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# Utilization and expenditure of Indonesia National Health Insurance before and during COVID-19 pandemic in Indonesia: a descriptive study

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## Abstract

**Purpose**: This study describes the utilization of healthcare facilities before and during the COVID-19 pandemic and the expenditure of national health insurance at primary and secondary healthcare facilities. **Methods:** This is a descriptive study with a cross-sectional design. We utilized claim data from the National Health Insurance from January 2018 to June 2021. The population included in this study were all Indonesian citizens who contracted COVID-19. Both the Ministry of Health and National Health Insurance expenditure for COVID-19 services were captured. The data were analyzed in frequency and proportions. **Results:** There was a consistent utilization trend across all types of healthcare facilities (primary vs. secondary; public vs. private), with an upward trend before the Covid-19 pandemic, a downward trend in 2020, and a slight increase before June 2021. Primary healthcare utilization jumped by 19% during the 2018-2019 period and dropped by 34% from March to April 2020. A similar trend was observed in the secondary healthcare facilities, with the utilization cost being lower in the 2020 and 2021 periods than in previous years. Hospital visits also showed a decreasing trend during the start of the pandemic (both public and private-owned), which was linear to the expenditure of inpatient and outpatient visits. The total claim for COVID-19 health care increased to IDR 77.8 trillion by August 2021 (both inpatient and outpatient), with the highest cost per patient for inpatients with comorbidities. **Conclusion:** Healthcare utilization decreased significantly during the COVID-19 pandemic period. On the other hand, since COVID-19 increased expenditure, particularly due to inpatient services and comorbidities, National Health Insurance needs to prepare a health financing strategy to anticipate the shift of financing in time of the endemic.

**Keywords:** national health insurance; COVID-19 pandemic; utilization; expenditure

## INTRODUCTION

In December 2019, an outbreak of pneumonia caused by SARS-CoV-2 was first identified in Wuhan, a small city in the Hu Bei Province, People's Republic of China [1]. The World Health Organization (WHO) declared the disease known as COVID-19 a global pandemic on March 11$^{th}$, 2020 [2]. In May 2022, there were 527 million total confirmed cases of COVID-19 worldwide, with a death toll of 6.28 million lives. In Indonesia, the total number of confirmed cases of COVID-19 reached 6 million, with 157 thousand confirmed cases of COVID-19-related death. Most of the cases in Indonesia occurred during the two massive COVID-19 waves, in July 2021 and January-February 2022 [3].

The COVID-19 pandemic is a public health disaster that happened swiftly and caused the collapse of the health system in many of the world's nations. This phenomenon can be observed during the early days of the COVID-19 pandemic. The World Health Organization (WHO) preliminary reports on COVID-19-related expenditure showed that there was an increase in health spending during 2020 when compared to previous years (8.1% in 2020 vs. 2.4% on average in 2016-2019), with the highest proportion coming from health spending in forms of government and compulsory insurance financing arrangements. On the other hand, out-of-pocket health spending proportion decreased. Health spending of countries included in the preliminary studies consisted of treatment of COVID-19 patients (up to 83% in Slovenia), followed by testing and tracing, procurement of medical goods and equipment, and the vaccination program [4].

In the 2020 National Healthcare Expenditure (NHE) report of the United States of America conducted by Centres of Medicare & Medicaid Services, it is stated that the total NHE of the USA grew 9.7% in 2020, accounting for 19.7% of the country's GDP in the same year. The federal government's expenditure on health care increased by 36.0% in 2020 versus 5.9% in 2019. The health spending per capita of the USA is valued at $12.530 per person [5]. Similar growth in health expenditure in 2020 was also found in Asian countries, including China and Singapore, respectively, growing 16.3% and 47.1% from the previous year [6][7].

