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DETERMINE THE POLICY TARGET TO INCREASE INSTITUTIONAL DELIVERY AMONG INDONESIAN FEMALE WORKERS

Menentukan Target Kebijakan Persalinan Institusi pada Pekerja Perempuan Indonesia

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Abstract

Introduction: Indonesia continues to face a significant challenge in terms of maternal and infant mortality. The government is working to promote the use of health facilities for childbirth to mitigate maternal mortality.
Aim: The study aims to determine the policy target to increase the rate of institutional delivery among female workers in Indonesia.
Methods: The study analyzed secondary data from the 2023 Indonesian Health Survey. It conducted cross-sectional research on 30,173 female workers. In addition to institutional delivery as the dependent variable, we examined eight independent variables: residence, age, education, marital status, wealth, insurance, antenatal care (ANC), and parity. The analysis involved bivariate method followed by binary logistic regression in the last stage.
Results: Approximately 70.6% of female workers had institutional delivery. Female workers in urban areas were 1.157 times more likely than rural workers to perform institutional delivery (95%CI 1.153-1.161). Three worker characteristics (age, education, and marital status) were related to institutional delivery. Wealthier workers had a greater the possibility of executing institutional delivery. Insured workers were more likely than the uninsured ones to deliver in health facilities. Female workers with adequate ANC were 1.210 times more likely than those with inadequate ANC to execute institutional delivery (95%CI 1.166-1.256). Additionally, women with fewer childbirths had a higher probability of performing an institutional delivery.
Conclusion: The policy target to increase institutional delivery was women workers in rural areas who were older, had poor education, were divorced/widowed, were the poorest, had inadequate ANC, were uninsured, and were grand multiparous.

Keywords: institutional delivery, institutional birth, maternal health, female worker, public health.

Abstrak

Latar Belakang: *Indonesia terus menghadapi tantangan signifikan dalam hal kematian ibu dan bayi. Pemerintah berupaya untuk mempromosikan penggunaan fasilitas kesehatan untuk persalinan.*
Tujuan: *Studi bertujuan menentukan target kebijakan untuk meningkatkan persalinan di fasilitas kesehatan diantara pekerja perempuan Indonesia.*
Metode: *Riset cross-sectional mengevaluasi informasi dari Survei Kesehatan Indonesia 2023, mengevaluasi 30.173 responden. Selain persalinan di fasilitas kesehatan sebagai variabel dependen, kami memeriksa delapan faktor independen: usia, tempat tinggal, pendidikan, kekayaan, perkawinan, asuransi, perawatan antenatal (ANC), dan paritas. Pertama, studi menggunakan analisis bivariate sebelum regresi logistik biner pada tahap akhir.*
Hasil: *Sekitar 70,6% pekerja perempuan melakukan persalinan di fasilitas kesehatan. Pekerja perempuan di perkotaan 1,157 kali lebih mungkin daripada pekerja pedesaan untuk melakukan persalinan di fasilitas kesehatan (95%CI 1,153-1,161). Tiga karakteristik pekerja terkait dengan persalinan di fasilitas kesehatan: usia, pendidikan, dan perkawinan. Semakin kaya pekerja, semakin besar kemungkinan untuk bersalin di fasilitas kesehatan. Semua jenis asuransi lebih mungkin untuk bersalin di fasilitas kesehatan daripada yang tidak diasuransikan. Pekerja perempuan dengan ANC memadai memiliki kemungkinan 1,210 kali lebih besar daripada yang tidak untuk melakukan persalinan di fasilitas kesehatan (95%CI 1,166-1,256). Semakin sedikit seorang perempuan melahirkan, semakin tinggi kemungkinan untuk melakukan persalinan di fasilitas kesehatan.*
Kesimpulan: *Target kebijakan untuk meningkatkan persalinan di fasilitas kesehatan adalah pekerja perempuan di daerah pedesaan yang berusia lebih tua, berpendidikan rendah, bercerai/janda, paling miskin, melakukan ANC tidak memadai, tidak diasuransikan, dan multipara.*

Kata kunci: *persalinan institusi, kesehatan maternal, pekerja perempuan, kesehatan masyarakat.*

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Introduction

The Maternal Mortality Ratio (MMR) is defined as the number of maternal deaths per 100,000 live births within a defined timeframe. This statistic reflects the probability of maternal mortality due to complications arising from pregnancy, childbirth, or the postpartum period. Similarly, the Infant Mortality Rate (IMR) is the number of infant fatalities per 100,000 live births. The number of deaths per 1,000 live births is used to measure this statistic (OECD, 2021). Both MMR and IMR measure a nation's health status, reflecting the efficacy and quality of healthcare services. Lower Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) indicate superior maternal health services in a country or region (Laksono *et al.*, 2023).

