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Research Article

Determining Factors in Choosing a Caesarean Section: The Role of Health Financing and Availability of Health Facilities in Indonesia

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Abstract: The rising global cesarean section (SC) rate, projected to reach 29% by 2030, is a concern in Indonesia, where SC prevalence increased to 25.9% in 2023 from 17.6% in 2018. While medical indications drive SC, non-clinical factors like financing and healthcare access may contribute to overuse. This study examines the role of Indonesia's BPJS health insurance and hospital availability in determining SC utilization. A cross-sectional analysis was conducted using SKI 2023 data, including 70,916 women with deliveries between 2018 and 2023 (weighted n = 20,076,001). Bivariate associations were assessed using chi-square tests with complex sample design, applying survey weights for national representativeness. SC prevalence was 25.9%, with 34.9% of BPJS-covered deliveries being SC compared to 10.8% for out-of-pocket payments ($p < 0.001$). Hospital availability within the district was associated with a 27.0% SC rate versus 16.1% where no access existed ($p < 0.001$). Private insurance (50.3%) and employer-funded (37.4%) deliveries also showed higher SC rates. BPJS coverage and hospital availability significantly influence SC utilization in Indonesia, suggesting improved access but potential overuse. Rural disparities highlight the need for infrastructure investment to ensure equitable maternal care under Universal Health Coverage. Further research with causal methods is recommended.

Keywords: Cesarean section; BPJS; Healthcare; access; Indonesia

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1. Introduction

The increase in caesarean section (CS) deliveries has become a global concern, with an estimated 21% of deliveries being carried out by CS and this will continue to increase to 29% by 2030 (WHO, 2021). The proportion of CS deliveries in Indonesia is 25.9%, an increase compared to the 2018 Riskesdas results of 17.6% (Badan Kebijakan Pembangunan Kesehatan, 2023; Kemenkes RI, 2018). The choice of delivery method must be based on medical indications, because CS delivery has a mortality risk 3 times higher than normal delivery and triggers neonatal complications (Mena-Tudela et al., 2020). Current medical interventions are overused, leading to an increased trend of CS deliveries and increased medical costs (Shadi Sabetghadam et al., 2022).

The determining factors for choosing a cesarean section delivery method are very diverse, including medical indications, namely previous childbirth history, complications during pregnancy and childbirth, and comorbidities; maternal preferences such as gestational age, maternal age, and parity; and socioeconomic factors such as occupation, income, residence, access to health facilities, and ownership of health insurance or insurance (Ashar

& Kusrini, 2020; Fristika, 2023; C. V. A. Putri et al., 2022; Siregar et al., 2023). In terms of financing, the National Health Insurance (JKN), managed by the BPJS Kesehatan (Social Security Agency for Health), has become a key pillar in increasing access to healthcare services, including childbirth. Access to healthcare facilities also plays a crucial role in determining delivery methods. Urban areas generally have better infrastructure than rural areas, making access to healthcare easier and less time-consuming. Urban mothers are more likely to give birth by caesarean section than those in rural areas (Ashar & Kusrini, 2020).

The increasing number of cesarean deliveries also has implications for the sustainability of Indonesia's healthcare financing system. The higher costs incurred by hospitals compared to those covered by BPJS Kesehatan (Indonesian National Health Insurance) at INA-CBGs rates pose a major challenge to achieving universal healthcare coverage (Mustofa & Meliala, 2024; Pradnyantara, 2023). This can also affect the sustainability of financing management in hospitals (Ewi et al., 2025; Nurhayati et al., 2023).

Based on this context, this study aims to analyze the factors influencing the choice of cesarean delivery in Indonesia, with a focus on the role of financing and access to health facilities, using the 2023 SKI data. This study is expected to provide empirical evidence to support the development of more inclusive and sustainable health policies, particularly in reducing the disparity in access and the cost burden of cesarean delivery in Indonesia.

2. Materials and Method

Study Design

A cross-sectional study was used in this study, utilizing secondary data from the 2023 Indonesian Health Survey (SKI). The raw data used in this study came from individual questionnaires related to childbirth history (coded H32 "What was the method of delivery") and health insurance coverage (coded H31 "Where did the funding for delivery come from"). Data related to access to healthcare facilities, particularly hospitals, were also collected from household questionnaires (coded B5R1DK2 "Existence of hospitals"). The independent variables in this study were healthcare financing and the availability of healthcare facilities, while the dependent variable was the method of delivery.

