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THE SUITABILITY OF DIRECT MEDICAL COSTS WITH INA-CBG'S CLAIMS OF OUTPATIENT BREAST CANCER IN CLASS A AND B HOSPITALS

Diesty Anita Nugraheni[1 *], Fanyda Amiyassin Hafi'ah[2], May Syahra Indah Permata Harlin[3], Aji Tetuko[4], Titik Rahayu Indarti[5], Gita Mayasari [6]

[1,2,3]Jurusan Farmasi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Islam Indonesia, Yogyakarta, Indonesia
[4]Farmasi STIKES Akbidyo, Yogyakarta, Indonesia
[5]Rumah Sakit Umum Pusat Dr. Sardjito Yogyakarta, Indonesia
[6]Rumah Sakit Umum Daerah, Kota Yogyakarta, Indonesia
* Correspondence Author: diesty.anita@uii.ac.id

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ABSTRACT

BPJS Kesehatan noted that cancer financing claims reached IDR 3.5 trillion, ranking second after heart disease. This study aimed to determine the difference in direct medical costs with Indonesian-Case Base Groups (INA-CBGs) claims of outpatient breast cancer in Class A and B hospitals. The population is National Health Insurance (JKN) patients with outpatient breast cancer with the code INA-CBGs C-3-13-0. Data was collected retrospectively by tracing medical records, pharmaceuticals, and direct medical cost data for outpatient cancer patients in Class A and B hospitals for 2021. Direct medical costs are the actual costs of a patient's health care during a single visit to the hospital based on the hospital's perspective. Using the Mann-Whitney test, statistical analysis was performed to see how INA-CBGs claims differ from direct medical costs. The study result showed that the average direct medical cost of outpatient breast cancer patients in the group of recipients of contribution assistance (PBI) in Class A hospitals was IDR 3,397,073, non-PBI patients were IDR 3,439,253, and in Class B hospitals were IDR 2,619,355.26 with the direct medical cost component that contributed the most was drug bills. The direct medical costs of the hospital are more significant than the claims of INA-CBGs, resulting in a negative difference with the details of PBI patients in class A hospitals of minus IDR 88,041,600, non-PBI patients of minus IDR 91,386,300, and patients in Class B hospitals of minus IDR 160,419,079. There is a significant difference between the total claims of INA-CBG and direct medical costs for outpatient breast cancer patients in Class A and B hospitals (p=0.0001).

Keywords: cost analysis, Indonesian-Case Base Groups (INA-CBG), jaminan kesehatan nasional, cancer, hospital

Introduction

Cancer is one of the catastrophic diseases that is the second leading cause of death globally. Breast cancer is a type of catastrophic disease, namely a disease with high cost, *high volume*, and *high risk*, which causes a considerable cost of treatment.[1] The three highest types of cancer in Indonesia in a row are breast, cervical, and lung cancer.[2] Breast cancer accounted for the most significant contribution of cancer incidence globally in 2020, with an estimated 11.7% of all cancer cases worldwide. The highest incidence of breast cancer is found in the Australia/New Zealand region, Western Europe, and North America.[3] Data sourced from Globalcan 2020 shows that the most significant cancer case in Indonesia is breast cancer, with an incidence of 65,858 cases.[4] In the Special Region of Yogyakarta, breast cancer cases are the highest, with 1,194 new cases.[5] Based on BPJS data, cancer is ranked as the second most expensive disease, with a total of IDR 3.5 trillion or around 18% of the costs incurred for JKN-KIS patients.[6] Cancer care costs continue to rise and are expected to reach more than $240 billion by 2030.[7,8]

In order to meet basic health needs, the government provides health service guarantees by holding JKN managed and organized by BPJS Kesehatan.[9] At the hospital level, the JKN team has developed the concept of INA-CBG as a payment system for health services, which is a payment method perspective.[10] Later, the hospital (RS) will receive payment based on the INA-CBGs rate, the average cost spent by the diagnosis groups.[11] In 2020, BPJS Kesehatan paid as many as 19.9 million catastrophic cases, amounting to IDR 20.0 trillion or 25% of the total cost of health service claims that year.[12] Participants in this health insurance consist of PBI (Recipient of Contribution Assistance) health insurance and non-PBI health insurance. PBI membership is the poor and underprivileged people as beneficiaries (participants) of the health insurance program.[13]