Indonesia ranks third in MMR among ASEAN countries, with an MMR of 173. Respectively holding the first, second, fourth, and fifth highest maternal mortality ratios are Cambodia at 218 and Myanmar at 179, the Philippines at 78, and Brunei Darussalam at 44. Three countries with the lowest MMR are Thailand at 29, Malaysia at 29.21, and Singapore, which has the lowest, MMR at just 7 (Armavillia, 2023). Meanwhile, Indonesia's IMR in 2024 was 15,488 deaths per 1000 live births, down 2.71% from 2023. However, this figure is higher than Egypt's 12,816 and Ukraine's 5,795 (Prospects, 2024). This data shows that MMR and IMR in Indonesia are still priority health problems that require serious attention.

The Indonesian government promotes institutional delivery to decrease maternal and infant mortality rates. Regulation Number 97 of 2014, issued by the Indonesian Ministry of Health, stipulates in Article 14, paragraph 1, that birth must occur in a medical facility. The objective of this regulation is to reduce the incidence of illness and mortality among mothers and newborns (The Indonesian Ministry of Health, 2014). However, we are still having trouble getting more trained medical staff to help with deliveries at health service centers (Putri and Laksono, 2022).

Prior studies have reported that 73.8%of mothers in Indonesia, 88.0% of Philippines mothers, 39.6% of mothers in Gilgelbelles City, northwest Ethiopia, 28.8%of women in the Benishangul Gumuz region, southwest Ethiopia, 72% of mothers in Bule Hora City, and 44.82% of mothers in Bangladesh delivered at healthcare facilities. Several factors were significantly associated with delivering in a hospital. These include the mother's age, the age at which she first became pregnant, her father's educational attainment, her education, her children's education, her mindset, her decision-making capabilities, her marital status post-18, her knowledge of childbirth preparation and emergency procedures, experiencing at least one complication during pregnancy, having fewer than two children, her capacity to travel less than thirty minutes to the nearest hospital, and her avoidance of traditional birthing methods (Arega *et al.*, 2022; Tarik *et al.*, 2022; Laksono *et al.*, 2023; Philippine Statistics Authority and The DHS Program, 2023; Afaya *et al.*, 2024). According to this data, there are still many obstacles to overcome before using institutional delivery services.

Conversely, employed women typically do not utilize health centers for deliveries. Research in Indonesia suggests that employment is advantageous for mothers who deliver in healthcare institutions, aligning with your assertion (Putri and Laksono, 2022; Ipa *et al.*, 2023). However, a female worker has three challenges related to family responsibilities, workplace environment, and stereotypes (ALobaid *et al.*, 2020). Although, working women may seem normal to people today, but there are still cultural barriers that make their dual tasks even worse and keep gender inequality going. Even for women who do not have to deal with strict cultural norms, getting a job can still be challenging because they do not have many educational choices and their income is low (Aziz, 2023). The dual burden puts women at risk of not being able to utilize healthcare services optimally. This study aimed to determine the policy target to increase the institutional delivery rate among Indonesia's female workers.

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Method

Study Design, Data Source, and Participants

The study analyzed the 2023 Indonesian Health Survey data administered by the Indonesian Ministry of Health. The survey employed interviews with individual and household instruments and multistage and stratified random sampling techniques. Data collection occurred from May to July 2023, with a response rate of 91.49% (The Indonesian Ministry of Health, 2024).

The study population consisted of female workers in Indonesia who had given birth five years before the interview. Female workers in this study include civil servants, army, police, government company employees, private employees, entrepreneurs, farmers, fishermen, laborers, and other non-formal employees. The cross-sectional study's weighted sample included an investigation of approximately 30,173 workers.

