Research Article

Hospital Cost vs INA-CBGs Claim for Obstetrics Procedure In Soe Rural General Hospital, East Nusa Tenggara

Tarif Rumah Sakit vs Klaim INA-CBGs untuk Prosedur Obstetrik di Rumah Sakit Umum Daerah SoE, Nusa Tenggara Timur

Raymond Surya[1,2], Ascobat Gani[1], Yudianto B. Saroyo[3]

[1] Faculty of Public Health Universitas Indonesia, Depok
[2] Specialist of Obstetrician-Gynecologist, RSUD SoE, Timor Tengah Selatan District Nusa Tenggara Timur
[3] Department of Obstetrics and Gynecology Faculty of Medicine Universitas Indonesia Dr. Cipto Mangunkusumo Hospital, Jakarta

Abstract

Objective: To depict the discrepancy and analyze the difference between hospital cost and INA-CBGs claim in obstetrics' cases in SoE Rural General Hospital, Timor Tengah Selatan regent, East Nusa Tenggara.

Methods: This is an observational descriptive study using medical record documents of spontaneous vaginal, assisted vaginal, and cesarean delivery cases from the period of October to December 2022. We included all completed billing documents on that period. Cases paid by fee-for-service and local government were excluded. Data analysis was conducted using IBM SPSS Statistic 23.0

Results: From the total of 323 delivery cases recorded in SoE Rural General Hospital, only 245 cases were included. Most subjects were patients aged around 30 years old, referred from primary healthcare facility in the district, were in term pregnancy, and in 3rd class inpatient rooms. The median of length of stay (LOS) in vaginal delivery (spontaneous and assisted) and cesarean delivery were 2 days and 3 days, respectively. Mean difference between hospital cost to INA-CBGs claim was 67% to 158% for either vaginal or cesarean delivery based on class inpatient room. We found that hospital cost was always higher than claim cost based on INA-CBGs claim.

Conclusion: There is a significant discrepancy between hospital cost and INA-CBGs claim (from 67% to 158%) for obstetric services in SoE Rural General Hospital.

Keywords: hospital cost, INA-CBGs claim, obstetric.

Abstrak

Tujuan: *Untuk memberikan gambaran perbedaan dan menganalisis perbedaan antara tarif RS dengan klaim INA-CBGs pada kasus obstetrik di RSUD SoE, Timor Tengah Selatan, Nusa Tenggara Timur.*

Metode: *Studi deskriptif observasional menggunakan dokumen rekam medis dari kasus persalinan pervaginam spontan, persalinan pervaginam dengan alat, dan seksio sesarea dari Oktober hinga Desember 2022. Kami memasukkan seluruh dokumen billing yang lengkap. Dokumen biling yang dibayarkan mandiri dan oleh pemerintah lokal diesksklusi. Analisis data dengan menggunakan IBM SPSS Statistik 23.0.*

Hasil: *Dari 323 persalinan yang terekam di RSUD SoE, hanya 245 kasus diinklusikan. Kebanyakan subjek berusia 30 tahun, dirujuk dari puskesmas, kehamilan cukup bulan, dan ruang perawatan kelas 3. Angka median dari lama rawat pervaginam (baik spontan maupun dengan alat) adalah 2 hari dan seksio sesarea 3 hari. Rerata perbedaan tarif RS dengan klaim INA-CBGs ialah 67% hingga 158% baik persalinan pervaginam maupun seksio sesarea berdasarkan ruang kelas perawatan. Kami menemukan angka tarif RS selalu lebih tinggi cukup jauh dari klaim INA-CBGs.*

Kesimpulan: *Terdapat perbedaan antara tarif RS dan klaim INA-CBGs (antara 67 hingga 158%) untuk prosedur obstetrik di RSUD SoE.*

Kata kunci: *tarif RS, klaim INA-CBGs, obstetrik.*

Correspondence author. Raymond Surya. Faculty of Public Health Universitas Indonesia, Depok.
Email; Raymond_s130291@yahoo.co.id

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INTRODUCTION

The World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity [1]. According to the Law of the Republic of Indonesia Number 36 of 2009, health is essential for everyone to live productively in society and the economy. Health services are established either individually or collectively in organizations to promote health, prevent and treat diseases, and enhance the well-being of individuals, families, groups, and society[2]. Indonesian Minister of Health Regulation Number 3 of 2020 about hospital's classification stated that hospital is a health service institution which carries out individual health service comprehensively through outpatient, inpatient, and emergency unit [3]. To enhance patient's satisfaction, hospital should maintain health service quality as customer expectation in order to meet patient's satisfaction. One of them is through appropriate cost in accordance with treatment offered by the hospital.