According to research conducted by Satibi[14] on the Indonesia National Health Insurance with the INA-CBGs rate that has been implemented, there is still a difference between the actual cost of health and the INA-CBGs rate.[14] In 2018, Putri[15] conducted additional research on the amount of direct medical costs and the difference in actual costs with INA-CBGs rates in patients with outpatient breast cancer at Dr Sardjito Hospital. The results of the study show that there is still a negative difference between the actual cost and the INA-CBGs tariff, which is IDR 8,061,296.[15] Research on the *Cost of Illness* in Breast Cancer patients at Prof. Dr. R.D Kandou Manado Hospital obtained the difference between the INA-CBGs tariff and the total real cost, which is minus IDR 668,973,281 with a total of 183 patients.[16] The comparison between the real cost and the cost of INA-CBG was obtained as a negative difference; this illustrates that the hospital suffered a loss because the hospital had to bear the cost difference. After all, the service package tariff still did not follow the unit cost.[17,18] This study can provide an overview of the real cost or direct medical costs of breast cancer in two hospitals, namely type A hospital which is the last referral, and type B hospital which is the first referral for PBI and non-PBI members of JKN.

This has not been done in previous studies. The results of the cost analysis at the two hospitals will be compared with the INACBG tariff so that it can be known whether the tariff is suitable for the actual real cost at the two hospitals. This study wanted to examine the difference in INA-CBG package rates and direct medical costs of JKN PBI and non-PBI participants in outpatient breast cancer patients in class A hospitals and class B hospitals.

Methods

This study was observational analytical research using the cross-sectional method according to the perspective or viewpoint of the hospital by observing patient cost data obtained from medical record numbers. Data was collected retrospectively, using secondary data from patient medical records, drug data from hospital pharmacy installations, and data on direct medical costs of outpatient cancer patients at Class A and B hospitals during 2021. Direct medical costs were the real (actual) cost of a patient's health care during a single outpatient visit based on the hospital's perspective. The population in this study was breast cancer patients who underwent outpatient treatment in 2021 and registered to undergo treatment with the National Health Insurance (JKN) with the code C-3-13-0 at Class A and Class B hospitals.[19]

The minimum sample size was obtained based on the Slovin calculation formula with an error rate of 10%,[20] The result was 200 breast cancer patients in class A and B hospitals.

Sample calculation of Class A Hospital

$$n = \frac{N}{1+Ne^2}$$

$$= \frac{65858}{1+(65858x(0,1)^2)}$$

$$= 99.85$$

Sample calculation of Class B Hospital

$$n = \frac{N}{1+Ne^2}$$

$$= \frac{72430}{1+(72430x(0,1)^2)}$$

$$= 99.86$$

Information:
n = minimum number of samples
N = population
e = error margin

The sample was over increased by 15% to prevent a shortage of samples due to exclusion. The researcher conducted accidental sampling and selected subjects based on inclusion and exclusion criteria. Inclusion requirements: (1) JKN patients who were diagnosed with breast cancer in the outpatient of Class A and B Yogyakarta Hospitals from January to December 2021; (2) patients with outpatient cancer diagnosis with the code INA-CBG C-3-13-0, (3) complete details of direct medical costs (4) financing have been claimed to BPJS Kesehatan. Exclusion conditions: (1) patients who do not have data on the cost of chemotherapy drugs or non-chemotherapy during the

visit, (2) patients who are upgraded to VIP class. Data collection was carried out using observation techniques and quantitative data in 2021. The quantitative data was derived from secondary data obtained from the patient's medical records in age, gender, date of treatment visit, primary diagnosis, and INA-CBG code. Then, from the data, medical costs can be traced in the financial department, and then to find out the suitability of the therapeutic picture with the National Formulary, a search of the use of drugs in pharmaceutical installations of Class A and B Yogyakarta Hospitals is carried out.

Data analysis is carried out by:

(1) Calculating the direct medical cost component: all costs used are calculated, then the average of each direct medical cost component is calculated along with the percentage,

(2) *Mann whitney test* was used to test hypotheses and draw conclusions about the difference between real costs and INA-CBGs claims. If the value of $p > 0.05$, Ho is accepted, but if the value of $p < 0.05$, Ho is rejected. The Faculty of Medicine UGM ethics committee has approved this study with the number KE/FK/0539/EC/2021.