Dependent and Independent Variables

The dependent variable in this study was institutional delivery, defined as births occurring in medical facilities, such as hospitals and health centers. The study categorized institutional delivery into two groups: "yes" and "no".

The study encompassed eight independent factors: residence, age, marital, education, insurance, wealth, ANC, and parity. The residence comprises urban and rural locations.

We categorized age into ≤19, 20-24, 25-29, 30-34, 35-39, 40-45, and ≥45. Marital status comprises married or divorced/widowed. Moreover, education encompasses five categories: none, primary school, junior high school, senior high school, and college.

The survey evaluated a household's wealth by considering the wealth quintile of its possessions. Households were assessed according to the quantity and diversity of amenities, such as televisions, vehicles, or bicycles, and the quality of their dwelling, including access to potable water, toilet facilities, and the materials utilized in constructing the ground level. The study employed principal component analysis to obtain the score. The 20% of the population that formed five distinct groups were categorized into national wealth quintiles by combining the household scores of each household member. The wealth status categories include the poorest, poorer, middle, more prosperous, and richest (Wulandari, Laksono, Prasetyo, *et al.*, 2022).

The Indonesian government still uses the alternative ANC model even though the World Health Organization said in 2016 that the minimum number of ANC meetings should be raised from four to eight. It is suggested that women who are pregnant typically get ANC treatments at least six times. The first period has one visit, the second has two, and the third has three. It is recommended to see a doctor twice, especially on the first visit during the first trimester and on the fifth visit during the third trimester (Laksono *et al.*, 2023). The study classifies ANC completeness into two categories: inadequate (<6 visits) and adequate (≥6 trips).

The research divided health insurance into uninsured, government-run, private-run, and a combination of government and private-run. Meanwhile, parity represented the total number of births, comprising primiparous (≤1), multiparous (2-4), and grand multiparous (> 4).

Data Analysis

Initially, we performed a bivariate analysis with the Chi-Square test. The second stage employed the collinearity test to verify the absence of significant association among the independent variables. In the concluding phase, we conducted a binary logistic regression analysis. The study's adjusted odds ratios were accompanied by 95% confidence intervals. Furthermore, IBM SPSS 26 was employed for the study.

Additionally, ArcGIS 10.3 (ESRI Inc., Redlands, CA, USA) delineated the distribution of institutional delivery ratios among Indonesian female workers. The Indonesian Statistics provided a shapefile including administrative border polygons.

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Result and Discussion

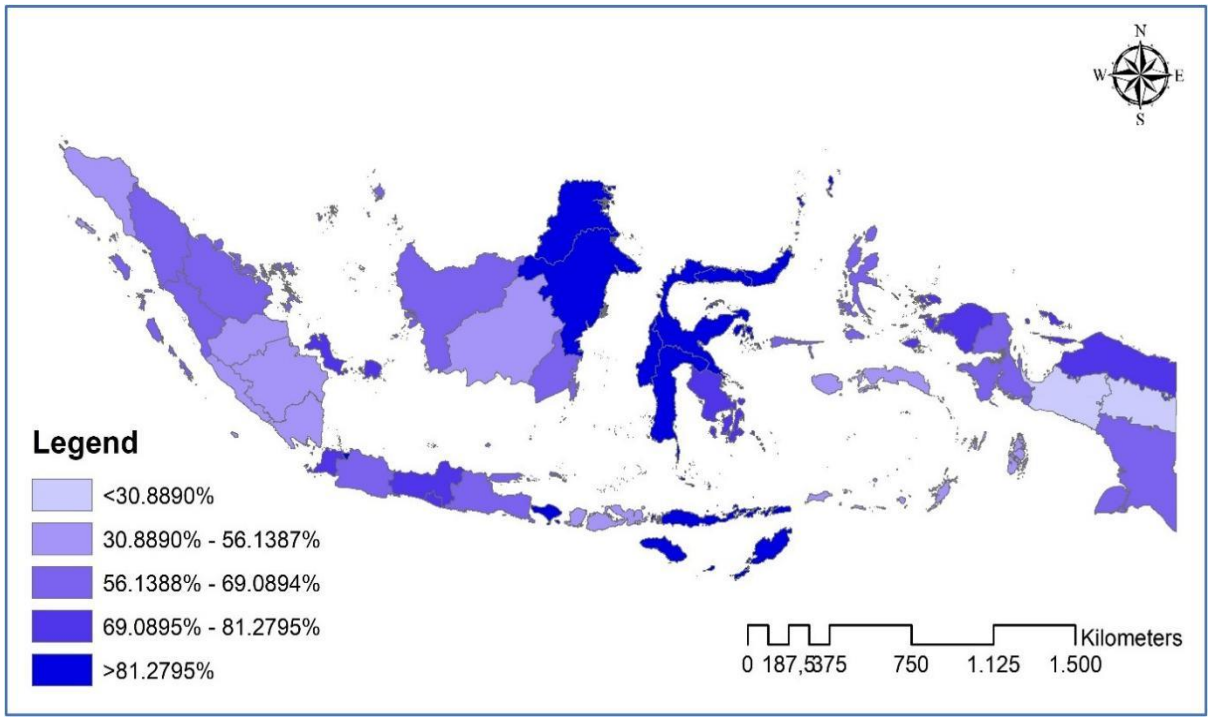
The data reveal that 70.6% of female workers in Indonesia deliver in institutional settings. Figure 1 presents a geographical representation of the prevalence of institutional delivery among Indonesian female workers. The figure indicates that the highest ratio of institutional delivery among female workers tends to be in the central region. The achievements of the central region tend to be better than those of the Java-Bali region as the center of government. This situation shows the results of efforts to equalize health development, which is not only focused on the center of government (Laksono, Wulandari and Rukmini, 2021; Laksono *et al.*, 2023).

