

# Cost recovery rate analysis of inpatient services with national health insurance at cardiology poly in Hospital X

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## Abstract

This study aims to analyze the cost recovery rate based on the type of case and service characteristics of inpatient national health insurance patients in cardiology poly and to find out the strategies used by the hospital if there is a financial loss. This research is quantitative descriptive research with a case study approach. Quantitative methods were used to compare hospital costs with the Indonesian case-based group tariff. This research data is in the form of primary data and secondary data. The object of research is the cost recovery rate of inpatients with national health insurance for cardiology poly in the period January-December 2023. This study obtained the results (1) overall for 19 types of cases, the cost recovery rate was 95%. (2) Based on patient service characteristics, the cost recovery rate of severity has an average value of 99%, the class of care has an average value of 96%, and the length of stay level has an average of 95%. (3) Hospital X's strategy is to increase the number of high social security organizing agency claims, evaluate hospital tariff components, and implement clinical pathways. The results of this study are expected to be input, consideration, and evaluation in controlling the cost of hospital services, so that there are not many losses. The limitation in this study is that the research was only conducted at the cardiology poly, so the sample studied was still small.

Keywords: Cost Recovery Rate, Cardiology Poly, National Health Insurance, Indonesian Case Based Groups

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## INTRODUCTION

Access to quality health services is a basic right of every individual in the Republic of Indonesia. This is regulated in the Law of the Republic of Indonesia Number 36 of 2009 concerning Health, which explains that everyone has the same rights in gaining access to resources in the health sector and obtaining affordable, safe, and quality health services. Many countries implement national health insurance programs to ensure that all citizens have access to necessary health services. The Indonesian government enacted Law No. 24/2011 on the Social Security Organizing Agency as the organizer of the National Health Insurance program. The national health insurance program has an important role in facilitating patient access to healthcare services.

The social security administration has developed a healthcare payment system for hospitals, where payment is made through packages of services categorized by diagnosis and procedure, known as Indonesian Case Based Groups (INA-CBGs) (Ministry of Health of the Republic of Indonesia, 2016). Kasie et al., (2023) mentioned that many government hospitals and private hospitals complained about the use of the INA-CBGs system. The financing system in the national health insurance through the health social security organizing agency is considered unable to cover the health costs incurred by hospitals.

Cost recovery rate (CRR) is an efficiency measurement tool that aims to determine the extent to which hospital revenue is able to cover the costs incurred (Yusuf et al., 2022). Through the cost recovery rate, it can be seen whether the INA-CBG's tariff can cover the costs incurred by the hospital in serving national health insurance patients. Research by Arfiani et al., (2020) shows that the accumulated cost recovery rate is only 60%, which means that the INA-CBGs tariff is only able to cover 60% of the costs incurred by the hospital. This study also found differences in claims and INA

DRGs / CBGs between patient age, gender, days of treatment and severity. Research conducted by Kasie et al., (2023) showed that there was no significant difference in the value of the cost recovery rate for the inpatient class. While there is a significant difference in the value of the cost recovery rate based on patient age, length of stay, disease severity, and type of disease.

Based on preliminary studies, it is known that 60% of Hospital X's revenue is obtained from the income of patients participating in the Social Security Organizing Agency. In addition, since 2021, Hospital X has changed its status to a type B hospital. This change in the status of Hospital X will have an impact on changes in health service tariff standards in the implementation of the JKN program, which originally used tariff standards for type C private hospitals to type B private hospitals. Several clinics at Hospital X have very high patient care costs, one of which is the Cardiology clinic. Based on the Indonesian Health Survey 2023 from the Ministry of Health, the prevalence of heart disease in Indonesia reached 0.85%. Based on the province, Yogyakarta ranks first with the highest prevalence, which is 1.67%.

Referring to the Regulation of the Minister of Health of the Republic of Indonesia Number 76 of 2016 concerning Indonesian Case Base Groups Guidelines, Cardiology service cases in this study are classified as Case-Mix Main Groups (CMGs) code I. The study period was limited to national health insurance patients hospitalized in Cardiology Poly in 2023. Researchers analyzed cost recovery rate based on service characteristics based on class type, severity, and length of stay. Departing from the above phenomenon, the author is interested in conducting research on analyzing the cost recovery rate at Hospital X in serving national health insurance patients for inpatient services with cardiology services. This study aims to analyze the cost recovery rate based on the type of case and service characteristics of national health insurance patients inpatient Cardiology Poly at Hospital X, as well as knowing the policies and strategies used by the hospital if there is a financial loss in providing services to national health insurance patients inpatient Cardiology Poly.