Results

The variable studied was the difference in INA-CBG claims for real costs for outpatient JKN PBI and Non-PBI JKN patients in Class A and B hospitals in 2021 with INACBG's code C-3-13-0. The data collected at Class A Hospitals starts with the medical record number, age, gender, address, entry and exit dates, payment method, and INA-CBG code. Then, the medical record number data is used to take medical expense data from the accounting department. Next, data on drugs used by patients will be collected, which will be carried out in the Pharmaceutical Installation section. The data collected at Class B hospitals includes medical record records, data on drugs in pharmaceutical installations, and costs in the guarantee or financial department of the hospital. The number of samples in Class A hospitals in this study was 115, and in Class B hospitals, 121 samples; from the samples in Class A hospitals, 12 samples were excluded because there was no drug cost data; in Class B hospitals, 11 patients were excluded because medical records, drug data, and cost data were incomplete so that the total sample studied was 213 patients with details of Class A hospitals as many as 103 patients and Class B hospitals 110 patients.

The research is based on the hospital's perspective on the direct medical costs of outpatient breast cancer patients in class A hospitals. Patients in class A hospitals are differentiated based on the membership type, namely Contribution Assistance Recipients (PBI) and non-PBI. Meanwhile, in Class B hospitals, this study's direct medical cost component consists of non-surgical procedure costs, surgical procedures, consultation service costs, nursing service costs, support, laboratories, drugs, chemotherapy drugs, and medical consumables. In Class B hospitals, patients cannot be differentiated based on JKN membership (PBI or non-PBI) because data is unavailable.

Table 1. Components of Direct Medical Costs for JKN Patients Receiving Contribution Assistance (PBI) at Class A Hospitals

Components of Direct Medical Costs	Total (IDR)	Mean ± SD (IDR)	Percentage (%)
Medicine	108,201,100	2,164,022 ± 2,385,007.1	62.99
Non-Surgical Procedures	43,350,000	867,000 ± 517,915.8	25.23
Consultation	8,527,000	170,540 ± 42,627.6	4.96
Support	336,000	12,000 ± 0.0	0.20
Radiology	3,946,500	116,074 ± 257,693.8	2.30
Laboratory	5,008,000	156,500 ± 72,698.2	2.92
Medical consumables	2,418,000	48,360 ± 16,616.6	1.41
Total Cost		171,786,600	
Mean ± SD		3,435,732 ± 2,413,810.0	
Number of Patients		50	

Information: SD (Standard Deviation)

Table 2. Components of Direct Medical Costs for JKN Patients Non-Recipient of Contribution Assistance (Non-PBI)

Components of Direct Medical Costs	Total (IDR)	Mean ± SD (IDR)	Percentage (%)
Medicine	124,716,000	2,353,132 ± 2727224.7	69.23
Non-Surgical Procedures	38,036,000	731,462 ± 548264.1	21.11
Consultation	8,865,000	167,264 ± 51010.6	4.92
Support	168,000	12,000 ± 0.0	0.09
Radiologi	1,757,000	60,586 ± 22004.9	0.98
Laboratory	4,069,000	176,913 ± 79743.9	2.26
Medical consumables	2,545,000	48,019 ± 17827.7	1.41
Total Cost		180,156,000	
Mean ± SD		3,399,170 ± 2609202.5	
Number of Patients		53	

Information: SD (Standard Deviation)

Table 3. Components of Direct Medical Costs for Outpatient JKN Breast Cancer Patients in Class B Hospitals in 2021

Cost Components	Total Cost (IDR)	Mean ± SD (IDR)	Percentage (%)
Non-Surgical Procedures	54,543,000.00	495,845.45 ± 211470.66	18.93
Consultation	2,381,400.00	21,649.09 ± 15673.78	0.83
Nursing	5,289,000.00	48,081.82 ± 22821.66	1.84
Support	12,679,500.00	115,268.18 ± 226416.30	4.40
Laboratory	3,218,000.00	29,254.55 ± 41058.57	1.12
Medicine	15,780,826.00	143,462.05 ± 288054.06	5.48
Chemotherapy Drugs	189,320,795.00	1,721,098.14 ± 648420.83	65.71
Medical consumables	4,916,558.00	44,695.98 ± 9465.91	1.71%
Total	288,129,079.00	2,619,355.26 ± 556609.84	100.00%

Information: SD (Standard Deviation)

The results of the study referring to tables 1 and 2 obtained the total direct medical costs of breast cancer patients at Class A hospitals participating in JKN Contribution Assistance Recipients (PBI) of IDR 171,786,600, with an average cost of IDR 3,435,732. Meanwhile, for JKN breast cancer patients, non-recipients of contribution assistance (non-PBI) amounted to IDR 180,156,000, with an average cost of IDR 3,399,170. The direct medical costs of Class B hospitals referred to in Table 3 are the total cost incurred of IDR 288,129,079.00 for 110 patients, with an average value of direct medical costs of IDR 2,619,355.26.