Table 1 shows that female workers in urban areas have a higher institutional delivery proportion than workers in rural areas. Regarding the age group, 40-44 has the highest institutional delivery ratio. According to education, education correlates positively with the fraction of institutional deliveries. Moreover, married workers have a higher proportion of institutional delivery than divorced/widowed workers.

Table 1 highlights that the wealthier the workers are, the higher the institutional delivery ratio. According to health insurance ownership, the insurance combination (government and private-run) has the highest institutional delivery ratio.

Meanwhile, regarding the ANC's completeness, workers with completed ANC have a higher proportion of institutional delivery. Furthermore, primiparous workers have the highest institutional delivery regarding parity.

In the next phase, the collinearity evaluation was conducted. The results suggest a minimal or negligible correlation among the independent factors. The tolerance value for each factor is ≥ 0.10. Furthermore, the variance inflation factor value for each variable is below 10.00. The outcome demonstrates that the regression model exhibits no multicollinearity.



Source: Visualization by the author

Figure 1. The geographical representation of the proportion of institutional delivery among female workers by Indonesia's province in 2023

Indonesian Journal of Health Administration
(Jurnal Administrasi Kesehatan Indonesia)
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10.20473/jaki.v12i2.2024.228-237

Table 1. The results of bivariate analysis

Demographic Characteristics	Institutional Delivery		p-value
	No (n=8,749)	Yes (n=21,424)	
Residence			<0.001
• Urban	24.7%	75.3%	
• Rural	35.2%	64.8%	
Age group			<0.001
• ≤19	41.6%	58.4%	
• 20-24	34.3%	65.7%	
• 25-29	29.9%	70.1%	
• 30-34	28.7%	71.3%	
• 35-39	28.1%	71.9%	
• 40-44	26.1%	73.9%	
• ≥45	31.4%	68.6%	
Education Level			<0.001
• No education	55.6%	44.4%	
• Primary School	39.8%	60.2%	
• Junior High School	36.1%	63.9%	
• Senior High School	28.6%	71.4%	
• College	19.0%	81.0%	
Marital status			<0.001
• Married	29.1%	70.9%	
• Divorced/Widowed	36.9%	63.1%	
Wealth Status			<0.001
• Poorest	41.4%	58.6%	
• Poorer	35.6%	64.4%	
• Middle	33.6%	66.4%	
• Richer	29.2%	70.8%	
• Richest	19.3%	80.7%	
Health Insurance			<0.001
• Uninsured	48.4%	51.6%	
• Government-run	25.0%	75.0%	
• Private-run	16.1%	83.9%	
• Government + Private-run	15.8%	84.2%	
Antenatal Care			<0.001
• Inadequate	32.9%	67.1%	
• Adequate	29.4%	70.6%	
Parity			<0.001
• Primiparous	26.0%	74.0%	
• Multiparous	30.7%	69.3%	
• Grand Multiparous	35.3%	64.7%	

Table 2 reveals that female workers in urban regions are 1.157 times more likely than rural workers to perform institutional delivery (95%CI 1.153-1.161). The condition suggests that residence is related to institutional childbirth. A study in Myanmar documented that rural women are less expected to have institutional births compared to urban areas (Rashid *et al.*, 2022).

