Original Article

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Quantifying the Effectiveness of Health Insurance in Reducing Home Births: Evidence from the 2023 Indonesia Health Survey

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Abstract:

Objective: To assess the association between different types of health insurance (National Health Insurance [NHI], private, and mixed) and the likelihood of home delivery among women in Indonesia.

Material and Methods: This secondary analysis used data from the 2023 Indonesia Health Survey, including 70,916 women who had given birth in the past five years. Home delivery was the outcome, and health insurance ownership (uninsured, NHI, private, mixed) was the exposure. Eight covariates were included. Binary logistic regression was used to estimate associations across individuals, with uninsured women as the reference group, and the results were reported as adjusted odds ratios (AORs) and 95% confidence intervals (CI).

Results: The prevalence of home delivery was 7.2%, and 22.7% of women were uninsured. Compared with uninsured women, those with NHI (AOR 2.218; 95% CI 2.210–2.226; p-value<0.001), private insurance (AOR 1.790; 95% CI 1.758–1.822; p-value<0.001), and mixed coverage (AOR 4.237; 95% CI 4.054–4.429; p-value<0.001) had significantly higher odds of facility-based delivery. Timely antenatal care was also strongly associated with reduced home delivery (AOR 2.330; 95% CI 2.322–2.339; p-value<0.001). Socioeconomic disparities persisted, with a higher likelihood of home delivery among women who were poorer, less educated, and living in rural areas.

Conclusion: Health insurance coverage was associated with a lower likelihood of home delivery in Indonesia, especially among women with mixed insurance coverage. Nonetheless, the observed relationships should be interpreted as associations rather than causal effects.

Keywords: big data, home delivery, maternal health, population health, public health

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Introduction

The maternal mortality ratio (MMR) is a key indicator used to assess progress in improving maternal health. The World Health Organization (WHO) defines MMR as the number of maternal deaths per 100,000 live births, and it is the official metric used to monitor the Sustainable Development Goal (SDG) indicator 3.1.1[1]. According to World Bank estimates, Indonesia's MMR was 117 maternal deaths per 100,000 live births in 2017. This measure differs from the maternal mortality rate, which refers to the number of maternal deaths per 100,000 women of reproductive age (15–49 years) and is less commonly used in global monitoring frameworks[2]. MMR is a serious health issue that has a tremendous impact on the growth and development of children, as well as families as a whole. The MMR in Indonesia has declined over the past decade. Conversely, it has not yet achieved the SDGs objective of 70 emissions per 100,000 live births by 2030[3,4].

Indonesia has the third-highest MMR in ASEAN. Myanmar ranks the highest with 250 deaths, while Laos ranks second with 185 deaths per 100,000 live births. The maternal mortality rate in Indonesia is elevated compared to other developing nations. In 2017, the MMR in Uzbekistan was 29 deaths per 100,000 live births; in China, 29 deaths; in Mongolia, 45 deaths; in Iran, 16 deaths; in the Maldives, 53 deaths; and in Jordan, 46 fatalities. The maternal mortality rate in developed countries is significantly lower than that in Indonesia. In 2017, the MMR was 5 deaths per 100,000 live births in Japan, 11 in the Republic of Korea, 7 in the United Kingdom, 10 in Canada, 5 in the Netherlands, 8 in France, and 7 in Germany[2].

Severe bleeding and infections after giving birth, pre-eclampsia, eclampsia during pregnancy, and problems during or after giving birth are the main reasons why mothers die. These complications for mothers are becoming more likely because health facilities take too long to send patients, and they provide poor care[5,6]collected data was extracted from existing MPDSR data base, andanalyzed using the Statistical Package for Social Sciences (SPSS. Women and their families prefer home birth over birthing in a hospital, according to several studies[7,8] as it has a significant impact on maternal mortality rates. The World Health Organization (WHO). The situation is because they know that giving birth is a normal process. People only think that giving birth in a hospital is crucial for very complicated deliveries. Problems with culture and society, money, health facilities, wanting to give birth at home, and not meeting the minimum requirements for the WHO's antenatal care (ANC) services are some of the other reasons. Some other factors that can affect this include a lack of transportation options, distance, delivery costs, poverty, lack of a formal education, and lack of parental permission[9,10] 686 women of reproductive age group (15–49 years).