The purpose of the study is to find out the difference between INA-CBG claims and real costs in outpatient breast cancer patients who participate in the JKN program, both PBI and non-PBI. Real costs are direct medical costs for outpatient breast cancer patients who follow the JKN program from the hospital's perspective. Using the Mann-Whitney method, we investigated whether there is a significant difference between INA-CBGs and real cost claims; the Mann-Whitney method can be used because the data are generally not distracted ($p<0.05$). Tables 4 and 5 show the cost difference by subtracting the total claims of INA-CBGs from the total real costs at class A and B hospitals.

Table 4 Difference between INA-CBG Claims and Real Costs of Outpatient Breast Cancer Patients at Class A Hospitals

Membership	Number of Patients	INA-CBGs (IDR) Total Claims (a)	Total Real Cost (IDR) (b)	Difference (IDR) (a-b)
PBI	50	83,745,000	171,786,600	-88,041,600
Non-PBI	53	88,769,700	180,156,000	-91,386,300
Total	103			

Information: Patients Receiving Contribution Assistance (PBI); Patients Non-Recipient of Contribution Assistance (Non-PBI)

Table 5. Difference between INA-CBG Claims and Real Costs of Outpatient Breast Cancer Patients in Class B Hospitals

INA-CBG's Code	Number of Patients	INA-CBGs (IDR) Total Claims (a)	Real Cost (IDR) (b)	Difference (IDR) (a-b)
C-3-13-0	110	127,710,000.00	288,129,079.00	-160,419,079

Information: a = INA-CBGs Claim; b = Real Costs;

Table 6. Comparison of Real Cost Claims for PBI and Non-PBI Outpatient Breast Cancer Patients in Class A Hospitals

Membership	Number of Patients	Average INA-CBGs Claim (IDR)	Average Real Cost (IDR)	SD	Sig (p)
PBI	50	1,674,900	3,397,073	2,591,051.3	0.0001
Non-PBI	53	1,674,900	3,439,253	2,782,314.5	0.0001
Total	103				

Information: Patients Receiving Contribution Assistance (PBI); Patients Non-Recipient of Contribution Assistance (Non-PBI); SD (Standard Deviation)

Table 7. Difference between INA-CBG's Claims and Real Costs of Outpatient Breast Cancer Patients in Class B Hospitals

INA-CBG's Code	Number of Patients	Average INA-CBGs Claim (IDR)	Average Real Cost (IDR)	Sig (p)
C-3-13-0	110	1,161,000.00	2,619,355.26	<0.001

Information: a = INA-CBGs Claim; b = Real Costs;

Table 4 shows the study results that Class A hospitals have a negative difference between the total claims of INA-CBGs and the real costs, meaning that there are total real costs or direct medical costs than the total claims of INA-CBGs. Fifty PBI patients had a difference in cost compared to the INA-CBGs claim of IDR 88,041,600, while 53 non-PBI patients had a difference of IDR 91,386,300. Table 5 shows that Class B hospitals have a negative difference between INA-CBG claims and real costs of IDR 160,419,079.00 for 110 patients with PBI and non-PBI. Both class A and class B hospitals with PBI and non-PBI patients have higher real costs than INA-CBG.

There was a significant difference between INA-CBG claims and real costs in JKN PBI patients and non-PBI patients, according to the statistical analysis results in Tables 6 and 7 using the Mann-Whitney test. The results showed that the $p<0.05$ value, which means that Ho was rejected and Ha was accepted, meant that there was a statistically significant difference between the average direct medical costs and INA-CBG claims per outpatient cancer patient in both class A and class B hospitals.