Meanwhile, a study in Indonesia reported that the ease of transportation and facilities in urban regions is better than in rural regions; this condition strengthens the reasons for institutional delivery in metropolitan areas (Wulandari, Laksono,

Indonesian Journal of Health Administration
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Nantabah, *et al.*, 2022). Several reasons why women in rural areas do not have institutional births are family influence, socio-economic, health belief status, geographic location of residence, family and community resources, and lack of knowledge (Nigusie *et al.*, 2021).

Regarding age group, all ages are likelier to perform institutional delivery than ≤19. The age factor is closely related to decision-making and maturation; sharing information from friends at work also influences this. A previous study reported that older age tended to have a greater likelihood of institutional delivery than those aged ≤19. Working women aged >19 have better access to information on childbirth benefits and have better knowledge and awareness (Olubodun *et al.*, 2023).

According to education, the better the education, the greater the likelihood of performing institutional childbirth. Workers with higher education tend to be more aware of their health. However, a lot of women don't give institutional birth because they don't know much about pregnancy and childbirth and don't use information services that are important for pregnancy care. This might reduce the number who give birth in a hospital (Afaya *et al.*, 2024).

Table 2. The results of binary logistic regression

Variables	Institutional Delivery			
	p-value	Adjusted Odds Ratio	95% Confidence Interval	
			Lower Bound	Upper Bound
Residence: Urban	<0.001	1.157	1.153	1.161
Residence: Rural (Ref.)	-	-	-	-
Age: ≤19 (Ref.)	-	-	-	-
Age: 20-24	<0.001	1.186	1.162	1.210
Age: 25-29	<0.001	1.189	1.166	1.213
Age: 30-34	<0.001	1.352	1.325	1.379
Age: 35-39	<0.001	1.497	1.467	1.527
Age: 40-44	<0.001	1.818	1.781	1.855
Age: ≥45	<0.001	1.615	1.578	1.652
Education: None (Ref.)	-	-	-	-
Education: Primary School	<0.001	1.746	1.724	1.767
Education: Junior High School	<0.001	1.867	1.844	1.891
Education: Senior High School	<0.001	2.215	2.188	2.243
Education: College	<0.001	2.831	2.795	2.867
Marital: Married	<0.001	1.262	1.251	1.273
Marital: Divorced/Widowed (Ref.)	-	-	-	-
Wealth: Poorest (Ref.)	-	-	-	-
Wealth: Poorer	<0.001	1.099	1.092	1.105
Wealth: Middle	<0.001	1.129	1.122	1.136
Wealth: Richer	<0.001	1.229	1.222	1.236
Wealth: Richest	<0.001	1.654	1.644	1.665
Insurance: Uninsured (Ref.)	-	-	-	-
Insurance: Government-run	<0.001	2.336	2.327	2.345
Insurance: Private-run	<0.001	3.261	3.217	3.307
Insurance: Government + Private-run	<0.001	3.388	3.310	3.468
ANC: Inadequate (Ref.)	-	-	-	-
ANC: Adequate	<0.001	1.210	1.166	1.256
Parity: Primiparous	<0.001	1.515	1.499	1.531
Parity: Multiparous	<0.001	1.101	1.090	1.111
Parity: Grand multiparous (Ref.)	-	-	-	-

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Table 2 shows that married workers are 1.262 times more expected than divorced/widowed workers to perform institutional childbirth (95% CI 1.251-1.273). The marital status determines the support from the family that strengthens decision-making (Megatsari *et al.*, 2021). A study reports that husbands who are knowledgeable about the dangers of childbirth and have good economics are essential for access to health facilities for childbirth. The husband also becomes a companion and reminds the wife about appropriate medical care (Tegegne *et al.*, 2023).