Indonesia's healthcare system has adopted a decentralized nature following the 1999 reform. The Ministry of Health handles health problems at the national level, whereas the local health services are further differentiated into a tiered system from the provincial level down to the district/municipality level. This tiering of healthcare services from primary healthcare facilities – to district hospitals – provincial hospitals – central hospitals is important as it plays a role in the referral system of the national health insurance program (*Jaminan Kesehatan Nasional* or JKN). Primary healthcare facilities (called *fasilitas kesehatan tingkat pertama* or *FKTP*) in Indonesia are the entry point for most patients, governed under the district health office (*dinas kesehatan daerah)* provides basic and emergency medical services to a small geographic area. Based on the Social Health Insurance Administration Body (BPJS) Health data, 23.347 primary healthcare facilities are in Indonesia [8]. Primary health care facilities have an important role as gatekeepers for cases before referral to hospitals. In Indonesia, hospitals are classified into several classes, from class A to class D, which are all referred to as referral healthcare facilities (*Fasilitas Kesehatan Rujukan Tingkat Lanjut*). Provincial, district, municipal, and private hospitals fall under this category. To be eligible for healthcare coverage in Indonesia via JKN, patients must adhere to this referral system, except for emergency cases [9]. During the COVID-19 pandemic, the same referral system was implemented, where primary healthcare facilities function as quarantine or isolation centers, whereas referral hospitals took care of moderate-to-severe patients [10].

Studies in the past 2 years showed that visits to hospitals had dropped significantly during the pandemic compared to pre-pandemic levels. In the United States, hospital admissions due to non-COVID-19 declined in early April. By late June/early July, the level of hospital admission had dropped 16% compared to the pre-pandemic level (8% when adjusted for COVID-19-related hospital admissions) [11]. A recent systematic review shows a decline in healthcare utilization (hospital visits, inpatient admissions, diagnostics, and therapeutics) in several countries, with a median of 37% reduction [12].

In Indonesia, the expenditure for COVID-19 patient management, including testing, inpatient services, quarantine facilities, and treatment, are fully covered by the government, with an allocation of $5.9 billion (IDR 87 trillion) from the national budget (APBN) [13]. BPJS Health acts as the mediator and authorizer of funds from the government to healthcare facilities.

Members of National Health Insurance (NHI) are divided into two main categories, those who receive subsidies from the government (*Penerima Bantuan*

*Iuran/PBI*) and those who do not (*non-PBI*). Non-PBI members of the NHI program are separated into three main classes with different prices for the monthly premium, into the 1st, 2nd, and 3rd class (IDR 150.000; IDR 100.000; and IDR 35.000, respectively). There was no difference in the medical treatment between the different classes, the only difference is the number of beds per ward they were assigned to [9].

Future predictions of the COVID-19 pandemic are unclear of whether another wave of infection will occur or whether we are nearing the end of the Pandemic. However, COVID-19 will eventually become endemic since it won't disappear completely and remain relevant, causing possible hospitalizations and deaths in the future. This is a crucial point, as the treatment cost of endemic disease needs to be covered by the National Health Insurance program instead of the government via the APBN.

Thus, it is important to be able to project the total expenditure of COVID-19-related patient management, healthcare facilities utilization during and before the pandemic for both COVID and non-COVID-related causes, and whether the COVID-19 fund can be transferred from the APBN to the JKN budget in the future.

## METHODS

The primary data source for this study was the billing system's registry connected to the patient's medical resume on the National Health Insurance Program across the country who sought healthcare treatment from January 2018 to September 2021. The data was collected from the registry within seven months, from May to November 2021. Patients' diagnoses, medical conditions, and healthcare expenses were collected from the medical resume and the hospital billing system, while the data regarding sociodemographic characteristics were collected from the registry of the National Health Insurance membership database.

A cross-sectional approach was taken to observe and describe the characteristics of COVID-19 patients, trends of expenses, and healthcare utilization from before and during the pandemic. This study is conducted jointly between health economic consultants and the study teams of BPJS Health. The study subjects consist of all Indonesian citizens that were contracted COVID-19.

