



Comparison of the Variation Cost of COVID-19 Medicine Among Public and Private Hospitals in Indonesia

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Abstract. Cost information is important for efficiently allocating healthcare expenditures, estimating future budget allocation, and setting user fees to start new financing systems. Indonesia has a very high number of COVID-19 cases. Because of new instances, Indonesia requires information on the cost of COVID services, one of which is information on the cost of COVID-19 treatment medicine. This study assesses the cost of medical services for COVID-19 patients in public and private hospitals based on the severity from the provider's perspective. This study also analyses variations in the price of COVID-19 treatment medicine based on the type and class of hospital to allocate and manage the budget appropriately. A hospital-based cross-sectional study was conducted in 9 public and 7 private hospitals spread across 5 provinces in Indonesia for the financial year 2020. The activity-based costing method was applied to calculate the unit cost of the cost of drugs for inpatient covid-19 treatment per episode of disease according to severity. Costs are calculated using Microsoft Excel 2010. The differentiating factor for patient care in hospitals for COVID-19 patients is the severity level. The average cost of medicine for COVID-19 patients with mild symptoms in government hospitals is IDR. 734,305.5, moderate symptoms IDR 1,685,200.25, severe symptoms IDR 6,126,585.6 and with critical condition IDR 3,035,938.3. The average variation in the cost of medicine for treating COVID-19 patients in private hospitals is high in each hospital class for the same severity of illness. The average cost of COVID-19 treatment drugs for patients with mild symptoms is IDR 1,782,489, moderate symptoms IDR. 2,527,738.6, severe symptoms of IDR. 2,229,679.5 and in critical condition IDR. 15,331,045.5. The cost of COVID-19 treatment drugs is influenced by the flow of COVID-19 treatment, length of stay, type of hospital, hospital class, and severity of illness. There is a wide variation in the average cost of medicine for treating COVID-19 patients in hospitals, both styles, and types of hospitals at the same severity level. The average treatment price for COVID-19 patients in private hospitals is more expensive than in government hospitals for mild, moderate, and critical conditions. However, the average cost of medicine for COVID-19 patients with severe symptoms is more costly at government hospitals compared to private hospitals.

Keywords: medicine cost of COVID-19 · public and private hospitals · Indonesia

1 Introduction

COVID-19 is an unprecedented pandemic posing a major threat to global public health. In January 2020, the WHO Emergency Committee declared a global health emergency based on growing case notification rates at Chinese and international locations [1]. COVID-19 represents a spectrum of clinical manifestations that typically include fever, dry cough, and fatigue, often with pulmonary involvement. SARS-CoV-2 is highly contagious, and most individuals within the population at large are susceptible to infection [2].

On April 13, 2020, the Indonesian government officially declared the COVID-19 outbreak a national disaster, and the number of cases is growing rapidly in Indonesia. This increase in cases has had a tremendous impact on the health system in Indonesia, both in terms of financing and supply. As a new case, COVID-19 services and treatment still do not have standards [3]. Although the Indonesian Ministry of Health has issued guidelines for handling COVID-19 patients, many treatment variations have been found in the hospitals, especially regarding the COVID prescription. Cost information is important for efficiently allocating healthcare expenditures, estimating future budget allocation, and setting user fees to start new financing systems [4].

This study aims to calculate the variable cost of treating COVID-19 patients in some government and private hospitals based on severity (mild, moderate, severe, and critical). The results of this study are useful for BPJS Health as a basis for determining INA CBG rates for COVID-19 treatment. After COVID-19 is declared not a pandemic disease, all payments for treating COVID-19 patients will be returned to the health insurance payment mechanism through the National Health Insurance (JKN) program. And during the pandemic, JKN did not yet have a COVID -19 service rate in all health facilities, especially hospitals.

The role of the government is to ensure access to health services for its people, including access to medicines, which is the mandate of a state. A new pharmaceutical preparation is considered a drug when it is accessible, available, and used appropriately. Therefore, it is important to calculate the drug budget to improve budget readiness.

2 Materials and Methods

This research is an operational study with a cross-sectional approach. Data collection was conducted in 2020 in 9 government hospitals and 7 private hospitals spread across 5 provinces (DKI Jakarta, Banten, East Java, Yogyakarta, and South Sulawesi). The stage of collecting data on drug costs for treating COVID-19 patients in this study included identifying the flow of services for COVID-19 patients, observing services with in-depth interviews, and examining the medical records of selected COVID-19 patients by considering the representativeness of the patient's severity (mild, moderate, severe, and chronic). The examination of the patient's medical record is carried out by the medical record officer of each hospital using special instruments developed by the researcher. Each hospital took 3 samples of COVID-19 patients at each level of severity (mild, moderate, severe, and chronic), so the number of drug costs in this study was presented as average. The cost of drugs calculated in this study was purely the cost of drug consumption by COVID-19 patients during the treatment period in the hospital

based on severity. In calculating the price of this drug, the cost components of medical devices and consumable medical materials were not included. The drug costs in this study were estimated using the activity-based costing method, where prices were calculated based on the allocation of resources used to carry out activities related to the care of COVID-19 patients in hospitals.