## **LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

### **Social Security Organization Agency for Health**

Based on Law of the Republic of Indonesia Number 24 of 2011 concerning the Social Security Organizing Agency, the Social Security Organizing Agency, hereinafter abbreviated as BPJS, is a legal entity established to administer social security programs. Presidential Regulation of the Republic of Indonesia Number 82 of 2018 concerning Health Insurance, explains that Health Insurance is a guarantee in the form of health protection so that Participants obtain health maintenance benefits and protection in meeting basic health needs provided to everyone who has paid Health Insurance Contributions or whose Health Insurance Contributions are paid by the Central Government or Regional Government.

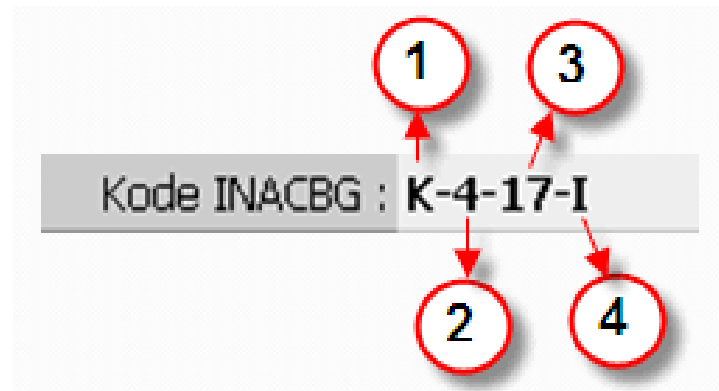
### **National Health Insurances**

Based on the Presidential Regulation of the Republic of Indonesia Number 12 of 2013 concerning Health Insurance, Health Insurance is a guarantee in the form of health protection so that participants obtain health care benefits and protection in meeting basic health needs provided to everyone who has paid dues or whose dues are paid by the government.

### **Indonesian Case Base Groups (INA-CBG's)**

The Indonesian Case Base Groups (INA-CBG) Guidelines in the Implementation of National Health Insurance are a reference for advanced health facilities, the Health Social Security Organizing Agency, and other related parties regarding the INA-CBGs payment method in the implementation of Health Insurance (Kemenkes RI, 2016). According to the Regulation of the Minister of Health of the Republic of Indonesia Number 76 of 2016 concerning Guidelines for Indonesian Case Base Groups in the Implementation of National Health Insurance explains that, the basis for grouping in INA-CBGs uses a codification system of the final diagnosis and actions / procedures that become service outputs, with reference to ICD-10 for diagnosis and ICD-9 CM for actions / procedures. Grouping using an information technology system in the form of the INA-CBG Application resulted in 1,077

Groups/Case Groups consisting of 789 inpatient case groups, and 288 outpatient case groups. Each group is denoted by an alphabetic and numeric combination code, with the following example:



**Figure 1.** INA-CBG's Code Structure

Description: 1st digit (alphabetic) describes the CMG (Case mix Main Groups) code, 2nd digit (numeric) describes the case group type, 3rd digit (numeric) describes the case group specification, and 4th digit (roman) describes the case group severity.

#### **Service Characteristics**

This research examines service characteristics based on:

- Severity: the severity of the case is influenced by the presence of comorbidities or complications during the treatment period. Case severity in INA-CBG is divided into 4, namely: "0" - for outpatient, "I" - for mild, "II" - for moderate, and "III" - for severe (Ministry of Health, 2016).
- Class of care: Indonesia classifies patients into three classes, namely class 1 (executive), class 2 (standard) and class 3 (low-income patients). This classification determines the patient's room, while care and treatment remain the same (Rahayu et al., 2023).
- Length of Stay: is a determinant of medical costs, longer hospital stays tend to result in higher healthcare costs as patients consume more hospital resources (Rahayu et al., 2023).

#### **Cost Recovery rate (CRR)**

According to Kasie et al., (2023) the cost recovery rate is the percentage ratio between the total revenue earned by the hospital compared to the total costs that the hospital needs to incur for health care. The cost recovery rate is often used as an indicator of hospital financial performance. If the cost recovery rate is below 100%, it means that the service unit is operating at a deficit and is highly dependent on subsidies, and if the cost recovery rate level is above 100%, it means that the unit is profitable.