The data used in this study is from January 2018 until September 2021, the end of the second large wave of COVID-19 infections in Indonesia caused by the Delta Variant. It consisted of several types of variables, including the healthcare utilization before (defined as the period before the WHO declared COVID-19 as a global pandemic; 2018-2019 period) and during (defined as the time period after the WHO declared COVID-19 as a global pandemic; 2020 - September of 2021) the COVID-19 pandemic, both in primary health care facilities and in advanced health care facilities, the expenditure of COVID-19 related hospital cost based on regions, comorbidities, and the type of hospitals (public or private), and the total insurance claim of COVID-19 during the pandemic.

The "Total Expenditure" variables analyzed in this study include capitation- and non-capitation-related expenses, INA-CBG claims, and total expenditure of secondary healthcare facilities. The utilization rate variables are defined as visits to healthcare facilities per 1000 members, while primary and secondary healthcare facilities visits are defined as the total number of visits (inpatient and outpatient) per month.

The data collected were analyzed using descriptive analysis in proportions and frequencies, as well as regression analysis between the cost per member per month and confirmed COVID-19 cases in Indonesia. This study is approved by the ethical committee of the Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University (KE/FK/0945/EC/2021).

## RESULTS

Table 1 shows the characteristics of COVID-19 patients in Indonesia from January 2020 to June 2021. Of 1.015.920 confirmed cases, 705.352 cases (69%) are from Java, with the province of West Java reporting the highest number of cases at 178.480 confirmed cases, followed by East Java, Jakarta, Central Java, and the

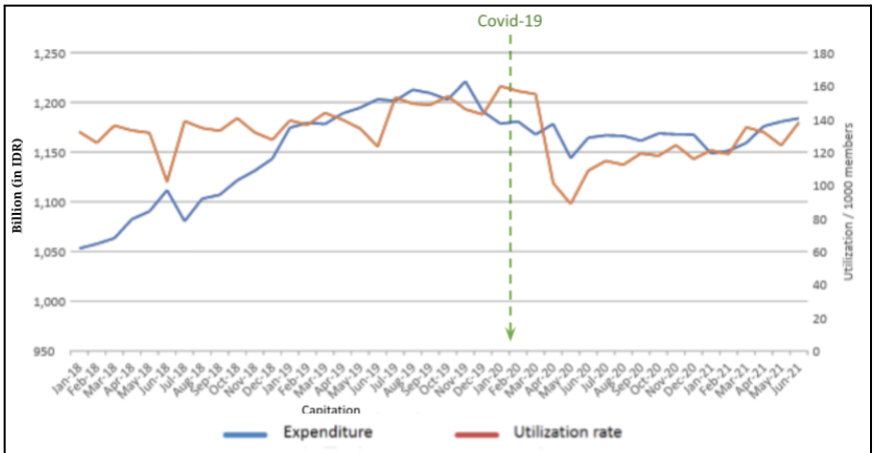


**Figure 1.Total expenditure and utilization of primary healthcare facilities**

Special Region of Yogyakarta. Less than half of the COVID-19 patients (42%) are registered as members of the National Health Insurance. Based on the age group, most of the COVID-19 patients in Indonesia are within the productive age, with the highest being the 46-55 age group at 212.060 (20.8% of the total case). A total of 122.337 (12%) deaths were confirmed, with a higher proportion of those not registered as members of the National Health Insurance (97.543 vs. 24.974).

Figure 1 shows the utilization trend at the primary healthcare facilities level, which was relatively stable during the 2018-2019 period, with an increasing expenditure trend reaching its highest in the final quarter of 2019. When the World Health Organization declared COVID-19 as a pandemic and global health emergency in early 2020, the utilization of primary healthcare facilities dropped to its lowest point, while the expenditure on primary healthcare showed a stable and similar trend to previous years.