3 Results

The calculation of medicine costs for treating COVID-19 patients was conducted in 9 government hospitals and 7 private hospitals spread across 5 provinces, that are DKI Jakarta, Banten, East Java, Yogyakarta, and South Sulawesi. The public hospitals selected as research locations consisted of class A, class B, class C, and class D hospitals. Meanwhile, the private hospitals selected in this study consisted of class B, class C, and class D hospitals.

The medicine costs calculated in the study are only from the provider's perspective, meaning the drugs consumed by COVID-19 patients while hospitalized. Observation results show that the medical costs consumed by COVID-19 patients during treatment are distributed over 4 rooms, including the emergency room (IGD), the poly room, the inpatient room, and the ICU room.

The medicine costs in this study were calculated based on the severity of the patient's COVID-19 condition, which is classified as mild, moderate, severe, or critical. The severity of the disease affects the flow of patient care in the hospital. Based on the COVID-19 patient service guidelines set by the Ministry of Health in 2020, in general, the COVID-19 patient service flow is as follows (Fig. 1):

The differentiating factor for patient care in hospitals for COVID-19 patients is the severity level. After receiving laboratory and radiological examinations, the patient is advised to self-isolate if the patient has mild symptoms. However, if the patients experience moderate, severe, or critical symptoms, they will be admitted to the hospital and placed in an isolated inpatient room. The patient will then be treated based on the findings of the observations. If the observations, laboratory, and radiological examinations indicate evidence of severe and critical symptoms, the patient will be transferred to the intensive care unit (ICU). These treatments affect medicine costs for COVID-19 patients

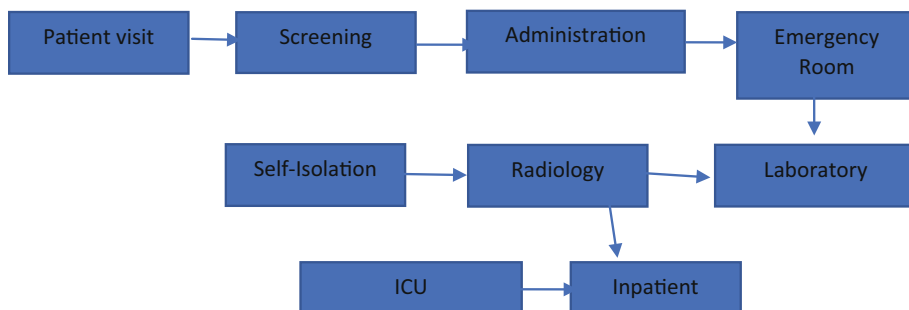


Fig. 1. COVID-19 Patient Care Flow

Table 1. The average length of stay of COVID-19 patients based on the disease’s severity

Type of health facility	The average length of stay of COVID-19 patients			
	Mild (day)	Moderate (day)	Severe (day)	Critical (day)
Public Hospital Class A	14	13	7	5
Public Hospital Class B	10	12	12	11
Public Hospital Class C	10	13	8	4
Public Hospital Class D	14	14	–	–
Average	12	13	9	6.6
Private Hospital Class B	17	15	15	18
Private Hospital Class C	6	11	13	11
Private Hospital Class D	7	14	–	–
Average	10	13.3	14	14.5

in hospitals. In addition to the severity and treatment variations received by COVID-19 patients, the length of stay in the hospital determines the number of drug costs for COVID-19 patients at the hospital. The longer the patient is hospitalized, the higher the medicine cost.

Table 1 shows the variation in the average length of stay for COVID-19 patients in government and private hospitals. The average length of stay for COVID-19 patients in government and private hospitals is varied. In general, the length of stay for COVID-19 patients is longer in private hospitals than in public hospitals. The average stay for COVID-19 patients with mild symptoms in government hospitals is around 12 days, meanwhile in private hospitals is about 10 days. Patients with mild and moderate symptoms in government and private hospitals have a similar average length of stay (13 days). However, COVID-19 patients with severe symptoms have an average stay of approximately 9 days in government hospitals and 14 days in private hospitals. Patients with critical conditions have 6.6 days of stay in government hospitals and 14.5 days of stay in private hospitals.

Table 2 shows medicine costs for COVID-19 patients based on the severity and type of health facilities. The results showed a high variation in medicine cost of COVID-19 by hospital classes and types of hospitals at the same level of disease severity. The average medicine costs for patients with mild symptoms in government hospitals is IDR 734,305.5, for patients with moderate symptoms are IDR 1,685,200.25, for patients with severe symptoms are IDR 6,126,585.6, and for patients with critical conditions IDR 3,035,938.3. The medicine cost for COVID-19 patients in private hospitals also varied in each hospital class for the same severity of illness. The average medicine costs for COVID-19 patients with mild symptoms are IDR 1,782.489, for patients with moderate symptoms are IDR 2,527,738.6, for patients with severe symptoms are IDR 2,229,679.5, and for patients with critical conditions IDR 15,331,045.5.