#### **Cardiology**

Cardiology as a branch of medical specialization is mainly concerned with the diagnosis and management of diseases that cover the heart and blood vessels (Tondas et al., 2019). The INA-CBG's case mix for the cardiology section in this study is Cardiovascular System Groups. Cardiovascular System Groups (Code: I) has 385 services.

#### **METHODS**

This research is quantitative descriptive research with a case study approach. Quantitative methods are used to calculate the cost recovery rate and compare the cost of claims that should be incurred by patients based on hospital rates with costs borne by the Social Security Provider Agency based on INA-CBGs rates on cardiology inpatient services in the period January-December 2023. The research was conducted at Hospital "X". The object of research was mentioned by initials at the request of the hospital and to maintain the privacy/confidentiality of the object under study. This research was then continued with conducting interviews to obtain information in the form of strategies carried out by

the hospital in connection with differences in hospital rates and INA-CBGs rates for inpatients with national health insurance in the cardiology poly.

The data that researchers take are primary data and secondary data. Primary data in this study came from interviews with the finance manager, tariff management accounting supervisor, and cost accounting supervisor. The interview data related to the policy of determining and controlling the costs of inpatient services for national health insurance by the hospital, as well as the revenue and profit/loss obtained by the hospital. Secondary data in this study were obtained from medical record data of Hospital X, namely in the form of financial reports, direct and indirect cost expenditure reports, data on the total costs of inpatients with national health insurance for cardiology services, as well as data on the recapitulation of revenue for inpatient services of national health insurance patients for cardiology services.

Data validity testing techniques in this study used triangulation. Purba et al., (2021) explain that triangulation in credibility testing is defined as checking that data from various sources in various ways and various times. Triangulation is grouped into three types: 1) source triangulation is done by checking data that has been collected from several sources. 2) Triangulation of techniques is done by checking data on the same source and with different techniques. 3) Time triangulation is related to the effectiveness of time.

The data analysis technique used in this research is descriptive quantitative. The stages of data analysis in this study are as follows:

- 1) Grouping the total revenue and total cost data for each type of case in the selected Case-Mix Main Groups, namely coded I.
- 2) Calculating the cost recovery rate for each type of case in the selected Case-Mix Main Groups with the formula:

$$\text{CRR} = \frac{\text{Total income}}{\text{Total expenditure}} \times 100\%$$

- 3) Analyze the results of the cost recovery rate calculation per case type based on Case-Mix Main Groups coded I.
- 4) Analyze the results of the cost recovery rate calculation per service characteristic based on Case-Mix Main Groups coded I.
- 5) Interview data related to the policy of determining and controlling the cost of national health insurance inpatient services by the hospital as well as the income and profit/loss obtained by the hospital were analyzed in three stages, namely, data reduction, data presentation and conclusion drawing.

## RESULT AND DISCUSSION

The data used in this study are data on inpatient cardiology INA-CBG's (code I) who use national health insurance in January-December 2023. Based on the data obtained, the amount of cost recovery rate in the cardiology poly can be described as follows:

**Table 1.** Characteristics and Number of Cardiology Inpatients with National Health Insurance at X Hospital in 2023

Patient characteristics	Number of patients	Average
Gender		
Male	923	-
Patient age		
<40	52	36
>40	871	65
Female	611	-
Patient age		
<40	26	36
>40	585	68
	1534	

Cardiology inpatients at X Hospital in 2023 were 1,534 with 923 males and 611 females. Researchers grouped age into two groups, namely groups <40 years and >40 years. Male patients aged <40 years were 52 with an average patient age of 36 years. The age group > 40 years was 871 with an average age of 65 years. Female patients aged <40 years were 26 with an average age of 36 years. The age group >40 years was 585 with an average age of 68 years.

### **Overall Cost Recovery Rate Analysis of National Health Insurance Patients Hospitalized Cardiology**

One of the hospital's revenues comes from the payment of the Health Social Security Organizing Agency for hospital claims. Calculating the cost recovery rate can determine the ability of the social security organizing body tariff received by the hospital to cover the patient's medical expenses incurred through hospital tariffs. If the cost recovery rate is greater than 100%, then the hospital will benefit from the payment of the health social security organizing body because the total hospital claim is smaller than the total tariff of the social security organizing body. Meanwhile, if the cost recovery rate value is less than 100%, the hospital will experience a loss because the total hospital claim cannot be covered by the tariff paid by the Social Security Organization Agency for Health. The following is the calculation of the overall cost recovery rate for 19 types of cardiology cases in Hospital X:

