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Predicting Financial Outcome Gaps in ICU Services for National Health Insurance Patients Based on Length of Stay Comorbidity and Outcomes

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Abstract:

Intensive Care Unit (ICU) services represent the most clinically complex and cost-intensive hospital units, often creating discrepancies between actual service costs and Indonesia Case-Based Groups (INA-CBGs) reimbursement, particularly for National Health Insurance (JKN) patients. These discrepancies are reflected in financial outcome gaps, which may threaten hospital financial sustainability when negative. This study analyzes the effects of length of stay (LOS), number of comorbidities, and patient outcomes on ICU financial outcome gaps and develops a regression model to predict the risk of negative financial outcomes among JKN ICU patients at RSUD dr. H. Jusuf SK. A quantitative retrospective observational design was applied using data from 290 JKN ICU patients treated between July 1, 2024, and June 30, 2025. Data were analyzed using descriptive statistics, simple linear regression, and multiple linear regression with robust standard errors (HC3) in SPSS version 27. The results indicate an average ICU LOS of 3.45 ± 3.03 days, a mean of 7.05 ± 3.67 comorbidities, and an average financial outcome gap of −IDR 23,149,588. Simple regression analysis shows that LOS, comorbidities, and patient outcomes significantly affect financial outcome gaps. Multiple regression results confirm that these variables simultaneously influence financial outcome gaps (R^2 = 0.217). The developed model demonstrates low-to-moderate explanatory power and may serve as an early, non-clinical predictive tool to identify financial risk and support managerial decision-making in ICU financing under the INA-CBGs system.

Keywords: Length of Stay; Comorbidities; Patient Outcomes; Financia

Introduction

Healthcare services constitute a fundamental pillar of national development aimed at improving population health in a sustainable manner. Within the healthcare system, hospitals play a strategic role as referral facilities providing advanced medical services, particularly for critically ill patients. Among hospital service units, the Intensive Care Unit (ICU) represents the highest level of clinical complexity and resource intensity,

requiring continuous monitoring, advanced medical technology, and multidisciplinary care, which directly translates into substantial operational costs (Murthy et al., 2015; Society of Critical Care Medicine, 2020; Waydhas, 1999).

In Indonesia, healthcare financing for the population is administered through the National Health Insurance (Jaminan Kesehatan Nasional, JKN) scheme using the Indonesia Case-Based Groups (INA-CBGs) payment system. INA-CBGs is a prospective payment mechanism that determines reimbursement based on diagnostic groups, procedures, and severity levels with the objective of enhancing efficiency and cost containment (Busse, Geissler, Quentin, & Wiley, 2011; Kementerian Kesehatan Republik Indonesia, 2016b). However, existing evidence indicates that INA-CBGs tariffs often fail services such as ICU care (I J Halim & Manggala, 2025; Leonard & others, 2020; S. to fully reflect the actual costs incurred by hospitals, particularly for high-complexity Ratnawati, 2020). This discrepancy creates a financial outcome gap, defined as the difference between INA-CBGs reimbursement and actual service costs, which may result in financial losses and threaten hospital financial sustainability (Dewi & others, 2019; World Bank, 2018).

This issue is particularly critical for regional public hospitals (Rumah Sakit Umum Daerah, RSUD), which rely heavily on JKN claims as their primary revenue source and possess limited financial flexibility. Unlike private or national referral hospitals, RSUDs face greater constraints in absorbing financial deficits arising from high-cost services (Leonard & others, 2020; Pfeffer & Salancik, 1978). Empirical conditions at RSUD dr. H. Jusuf SK, a regional referral hospital in North Kalimantan Province, demonstrate a substantial increase in ICU admissions among JKN patients accompanied by a widening financial outcome gap, indicating that rising service volumes are not matched by proportional revenue growth.

Previous studies consistently report that prolonged length of stay (LOS), high comorbidity burden, and unfavorable patient outcomes are associated with increased resource utilization and higher ICU costs (Kementerian Kesehatan Republik Indonesia, 2019; Munawaroh et al., 2024; World Health Organization, 2020). Nevertheless, findings regarding the extent to which these clinical factors influence reimbursement under INA-CBGs remain inconsistent. While LOS is frequently identified as a significant cost driver, comorbidities and patient outcomes are not always adequately captured within prospective payment tariffs, resulting in persistent financial mismatches (Admaja et al., 2024; Galvis et al., 2023; Hammer et al., 2020).