The analysis results show that the average medical costs for COVID-19 patients with mild symptoms in private hospitals were 41% higher compared to the patients with

Table 2. COVID-19 medicine cost in public and private hospitals by the severity of disease in 2020

Type of health facility	Cost of medicine (IDR)			
	Mild	Moderate	Severe	Critical
Public Hospital Class A	399.631	2.183.556	11.800.491	20.414.181
Public Hospital Class B	302.614	1.677.266	5.802.752	4.774.420
Public Hospital Class C	654.077	1.008.889	776.514	1.919.214
Public Hospital Class D	1.580.901	1.871.090	–	–
Average Medicine Cost of Public Hospital	734,305.5	1,685.200.25	6,126,585.6	3,035,938.3
Private Hospital Class B	4.409.042	4.584.127	2.424.280	27.083.117
Private Hospital Class C	417.795	1.072.105	2.035.079	3.578.974
Private Hospital Class D	520.630	1.926.984	-	-
Average Medicine Cost of Private Hospital	1,782,489	2,527,738.6	2,229,679.5	15,331,045.5

similar severity in government hospitals. The average medicine costs for COVID-19 patients with moderate symptoms in private hospitals is 66% higher compared to the patients with similar severity in government hospitals. In contrast, COVID-19 patients with severe symptoms have medicine cost 36% higher in government hospitals than in private hospitals. Meanwhile, medicine costs for critically ill COVID-19 patients are 20% higher in private hospitals than in government hospitals.

4 Discussion

The Ministry of Health has launched the COVID-19 service flow. However, the implementation may differ in the field depending on local policies. Variations of COVID-19 handling policies were found in 9 provinces. At the government level, the policy was determined by the local mayor or regent, meanwhile, at health facilities, the policy was determined by primary and secondary health facilities, private, and government. Research conducted by Diyar showed that local governments are required to develop strategies that address COVID-19 while maintaining essential healthcare services. However, it was not regional government regulation, but Health Quarantine Law was applied during the COVID-19 pandemic [6, 7]. In addition, decentralization in the health sector has led to different standards for basic health services following local governments' commitment and fiscal capacity. Strengthening the role of local governments is a major factor in overcoming COVID-19 [8–10].

This study's results indicate high variations in the medical costs for COVID-19 treatment by types and classes of hospitals. This is due to differences in the flow of services for COVID-19 patients, which can potentially affect the length of hospitalization and the number of treatment costs [11, 12]. Government hospitals show that the average

medical cost is lower than private hospitals. The reason is government hospitals still receive subsidies for operating, investment, and maintenance costs from the government, while private hospitals do not [13]. The tariff component will consider all costs incurred by a private institution. Other research findings show that medical costs are about 15% in government and 17% in private service facilities [4]. The variation in medicine costs between government and private hospitals in this study is high, even though there are guidelines for handling COVID-19 patients from the Ministry of Health. Still, the facts in the field show many discrepancies [15]. Doctors' preference for prescribing certain patent medicines for patients is an enabling factor for the high medical costs in private hospitals.

Disruption of drug availability has different implications in each hospital. A study in Chicago reported the most response from hospitals was to replace them with alternative medicine and the second most common option is to delay therapy. Unavailable medicine led to various outcomes, such as suboptimal treatment, readmission, failure of medicine, and increased length of stay [16]. Low medicine costs do not necessarily indicate efficiency, there are still many factors that must be considered. Hospital location is another factor that must be considered for its influence on the disruption of medicine availability. Improving the function of pharmacists in the clinical field helps to control costs and improve the quality of therapy, as well as improve management strategies in hospitals [17–19].

The length of days for COVID-19 patients' care has a high variation in each hospital according to treatment classes, types of hospitals, and disease severity. The variation of COVID-19 medicine is very high between hospital classes and types of hospitals at each level of disease severity. The reasons are due to variations in patient conditions, variations in local government policies, and the presence of comorbidities [15].

It is necessary to make guidelines for using standard medicine to handle COVID-19 patients, thus it can reduce the cost variation. Policies for handling COVID-19 may vary between regions regarding the availability and readiness of health facilities, health resources, geographical conditions, and population of each area. These factors affect local hospital policies. This study has limitations that were not considering the cost of medicine purchased directly by patients. Further research is needed to determine the medical costs of COVID-19 treatment for providers and patients.

5 Conclusion

The flow of handling COVID-19 patients varies in each region according to local government policies. There is a wide variation in the average cost of medicine for treating COVID-19 patients in hospitals, by classes and types of hospitals at the same level of disease severity. The average treatment price for COVID-19 patients in private hospitals is more expensive than in government hospitals for mild, moderate, and critical conditions. However, the average cost of medicine for COVID-19 patients with severe symptoms is more costly at government hospitals than at private hospitals. The central government must ensure health services in the regions comply with COVID-19 handling standards. With the current public health emergency, it is hoped that the roles of central and regional governments are expected to ensure citizens' safety.

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