Discussion

The objective of this study was to demonstrate the discrepancy between INA-CBG claims and direct medical costs for patients with breast cancer in government-owned class A and B hospitals in the province of DI Yogyakarta. Direct medical costs are the real cost of treatment for outpatient breast cancer patients of JKN participants. The INA-CBG tariff is a tariff determined by the Ministry of Health with a prospective financing system according to the rules of health service tariffs in the implementation of JKN in 2016.[21] INA-CBG rates are derived from the average cost for a detailed diagnosis classified based on region, hospital ownership (private or government), and hospital class. In the case of financing outpatient cancer patients, in addition to using the INA-CBGs tariff, BPJS Kesehatan also added a claim for the cost of chemotherapy drugs as an additional rate for drugs.[22]

This study compared direct medical costs with INA-CBG claims using Mann-Whitney statistical analysis. There was a significant difference between the average direct medical costs and INA-CBG claims in class A and B hospitals, with $p < 0.0001$ and $p < 0.001$, respectively. Research at the Dharmais Cancer Specialty Hospital for inpatient breast cancer showed that there was a difference between the INA-CBG rate and the real cost; the highest cost was found in the cost of breast cancer patients' drugs [23]. For PBI and non-PBI samples in class A hospitals, a significance value of $p<0.0001$ was obtained, meaning that Ho was rejected while Ha was acceptable. It can be concluded that there is a significant difference between the real cost (direct medical) and the INA-CBGs rate for JKN PBI and non-PBI patients. Research conducted at the Dharmais Cancer Center Hospital stated that the real cost of the hospital and the INA-CBGs rates for lung, breast, and

cervical cancer found statistical differences in calculating the cost difference.[23] A study conducted at the Sultan Agung Islamic Hospital in Semarang in 2017 showed a significant difference between the INA-CBGs tariff and the real cost ($p<0.05$), where the results showed that the real cost was more significant than the INA-CBG tariff of IDR 187,228,700. This study shows that the INA-CBG rates received by hospitals have not been able to meet the needs of treatment costs for breast cancer patients. [24]

Other studies show that the cost of INA-CBG is lower than the real cost.[24] In line with the results of a previous study conducted by Putri in 2018,[15] about the analysis of the difference between real costs and INA-CBG rates at Dr Sardjito Hospital Yogyakarta, with the research subjects of all outpatient breast cancer patients of the National Health Insurance (JKN) with radiotherapy in 2017. The results of the study show that there is a difference in real costs with the INA-CBG tariff of minus IDR 8,061,296.[15] In addition, a 2019 study at type A hospitals in Manado found a difference between the INA-CBGs tariff and the total real cost of IDR. 668,973,281, where the real cost was much more prominent. [16] It is no different from the results of this study, which shows that the average claim for INA-CBGs is IDR 1,161,000 in class B hospitals and IDR 1,674,900 in class A hospitals. There is no difference in the average claims of PBI and non-PBI participants in class A hospitals. However, there is a difference in the average amount of real drug costs for treatment in class B and A hospitals of IDR 2,619,355 and IDR 3,397,073, respectively. The difference between class B and A hospitals is evident from the average amount of real drug costs, which shows the need to adjust the INA-CBG tariff because every year, there will be an increase in the real cost of treatment due to the increase in drug prices. The difference between INA-CBG claims and the real cost of treatment can be caused by a change in the treatment administration that is not followed by a change in the INA-CBG rate. The management of breast cancer can be achieved through a range of measures, including hormonal therapy, surgical intervention, radiation therapy, and chemotherapy. Chemotherapy is the most frequently used procedure in patients with breast cancer. The use of chemotherapy drugs can be the primary therapy in the condition of cancer cells that have spread and cannot be operated on; the use of high chemotherapy drugs causes the cost of chemotherapy drugs to be used to be high.[25]

The number of treatment procedures also increases the length of stay and cost. To enhance the effectiveness of health services and streamline treatment procedures, modifications to clinical pathways are necessary, clinical pathways should be modified, and clinical pathways need to be followed as guidelines in therapy. A clinical pathway is a detailed and structured treatment plan that consists of essential steps in caring for patients with specific clinical problems. [26] The role of clinical pathways is critical in improving the efficiency of resource utilization and treatment, and ultimately, it affects the real cost of hospitals.[14] Clinical Pathway (CP) has long been recognized as an essential tool for achieving effectiveness and efficiency in hospital services. In Lin's 2021 study,

it was found that the implementation of CP led to a reduction in Length of Hospitalization (LOS) and hospital costs. In addition, applying CP can reduce the incidence of complications in hospitals, improve documentation, and reduce resignation, mortality, LOS, and hospital costs. [26,27] Factors that affect real costs are class of care and LOS ($p< 0.001$).[24] The difference in costs between the real cost and the INA-CBGs rate can be caused by the type of medication used, complications, physiotherapy measures, and comorbidities that cause some of the cost components not covered in the INA-CBGs rate.[28] The length of stay also causes a significant difference in the amount of negative claim difference between the real cost and the INA-CBGs rate.[29] The results of previous studies prove that the accuracy of the diagnosis code also significantly impacts the accuracy of INA-CBG claims.[30]