Despite extensive literature on ICU cost analysis, prior studies in Indonesia largely adopt descriptive approaches or focus on cost differentials without explicitly positioning financial outcome gaps as a net performance indicator (Ananta, 2018; Mahardika et al., 2024). Moreover, predictive models that integrate LOS, comorbidities, and patient outcomes within the context of the JKN system remain scarce, particularly for regional public hospitals. This gap limits hospitals' ability to anticipate financial risks and implement proactive cost management strategies (Leonard & others, 2020; Pfeffer & Salancik, 1978).

Accordingly, this study develops a predictive model of ICU financial outcomes for JKN patients by integrating LOS, comorbidities, and patient outcomes into a unified regression framework. By conceptualizing the financial outcome gap as a net performance indicator at the episode-of-care level, this research contributes an early predictive, non-clinical tool to support managerial decision-making and policy evaluation within the INA-CBGs financing system.

Methods

This study adopts a quantitative descriptive–analytical design to examine the relationship between clinical characteristics of Intensive Care Unit (ICU) patients and income gaps as financial outcomes of ICU services. A retrospective observational approach was employed to analyze historical service data without researcher intervention, allowing for the assessment of associations between explanatory variables and financial outcomes within a measurable analytical framework (Creswell & Creswell, 2017; Sugiyono, 2022). This design is appropriate for evaluating financial performance under prospective payment systems.

The research context is RSUD dr. H. Jusuf SK, a regional public referral hospital in North Kalimantan Province operating under the National Health Insurance (Jaminan Kesehatan Nasional, JKN) scheme. The target population comprises all JKN patients admitted to the ICU between July 1, 2024, and June 30, 2025. The unit of analysis in this study is an ICU episode of care, with one observation representing one patient admission. A total sampling technique was applied to include all cases meeting the inclusion criteria, thereby minimizing selection bias and capturing the full variation of ICU financial outcomes (Sugiyono, 2022). Cases financed outside the INA-CBGs scheme, records with incomplete data, and ICU stays shorter than 24 hours were excluded to avoid distortion in cost measurement (Roesbiantoro et al., n.d.).

Data were collected from secondary sources, including hospital medical records, INA-CBGs claim data, and ICU cost reports. All variables were operationalized as follows: length of stay (LOS) was measured as the total number of days a patient was treated in the ICU; comorbidities were measured as the number of coexisting conditions recorded in the hospital e-claim system; patient outcomes were classified as survived or deceased at discharge; and financial outcome was defined as the net difference between INA-CBGs reimbursement and the actual cost of ICU services. Financial outcomes may take negative values (financial loss) or positive values (financial surplus), reflecting net financial performance at the episode-of-care level.

Statistical analysis was conducted using multiple linear regression to assess the partial and simultaneous effects of LOS, comorbidities, and patient outcomes on ICU financial outcomes. Classical assumption tests including normality, multicollinearity, and heteroskedasticity were performed to ensure model validity. When assumption violations were detected, robust standard error estimation was applied to obtain reliable statistical inference (Gumilang & Sulaeman, 2022). All patient data were anonymized, and the study received formal approval from hospital management and the institutional research ethics committee prior to data analysis.

Results

Sub 1 Descriptive Statistics

This subsection presents descriptive statistics to summarize the characteristics of Intensive Care Unit (ICU) services for National Health Insurance (Jaminan Kesehatan Nasional, JKN) patients at RSUD dr. H. Jusuf SK. The descriptive analysis provides an overview of patient demographics, clinical characteristics, and financial variables at the episode-of-care level, which forms the basis for subsequent regression analyses.

Categorical Variables

Table 1. Distribution of ICU Patient Characteristics (n = 290)

Characteristics	n	%
Gender		
Male	158	54.48
Female	132	45.52
Age Group		
< 18 years	5	1.72
18–40 years	60	20.69
41–60 years	133	45.86
> 60 years	92	31.72
ICU Length of Stay (LOS)		
≤ 3 days	190	65.52
4–7 days	76	26.21
8–14 days	19	6.55
> 14 days	5	1.72
Number of Comorbidities		
≤ 1 comorbidity	14	4.83
2–3 comorbidities	28	9.66
≥ 4 comorbidities	248	85.52
Patient Outcome		
Survived	130	44.83
Deceased	160	55.17

Source: Processed secondary data, 2025.

