Cost-to-Revenue Dynamics of Indonesia's National Health-Insurance (BPJS Kesehatan) Services: Evidence from a Government Hospital Case Study

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ABSTRAK

This study employs the cost-recovery rate (CRR) to evaluate the profitability of services delivered to National Health Insurance (BPJS Kesehatan) patients at the Regional General Hospital of Buleleng Regency. The hospital was selected for its comprehensive BPJS Kesehatan coverage, robust financial records, and logistical accessibility. Adopting a quantitative descriptive design, we juxtapose case-level revenues against corresponding costs to trace profitability patterns across key diagnoses. The analysis reveals positive CRR values—indicating financial surpluses—for stroke, acute diarrhoea, diabetes mellitus, and dengue haemorrhagic fever, yet shows a deficit for heart-failure management. These results provide an empirical basis for hospital administrators and policy-makers to refine reimbursement tariffs and optimise resource allocation in the treatment of BPJS Kesehatan patients.

Keywords: Hospital Profitability; BPJS Kesehatan; Cost Recovery Rate.

Dinamika Biaya-Pendapatan Layanan BPJS Kesehatan di Indonesia: Bukti dari Studi Kasus Rumah Sakit Pemerintah

ABSTRAK

Penelitian ini bertujuan untuk menganalisis profitabilitas rumah sakit pada penanganan pasien BPJS Kesehatan dengan menggunakan rasio cost recovery rate. Lokasi penelitian ini adalah Rumah Sakit Umum Daerah Kabupaten Buleleng. Pemilihan lokasi penelitian didasarkan pada ketersediaan dan akses data, serta status rumah sakit sebagai penyedia Jaminan Kesehatan Nasional. Teknik analisis data menggunakan analisis deskriptif kuantitatif untuk menganalisis pola perbedaan profitabilitas penanganan pasien rumah sakit dengan alat bantu statistik. Hasil penelitian menunjukkan bahwa Rumah Sakit Umum Daerah Kabupaten Buleleng menunjukkan profitabilitas yang baik dalam menangani penyakit stroke, diare akut, diabetes mellitus, dan demam berdarah dengue dengan rasio pendapatan yang lebih tinggi daripada biaya yang dikeluarkan. Namun, penanganan penyakit gagal jantung menunjukkan kerugian finansial. Hasil penelitian ini diharapkan dapat menjadi bahan evaluasi bagi rumah sakit maupun pemerintah mengenai kebijakan maupun strategi penanganan pasien BPJS Kesehatan.

Kata Kunci: *Profitabilitas Rumah Sakit; BPJS Kesehatan; Cost Recovery Rate.*

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INTRODUCTION

Hospital governance in Indonesia has evolved markedly as government regulation has intensified. A pivotal policy is Ministry of Health Regulation (Peraturan Menteri Kesehatan, PMK) No. 27 of 2014, which introduced the Indonesian Case-Based Groups System (INA-CBGs). By replacing the prevailing fee-for-service and capitation arrangements with a prospective payment model, the regulation seeks to realign incentives and curb escalating healthcare costs (Arfiani & Fahlevi, 2020).

Under fee-for-service and capitation, the Social Security Administration Agency (BPJS Kesehatan) reimburses hospitals for each service actually delivered, so higher treatment intensity directly increases BPJS outlays (Arfiani & Fahlevi, 2020). While this model shields hospitals from unexpected cost surges, it leaves insurers vulnerable to uncontrolled expenditure growth. By contrast, the prospective system classifies cases with similar clinical features and expected resource use, then pays a predetermined rate for each group (Permenkes, 2014).

Aulia et al., (2015) describe this approach as a package tariff: BPJS Kesehatan sets a fixed reimbursement based on diagnosis and procedure, regardless of length of stay or the hospital's actual costs. Hospitals therefore earn a margin only if they treat patients efficiently, encouraging quicker recoveries and tighter cost control (Arfiani & Fahlevi, 2020; Fahlevi et al., 2022).

Implementing such efficiencies, however, has proven challenging. Factors like extended length of stay frequently push actual expenses above the government-mandated rates (Arfiani & Fahlevi, 2020; Ariwardani et al., 2019; Evans et al., 2018; Fahlevi, Irsyadillah, Indriani, et al., 2022; Kuo et al., 2018; Nelson-Williams et al., 2016; Polverejan et al., 2003; Wu et al., 2020). Although the prospective system was intended to promote cost containment, empirical studies consistently report operational losses and difficulty reducing unnecessary expenditures (Arfiani & Fahlevi, 2020; Evans et al., 2018; Fahlevi, 2016; Fahlevi, Irsyadillah, Indriani, et al., 2022; Polverejan et al., 2003; Wu et al., 2020), a situation that appears to afflict many Indonesian public hospitals as well.