The study shows that institutional service is likely to happen when workers are wealthy. This situation indicates that workers with more money will use institutional delivery facilities because money affects how people decide and act to get good services. A recent study found that women with more excellent financial resources are more expected than those with less money to use health facilities for their deliveries (Laksono, Wulandari and Rukmini, 2021; Nigusie *et al.*, 2021). Several factors that inhibit giving birth in an institutional setting are the costs involved and the geographical distance that requires transportation (Damerow *et al.*, 2024).

Meanwhile, all insurance types are likelier than the uninsured to perform institutional delivery. Insurance positively impacts institutional births and is associated with hospital utilization among workers. Health services that refuse are subject to government sanctions (Laksono *et al.*, 2021). A Nepal study showed that women with insurance use health facilities more frequently than women without (Thapa *et al.*, 2023). Insurance can reduce the costs of institutional delivery; mothers feel protected and safe, and their use of birth services is increased. Research in Indonesia also illustrates this condition (Laksono, Wulandari and Matahari, 2021; Ipa *et al.*, 2023).

Regarding the ANC, workers who are adequate for it are 1.210 times more expected than those who are inadequate to execute institutional childbirth (95%CI 1.166-1.256). The importance of adequate ANC and optimal ANC quality ensures mothers use subsequent maternal care (Khanal, Bista and Mishra, 2024). Higher ANC visits and having undergone counseling about the importance of safe delivery and early detection of pregnancy complications are motivations for choosing a health facility for giving birth (Tarik *et al.*, 2022).

Based on parity, the fewer times a worker gives birth, the higher the probability of performing institutional delivery. The reason is to consider the safety of the mother and baby because the first experience of giving birth has many risks, such as the experience of a primiparous mother in Tanzania who chose to childbirth in a hospital (Straneo *et al.*, 2021). A study in Indonesia found that 84.6% of mothers with 1-2 children chose to give birth assisted in institutions (Dhewi, 2022). The study in Africa also found that most mothers with a birth parity of four or more chose to have their births assisted by non-health personnel at home (Agboyo *et al.*, 2024).

The findings indicate that younger mothers with multiple children, no formal education, living in rural areas, and from the poorest backgrounds are more expected to deliver outside healthcare establishments. This highlights significant healthcare access and education gaps, particularly for first-time mothers and those with many children. Delivering outside a health facility increases the complication risks for mothers and babies, potentially contributing to higher IMR and MMR if this trend persists.

Strength and Limitation

The research's strength is that it examines a large dataset, enabling comprehensive insights into essential things about female workers in Indonesia. However, as the study relies on secondary data, the poll only discusses the most critical aspects provided by the Ministry of Health, which owns the survey.

Conclusion

The findings led to the conclusion that the policy target to increase institutional delivery was female workers in rural areas, older age, with poor education,

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divorced/widowed, the poorest, incomplete ANC, uninsured, and grand multiparous.

We recommend that education initiatives focus on informing communities about pregnancy and delivery risk factors such as young age and high parity. Educational campaigns should emphasize the importance of prenatal care, healthcare delivery, and recognizing danger signs during pregnancy. Additionally, governments should identify individuals without health insurance and provide financial assistance at both central and local levels.

Abbreviations

ANC: antenatal care; MMR: maternal mortality ratio; IMR: infant mortality rate.

Declarations

Ethics Approval and Consent Participant

The research examined secondary data deemed "exempted" by the National Ethics Commission. The Ministry of Health collected the data for the survey after obtaining signed informed consent from the participants. Participants were required to sign a formal consent form to emphasize the voluntary and confidential nature of the data collection process.

Conflict of Interest

No conflict of interest.

Availability of Data and Materials

The data cannot be disclosed publicly due to the absence of authorization from the Indonesian Ministry of Health, the legitimate data owner. The dataset contains sensitive information, and its access is contingent upon prerequisites. Eligible researchers can obtain the dataset via https://layanandata.kemkes.go.id/.

Authors' Contribution

IMS and ADL formulated the proposal and conducted data analysis and interpretation. MF and NR substantially contributed to the investigation's execution and the manuscript's composition. DBL and ASA made significant contributions to the research and composition of the work. All writers reviewed and endorsed the final manuscript.

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Indonesian Journal of Health Administration
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