Home delivery in some areas of Indonesia remains comparatively elevated. Nonetheless, there is a significant discrepancy in the prevalence of deliveries at health facilities. According to the 2017 Indonesian Demographic and Health Survey (IDHS), 44.8% of the 17,401 births that occurred five years prior to the survey occurred in non-healthcare institutions. The National Strategic Plan aims for an 82% delivery rate in healthcare facilities by 2018[11]especially for achieving the country's Sustainable Development Goals (SDGs. Home delivery help has drawbacks, including potential delays in management during birth complications. This delay may exacerbate maternal mortality during childbirth[12].

Although the Indonesian government mandates facility-based delivery and has expanded its National Health Insurance (NHI) program to cover nearly the entire population, gaps persist. These gaps are not merely administrative but reveal deeper patterns of social stratification. A small but significant proportion of women still deliver at home, particularly in rural, poorer, and marginalized communities[13].

Indonesia operates a predominantly single-payer social health insurance system through its NHI program, which is administered by the Social Security Agency for Health (BPJS Kesehatan). The program is designed to achieve universal health coverage by integrating previously fragmented public insurance schemes into a unified system that provides a comprehensive benefits package, including maternal health services such as antenatal care, delivery, and postnatal care. Membership is mandatory, with contributions financed through a combination of payroll deductions for formal sector workers and government subsidies for the poor and near-poor[14]. Despite its broad population coverage, NHI is characterized by tiered service access and referral pathways, which may influence healthcare utilization patterns. Alongside the public system, private health insurance continues to play a complementary role, particularly among higher-income and formally employed populations. Private schemes often offer enhanced amenities, shorter waiting times, and greater provider choice. As a result, some individuals hold dual or mixed coverage, combining NHI with private insurance to optimize both financial protection and service quality. This coexistence of public and private insurance creates a layered financing landscape, where differential access and perceived quality of care may shape decisions regarding the place of delivery[15].

Recent national data indicate that Indonesia has achieved near-universal health insurance coverage through the NHI program. As of the end of 2024, approximately 98.45% of the population (around 278 million people) were registered as NHI participants[16]. This implies that only a small proportion, roughly 1.5–2% of the population, remains uninsured, although this group is often concentrated among socially and geographically disadvantaged populations. Earlier estimates also show consistent progress toward universal health coverage, with coverage exceeding 95% since 2023[17].

However, evidence suggests that financial protection alone may not fully determine the delivery location. Persistent disparities in infrastructure, service availability, and social conditions may limit the effectiveness of insurance in promoting institutional delivery, particularly among rural and disadvantaged populations. Moreover, the coexistence of public and private insurance schemes creates a layered system in which the extent of coverage may influence healthcare-seeking behavior differently.

Given these complexities, it is important to examine how different types of health insurance are associated with the delivery location. This study investigated the relationship between insurance ownership and home delivery in Indonesia, while accounting for key socioeconomic and demographic factors.

Material and Methods

Data source

The analysis utilised secondary data from the 2023 Indonesian Health Survey conducted by the Ministry of Health of the Republic of Indonesia. The research employed multistage, stratified random sampling to collect data through interviews with individuals and families from May to July 2023, achieving a response rate of 91.49%[18].

The 2023 Indonesian Health Survey employed a multistage, stratified cluster sampling design to ensure national representativeness. In the first stage, census blocks were selected as primary sampling units using probability proportional to size (PPS), based on the latest population census frame. In the second stage, households within each selected census block were systematically sampled. All eligible women within selected households who had given birth in the preceding five years were included in the analysis. Stratification was applied by province and urban–rural residence to capture geographic and socioeconomic variation across Indonesia[18].

To account for the complex survey design, sampling weights were applied in all analyses. These weights reflect the inverse probability of selection at each sampling stage and were further adjusted for non-response to maintain representativeness. The final weights were normalized to ensure that the weighted sample size corresponded to the total surveyed population. In addition, the analysis incorporated design effects by specifying clustering at the census block level and stratification variables, thereby producing robust standard errors and unbiased population estimates. This approach ensures that the findings can be generalized to the national population of women of reproductive age in Indonesia[18].