Research that evaluates financial performance in Indonesian public-sector hospitals, particularly in light of recent government regulations, remains scant. Yet these hospitals operate under mounting regulatory pressures that compel managers to refine strategic responses (Marques & Alves, 2023). Because public organizations increasingly emphasise financial outcomes to secure long-term viability, understanding how they adopt accounting and management techniques is essential (Ahmad & Khan, 2024; Fahlevi, Irsyadillah, Arafat, et al., 2022; Theodorakopoulos et al., 2024). Effective control of patient-care costs is therefore central to sustaining high-quality services (Sun et al., 2022). Against this backdrop, the present study investigates the profitability of caring for BPJS Kesehatan patients under the prospective payment system, focusing on government hospitals and their compliance with Ministry of Health Regulation No. 27 of 2014.

That regulation—Peraturan Menteri Kesehatan (PMK) No. 27/2014—instituted the Indonesian Case-Based Groups system (INA-CBGs), a prospective payment scheme that classifies patients by diagnosis and procedure so that cases with similar clinical characteristics attract a uniform tariff (Permenkes, 2014). BPJS Kesehatan sets these tariffs after considering disease type and severity (Abernethy et al., 2006; Arfiani & Fahlevi, 2020; Fahlevi, Irsyadillah, Indriani, et al., 2022).

Consequently, this study analyses hospital profitability across disease categories and severity levels.

Empirical work suggests that INA-CBGs can enhance hospital efficiency and productivity (Arfiani & Fahlevi, 2020). Because the tariff is fixed before services are rendered, hospitals are expected to contain costs so that actual expenditure falls below the prescribed rate; profit arises from the resulting differential (Permenkes, 2014; Arfiani & Fahlevi, 2020).

Realising such gains, however, depends on how effectively hospitals deploy their internal resources. The Resource-Based View (RBV) posits that sustainable advantage stems from skilfully managing assets such as human capital, finance and technology, including the design of efficient care pathways (Upadhyay et al., 2020). Hospitals that leverage these resources can reduce costs while enhancing care quality, thereby strengthening performance and sustainability.

Within this context, profitability in managing BPJS patients is assessed through the Cost Recovery Rate (CRR), which compares BPJS reimbursements with the actual costs incurred (Arfiani & Fahlevi, 2020; Fahlevi, Irsyadillah, Indriani, et al., 2022). By evaluating CRR, hospitals gain critical insight into whether revenues adequately cover expenditures, informing both operational decisions and policy discussions (Arfiani & Fahlevi, 2020; Indupurnahayu et al., 2021; Maharani et al., 2015; Mardiah, 2015; Mutmainnah & Shinta, 2024).

RESEARCH METHOD

This study was conducted at the Regional General Hospital of Buleleng Regency, Jalan Ngurah Rai No. 30, Singaraja, Bali. The site was selected because of its comprehensive, accessible patient-level data and its designation as a National Health Insurance (BPJS Kesehatan) provider. Interviews with the hospital's Deputy Finance Director further revealed implementation challenges surrounding the INA-CBGs payment system—challenges that may materially influence profitability—making the hospital an apt setting for analysing the financial consequences of INA-CBGs adoption.

The investigation relies on secondary data extracted from the hospital's electronic medical-record database. For each patient, the database records disease type, severity classification, total treatment cost, and the corresponding BPJS tariff. These data were obtained through document review, ensuring a complete picture of cost and reimbursement for the period under study.

Quantitative descriptive methods were then applied to explore how profitability varies across severity levels, following the three-tier system specified in Ministry of Health Regulation No. 27 of 2014 (1 = mild, 2 = moderate, 3 = severe). Statistical procedures allowed the identification of patterns and relationships in cost recovery across these categories.

Profitability was measured with the Cost Recovery Rate (CRR)—the ratio of the BPJS tariff to the hospital's actual cost for each case (Arfiani & Fahlevi, 2020). A CRR greater than 1 denotes cost efficiency, indicating that reimbursements exceed expenditures. After calculating CRRs for each disease group, a Games–Howell post-hoc test assessed whether differences in mean CRR across severity

levels were statistically significant, thereby clarifying how case complexity affects cost efficiency under the INA-CBGs framework.