Population and Sampling Procedure

The population in this study was all women of reproductive age who gave birth between 2018 and 2023. A total of 70,916 mothers with a history of childbirth in the past five years since the survey was conducted and who were successfully interviewed by enumerators. Total sampling was used in the study, selecting all mothers with a history of childbirth in the past five years.

Population and Sampling Procedure

Descriptive analysis was used to determine the frequency distribution and percentage of each variable. The chi-square test was used in bivariate analysis to determine the relationship between the independent and dependent variables. The 2023 SKI dataset was collected using a multistage sampling design; therefore, a complex sample analysis was used in this study, incorporating weighting, primary sampling units, and strata. Statistical analysis was performed using IBM SPSS Statistics. This study used a 5% statistical significance level ($p \leq 0.05$) to determine the relationship between variables.

Ethical Considerations

This study uses secondary data sourced from the 2023 Indonesian Health Survey. The data used has received approval from the Ministry of Health by submitting a data submission to https://layanandata.kemkes.go.id/.

3. Results and Discussion

The research results were obtained from the 2023 SKI data, focusing on women of reproductive age who gave birth between January 2018 and the interview date in 2023. The sample consisted of 70,916 unweighted observations, representing a weighted population of 20,076,001 mothers. Univariate and bivariate analyses used weighting to ensure national representation.

Table 1. Distribution of frequency of cesarean delivery, health financing, and availability of health facilities.

Variable	Weighted		Un-Weighted		Standard error
	n	%	n	%	
Sectio delivery					
Yes sectio	5,190,264	25.9	17,178	24.2	95,062.803 (0.3%)
No sectio	14,885,736	74.1	53,738	75.8	60,100.279 (0.3%)
Financing source					
BPJS	11,940,193	59.5	45,024	63.5	87,610.289 (0.3%)
Private insurance	233,902	1.2	755	1.1	14,798.687 (0.1%)
Employer-funded	203,209	1.0	593	0.8	14,806.715 (0.1%)
Self-financing or other financing	7,698,696	38.3	24,544	34.6	79,250.407 (0.3%)
Hospital availability					
Hospital in their district	17,142,439	85.4	58,938	83.1	102,891.201 (0.3%)
Hospital in neighboring districts	1,709,865	8.5	6,752	9.5	41,167.005 (0.2%)
Without access	623,299	3.1	3,167	4.5	22,911.382 (0.1%)
Didn't know	600,396	3.0	2,059	2.9	25,685.557 (0.1%)

Prevalence of Cesarean Section

Based on the data presented in Table 1, the prevalence of cesarean deliveries in Indonesia over the past five years (2018-2023) was 25.9%, equivalent to 5,190,264 deliveries. Meanwhile, 74.1% of deliveries in Indonesia, equivalent to 14,885,736 deliveries, were non-cesarean deliveries, including vaginal deliveries, vacuum-assisted deliveries, forceps deliveries, and others. A standard error of 0.3% indicates a highly accurate estimate.

This prevalence aligns with the trend reported in the 2023 Indonesian Child Health Survey (SKI) and the global trend of increasing cesarean section prevalence annually. The significant increase in cesarean deliveries has a worrying impact on the availability of adequate resources for safe deliveries. Increased maternal and infant mortality is likely to occur without further control over delivery procedures, and overuse of cesarean sections is also possible without the necessary indications for cesarean delivery (Betran et al., 2021; Lebedenko et al., 2021).

Health Financing Utilization

The utilization of health financing in Indonesia for childbirth can be seen in Table 1. The majority of people use BPJS (Indonesian Social Security Agency) (BPJS Kesehatan), both PBI and non-PBI, for childbirth payments, at 59.5%, equivalent to 11,940,193 deliveries. Self-financing and other financing methods, including payments from others, village funds, and other assistance, are also widely used by 38.3%. Private health insurance and office payments account for 1.2% and 1%, respectively.

