

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	.784	.335		2.338	.021
Dummy FFS	-.204	.168	-.122	-1.216	.227
Length Of Stay	-.043	.079	-.056	-.551	.582
Drug Costs	4.454E-7	.000	.133	1.308	.193
Laboratory Costs	3.925E-7	.000	.062	.614	.541

Table 5. Dummy Linear Regression Test Results

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	465763.20-9	108489.033		4.293	.000
Dummy FFS	-194773.021	59232.825	-.137	-3.288	.001
Length Of Stay	189111.971	25236.840	.336	7.493	.000
Drug Costs	1.314	.117	.491	11.253	.000
Laboratory Costs	1.156	.231	.203	4.998	.000

CONCLUSIONS

The results show that the type of doctor's medical services, length of stay, drug costs, and laboratory costs have a statistically significant influence on hospital rates in BPJS patients with typhoid fever diagnoses. This finding is in line with previous research which shows that these factors contribute significantly to the total cost of treating typhoid fever patients.

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