RESULTS AND DISCUSSION

This study analysed 1,127 patient episodes involving the five most common conditions treated at Regional General Hospital of Buleleng Regency: stroke, acute diarrhoea, diabetes mellitus, dengue fever and heart failure. Table 1 summarises each condition's Cost Recovery Rate (CRR), calculated as the ratio of the BPJS Kesehatan reimbursement to the hospital's actual cost per case.

Stroke achieved the highest CRR at 1.3915, indicating that reimbursements more than covered costs and yielded a sizable surplus. Acute diarrhoea (1.1287), diabetes mellitus (1.1438) and dengue fever (1.1132) likewise exceeded the break-even point, though with smaller surpluses than stroke.

Heart failure, by contrast, posted a CRR of 0.6687, revealing that only two-thirds of its costs were recovered and leaving a deficit. These results underscore pronounced variation in cost-recovery efficiency across diseases: stroke is the most financially favourable, whereas heart failure warrants closer managerial scrutiny. The subsequent section explores whether these disparities persist once cases are stratified by severity level.

Table 1. List of the Most Common Diseases Treated at Regional General Hospital of Buleleng Regency

Deseases	Sample Size	CRR Ratio
Stroke (I63)	351	1.391
Acute Diarrhea (A09)	284	1.128
Diabetes mellitus (E10)	206	1.143
Dengue Hemorrhagic Fever (A91)	153	1.113
Heart Failure (I50)	133	0.668
Total	1127	

Source: Research Data, 2024

To examine whether profitability varies significantly across conditions once clinical complexity is taken into account, we applied the Games–Howell post-hoc procedure to mean CRRs stratified by severity—mild, moderate and severe. Severity must be incorporated because BPJS tariffs are explicitly adjusted for case complexity, shaping the margin a hospital can achieve (Abernethy et al., 2006; Arfiani & Fahlevi, 2020; Fahlevi, Irsyadillah, Indriani, et al., 2022).

Stroke offers a clear illustration. As shown in Table 2, mild episodes (79 cases) yielded an average CRR of 1.5415, moderate episodes (208 cases) averaged 1.2840 and severe episodes (64 cases) averaged 1.5555. The pooled mean of 1.3915 indicates that stroke management remains profitable across the severity spectrum under the INA-CBGs payment regime.

Table 2. Descriptive Data of CRR for Stroke Based on Severity Levels

	Severity	N	Mean
CRR	1	79	1.5415
	2	208	1.2840
	3	64	1.5555
	Total	351	1.3915

Source: Research Data, 2024

Based on the Games-Howell comparison test results in Table 3, there is no significant difference between the groups compared (Severity 1, 2, and 3) in terms of CRR. All p-values (Sig.) are greater than 0.05, indicating that the mean differences between these groups are not significant. Therefore, it can be concluded that there is no significant difference in CRR across severity levels in the management of Stroke.

Table 3. Games-Howell Test Results on CRR for Stroke

Multiple Comparisons Games-Howell					
Dependent Variable	*(I) Severity*	*(J) Severity*	*Mean Difference (I-J)*	*Std. Error*	*Sig.*
CRR	1	2	0.25753	0.14976	0.202
		3	-0.01395	0.27385	0.999
	2	1	-0.25753	0.14976	0.202
		3	-0.27148	0.24794	0.520
	3	1	0.01395	0.27385	0.999
		2	0.27148	0.24794	0.520

Source: Research Data, 2024

Table 4 presents a descriptive summary of CRR data based on severity levels for acute diarrhea. According to the table, there is a decreasing trend in CRR as patient severity increases. For the Severity 1 group, the CRR is 1.1799, indicating a favorable condition for the hospital (hospital costs are lower than the reimbursement received from the insurance). This group has the highest average value among the three groups. For Severity 2, the average CRR decreases to 0.9631, and for Severity 3, the CRR further decreases to 0.9300.

Table 4. Descriptive Data of CRR for Acute Diarrhea Based on Severity Levels

Severity		N	Mean
CRR	1	219	1.179
	2	52	0.963
	3	13	0.930
	Total	284	1.128

Source: Research Data, 2024

Table 5. Games-Howell Test Results on CRR for Acute Diarrhea

Multiple Comparisons Games-Howell					
Dependent Variable	*(I) Severity*	*(J) Severity*	*Mean Difference (I-J)*	*Std. Error*	*Sig.*
CRR	1	2	0.216*	0.083	0.029
		3	0.249	0.148	0.244
	2	1	-0.216*	0.083	0.029
		3	0.033	0.156	0.976
	3	1	-0.249	0.148	0.244
		2	-0.033	0.156	0.976

Source: Research Data, 2024

Table 5 reports the Games–Howell comparisons of CRR across severity classes for acute diarrhoea. A statistically significant gap emerges only between mild and moderate cases; differences involving the severe category are not significant. The marked fall in CRR from Severity 1 to Severity 2 suggests that cost recovery deteriorates as clinical complexity rises, implying that BPJS reimbursements do not fully track the higher resource use required for moderate diarrhoea. Even so, the overall CRR of 1.1287 confirms that acute-diarrhoea management remains profitable for the hospital.