Table 1 reports the frequency distribution of categorical variables. The sample consists of 290 ICU episodes, with male patients accounting for 54.48% of admissions and female patients for 45.52%. Most patients were in the 41–60 age group (45.86%), followed by patients aged over 60 years (31.72%). In terms of ICU utilization, the majority of patients experienced relatively short stays, with 65.52% having a length of stay (LOS) of three days or less. However, a substantial proportion of patients exhibited high clinical complexity, as 85.52% had four or more comorbidities. Regarding patient outcomes, more than half of ICU admissions (55.17%) resulted in in-hospital mortality.

Numerical Variables Table 2. Descriptive Statistics of Numerical Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
ICU Length of Stay (days)	290	1	17	3.45	3.03
Number of Comorbidities	290	0	19	7.05	3.67
INA-CBGs	290	2,251,000	130,649,600	42,115,619.31	28,642,706.98

Reimbursement (IDR)					
Actual ICU Cost (IDR)	290	1,458,663	243,046,518	65,265,207.76	40,201,664.63
Financial Outcome / Income Gap (IDR)	290	−130,723,510	53,678,566	−23,149,588.45	32,170,644.62

Source: Processed secondary data (SPSS 27), 2025.

Table 2 presents summary statistics for numerical variables. The average ICU length of stay was 3.45 days (SD = 3.03), with a range from 1 to 17 days. The mean number of comorbidities was 7.05 (SD = 3.67), indicating considerable variation in patient complexity. From a financial perspective, the mean INA-CBGs reimbursement received by the hospital was IDR 42.12 million per episode, while the mean actual ICU cost reached IDR 65.27 million. Consequently, the average financial outcome (income gap) was negative, amounting to IDR −23.15 million per episode, reflecting that actual ICU costs generally exceeded reimbursement levels under the INA-CBGs payment system.

Overall, the descriptive statistics indicate substantial heterogeneity in ICU clinical characteristics and financial outcomes. Despite relatively short average lengths of stay, the high burden of comorbidities and elevated mortality rates are accompanied by significant financial losses at the episode-of-care level. These patterns highlight the relevance of examining clinical determinants of ICU financial outcomes under a prospective payment system and provide a foundation for the regression analyses presented in the following sections.

Sub 2 Bivariate Regression Results

This subsection presents the results of bivariate regression analyses examining the partial relationship between each explanatory variable and ICU financial outcomes. Separate linear regression models with robust standard errors (HC3) were estimated to assess the individual association of length of stay (LOS), comorbidities, and patient outcomes with the income gap (financial outcome), without controlling for other variables.

Table 3. Bivariate Regression Results for ICU Financial Outcomes

Independent Variable	Coefficient (B)	Robust Std. Error (HC3)	t-statistic	p-value	R^2
Length of Stay (LOS) ICU	−2,435,429.169	724,287.423	−3.363	0.001	0.053
Comorbidities	−2,158,530.087	569,817.855	−3.788	<0.001	0.061
Patient Outcome	16,885,011.680	3,662,043.027	4.611	<0.001	0.068

Dependent variable: Financial Outcome (Income Gap).

Robust standard errors estimated using HC3.

Source: Processed secondary data (SPSS 27), 2025.

The bivariate regression results indicate that each explanatory variable is significantly associated with ICU financial outcomes when examined separately. Length of stay (LOS) exhibits a negative and statistically significant relationship with the income gap, indicating that longer ICU stays are associated with more negative financial outcomes. Similarly, comorbidity burden shows a significant negative association, suggesting that higher clinical complexity is linked to increased financial losses at the episode-of-care level.

In contrast, patient outcome displays a positive and statistically significant coefficient, indicating systematic differences in financial outcomes between patients with different discharge statuses. Although each variable explains a relatively small proportion of the variance in financial outcomes (R^2 ranging from 0.053 to 0.068), the consistent direction and significance of the coefficients provide preliminary evidence that clinical characteristics are relevant determinants of ICU financial performance. These findings motivate the multivariate analysis presented in the following subsection, which evaluates the simultaneous effects of all explanatory variables.