In the era of Universal Health Coverage (UHC), payments at health facilities aim to improve quality, provide patient-oriented services, and increase efficiency without rewarding providers for over- or under-treatment or adverse events. In Indonesia, *Badan Penyelenggara Jaminan Sosial Kesehatan* (BPJS) manages the national health insurance system (JKN) as part of UHC. One of the fundamental payment system in JKN to hospitals is a prospective payment or bundling system known as Indonesia Case Based Groups (INA-CBGs) [4]. Indonesian Minister of Health Regulation Number 76 of 2016 authorizes INA-CBGs to be implemented in Indonesia [5].

Based on data from the Badan Pusat Statistik (BPS) in 2020, Indonesia's maternal mortality rate (MMR) remains high, at approximately 189 per 100,000 live births[6]. Meanwhile, the World Health Organization (WHO) has set a global target of reducing maternal mortality to less than 70 per 100,000 live births by 2030[7]. JKN aims to support this vision by addressing the three delays that contribute to maternal deaths, ensuring easy access to health services for all women [8].

The disparity in INA-CBGs claims for deliveries can pose obstacles to reducing MMR directly and indirectly. The Indonesian national report for 2018 indicated that cesarean sections accounted for over 17.6% of delivery modes in Indonesia9. Previous studies have revealed differences between actual hospital costs and INA-CBGs claim rates, with negative differences observed for both vaginal and cesarean delivery procedures [9,10]This disparity between costs and claims prompts hospitals to manage their expenses through cost containment measures, including enhancing efficiency, payment systems, and service standardization[10]. Therefore, this study aims to determine and analyze the difference between hospital cost and INA-CBG claim for delivery cases either spontaneous vaginal delivery or cesarean section in RSUD SoE, Timor Tengah Selatan district, East Nusa Tenggara. RSUD SoE is the only one referral hospital for regent of Timor Tengah Selatan, East Nusa Tenggara; thus, complicated delivery cases in primary health care will be referred to this hospital.

METHODS

This observational descriptive study was conducted in RSUD SoE, Timor Tengah Selatan district, East Nusa Tenggara using patients' billing documents for cases of spontaneous vaginal delivery and cesarean section cases from October to December 2022. These billing documents consisted of total patients' billing during hospitalized/treatment and successful INA-CBG claim. We included all completed billing documents on that period. Cases paid by fee-for-service and local government were excluded. Total sampling was employed to collect cases, and the flowchart illustrating our case recruitment process is presented in Figure 1.

Demographic characteristics consisted of age, referral status, gestation, parity, gestational age, complication, length of stay (LOS), and inpatient hospital class. Gravidity defines as the number of pregnancies both current and past regardless of pregnancy outcome. Parity is the number of pregnancies after 20 weeks and 0 days of gestation regardless of the number of fetuses or outcomes. Gestational age is calculated by (280-estimated due date-reference date)/7 and it is written in both weeks and days. Pregnancy complications include hypertension, pre-labor rupture of membranes (PROM), preterm labor, post-term, twin pregnancy, intrauterine fetal demise (IUFD), failed of induction, previous cesarean section (CS), fetal distress, abnormal placentation, malpresentation, dystocia 1st or 2nd stage of labor, cephalopelvic disproportion (CPD), primary infertility, condyloma, and HIV. Pre-labor rupture of membranes (PROM) is spontaneous