The study participants were Indonesian women who had given birth within the previous 5 years. According to the weighted sample, approximately 7,548 individuals participated in the cross-sectional study.

Outcome variable

The outcome variable was the place of delivery, categorized as home delivery (yes/no) based on the respondent's report of where the most recent birth occurred within the past five years.

Exposure variable

The study used health insurance ownership as an exposure variable. The study divided health insurance into four groups: uninsured, NHI, private-run, and mixed (which owns both NHI and private-run plans). Health insurance ownership was measured based on respondents' reported status at the time of the survey interview. The survey did not capture insurance status specifically at the time of pregnancy or delivery.

Control variables

Covariates were selected as potential confounders based on theoretical and empirical evidence. However, some variables may also lie along the causal pathway or act as effect modifiers. Given the cross-sectional nature of the data, formal mediation analysis was not performed. Future studies using longitudinal designs are needed to better assess causal pathways. Moreover, a conceptual framework (DAG) was developed to guide variable selection and illustrate hypothesized relationships among insurance status, socioeconomic factors, healthcare utilization, and delivery location.

The analysis employed eight control variables: age group, type of residence, work status, education level, marital status, affluence, parity status, and delayed antenatal care (ANC). The category of residence encompasses both urban and rural areas. The age range is categorized into seven segments: ≤19, 20–24, 25–29, 30–34, 35–39, 40–44, and ≥45. Simultaneously, there existed five tiers of education: no education, elementary education, junior secondary education, senior secondary education, and tertiary education. Regarding employment status, there were two options: unemployed or employed. The two marital statuses are marriage and divorce/widowhood.

The study assessed a family's wealth by examining the 5th-most valuable items in their home. Each family was evaluated based on the quantity and variety of amenities, including televisions, automobiles, and bicycles, as well as the quality of its living conditions, such as access to potable water, sanitation facilities, and the materials used to construct the ground floor. The study employed principal component analysis to obtain the score. The ratings of each family member were aggregated to categorise the top 20% of the population into five distinct national wealth quintiles. There are five tiers of wealth: poorest, poorer, middle, more prosperous, and richest[19].

Parity is classified into three categories: primiparous (one), multiparous (two to four), and grand multiparous (five or more). Delayed ANC was defined as initiation of the first antenatal care visit after the first trimester (>12 weeks

of gestation), including women who had no ANC visits, consistent with data categorization. This differs slightly from the World Health Organization definition, which considers only the timing of the first visit.

Data analysis

The authors conducted a bivariate analysis employing the chi-squared test. Before regression analysis, multicollinearity diagnostics were conducted among independent variables using tolerance and variance inflation factor (VIF) values. Multicollinearity was assessed using tolerance and the variance inflation factor (VIF). A VIF value <10 and tolerance >0.10 were considered indicative of no significant multicollinearity.

The final test was a binary logistic regression. Binary logistic regression was performed using the enter method, in which all exposure and covariates were included simultaneously based on theoretical relevance. No stepwise (forward or backward) variable selection procedures were applied. The study reported adjusted odds ratios (AORs) with 95% confidence intervals (CIs). Furthermore, the study employed IBM SPSS 26.

Ethical approval and consent to participate

The National Ethics Committee approved the Indonesian Health Survey to be conducted in 2023 (LB.02.01/1/KE/L/287/2023). To ensure that the data collection was voluntary and confidential, the survey utilized written informed consent, which participants or guardians signed.

Results

The outcome suggests that approximately 7.2% of pregnant women in Indonesia deliver at home. Meanwhile,