Sub 3 Multivariate Regression Results

This subsection presents the results of the multivariate regression analysis examining the simultaneous effects of length of stay (LOS), comorbidities, and patient outcomes on ICU financial outcomes. A multiple linear regression model with robust standard errors (HC3) was estimated to account for heteroskedasticity commonly observed in health care cost data and to ensure reliable statistical inference.

Table 4. Multivariate Regression Results: Determinants of ICU Financial Outcomes

Independent Variable	Coefficient (B)	Robust Std. Error (HC3)	t-statistic	p-value
Constant	−11,097,725.316	3,740,541.207	−2.967	0.003
Length of Stay (LOS) ICU	−1,586,920.370	756,510.983	−2.098	0.037
Comorbidities	−2,897,672.471	580,854.878	−4.989	<0.001
Patient Outcome	25,120,044.911	3,527,683.651	7.121	<0.001

Dependent variable: Financial Outcome (Income Gap).

Robust standard errors estimated using HC3.

Source: Processed secondary data (SPSS 27), 2025.

Model statistics:

F-statistic = 26.481 (p < 0.001)

R^2 = 0.217; Adjusted R^2 = 0.209

The multivariate regression results indicate that length of stay (LOS), comorbidities, and patient outcomes jointly exert statistically significant effects on ICU financial outcomes. After controlling for other variables in the model, LOS retains a negative and significant coefficient, implying that each additional day of ICU stay is associated with a deterioration in financial outcomes. This finding confirms that prolonged ICU utilization increases financial risk under the INA-CBGs prospective payment system.

Comorbidity burden emerges as a strong negative determinant of financial outcomes, with a larger magnitude of effect compared to LOS. This result suggests that higher clinical complexity substantially increases the likelihood and magnitude of financial losses, even after accounting for length of stay and patient outcomes. In contrast, patient outcome shows a positive and statistically significant association with financial outcomes, indicating systematic differences in reimbursement–cost gaps between patients with different discharge statuses.

Overall, the model is statistically significant, as indicated by the F-test, and explains approximately 21% of the variation in ICU financial outcomes. Although a considerable share of the variation remains attributable to factors outside the model, the results demonstrate that key clinical characteristics provide meaningful explanatory power. These findings support the use of the estimated model as an early, non-clinical

predictive tool for identifying financial risk in ICU services, which is further discussed in the subsequent section.

Sub 4 Model Significance and Goodness of Fit

This subsection evaluates the overall statistical significance and goodness of fit of the multivariate regression model used to explain ICU financial outcomes. Model significance is assessed using the F-test, while explanatory power is evaluated through the coefficient of determination (R^2) and adjusted R^2. These indicators are reported to assess whether the proposed model provides a meaningful representation of the relationship between clinical characteristics and financial outcomes under the INA-CBGs payment system.

Table 5. Model Significance and Goodness of Fit Statistics

Statistic	Value
F-statistic	26.481
p-value (Prob > F)	< 0.001
R^2	0.217
Adjusted R^2	0.209
Number of observations	290

Dependent variable: Financial Outcome (Income Gap).

Source: Processed secondary data (SPSS 27), 2025.

The F-test results reported in Table 5 indicate that the regression model is statistically significant as a whole. The F-statistic of 26.481 with a p-value below 0.001 confirms that length of stay (LOS), comorbidities, and patient outcomes jointly explain variation in ICU financial outcomes and that the model performs better than a null model with no explanatory variables.

In terms of goodness of fit, the R^2 value of 0.217 and adjusted R^2 of 0.209 indicate that approximately 21% of the variation in ICU financial outcomes is explained by the variables included in the model. While a substantial proportion of the variation remains unexplained, this level of explanatory power is considered acceptable in studies of health care cost and episode-level financial outcomes, which are typically characterized by high variability and unobserved heterogeneity.

Sub 5 Predictive Model of ICU Financial Outcomes

This subsection presents the predictive model of ICU financial outcomes derived from the multivariate regression analysis. The model is developed to estimate the expected financial outcome (income gap) of ICU services for National Health Insurance (Jaminan Kesehatan Nasional, JKN) patients based on key clinical characteristics identified as statistically significant determinants, namely length of stay (LOS), comorbidities, and patient outcomes.