rupture of membranes occurring before onset of labor11. Preterm happens less than 37 weeks and 0 days [11]. Intrauterine fetal demise (IUFD) defines as the delivery of fetus without showing sign of life, indicated by absent breathing, heartbeats, pulsation of umbilical cord, or definite movements of voluntary muscles, regarding to greater than 20 weeks of gestation or birth weight greater than or equal to 500 grams [12]. Malpresentation is any presentation other than a vertex presentation [11]. Dystocia is characterized by the slow or abnormal progression of labor. Meanwhile, cephalopelvic disproportion is a discrepancy between the size of maternal pelvis and fetal head precluding vaginal delivery [13]. Length of stay (LOS) is a measure the length of time elapsed between hospital discharge and admission [14]. Inpatient classroom is divided into one, two, and three based on Regulation of Government of the Republic of Indonesia Number 47 of 2021 [15].

Hospital cost includes summary of the surgery procedures, medication, nursing, laboratory, room charges, disposable medical supplies, consultations, supportive items, and blood transfusions. This hospital cost refers to the Regulation of Timor Tengah Selatan Regent Number 24 of 2021 about hospital cost in Timor Tengah Selatan district [16]. INA-CBGs claims follows the guidelines of the Regulation of Indonesian Minister of Health Number 69 of 2013 in which the claims are different based on 5 regions. RSUD SoE falls under regional 5 for class C hospitals [17]. Cost difference signify the disparity between hospital costs and INA CBG claim. Proportion in percentage is calculated as the mean variable cost divided by the average hospital cost. This study did not require ethical clearance due to the use of secondary data using medical records. However, it has been approved by the head of RSUD SoE under number RSUD.35.01.02/244/2023.

The data were described descriptively. To assess the normality data, we used Kolgomorov-Smirnov test and univariate test to describe each variable also frequency distribution. IBM SPSS Statistic 23.0 was also used for the data analysis.

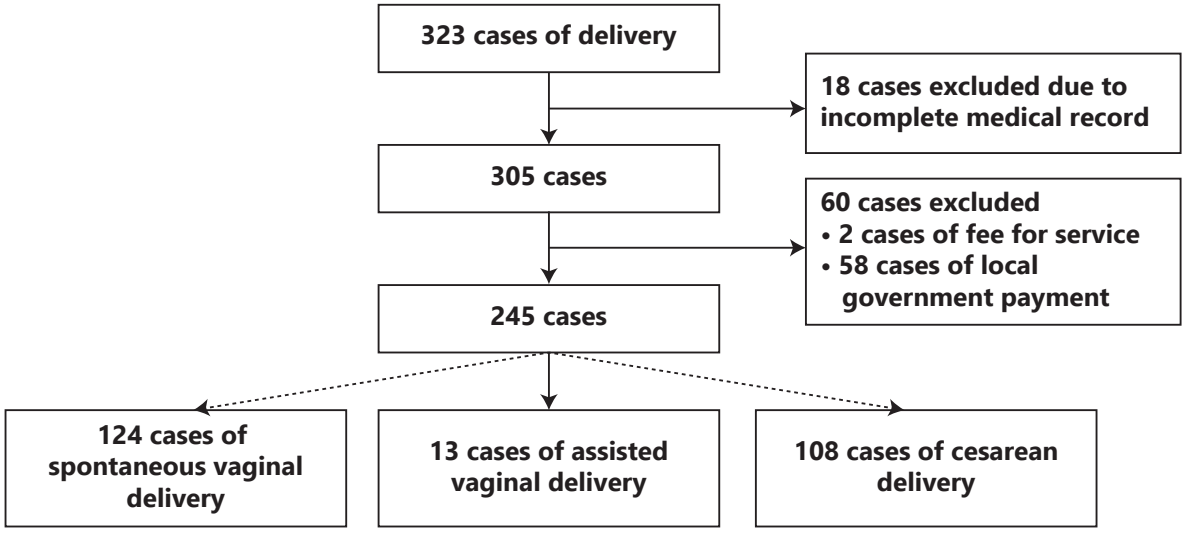


Figure 1. Flow chart of recruiting cases in this study

RESULTS

Out of 323 cases of delivery either vaginal or cesarean section in RSUD SoE during this study, only 305 were well-recorded cases due to the absence of electronic medical records (EMR) usage. Approximately 60 cases were excluded because they were paid for using the fee-for-service method or local government payment, which did not align with the case mix system according to JKN. Table 1 depicted the demographic characteristics of patients included in this study. Most of them aged around 30 years old, referred from primary health care in the district, term pregnancy, and 3rd class of inpatient hospital room. For LOS, the median both in spontaneous vaginal delivery and assisted vaginal delivery was 2 days; meanwhile, for cesarean delivery, it was 3 days. Statistically, there was significant differences in age and LOS among the groups ($p < 0.05$).