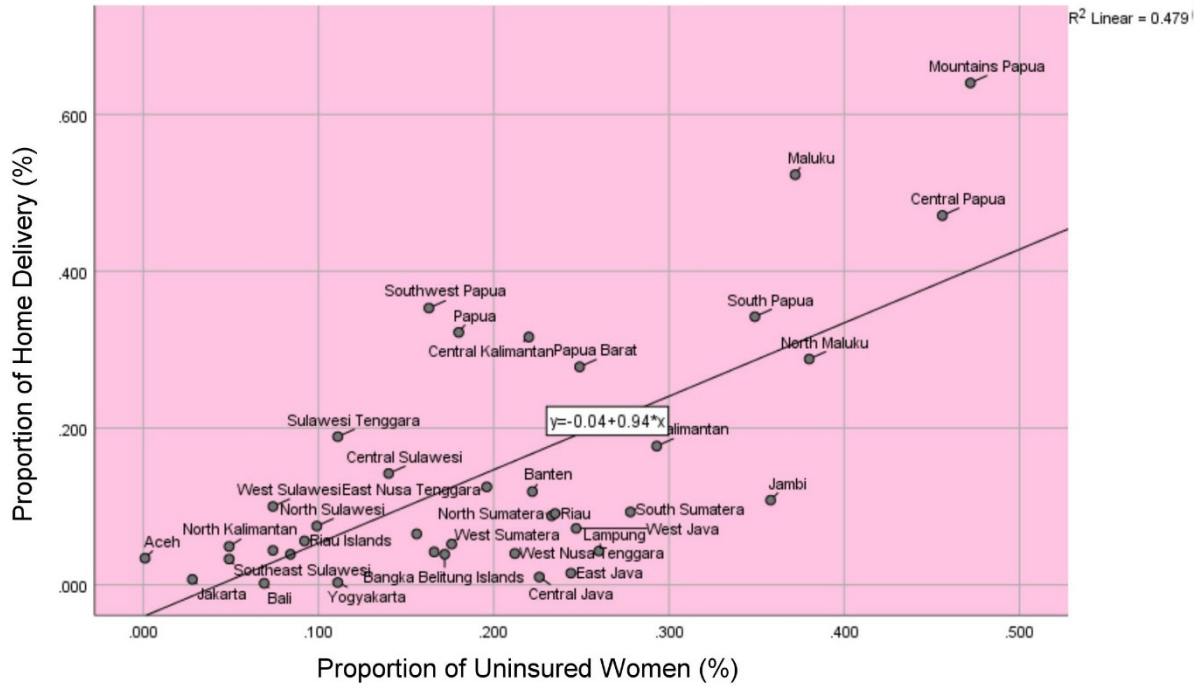


Figure 1 The scatter plot of the proportion of home delivery and uninsured pregnant women by province in Indonesia in 2023

22.7% acknowledged they did not have health insurance. Additionally, Figure 1 shows a moderate positive association between the proportion of uninsured pregnant women and home delivery (R^2=0.48). Provinces with higher uninsured rates, such as Papua, Maluku, and Central Papua, also reported markedly higher home-delivery rates. In contrast, provinces with lower uninsured proportions—such as Jakarta, Bali, and Yogyakarta—showed minimal reliance on home delivery. This trend suggests that a lack of health insurance is a significant barrier to accessing facility-based delivery services, with disparities most pronounced in eastern Indonesia.

Table 1 shows significant variations in health insurance ownership across individual characteristics in Indonesia. Uninsured women were more likely to deliver at home, live in rural areas, have lower education, be unemployed, and belong to poorer households. In contrast, ownership of private and mixed insurance was concentrated among urban, wealthier, highly educated, and employed women. NHI coverage dominated overall but was more evenly distributed across socioeconomic groups, though it remained less common among the poorest. Delayed antenatal care was also more prevalent among uninsured women compared to all insured groups. These patterns highlight substantial socioeconomic and service access disparities in health insurance ownership.

The research examined collinearity during the second phase. Independent variables show little correlation with the test results. Every factor possesses a tolerance of at least 0.10. The variance inflation factor for each variable is below 10.00. No multicollinearity was detected in the regression model.

Table 2 presents the results of the binary logistic regression analysis of the factors associated with home delivery in Indonesia. Compared with uninsured women, those with NHI had higher odds of delivering in a health facility (AOR 2.218; 95% CI 2.210–2.226). Similarly, women with private insurance (AOR 1.790; 95% CI 1.758–1.822) and those with mixed coverage showed increased likelihood, with the strongest association observed among women holding both types of insurance (AOR 4.237; 95% CI 4.054–4.429). In addition, all parity groups were more likely to deliver outside the home compared with grand multiparous women. Women who initiated antenatal care on time also had higher odds of facility-based delivery than those with delayed ANC (AOR 2.330; 95% CI 2.322–2.339).