In this study, the highest direct medical cost component of JKN outpatient breast cancer patients, both PBI and non-PBI membership types in class A hospitals, is drugs, which are 62.99% and 69.23% of the total direct medical costs of outpatient breast cancer patients, respectively. That difference shows that the cost of drugs, both type and amount, dramatically affects the cost of treatment for outpatient cancer patients. In class A hospitals, the drug components in question are chemotherapy and non-chemotherapy drugs. Therefore, providing the right therapy not only improves the patient's quality of life but also saves the cost of outpatient breast cancer. After the drug component, non-surgical procedures as a procedure in the administration of chemotherapy occupy the second highest portion in the direct medical costs of outpatient breast cancer patients. Like in class B hospitals, the first highest component is chemotherapy drugs at 65.71%, followed by non-surgical procedures at 18.93%. The observation shows that in the two classes of hospitals, there is no difference in outpatient breast cancer treatment procedures compared to the direct medical cost component. The cost of chemotherapy drugs is a relatively high percentage of cost components because chemotherapy drugs are expensive.[1] Based on previous research by Kuderer [31] patients in this condition require optimal treatment during chemotherapy and post-chemotherapy; therefore, the cost of treatment, including non-chemotherapy expenses, will be increased.[31] The size of the drug cost component is in line with research conducted at a class A hospital, namely Dr Wahidin Sudirohusodo Hospital, Makassar, South Sulawesi, where the use of drugs takes a portion of 80-90% of the total components of direct medical costs.[32] Similar to the results of research conducted at the government's class B hospital, Ulin Banjarmasin Hospital, in 2018 and 2020, which stated that chemotherapy drugs had the highest allocation for the treatment of breast cancer patients, by 64.3% in 2018 and 48.14% in 2020.[1,33] Research at Dharmais Cancer Hospital, the highest cost was found in the cost of breast cancer patients' drugs. [23] This aligns with Ibarrondo's study in Spain in 2022, which states that chemotherapy costs significantly more than other costs. [34] Another study states that outpatient costs for breast cancer have a range of IDR 1,538,750 – IDR 4,202,935, with the most significant percentage of costs found in drugs, which is 63.57%.[35]

In addition, this study aims to identify the difference between direct medical costs and INA-CBG's JKN outpatient breast cancer claims with the type of Contribution Assistance Recipient (PBI) and non-PBI membership, especially in class A hospitals. PBI membership comprises the poor and underprivileged as national health insurance program participants.[13] In class A hospitals with 50 PBI participants, direct medical costs are more significant than INA-CBGs claims with a negative difference of IDR 88,041,600, while in non-PBI participants with a total of 53 patients have a negative difference of IDR 91,386,300. The negative difference between direct medical costs and INA-CBG's claims shows that the real costs of direct medical care are greater than those of INA-CBG's. The hospital bears a negative cost difference because the INA-CBG tariff is prospective. The prospective payment method is a rate set before health services are provided to patients and will not change depending on the type or number of services provided.[36] According to the results of the evaluation of JKN policies in 13 provinces in Indonesia, non-PBI participants benefit from more services than PBI participants. This difference is due to the varying readiness levels of healthcare facilities. There is almost double variation for non-communicable diseases between the provinces with the lowest and highest public service readiness. Meanwhile, there is a gap between segments of JKN participants. Non-wage earners (PBPU) and Non-Workers (BP) benefit more from the PBI segment of the State Budget. It was recorded that the most prominent deficit came from the PBPU segment, reaching 20.9 trillion rupiah in 2019 in the payment of health service claims during the JKN program.[37]