Table 1. Demographic Characteristics in this Study

	Spontaneous Vaginal Delivery (N=124)	Assisted Vaginal Delivery (N=13)	Cesarean Delivery (N=108)	*P-value*
Age (years old) (median (min-max))	29 (14-46)	30 (17-36)	32 (19-49)	0.047[a]
Referral (N, %)				
Polyclinic	12 (9.7)	1 (7.7)	15 (13.9)	
Primary health care	57 (46.0)	9 (69.2)	43 (39.8)	
Clinic	12 (9.7)	0	31 (28.7)	
Other hospital	2 (1.6)	0	1 (0.9)	
No referral	41 (33.1)	3 (23.1)	18 (16.7)	
Gravidity (median (min-max))	2 (1-8)	2 (1-5)	2 (1-9)	0.632[a]
Parity (median (min-max))	1 (0-7)	1 (0-4)	1 (0-6)	0.917[a]
Gestational age (weeks) (median (min-max))	39 (26-44)	39 (33-43)	40 (36-42)	0.125[a]
Complication (N, %)				
Hypertension	9 (7.3)	0	15 (13.9)	
PROM	12 (9.7)	0	2 (1.9)	
Preterm labor	6 (4.8)	0	0	
Post-term	4 (3.2)	0	1 (0.9)	
Twin pregnancy	3 (2.4)	0	0	
IUFD	7 (5.6)	0	0	
Failed of induction	0	0	8 (7.4)	
Previous CS	1 (0.8)	0	20 (18.5)	
Fetal distress	0	2 (15.4)	12 (11.1)	
Abnormal placentation	0	0	6 (5.6)	
Malpresentation	2 (1.6)	0	19 (17.6)	
Dystocia 1st or 2nd stage	12 (9.7)	11 (84.6)	16 (14.8)	
CPD	0	0	6 (5.6)	
Primary infertility (patient's value)	0	0	1 (0.9)	
Condyloma	0	0	1 (0.9)	
HIV	0	0	1 (0.9)	
None	68 (54.8)	0	0	
Length of stay (LOS) (days) (median (min-max))	2 (1-5)	2 (1-3)	3 (2-10)	<0.001[a]
Inpatient Hospital Class (N (%))				
I	4 (3.2)	0	9 (8.3)	
II	14 (11.3)	1 (7.7)	13 (12.0)	
III	106 (85.5)	12 (92.3)	86 (79.6)	

a. Kruskal Wallis non-parametric test. PROM: Prelabor rupture of membrane. IUFD: Intrauterine fetal demise
CS: Cesarean section. CPD: Cephalopelvic disproportion. HIV: Human Immunodeficiency Virus

Table 2 showed the summary, mean, percentage, and different component of hospital cost in RSUD SoE to INA-CBGS claim based on methods of delivery. For spontaneous vaginal delivery, the mean difference in hospital costs compared to INA-CBGS claims ranged from 67% to 129%. Meanwhile, the mean difference between 92% and 109% was described for assisted vaginal delivery based on inpatient hospital class. Also, the mean difference from 87% to 158% was shown in cesarean delivery appropriate to inpatient hospital class. Figure 1 to 3 depicted the average, minimum, and maximum value of difference between hospital costs and INA-CBGS claims according to vaginal delivery, assisted vaginal delivery, and cesarean delivery; respectively. All analyzed data showed that hospital cost was always higher than INA-CBGS claim. In spontaneous vaginal delivery and assisted vaginal delivery, the highest mean cost was contributed by non-surgery procedure around 26-34%. Meanwhile, in cesarean delivery, the highest proportion of hospital cost was coming from surgery procedure (55-59%).