Furthermore, the study finds that all the control variables are related to home delivery. Regarding the type of residence, pregnant women in urban areas are 1.963 times as likely as those in rural areas to have no home delivery (AOR 1.963; 95% CI: 1.955–1.971). Moreover, five maternal characteristics are associated with home delivery, including age group, marital status, education level, employment status, and wealth status.

Table 2 shows that, across parities, all types are more likely than grand multiparous women to give birth outside the home. In contrast, based on ANC, pregnant women who did not perform delayed ANC are 2.330 times more likely than those who did to have no home delivery (AOR 2.330; 95% CI 2.322–2.339).

Discussion

This study highlights that home delivery in Indonesia is not simply a matter of personal preference, but rather a manifestation of intersecting social determinants—including socioeconomic status, education, geographic accessibility, and health system engagement. Insurance reduces financial barriers but cannot entirely mitigate structural inequalities embedded in rural infrastructure, income disparities, or deeply rooted cultural norms.

The study indicated that health insurance can reduce home deliveries in Indonesia. By lowering financial barriers to healthcare services, health insurance encourages more women to seek childbirth assistance in medical

Table 1 Individual factors of health insurance ownership in Indonesia: descriptive statistics (n=70,916)

Characteristics	Health Insurance Ownership				p-value
	Uninsured (n=13,625) (%)	NHI (n=55,784) (%)	Private run (n=1,193) (%)	Mixed (n=314)(%)	
Home delivery					<0.001
Yes	2,634 (19.3)	4,270 (7.7)	64 (5.4)	16 (5.1)	
No home delivery	10,991 (80.7)	51,514 (92.3)	1,129 (94.6)	298 (94.9)	
Residence type					<0.001
Urban	5,948 (43.7)	29,688 (53.2)	813 (68.1)	224 (71.3)	
Rural	7,677 (56.3)	26,096 (46.8)	380 (31.9)	90 (28.7)	
Age					<0.001
≤19	161 (1.2)	440 (0.8)	6 (0.5)	2 (0.6)	
20–24	1,434 (10.5)	4,957 (8.9)	77 (6.5)	16 (5.1)	
25–29	3,255 (23.9)	13,345 (23.9)	269 (22.5)	82 (26.1)	
30–34	3,860 (28.3)	16,100 (28.9)	439 (36.8)	105 (33.4)	
35–39	2,994 (22.0)	12,652 (22.7)	267 (22.4)	66 (21.0)	
40–44	1,519 (11.1)	6,681 (12.0)	111 (9.3)	36 (11.5)	
≥45	402 (3.0)	1,609 (2.9)	24 (2.0)	7 (2.2)	
Marital					<0.001
Married	13,343 (97.9)	54,747 (98.1)	1,182 (99.1)	311 (99.0)	
Divorced/widowed	282 (2.1)	1,037 (1.9)	11 (0.9)	3 (1.0)	
Education					<0.001
No education	524 (3.8)	1,086 (1.9)	16 (1.3)	5 (1.6)	
Primary school	3,607 (26.5)	10,390 (18.6)	124 (10.4)	33 (10.5)	
Junior high school	3,472 (25.5)	10,615 (19.0)	150 (12.6)	53 (16.9)	
Senior high school	4,844 (35.6)	21,490 (38.5)	471 (39.5)	116 (36.9)	
College	1,178 (8.6)	12,203 (21.9)	432 (36.2)	107 (34.1)	
Employment					<0.001
Unemployed	8,430 (61.9)	31,493 (56.5)	657 (55.1)	163 (51.9)	
Employed	5,195 (38.1)	24,291 (43.5)	536 (44.9)	151 (48.1)	
Wealth Status					<0.001
Poorest	345 (25.3)	8,617 (15.4)	73 (6.1)	33 (10.5)	
Poorer	2,718 (19.9)	10,041 (18.0)	110 (9.2)	36 (11.5)	
Middle	2,928 (21.5)	11,499 (20.6)	192 (16.1)	40 (12.7)	
Richer	2,703 (19.8)	12,152 (21.8)	269 (22.5)	57 (18.2)	
Richest	1,831 (13.4)	13,475 (24.2)	549 (46.0)	148 (47.1)	
Parity					<0.001
Primiparous	3,259 (23.9)	13,604 (24.4)	343 (28.8)	82 (26.1)	
Multiparous	9,576 (70.3)	39,261 (70.4)	816 (68.4)	216 (68.8)	
Grand multiparous	790 (5.8)	2,919 (5.2)	34 (2.8)	16 (5.1)	
Delayed ANC					<0.001
No	9,745 (71.5)	43,848 (78.6)	995 (83.4)	257 (81.8)	
Yes	3,880 (28.5)	11,936 (21.4)	198 (16.6)	57 (18.2)	