A parallel analysis for diabetes mellitus appears in Table 6. Here, severe cases generate the highest mean CRR (1.1366) despite representing the smallest subsample, whereas moderate cases record the lowest CRR (1.0190) but dominate the patient count. These results indicate that cost recovery improves for the most complex diabetes admissions, yet slips toward break-even in less severe presentations. Taken together, the average CRR of 1.1438 still reflects satisfactory profitability in treating BPJS-covered diabetes patients, though margins clearly vary with severity.

Table 6. Descriptive Data of CRR for Diabetes Mellitus Based on Severity Levels

	Severity	N	Mean
CRR	1	73	1.136
	2	93	1.019
	3	40	1.447
	Total	206	1.143

Source: Research Data, 2024

Table 7. Games-Howell Test Results on CRR for Diabetes Mellitus

Multiple Comparisons
Games-Howell

Dependent Variable	*(I) Severity*	*(J) Severity*	*Mean Difference (I-J)*	*Std. Error*	*Sig.*
CRR	1	2	0.117	0.111	0.544
		3	-0.310	0.283	0.521
	2	1	-0.117	0.111	0.544
		3	-0.427	0.271	0.267
	3	1	0.310	0.283	0.521
		2	0.427	0.271	0.267

Source: Research Data, 2024

Based on the Games-Howell comparison test results in Table 7, there is no significant difference in CRR among the diabetes mellitus patient severity levels (Severity 1, 2, and 3). All p-values (Sig.) are greater than 0.05, indicating that the mean differences between these groups are not significant. Therefore, it can be concluded that there is no significant difference in CRR across severity levels in the management of diabetes mellitus.

Table 8 presents a descriptive summary of CRR data based on severity levels for dengue hemorrhagic fever. According to Table 8, Severity 3 has the highest CRR value (1.4811), while Severity 2 has the lowest CRR value (0.9017). This indicates that the hospital is better able to recover costs from patients with high severity (Severity 3), despite the small sample size (9 patients). Conversely,

the hospital has more difficulty recovering costs from patients with Severity 2, as indicated by a CRR value below 1. On average, the CRR for managing dengue hemorrhagic fever patients appears profitable (CRR 1.1132).

Table 8 Descriptive Data of CRR for Dengue Hemorrhagic Fever Based on Severity Levels

	Severity	N	Mean
CRR	1	126	1.117
	2	18	0.901
	3	9	1.481
	Total	153	1.113

Source: Research Data, 2024

Table 9. Games-Howell Test Results on CRR for Dengue Hemorrhagic Fever

Multiple Comparisons
Games-Howell

Dependent Variable	*(I) Severity*	*(J) Severity*	*Mean Difference (I-J)*	*Std. Error*	*Sig.*
CRR	1	2	0.215	0.118	0.185
		3	-0.363	1.030	0.934
	2	1	-0.215	0.118	0.185
		3	-0.579	1.035	0.844
	3	1	0.363	1.030	0.934
		2	0.579	1.035	0.844

Source: Research Data, 2024

Based on the Games-Howell comparison test results in Table 9, there is no significant difference in CRR among the severity levels of dengue hemorrhagic fever patients (Severity 1, 2, and 3). Although there is a decrease in CRR from Severity 1 to Severity 2 to an unfavorable value (CRR < 1), this decline is not statistically significant. Therefore, it can be concluded that there is no significant difference in CRR across severity levels in the management of dengue hemorrhagic fever.

Table 10 presents a descriptive summary of CRR data based on severity levels for heart failure. According to Table 10, Severity 3 has the highest CRR value (0.7067), followed by Severity 2 (0.6622), and Severity 1 (0.6013). When viewed from the CRR pattern based on severity levels, there is an increasing CRR trend with increasing patient severity. Overall, the hospital incurs losses in managing heart failure patients, with a CRR value of 0.6687, indicating that the hospital's treatment costs exceed the revenue from insurance reimbursements.