**Table 2.** Calculating of the Overall Cost Recovery Rate of National Health Insurance Inpatients at the Cardiology Poly in 2023

	Total	CRR
Hospital rate	Rp 24.084.205.389	95%
INA-CBGs rate	Rp 22.972.120.000	

Based on the data that has been processed, the cost recovery rate value for the entire Cardiology Poly inpatient service in 2023 is only 95%, meaning that there is a loss on the service because the total hospital costs cannot be covered by the INA-CBG's claim payment. This is because the total hospital tariff is much greater, namely Rp 24,084,205,389, than the amount paid by the Health social security organizing body to the hospital, which is Rp 22,972,120,000, resulting in a negative difference (loss) of Rp 1,112,085,389.

### **Cost Recovery Rate Analysis Based on the INA-CBG's Code of National Health Insurance Patients Hospitalized in Cardiology**

After knowing the overall cost recovery rate value, the researcher then further examines the cost recovery rate value of each type of case in the Cardiology Poly. This aims to find out which case type services are experiencing losses or vice versa. There are 19 types of cardiology cases in Hospital X during 2023, from this data, the cost recovery rate calculation is then carried out based on the specific INA-CBG's code in the case group or type of cardiology service case. The results of the cost recovery rate calculation and analysis of each of the 19 types of cardiology cases at Hospital X in 2023 can be seen in Table 3.

Based on the calculation table 3, of the 19 types of cases of national health insurance inpatients in Cardiology Poly, only 8 types of cases have a cost recovery rate of more than 100%. These services are venous blood vessel ligation and stripping valued at 231%, other circulatory system procedures 101%, percutaneous cardiovascular procedures 106%, thrombophlebitis of the veins 121%, congenital heart disease and heart valves 110%, conduction disorders & cardiac arrhythmias 135%, syncope & collapse 139%, and cardio myopathies 101%. Hospital X was able to cover the costs incurred to provide services to these 8 types of cases and make a profit from INA-CBG's claim payments.

The cost recovery rate of permanent cardiac pacemaker service type was 77%, cardiac catheterization 64%, acute myocardial infarction 98%, heart failure 84%, cardiac arrest, unknown 67%, peripheral vascular disease and others 61%, atherosclerosis 70%, hypertension 73%, angina percussion and chest pain 94%, malfunctions, reactions and complications of cardiovascular devices or procedures 80%, and other vascular system disorders 99%. Based on the results of the cost recovery

rate calculation for the 11 types of cases, it can be seen that the costs incurred by the hospital are not covered by payments based on INA-CBG's claims. This means that the 11 case type services caused losses to the hospital.

**Table 3.** Calculation of Cost Recovery Rate Based on Case Type of National Health Insurance Inpatients at Cardiology Poly in 2023

No.	INA-CBGs Code	Description of INA-CBGs Code	Total	INA-CBGs Rate	Hospital Rate	CRR
1	I-1-14-I	Permanent Cardiac Pacemaker Insertion	2	Rp 63.835.700	Rp 82.489.732	77%
2	I-1-15-I,II,III	Cardiac Catheterization	181	Rp 1.534.293.500	Rp 2.383.269.200	64%
3	I-1-17-I	VeinLigation and Stripping	1	Rp 19.082.800	Rp 8.273.300	231%
4	I-1-20-I,II,III	Other Circulatory System Procedures	198	Rp 3.948.693.800	Rp 3.891.632.315	101%
5	I-1-40-I,II,III	Percutaneous Cardiovascular Procedures	367	Rp 13.073.257.400	Rp 12.338.773.382	106%
6	I-4-10-I,II,III	Acute Myocardial Infarction	72	Rp 643.211.500	Rp 656.372.010	98%
7	I-4-12-I,II,III	Heart Failure	138	Rp 670.494.300	Rp 802.815.430	84%
8	I-4-13-I,II,III	Thrombophlebitis of the Venous Blood Vessels	7	Rp 45.640.000	Rp 37.568.600	121%
9	I-4-14-I,II,III	Cardiac Arrest, Unknown	118	Rp 659.920.000	Rp 990.952.258	67%
10	I-4-15-I,II,III	Peripheral Vascular Diseases and Others	154	Rp 915.885.100	Rp 1.501.354.700	61%
11	I-4-16-I,III	Atherosklerosis	4	Rp 15.108.400	Rp 21.718.800	70%
12	I-4-17-I,II,III	Hypertension	109	Rp 259.330.900	Rp 355.552.923	73%
13	I-4-18-I,II,III	Congenital Heart Disease and Heart Valves	18	Rp 126.221.500	Rp 115.168.538	110%
14	I-4-19-I,II,III	Conduction Disorders & Cardiac Arrhythmias	68	Rp 397.416.900	Rp 294.121.107	135%
15	I-4-20-I,II,III	Angina Pectoris and Chest Pain	69	Rp 403.353.100	Rp 429.978.695	94%
16	I-4-21-I	Syncope & Collapse	4	Rp 15.426.400	Rp 11.100.735	139%
17	I-4-22-II,III	Cardiomyopathi	2	Rp 10.918.900	Rp 10.773.400	101%
18	I-4-23-II	Malfunctions, Reactions and Complications of Cardiovascular Devices or Procedures	1	Rp 5.694.700	Rp 7.155.900	80%
19	I-4-24-I,II,III	Other Vascular System Disorders	21	Rp 131.486.900	Rp 133.169.964	99%