Figure 2 shows the utilization, expenditure, and visits of referral healthcare facilities, both public and private hospitals. During the 2018-2021 period, the private hospital dominated the utilization and expenditure of referral healthcare facilities. Utiliza- tion and expenditure of both public and private hospitals show stable trends during the 2018-2019 period, with the highest point reached in October 2019. A decrease in utilization was found during March 2019 and again in March 2020. Overall utilization and expenditure of public and private hospitals decreased from 2020 through 2021 compared to 2018-2019. The expenditure of privately owned hospitals is similar to visitor numbers. In contrast, in the public hospital, the overall expenditure is relatively higher than the number of visitors.

Table 2 shows the average cost-per-case of COVID-19 classified based on provinces and severity level. The national average for mild cases is IDR 4.4 million, IDR 9.23 million for moderate cases, IDR 13.5 million for severe cases, and IDR 28 million for critical cases (approximately USD 296, 622, 910, and 1888).

Figure 3 shows a positive association between the monthly cost per member and the number of confirmed COVID-19 cases. This cost fluctuates with the number of confirmed COVID-19 cases that require hospitalization, with the highest being IDR 54.403 PMPM on the second wave of COVID-19 infection in July of 2021. The average

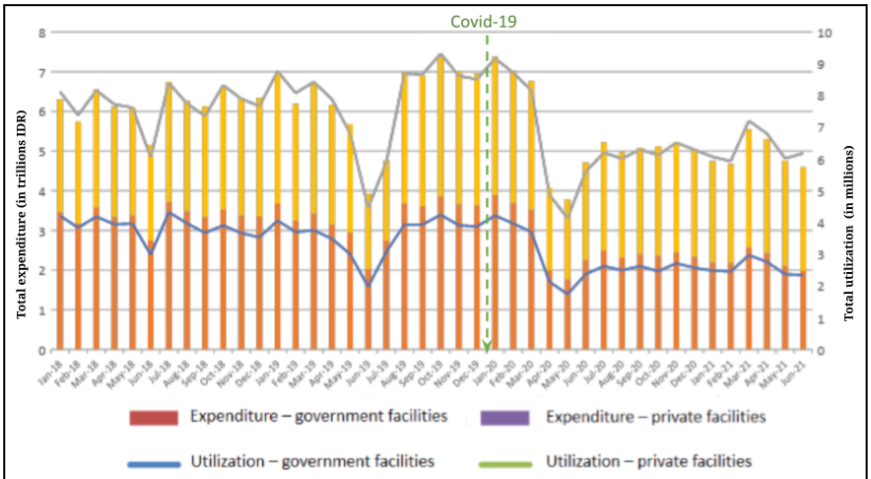


**Figure 2 Expenditure and utilization of referral healthcare facilities**

cost Per Member Per Month (PMPM) for 2020 and 2021 are IDR 11.233 and IDR 25.831, respectively, with a 2-year average of IDR 17.489.

## DISCUSSIONS

During the COVID-19 pandemic, BPJS Health was assigned to verify COVID-19 hospital claims. Since claim verifica- tion is timely, healthcare facilities and hospitals were required to use their funds to cover COVID-19 expenses while waiting for the verification process, along with the isolation facilities' requirement to treat severe COVID-19 patients and protect healthcare providers, meant that most hospital's budget was diverted toward this front [14].

In practice, there are processes and steps to submit a COVID-19 claim. Claim verification can take up to two weeks. Claim dispute further delays or even cancels claims, leaving the hospital treating COVID-19 patients with no funds to provide care. The causes of delays and cancellations are mainly due to the internal factors of hospitals (i.e., incomplete documents, multiple regulation changes throughout the year) and external factors like the multiple "entry point" for submitting claims, the uncertain nature of the pandemic, governmental policies regarding health fundings, and technical issues regarding the information system used for submitting claims (crash, lagging, or even down).