Based on the estimated regression coefficients with robust standard errors (HC3), the predictive model of ICU financial outcomes can be expressed as follows:

$$\text{Financial Outcome} = -11{,}097{,}725 - 1{,}586{,}920\,(\text{LOS}) - 2{,}897{,}672\,(\text{Comorbidities}) + 25{,}120{,}045\,(\text{Patient Outcome})$$

Where Financial Outcome represents the income gap between INA-CBGs reimbursement and actual ICU costs (in Indonesian Rupiah), LOS denotes the number of days a patient is treated in the ICU, Comorbidities refers to the number of coexisting

conditions, and Patient Outcome is a binary variable coded as 0 for patients discharged alive and 1 for patients who died during ICU care.

The direction and magnitude of the estimated coefficients indicate that increases in LOS and comorbidity burden are associated with a deterioration in financial outcomes, reflecting higher financial risk for the hospital. Conversely, the positive coefficient for patient outcome suggests systematic differences in financial outcomes between patients with different discharge statuses, after controlling for LOS and comorbidities.

Overall, this predictive model provides an early, non-clinical tool for estimating ICU financial outcomes at the episode-of-care level. Although the model explains a moderate proportion of outcome variation, it offers practical value for hospital management in identifying patients at higher risk of financial loss and supporting evidence-based decision-making in cost control and resource allocation within the INA-CBGs financing framework.

Discussion

This study demonstrates that financial outcomes of Intensive Care Unit (ICU) services under Indonesia's National Health Insurance (JKN) scheme are not random events, but systematic consequences of clinical complexity interacting with a prospective payment system. Empirically, the results show that length of stay (LOS), comorbidity burden, and patient outcomes jointly explain a meaningful share of variation in ICU financial outcomes, with the multivariate model being statistically significant ($F = 26.481$; $p < 0.001$) and accounting for approximately 21% of the variance in income gaps (Adjusted $R^2 = 0.209$). While this explanatory power is moderate, it is consistent with health care cost models, where financial performance is influenced by numerous clinical and organizational factors that are difficult to fully observe.

The negative and statistically significant effect of LOS on financial outcomes ($B = -1.59$ million IDR per ICU day; $p = 0.037$) confirms that prolonged ICU stays systematically increase financial losses under the INA-CBGs payment scheme. This finding substantiates earlier cost-of-illness studies identifying LOS as a major driver of ICU expenditure (Dasta et al., 2005; Tan et al., 2017), while extending them by demonstrating that increased LOS directly worsens the reimbursement–cost gap rather than merely raising absolute costs. Importantly, the reduction in the LOS coefficient from the bivariate (-2.44 million IDR) to the multivariate model indicates that part of its effect operates through clinical complexity, reinforcing the notion that LOS is both an operational and a clinically mediated cost driver.

Among all predictors, comorbidity burden emerges as the strongest determinant of ICU financial outcomes. Each additional comorbid condition is associated with a deterioration of approximately 2.90 million IDR in the income gap ($p < 0.001$), even after controlling for LOS and patient outcomes. Statistically, comorbidities display the largest magnitude and the most robust significance, confirming their dominant role in shaping ICU financial risk. From a health economics perspective, this finding aligns with the Cost of Illness framework, where multimorbidity increases costs in a non-linear manner due to treatment interactions, complication risks, and prolonged clinical management (Arrozi & Dewi, n.d.). The persistence of a strong comorbidity effect suggests that INA-CBGs severity adjustments remain insufficient to fully compensate hospitals for patients with high clinical complexity, particularly in ICU settings.

Patient outcomes also show a statistically significant association with financial

outcomes, with mortality linked to a less negative income gap (B = +25.12 million IDR; p < 0.001). Quantitatively, this indicates that ICU episodes ending in death tend to generate smaller financial losses compared to episodes where patients survive. This result should not be interpreted normatively, but structurally. It reflects differences in cost accumulation patterns: patients who survive often require longer ICU stays and extended resource use, whereas patients who die may incur intense but shorter-duration costs. Similar patterns have been reported in prior ICU cost analyses, where cumulative expenditure is driven more by duration than by peak intensity of care (Kurniawan & Rahmah, 2025). In this context, patient outcome functions as a revenue-adjusting factor rather than a primary cost driver.