Table 2. Summary, Mean, Percentage, and Different Component of Hospital Cost in RSUD SoE to INA-CBGS Claim for Obstetrics Cases (spontaneous, assisted vaginal, and cesarean delivery) According to the Inpatient Hospital Class.

Obstetric Cases	Inpatient Hospital Class															
	Spontaneous Vaginal Delivery						Assisted Vaginal Delivery				Cesarean Delivery					
	I (IDR)	*p-value (%)*	II (IDR)	*p value (%)*	III (IDR)	*p-value (%)*	II (IDR)	*p-value (%)*	III (IDR)	*p-value (%)*	I (IDR)	*p-value (%)*	II (IDR)	*p-value (%)*	III (IDR)	*p-value (%)*
Number of cases (N)	4		14		106		1		12		9		13		86	
LOS (average) (days)	2		2		2		2		2		4		3		3	
Hospital cost (average)	3,993		4,087		4,183		4,604		3,989		13,574		15,006		12,847	
Lowest hospital cost	2,963		2,508		1,257				2,502		11,308		11,206		1,782	
Highest hospital cost	4,414		7,241		10,461				6,308		17,284		31,463		26,681	
Non-surgery procedure (mean)	1,100	28	1,273	31	1,410	34	1,200	26	1,200	30	7,935	58	8,320	55	7,527	59
Lowest	1,000		1,000		1,000				1,200		6,935		6,935		369	
Highest	1,200		2,400		5,700				1,200		11,435		11,437		11,435	
Medicine (mean)	407	10	427	10	578	14	390	8	476	12	2,180	16	3,717	25	2,133	17
Lowest	316		315		104				210		1,735		1,857		250	
Highest	462		742		7,048				1841		2,403		20,784		8,520	
Nursing (mean)	880	22	1,174	29	991	24	1346	29	943	24	1,008	7	742	5	856	7
Lowest	445		401		65				155		446		577		161	
Highest	1,068		2,395		2,506				1,964		2,728		1.077		7.621	
Laboratory (mean)	332	8	359	9	369	9	343	7	392	10	508	4	511	3	600	5
Lowest	243		243		75				210		46		221		66	
Highest	391		636		832				771		882		1,044		6,619	
Room charge (mean)	750	19	846	21	710	17	900	20	728	18	1,121	8	1,055	7	1,163	9
Lowest	600		360		50				540		730		630		25	
Highest	900		1,980		1,800				1,260		1,500		1,230		2,790	
Disposable medical supplies (mean)	100	3	88	2	95	2	100	2	77	2	119	1	107	1	121	1
Lowest	100		50		25				25		100		100		25	
Highest	100		150		500				200		150		125		1,500	
Consultation (mean)	350	9	182	4	154	4	175	4	177	4	261	2	250	2	255	5 2
Lowest	200		100		25				75		225		150		23	
Highest	750		375		400				275		300		375		900	
Supporting item (mean)	100	3	123	3	138	3	150	3	114	3	211	2	184	1	201	2
Lowest	100		100		50				50		150		150		100	
Highest	100		200		532				246		299		300		600	
Blood transfusion (mean)	N/A		N/A		1,033	25	N/A		N/A		1,860	14	1,240	8	930	7
Lowest					620						1,860		1,240		620	
Highest					1,240						1,860		1,240		1,860	
INA-CBGS claim (average)	2,390		2,094		1,829		2,394		1,912		7,258		6,224		4,983	
Difference (average)	-1,603	-67	-1,993	-95	-2,354	-129	-2,210	-92	-2,077	-109	-6,316	-87	-8,782	-141	-7,864	-158