### Cost Recovery Rate Analysis Based on Service Characteristics of Inpatients National Health Insurance Patients Cardiology

Cost Recovery Rate can be calculated based on the characteristics of national health insurance patient services for inpatient cardiology. The severity level characteristic is one that affects the INA-CBG's claim rate according to the severity level. The class of care used by the patient can determine the level of facilities provided. Each class has different treatment facilities, such as room capacity, choice of

specialists and other additional services. Length of stay is the number of days the patient is hospitalized from admission to discharge.

The following is the calculation of the cost recovery rate value based on patient characteristics by comparing hospital rates with INA-CBG's:

**Tabel 4.** Calculation of Cost Recovery Rate Based on Service Characteristics in National Health Insurance Inpatients at Cardiology Poly in 2023

Characteristics	INA-CBGs rate	Hospital rate	Difference	Average difference	CRR
<b>Severity</b>					
I (n= 834)	Rp 9.069.724.700	Rp 11.239.509.851	-Rp 2.169.785.151	-Rp 2.601.661	81%
II (n=356)	Rp 6.158.235.100	Rp 5.979.430.899	Rp 178.804.201	Rp 502.259	103%
III (n=344)	Rp 7.744.160.200	Rp 6.865.264.639	Rp 878.895.561	Rp 2.554.929	113%
Average					99%
<b>Outpatient class</b>					
1 (n=377)	Rp 6.443.898.200	Rp 6.438.862.588	Rp 5.035.612	Rp 13.357	100%
2 (n=231)	Rp 3.466.091.900	Rp 3.689.598.343	-Rp 223.506.443	-Rp 967.560	94%
3 (n=926)	Rp 13.062.129.900	Rp 13.955.744.458	-Rp 893.614.558	-Rp 965.027	94%
Average					96%
<b>LOS</b>					
<5 (n=894)	Rp 13.013.333.300	Rp 13.232.739.480	-Rp 219.406.180	-Rp 245.421	98%
>5 (n=640)	Rp 9.958.786.700	Rp 10.851.465.909	-Rp 892.679.209	-Rp 1.394.811	92%
Average					95%

Based on the table above, it can be seen that the cost recovery rate value of each characteristic is different. Severity level I has a negative difference between the rates issued by the hospital and the INA-CBG's payment claim rates, so the cost recovery rate value is 81%. However, severity levels II and III obtained a positive difference, so that the resulting cost recovery rate value was >100%, meaning that the hospital was able to cover the costs incurred from INA-CBG's claims. In the characteristics of hospitalization class 1, the resulting cost recovery rate value is 100%, meaning that the hospital has not made a profit because the revenue earned is equal to the costs incurred (break-even), while in hospitalization classes 2 and 3 it produces a negative difference, so that the resulting cost recovery rate value is <100%. Similarly, the length of stay characteristic produces a negative difference between the hospital tariff and the INA-CBG's tariff, so that the resulting cost recovery rate value is <100%. This means that the length of hospitalization of national health insurance patients in the Cardiology Poly will cause losses for Hospital X.

### **Hospital Strategies for Quality and Cost Control of National Health Insurance Patient Services for Cardiology Poli Hospitalization**

If we look at the difference in the final claim results (see Table 2), the cost recovery rate for all types of national health insurance inpatient cases in Cardiology Poly is <100%. However, if accumulated based on all types of cases from all existing poly in Hospital X in 2023, the ability of the INA-CBGs tariff is able to cover all costs incurred by the hospital. This can be seen based on the total amount of social security organizing body claim revenue from national health insurance inpatients at Hospital X during 2023 of Rp. 93,096,300,500, while the costs incurred by Hospital X amounted to Rp. 88,674,206,667, thus the overall cost recovery rate of national health insurance inpatients at Hospital X in 2023 was 105%.