Taken together, the statistical evidence supports the interpretation that ICU financial losses are structurally embedded within the INA-CBGs prospective payment framework. The negative constant term in both bivariate and multivariate models (−11.10 million IDR; p = 0.003) further suggests the existence of a baseline financial deficit in ICU services, even before accounting for patient-specific characteristics. This finding reinforces arguments from prospective payment theory that high-intensity services face systematic under-compensation when tariffs are fixed ex ante and insufficiently sensitive to clinical variability (Manasikana et al., n.d.).

From a theoretical standpoint, the findings corroborate Agency Theory by illustrating how financial risk is effectively transferred from the payer to the hospital, particularly for complex ICU cases. Hospitals, acting as agents, must provide care according to clinical necessity while absorbing financial losses arising from rigid reimbursement structures. Resource Dependence Theory further explains why this risk is especially acute in regional public hospitals such as RSUD dr. H. Jusuf SK, where dependence on JKN funding limits the ability to cross-subsidize losses from other revenue sources.

Despite the statistical significance of the model, several limitations must be acknowledged. First, the Adjusted R² of 0.209 indicates that nearly 80% of the variation in ICU financial outcomes remains unexplained, likely due to omitted variables such as severity scores, procedural intensity, use of high-cost technologies, and organizational efficiency. This limitation may have attenuated coefficient estimates, implying that the reported effects represent conservative approximations. Second, the single-hospital design restricts generalizability, as cost structures and case mixes may differ across institutions. Third, reliance on retrospective secondary data introduces potential measurement error related to clinical documentation and coding practices, which may influence both comorbidity counts and reimbursement levels.

Nevertheless, these limitations do not undermine the central contribution of the study. By quantitatively demonstrating that LOS, comorbidities, and patient outcomes significantly shape ICU financial outcomes and by specifying their relative magnitudes, this research provides a robust empirical foundation for early financial risk prediction in ICU services. The findings support the use of clinically informed predictive models as managerial tools and highlight the need for policy refinement to improve tariff sensitivity for high-complexity critical care under the INA-CBGs system.

Conclusion

This study provides empirical evidence on the determinants of ICU financial outcomes for National Health Insurance (JKN) patients under the INA-CBGs payment system using episode-level data from 290 ICU admissions at RSUD dr. H. Jusuf SK.

Descriptive analysis shows that the average ICU length of stay was 3.45 days, with a high clinical complexity reflected by a mean of 7.05 comorbidities per patient. From a financial perspective, the mean INA-CBGs reimbursement was IDR 42.12 million per episode, while the mean actual ICU cost reached IDR 65.27 million, resulting in an average negative financial outcome of IDR −23.15 million per episode. These figures indicate a persistent mismatch between reimbursement levels and actual resource consumption in ICU services.

Multivariate regression results further confirm that length of stay, comorbidities, and patient outcomes significantly affect ICU financial outcomes. Each additional day of ICU stay was associated with a decrease in financial outcomes of approximately IDR 1.59 million (p = 0.037), while each additional comorbidity reduced financial outcomes by about IDR 2.90 million (p < 0.001). Patient outcome also showed a statistically significant association, with episodes resulting in in-hospital mortality associated with a financial outcome difference of approximately IDR 25.12 million compared to patients discharged alive (p < 0.001). The overall model was statistically significant (F = 26.481; p < 0.001) and explained 21% of the variation in ICU financial outcomes (Adjusted R^2 = 0.209), indicating moderate explanatory power for clinical variables.

From a managerial and policy standpoint, these findings suggest that ICU financial sustainability is strongly influenced by clinical complexity and utilization intensity rather than service volume alone. The predictive model developed in this study offers an early, non-clinical tool to estimate financial risk at the episode-of-care level and may support hospital managers n prioritizing cost control, case-mix monitoring, and resource planning. At the policy level, the magnitude of the observed financial gaps highlights the need for periodic review of INA-CBGs tariffs for ICU services to better reflect variations in length of stay and comorbidity burden.

Suggestion

This study is subject to several limitations. The use of single-hospital data limits external validity, and the moderate R^2 indicates that important clinical and operational factors—such as disease severity, use of mechanical ventilation, or staffing intensity—were not included in the model. These limitations stem primarily from data constraints rather than methodological flaws and may lead to conservative estimates of financial risk. Future research should incorporate multi-center datasets and additional clinical indicators to improve predictive accuracy and to further inform payment policy reform for high-cost hospital services.

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