IDR: Indonesian Rupiah. P: Proportion* All values in thousand rupiah

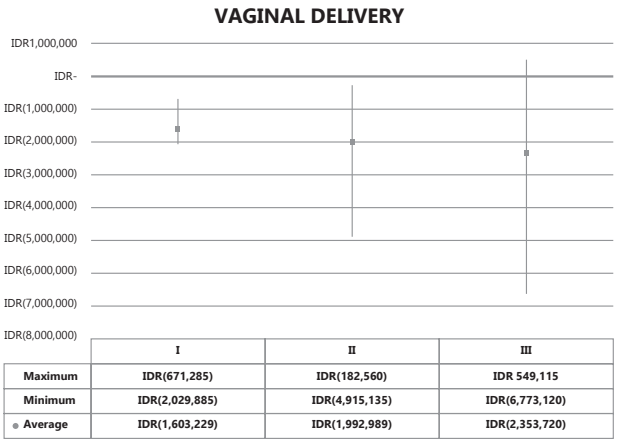


Figure 1. Average, minimum, and maximum value of difference between hospital cost and INA-CBGs claim for vaginal delivery

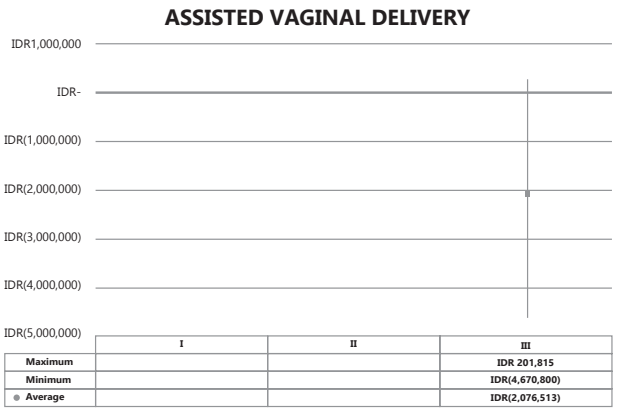
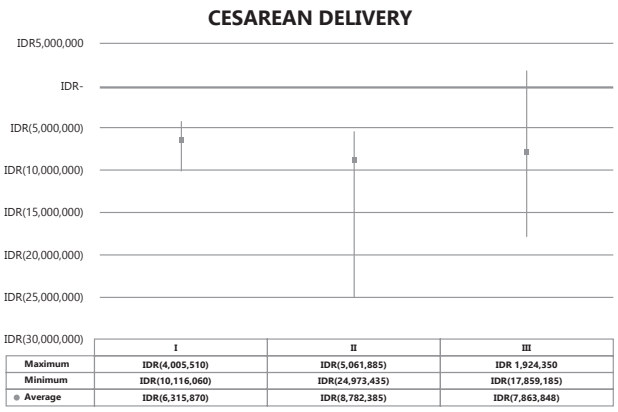


Figure 2. Average, minimum, and maximum value of difference between hospital cost and INA-CBGs claim for assisted vaginal delivery



	I	II	III
Maximum	IDR(4,005,510)	IDR(5,061,885)	IDR 1,924,350
Minimum	IDR(10,116,060)	IDR(24,973,435)	IDR(17,859,185)
Average	IDR(6,315,870)	IDR(8,782,385)	IDR(7,863,848)

Figure 3. Average, minimum, and maximum value of difference between hospital cost and INA-CBGs claim for caesarean delivery

DISCUSSION

There was a significant difference between hospital cost in RSUD SoE and INA-CBGs claim. The hospital costs are determined per service details according to the standard costs outlined by Regulation of Timor Tengah Selatan Regent Number 1 of 2021 concerning the redistribution of public services, and Number 24 of 2021 concerning hospital costs in the Timor Tengah Selatan district [16,18]. On the other hand, INA-CBGs claims are calculated based on diagnosis code grouping (ICD-X) with prospective payment method. Prospective payment method means that the payment is carried out by health service known before providing treatment to the patients. The cost divided into regional area and hospital type has been set by Regulation of Indonesian Minister of Health in 2016 [5].

The determination of hospital cost considers several aspects such as society's ability to pay, hospital services based on sophisticated degree of treatment and inpatient classroom, providing cost relief for poor people as appropriate to General Directorate of Medical Services corporation with BPJS.[19] The summary of the actual hospital cost, it showed that non-surgery or surgery procedure contributed to the highest hospital actual cost (26-59%). Meanwhile, disposable medical supplies and supporting item became the two lowest of hospital actual cost around 1-3%.