Case type services with positive claim differences are able to cover negative difference services, or called cross-subsidies. This is as stated by Mrs. S as the supervisor of costing and accounts payable of RS X:

“If we calculate each case individually, we will see services that are detrimental and profitable, but if globally the collective BPJS billing for a month for all types of services, we are still positive. Every month, we also provide reports to management for adverse diagnoses.”

Reports are given to management for follow-up so that adverse services can be minimized and evaluated. Apart from cross-subsidization between case types, the hospital also earns revenue from the difference in fees paid by patients to the hospital. For example, if an inpatient wants to move up a class, the difference in class increase will increase the hospital's income.

Along with the difference between hospital rates and INA-CBGs rates, management has carried out controls and strategies to control the financing of patients of the social security organizing body. Such as increasing the number of high social security organizing body claims, gradual tariff evaluation and the use of clinical pathways. Hospital X management has a strategy to increase the income of patients with social security organizations. This was conveyed by Ms. M as the finance manager:

“The strategy is to increase cases that have large BPJS claims. If in the past it was referred due to limited facilities, now we can handle it ourselves with the hope that the income will be higher than if it were still typed C. Special equipment used has its own top-up value or reimbursement from BPJS outside of hospitalization costs”.

There is special equipment that has its own claim, so it is different from the cost of services. Special equipment covered by the Social Security Organization Agency for Health is equipment used to assist patients in undergoing treatment. This special equipment usually has a much higher price. Therefore, Hospital X's strategy is to increase cases that have a higher value of social security organizing body claims, so that it will help in revenue from social security organizing body patients.

Hospital X is in the stage of revising tariffs. The tariff revision that has been carried out is only on the type of labour case. This was again conveyed by Mrs. M:

“Since changing to type B, the hospital has not revised the tariff. Tariff revisions are carried out in stages, but not simultaneously. So, we only see tariffs that have the potential to cause a lot of losses. So we revise the tariff according to the proposals of the units concerned and based on the costs in other hospitals or according to the market. Tariffs in labour cases have recently changed.”

Based on observations in the field, Hospital X has not yet implemented a clinical pathway. This was conveyed by Mrs. S:

“Currently the hospital has not implemented a clinical pathway, but we are currently in the process of preparing it by involving specialists and medical personnel at Hospital X.”

The absence of a clinical pathway makes Hospital X perform actions according to doctor's orders. Research by Fitria et al., (2021) revealed that the implementation of clinical pathways has proven effective in improving service quality and patient satisfaction. This can reduce the length of stay and actual hospital costs for caesarean section patients, so that it can show that the use of clinical pathways is more efficient.

Similar research was conducted by Paat et al., (2019) and Pradnyantara, (2023) which revealed that the application of clinical pathways addressed the certainty of the plan for patient management. The use of clinical pathways can improve efficiency and quality, control health service costs, and reduce complications and length of hospitalization. In addition, research by Dewi et al., (2019) revealed that the implementation of clinical pathways at Kolonade Hospital was proven effective in reducing variations in services for all inpatient classes.

## CONCLUSION

Based on the results of the research that has been done, it can be concluded that the overall cost recovery rate is 95%, which means that national health insurance inpatient services in 2023 at the cardiology poly are experiencing losses. Calculations based on INA-CBG's code, there are 11 INA-



CBG's codes whose results are <100%, and 8 INA-CBG's codes have results >100%. Based on the existing severity level, level I severity has a result of 81%, while level II severity has a result of 103% and level III of 113%. Based on the class of care, no one has obtained a value >100%. The cost recovery rate results based on Length of stay, patients treated for less than five days and more than five days both have results <100%. Hospital X's strategy in quality and cost control in national health insurance Cardiology Poly inpatient services is to increase the number of high social security organizing agency claims, evaluate hospital tariff components regularly, and implement clinical pathways. These strategies are implemented by Hospital X in order to overcome or minimize financial losses for inpatient services using the National Health Insurance. The author's suggestion is that future researchers should be able to conduct research on other polys, because this study has limitations, namely only focusing on the cost recovery rate value of national health insurance patients hospitalized in the cardiology poly.

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