As an effort to reduce the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR), the government is optimizing the national health insurance program, BPJS Kesehatan, within Indonesia's health financing system, including childbirth. The mutual cooperation system used by BPJS makes it easier for people from lower-middle income backgrounds to

obtain optimal healthcare services at healthcare facilities. The government has combined the Askes program for Civil Servants, Jampersal, Jamkesda, and Jamsostek into BPJS Kesehatan (Estetika, 2021; D. U. Putri et al., 2022; Salman et al., 2024).

Availability of Healthcare Facilities

The majority of healthcare facilities, particularly hospitals, are located within the districts/cities where the population resides (85.4%, or 17,142,439). Hospitals located in the nearest districts/cities account for 8.5%. The number of hospitals in Indonesia has increased, both government-owned and private. This increase has a positive impact on the community, as it allows people to access healthcare more easily, requiring less travel time and lower accommodation costs. This can positively impact public health.

Some remote areas still face difficulties in accessing healthcare facilities due to distance, geographical constraints, and socioeconomic factors. The increasing number of hospitals collaborating with the National Health Insurance (BPJS) makes healthcare more accessible to the public. The challenge also lies in the need to improve human resources and infrastructure to support the services provided by hospitals (Hammad & Ramie, 2022; Nurulisah & Zaky, 2021).

The relationship between health financing and the availability of health service facilities and caesarean section deliveries

Table 2 presents the weighted relationship between financing source, hospital availability, and CS delivery. Women with BPJS insurance had a significantly higher CS rate, at 34.9% (n = 4,164,320) compared to 10.8% (n = 832,358) among those with self-financing or other financing. Private and employer-funded deliveries had CS rates of 50.3% (n = 117,539) and 37.4% (n = 76,045), respectively, although these groups were smaller. Regarding hospital availability, the prevalence of CS was 27.0% (n = 4,635,386) for women with access in their district, 22.1% (n = 377,854) for those in neighboring districts, 16.1% (n = 100,144) without access, and 12.8% (n = 76,878) for those who did not know.

Table 2. The relationship between health financing and the availability of health service facilities and caesarean section deliveries.

Variable	Yes sectio		No sectio		p-value
	n	%	n	%	
Financing source					<0.001*
BPJS	4,164,320	34.9	7,775,873	65.1	
Private insurance	117,539	50.3	116,362	49.7	
Employer-funded	76,045	37.4	127,163	62.6	
Self-financing or other financing	832,358	10.8	6,866,338	89.2	
Hospital availability					<0.001*
Hospital in their district	4,635,386	27.0	12,507,052	73.0	
Hospital in neighboring districts	377,854	22.1	1,332,011	77.9	
Without access	100,144	16.1	523,155	83.9	
Didn't know	76,878	12.8	523,517	87.2	

*p-value<0.05

Bivariate analysis showed a significant association between BPJS coverage and higher cesarean section (CS) rates, with 34.9% of BPJS-covered deliveries being cesarean sections compared to 10.8% for direct payments ($p < 0.001$). This suggests that BPJS facilitates access to cesarean sections, likely by reducing financial barriers and enabling hospital-based care, consistent with global trends where UHC increases procedural interventions. Notably, private insurance (50.3%) and employer-funded deliveries (37.4%) showed higher cesarean section rates, likely reflecting a preference for private facilities or medical indications among the insured group. Hospital availability in the district was also a significant factor, with a cesarean

section rate of 27.0% compared to 16.1% where there was no access ($p < 0.001$), underscoring the role of infrastructure in cesarean section utilization.

Having health insurance, whether through BPJS (Social Security), private health insurance, or paid for by the office, significantly correlates with choosing a cesarean delivery. Mothers who use their own funds are more likely to choose a vaginal delivery. This is due to the higher costs of a cesarean delivery compared to a vaginal delivery. Mothers with health insurance don't need to worry about the costs involved, as everything is covered, except for supplies for the mother and baby (Emma et al., 2020; Mustofa & Meliala, 2024; Pristya et al., 2021).

4. Conclusion

BPJS coverage and hospital availability are significant determinants of SC in Indonesia, with significant urban-rural disparities. These findings underscore the need for an integrated UHC strategy that balances access with clinical appropriateness, warranting further causal research with detailed clinical data.

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