Several factors contribute to the significant cost difference between the hospital and INA-CBGs claims, including coding accuracy, efficiency, remuneration, hospital management, and clinical pathways. In the implementation of INA-CBGs claims, accurate coding is crucial, as it impacts the grouper results within the INA-CBGs application, and is inherently linked to the claimed costs. Observation indicated that certain claimed diagnoses and procedures were inconsistent with reality. Most reports contained codes for mild levels of claim severity, although, as the sole referral hospital in the Timor Tengah Selatan district, more moderate to severe claim codes would be expected. For instance, the omission of blood transfusions from the procedure list for INA-CBGs claims could affect the severity of the diagnosis. The improper completion of claim records by non-health providers led to the under-recording of disease severity and performed procedures in the actual INA-CBGs claim. A previous study concluded that internal accuracy in recording diagnoses and procedures significantly impacts INA-CBGs claims[20].

In the case of cesarean delivery, surgery procedures exceeded the INA-CBGs claims. Efficiency should be instituted in all aspects of actual hospital costs. Surgery procedures encompass the costs of operating theater usage, anesthesia and obstetric medications, and surgical tools. Hospital managers should assess the high cost associated with this procedure's contribution to the overall cost. Efficiency initiatives can begin with the planning of generic medications used in the hospital, purchasing medications through e-catalogs, promoting standard drug formularies, arranging medications and surgical tools within operating theaters, conducting laboratory examinations in line with medical indications, and holding evaluation meetings to discuss monthly claim differences within the management[21].

Through efficiency, cost control is necessary to maintain economic stability in a hospital without regarding the health quality of services. Efficiency has the role to balance between cost and good quality of health services[22]. Several determinants of hospital efficiency consist of competition, LOS, bed occupancy rate (BOR), ratio of doctors and nurses to patients, use of technology, family structure, and health policy [23].

Given that RSUD SoE functions as a local public service agency (BLUD), the hospital manager must consider the financial aspect. Currently, the hospital's income is allocated as 60% for operational expenditures and 40% for remuneration. This allocation should be inverted, resembling the structure of RSUD Budhi Asih in Jakarta, where 60% is dedicated to remuneration. The remuneration system, known as the medical services fee, is built upon three

fundamental principles: pay for position, pay for performance, and pay for people[21,24]. Therefore, to apply those basic principles, there was a need of indexing to produce the scores including basic index, positioning index, competency index, emergency index, risk index, performance index, and employees' attendances. By revising the remuneration system, it can be a motivation for hospital health workers to perform efficiency to minimalize the difference of costs.

To control hospital expenses is through standardization of service such as reducing the variation in services and increasing the procedure of cost-quality control in high-cost and also high-volume cases. A case manager should run these tasks to manage the hospital [10]. Unfortunately, there was no case manager in RSUD SoE, yet. Thus, the expenses of hospital actual cost in both vaginal and cesarean delivery can exceed 67-158% higher than INA-CBGs claim. Apart from that, the LOS of vaginal delivery and cesarean delivery was around 2 and 3-4 days, consecutively. LOS longer than expected will increase the hospital expenses which contribute to higher cost than INA-CBGs claim. Therefore, the implementation of clinical pathways is paramount for enhancing efficiency. Despite the substantial monthly delivery rates at the hospital, clinical pathways have not been introduced for either vaginal or cesarean deliveries. As a matter of fact, numerous deliveries take place at the hospital each month. Clinical pathways involve the integration of diagnosis and treatment, incorporating evidence-based medical service standards and measurable nursing care objectives during hospitalization. This implementation aligns with clinical governance principles aimed at maintaining and enhancing health service quality within affordable cost boundaries. It's crucial for a case manager to oversee this implementation[22].

CONCLUSION

There was a significant difference of hospital cost and INA-CBGs claim for obstetric services in RSUD SoE. To minimalize the disparity cost between hospital and INA-CBGs claim, several strategics include filling the accurate diagnosis and surgery procedure supervised by health providers, performing efficiency, stating good remuneration to hospital health workers, and controlling hospital through clinical pathway.

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