In general, managing COVID-19 patients is costly, which ranges from 8% to 50% of Indonesia's GDP per capita in 2020 [15]. The high cost of treating COVID-19 was mainly due to isolation wards, mechanical ventilators, ICU, and the length of stay of COVID-19 patients [16]. For patients requiring ICU, the hospital stay is between 15 to 20 days, with an average ICUs' length of stay of 18 days [17]. In Indonesia, the high-cost disparity between several regions may be due to the

availability of resources and facilities, drug availability, and medical healthcare professionals. The positive association between per member per month cost and confirmed COVID-19 cases in Indonesia is concordant with similar findings in other countries, which reported an increased health expendi- ture as the number of confirmed COVID-19 cases increased.

The overall healthcare utilization trend decreased in 2020 compared to previous years. This result is similar in other countries, such as South Korea. A study in 2021 shows that 73.2% of 1000 respondents in South Korea reportedly avoided seeking health care during the COVID-19 pandemic [18]. The United Kingdom reported a total decrease of 70% in healthcare utilization during the first wave of the COVID-19 pandemic. Germany reported a 10% reduction in total hospitalization during the high surge of COVID-19 cases. In comparison, China reported a 63% decline in total hospital visits and a 71% decline in total primary care visits [19-21]. The findings from these studies provide additional insights into the utilization of National Health Insurance during the COVID-19 pandemic and whether steps could be taken to shift the COVID-19 financing burden to National Health Insurance.

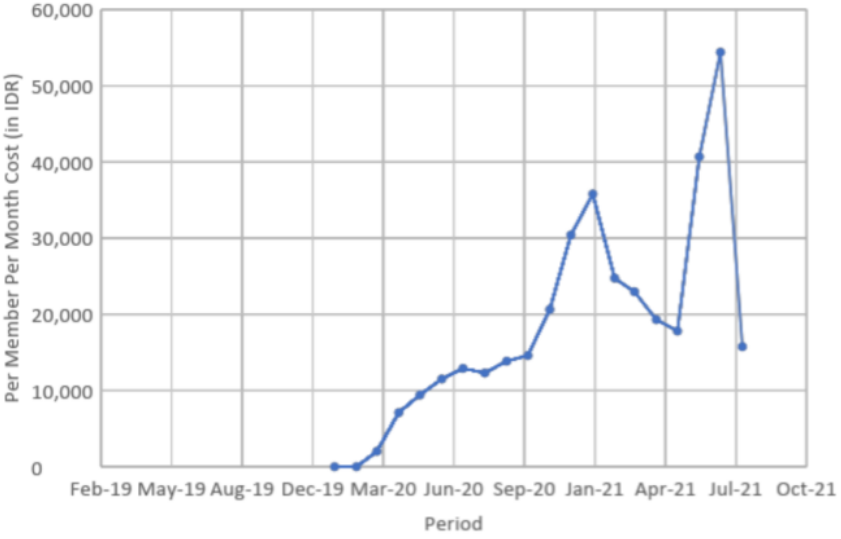


**Figure 3 Per Member Per Month (PMPM) Cost of Covid-19**

Reduced healthcare utilization of the National Health Insurance throughout 2020 will result in national budget savings. Shifting COVID-19 payments that the government has covered throughout the pandemic is a delicate step that requires cost analysis and prediction of the future of national and global health situations. The transitional process is done correctly to prevent unwanted consequences in the future. This result provide insights into the matter and the foundation for policymakers and stakeholders to move forward.

Due to the high cost per member per month in COVID-19 management, shifting COVID-19 expenses from the national budget to the National Health Insurance will likely increase the monthly premium over the population's ability to pay. Standardizing COVID-19 treatment must be done before inclusion as one of the National Health Insurance benefit packages. During this process, analysis of tariffs, mechanisms of payment, and future risk projections is essential to ensure the transfer proceeds smoothly [22,23].