The average real or direct medical cost per patient of class A hospitals is greater than that of class B and INA-CBG claims. This difference in costs demonstrates that the class of hospitals significantly influences the expenses incurred to treat outpatient cancer patients. Class A hospitals are the last referral hospitals for BPJS Kesehatan participants. In 2018, the results of a study at a class A hospital (Dr Sardjito Central General Hospital) on the amount of direct medical costs and the difference between real costs and INA-CBGs rates for breast cancer patients in outpatient services in the 2017 period showed that the real costs of hospitals had a more significant difference of IDR 8,061,296 from the INA-CBGs rates so that there was a negative difference.[15] In addition to class A hospitals, class B houses also have a difference between real costs and INA-CBGs rates. In this study, 110 patients in Class B hospitals showed a negative difference between the INA-CBGs rate and the real cost of IDR 164,113,635.00, which shows that the INA-CBGs rate is lower than the real cost of the hospital. These results follow Riyanto's research,[38] which concluded that *breast cancer patients* in Class B Private Hospitals have a negative difference.[38] Another study by Santoso in 2020 also showed a negative difference in breast cancer patients; the total difference from the study was minus IDR 187,228,700.[24] With this negative difference, the hospital has to bear the burden of the shortfall cost by paying the remaining shortfall in claims. [28]found that unit costs calculated using activity-based costs were lower than real and INA-CBG rates.[39] Compared to

established payment systems such as diagnostic-related groups (DRGs), lower actual hospital costs were found in research on breast cancer treatment in Germany.[40] Therefore, it is necessary to evaluate the INA-CBG tariff to accommodate the actual healthcare expenditure. On the other hand, hospitals need to evaluate the quality of patient care services by optimizing the budget allocated by health insurance.[14] If this is not done, the hospital will have a continuous deficit and the clinical pathway will not run optimally. If proper treatment is not given, the quality of patient health will suffer.

Compared to the INA-CBG rate, the real cost is due to the extensive use of chemotherapy drugs. Drug costs caused by chemotherapy drugs are the real cost component in class A and B hospitals, with the most significant contribution resulting in negative differences. A significant difference exists between the INA-CBG's rate and the real cost, according to a study conducted by Aisyah et al. in 2019 at a class B hospital.[41] Thus, it can be said that in the JKN program, class A and B hospitals suffer losses that can be seen from the difference between INA-CBG's claims and the real cost of outpatient *breast cancer* patients with chemotherapy treatment. A 2014 study of the cost of breast, cervical, and nasopharyngeal cancer cases at Sanglah Hospital showed a significant difference in non-chemotherapy expenditure based on real cost and INA-CBG rates, where the cost was lower for real costs. Factors significantly related to the real cost are the number of procedures, the type of inpatient room, and the length of stay.[14]

Many countries have introduced some form of case-based payment in their hospital financing systems to control costs and drive efficiency, such as Kazakhstan, Kyrgyzstan, Thailand and Turkey.[42–44] In Sweden, the comparison of local government areas (districts) that use DRG-based remuneration with those that do not suggest cost savings is about 10%.[45] The average length of hospital stay in the US is reported to be below DRG compared to other remuneration methods. However, capitation-based remuneration and DRG require the ability to accurately measure costs before implementation and monitor their impact over time.[46] The cost efficiency incurred by the government is offset by the implementation of customizable DRG's programs, but DRG's programs are only used for Medicare payments in the US financing system.[47]

The limitation of the study is that it is not possible to compare costs based on the type of PBI and non-PBI membership in both class A and B hospitals. Therefore, this research cannot analyze the difference in the actual cost of PBI and non-PBI members in both hospitals. This is because type B hospitals did not list the membership of PBI and non-PBI participants in the data sources used by the researchers.

Conclusion

There was a significant difference in INA-CBG's package claims and real costs ($p<0.05$) in outpatient *breast cancer patients* in class A and B hospitals in 2021, with a difference in adverse

claims in both PBI and non-PBI type membership. The difference between INA-CBG's claims and direct medical costs at class A hospitals in patients with PBI membership is a difference of minus IDR 88,041,600.00, while in non-PBI patients, there is a difference of minus IDR 91,386,300.00 and in class B hospitals the difference is minus IDR 160,419,079 with *the highest direct medical cost's* component, namely drug costs. In the case of outpatient cancer, the hospital can suffer losses because it has to bear the difference in costs due to the direct medical cost overrun compared to INA-CBG claims. The factor that affects this difference is the use of chemotherapy in *breast cancer patients* in outpatient services, which requires high costs. From the government's perspective, it is necessary to increase the INA-CBGs tariff, especially for breast cancer diagnosis, where the last tariff provision was in 2016. In terms of hospitals, it is necessary to evaluate chemotherapy treatment for breast cancer by implementing clinical pathways in hospitals so that the cost does not exceed INACBG claims.

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Conflict of Interest

No conflict of interest.

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