Table 10. Descriptive Data of CRR for Heart Failure Based on Severity Levels

	Severity	N	Mean
CRR	1	23	0.6013
	2	59	0.6622
	3	51	0.7067
	Total	133	0.6687

Source: Research Data, 2024

Table 11. Games-Howell Test Results on CRR for Heart Failure

Multiple Comparisons Games-Howell					
Dependent Variable	(I) Severity	(J) Severity	Mean Difference (I-J)	Std. Error	Sig.
CRR	1	2	-0.060	0.059	0.563
		3	-0.105	0.083	0.423
	2	1	0.060	0.059	0.563
		3	-0.044	0.088	0.870
	3	1	0.105	0.083	0.423
		2	0.044	0.088	0.870

Source: Research Data, 2024

The Games–Howell results in Table 11 reveal no statistically significant variation in Cost Recovery Rates (CRRs) across the three severity levels of heart-failure cases, even though a downward trend in profitability accompanies increasing clinical complexity. Accordingly, the hospital's ability to recover costs from BPJS reimbursements appears broadly uniform for mild, moderate, and severe heart-failure admissions. The implications of these findings are explored below.

CRR analysis offers a concise measure of hospital profitability in insurance-financed environments, capturing how effectively reimbursements offset patient-care costs. By comparing resource consumption across severity strata, hospitals can gauge the efficiency of service delivery and the adequacy of BPJS tariffs—objectives that mirror regulatory priorities for prudent cost management (Lachmann et al., 2024).

For stroke, the Regional General Hospital of Buleleng Regency demonstrates robust margins at every severity level, with an overall CRR of 1.3915. Payments therefore exceed costs, signalling efficient resource use under the INA-CBGs schedule. Diabetes mellitus exhibits a similarly favourable profile: all severity tiers post CRRs above unity and the aggregate rate stands at 1.1438, confirming sustainable profitability.

Dengue haemorrhagic fever yields an overall CRR of 1.1132, again denoting cost recovery in excess of expenditure. Although CRR dips from mild to moderate episodes before rebounding for severe cases, Games–Howell tests indicate that these shifts lack statistical significance. Profitability is thus maintained despite the apparent mid-tier decline.

Acute diarrhoea also delivers positive returns, with an average CRR of 1.1287. Yet a marked and significant fall from Severity 1 (1.1799) to Severity 2 (0.9631) shows that higher-complexity cases strain margins; reimbursements fail to keep pace with escalating inputs. While the overall service line remains profitable, cost-control efforts focused on moderate presentations could strengthen performance.

Heart-failure management presents the greatest challenge. The average CRR of 0.6687 indicates systematic losses, and although the downward slope across severity levels is not significant, the sub-unity ratio signals that BPJS tariffs are insufficient to cover actual costs. Management should therefore reassess clinical pathways and overhead allocation for heart-failure care. In parallel,

policymakers might reconsider reimbursement scales to reflect medical inflation, real input prices, and accepted standards of care (Marwan et al., 2024).

Collectively, stroke, acute diarrhoea, diabetes mellitus, and dengue haemorrhagic fever generate CRRs above one, confirming that the hospital recoups its outlays and realises surpluses on these services. Such surpluses can be reinvested in facility upgrades, staff development, and broader service expansion, promoting long-term sustainability (Arfiani & Fahlevi, 2020; Fahlevi, 2016; Fahlevi, Irsyadillah, Arafat, et al., 2022; Fahlevi, Irsyadillah, Indriani, et al., 2022; Nurkholis et al., 2023). Strengthened financial capacity, in turn, enhances stakeholder confidence and patient satisfaction (Mardaleta et al., 2022). Conversely, the persistent deficit in heart-failure treatment underscores the need for both managerial intervention and regulatory tariff review to ensure equitable, cost-effective care across all clinical domains.

CONCLUSION

The Cost Recovery Ratio analysis indicates that Regional General Hospital of Buleleng Regency achieves satisfactory profitability in treating stroke, acute diarrhoea, diabetes mellitus, and dengue haemorrhagic fever, yet incurs losses on heart-failure cases. To address this imbalance, management should reassess cost structures and refine clinical pathways for heart-failure treatment, because current BPJS Kesehatan tariffs do not cover the associated expenditures. At the same time, policymakers should reconsider reimbursement levels for resource-intensive conditions so that regulated rates more closely reflect hospitals' actual costs; inadequately priced tariffs risk undermining financial sustainability across the health-care system.

This study's chief limitation is its single-site design, which confines generalisability. Future research should include a broader sample of National Health Insurance hospitals to provide a wider perspective on profitability patterns and to inform a more nuanced appraisal of BPJS Kesehatan tariff adequacy, particularly for high-cost diseases that strain hospital finances.

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