Several funding options should be considered regarding COVID-19 management. During the transition period, vertical funding from the Ministry of Health (MoH) or local governments should be prioritized in possible areas. Fund allocation from MoH and local governments will relieve the burden of National Health Insurance in the event of future infection waves. Cost-sharing options should also be considered in patients with higher socioeconomic status, as it allows for optimal budget and resource allocation to the sectors that need it the most [24]. Moreover, preventive measures should be massively promoted to the population. Increasing the vaccination rate, promoting hygiene, using masks, and implementing universal infection prevention will indirectly alleviate the economic burden of the National Health Insurance.

There are several limitations of this study. First, this study does not elaborate on COVID-19 patients without NHI membership. Consequently, the specific demographic of the said population is not entirely described. A follow-up review of policies is necessary to decide whether to include COVID-19 into the National Health Insurance benefits package along with its future implications.

## CONCLUSION

With the decreasing utilization of National Health Insurance in Indonesia, along with the high cost of COVID-19 treatment, there was a consideration to shift the burden of COVID-19 from the National Budget to the National Health Insurance. However, this requires an extensive review of the evidence, strict regulatory protocols, standardization of medical treatment and costs, and support from the central and local governments for a smooth transition process.

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**Table 1. Characteristics of Covid-19 Patients in Indonesia**

| | Registered as BPJS-Health Member | Non BPJS-Health Member | Total Covid-19 Patients |
|---|---|---|---|
| **Gender** | | | |
| Male | 194.967 | n/a | 194.967 |
| Female | 232.028 | n/a | 232.028 |
| Not Available/Unknown | 7 | 588.918 | 588.925 |
| **Age Group** | | | |
| 0 – 5 | 6.248 | 27.495 | 33.743 |
| 6 – 11 | 5.200 | 7.068 | 12.268 |
| 12 – 16 | 4.622 | 9.294 | 13.916 |
| 17 – 25 | 28.132 | 53.898 | 82.030 |
| 26 – 35 | 70.387 | 92.026 | 162.449 |
| 36 – 45 | 68.705 | 92.446 | 161.151 |
| 46 – 55 | 90.673 | 121.387 | 212.060 |
| 55 – 65 | 91.659 | 110.248 | 201.907 |
| > 65 | 61.376 | 72.960 | 134.336 |
| **Death** | 24.794 | 97.543 | 122.373 |
| **Total Case per Main Island** | | | |
| Sumatera | 73.209 | 78.922 | 152.131 |
| Java | 286.790 | 418.562 | 705.352 |
| Borneo | 24.595 | 34.539 | 59.188 |
| Sulawesi | 18.927 | 22.597 | 41.524 |
| Maluku & North Maluku | 967 | 1.846 | 2.813 |
| Bali & Nusa Tenggara | 18.902 | 28.131 | 47.033 |
| Papua | 3.194 | 4.685 | 7.879 |

**Table 2. Covid-19 Management Cost per Province based on Severity**

| Province | Mean Cost (In IDR) | | | |
|---|---|---|---|---|
| | Mild | Moderate | Severe | Critical |
| North Sumatera | 784.200 | 5.653.550 | 12.760.000 | 15.481.505 |
| Banten | 4.479.195 | 5.582.355 | 10.757.115 | 15.663.480 |
| Special Capital Region of Jakarta | 631.040 | 7.285.815 | 17.496.570 | 28.251.800 |
| Central Java | 4.738.745 | 4.992.930 | 12.165.935 | 11.984.540 |
| Special Region of Yogyakarta | 7.171.265 | 12.575.415 | 21.071.690 | 34.304.970 |
| East Java | 979.910 | 11.557.515 | 17.789.760 | 57.018.060 |
| South Kalimantan | 6.184.540 | 11.765.155 | 13.477.460 | 21.133.605 |
| South Sulawesi | 6.231.085 | 11.540.550 | 6.124.220 | 42.945.230 |
| Papua | 8.518.315 | 12.127.365 | 22.769.205 | 28.134.205 |
| National Mean ± Standard Deviation | 4.409.160 ± 2.969.310 | 9.231.135 ± 3.251.915 | 13.518.350 ± 7.273.490 | 28.324.155 ± 14.649.350 |