NHI=National Health Insurance, ANC=antenatal care

facilities rather than at home. This shift is critical, as facility-based deliveries are typically attended by skilled health professionals, which can lead to better maternal and neonatal health outcomes. The implication is that policies aimed at increasing health insurance enrollment, especially among low-income and rural populations, could improve access to quality maternal care and contribute to reducing maternal and infant mortality rates. Therefore,

Table 2 The maternal deliveries at home in Indonesia were analyzed using binary logistic regression (n=70,916)

Predictor	No home delivery							
	Crude odds ratio	95% CI		p-value	Adjusted odds ratio	95% CI		p-value
		Lower bound	Upper bound			Lower bound	Upper bound	
Health insurance: uninsured (ref.)	–	–	–	–	–	–	–	–
Health insurance: NHI	2.209	2.084	2.341	***<0.001	2.218	2.210	2.226	***<0.001
Health insurance: Private run	1.986	1.509	2.614	***<0.001	1.790	1.758	1.822	***<0.001
Health insurance: Mixed	2.461	1.433	4.227	**0.001	4.237	4.054	4.429	***<0.001
Residence: Urban	2.461	2.306	2.626	***<0.001	1.963	1.955	1.971	***<0.001
Residence: Rural (ref.)	–	–	–	–	–	–	–	–
Age: ≤19 (ref.)	–	–	–	–	–	–	–	–
Age: 20–24	1.136	.892	1.447	0.301	1.721	1.701	1.740	***<0.001
Age: 25–29	1.147	.904	1.456	0.259	2.044	2.021	2.068	***<0.001
Age: 30–34	1.127	.885	1.434	0.332	1.960	1.936	1.983	***<0.001
Age: 35–39	1.199	.940	1.531	0.144	2.249	2.222	2.277	***<0.001
Age: 40–44	1.366	1.063	1.755	*0.015	2.324	2.294	2.355	***<0.001
Age: ≥45	1.020	.776	1.342	0.887	1.982	1.951	2.014	***<0.001
Marital: Married	1.130	.939	1.360	0.197	1.276	1.260	1.292	***<0.001
Marital: Divorced/Widowed (ref.)	–	–	–	–	–	–	–	–
Education: No education (ref.)	–	–	–	–	–	–	–	–
Education: Primary School	1.476	1.303	1.672	***<0.001	1.813	1.797	1.829	***<0.001
Education: Junior High School	2.105	1.849	2.397	***<0.001	3.281	3.252	3.311	***<0.001
Education: Senior High School	2.528	2.223	2.874	***<0.001	4.751	4.708	4.795	***<0.001
Education: College	2.694	2.307	3.146	***<0.001	4.056	4.009	4.103	***<0.001
Employment: Unemployed (ref.)	–	–	–	–	–	–	–	–
Employment: Employed	1.092	1.032	1.156	**0.002	1.272	1.267	1.277	***<0.001
Wealth: Poorest (ref.)	–	–	–	–	–	–	–	–
Wealth: Poorer	2.036	1.894	2.187	***<0.001	2.020	2.009	2.030	***<0.001
Wealth: Middle	2.820	2.605	3.053	***<0.001	2.371	2.358	2.383	***<0.001
Wealth: Richer	3.154	2.885	3.448	***<0.001	2.664	2.649	2.679	***<0.001
Wealth: Richest	5.307	4.688	6.008	***<0.001	4.861	4.822	4.901	***<0.001
Parity: Primiparous	2.087	1.848	2.357	***<0.001	2.432	2.409	2.455	***<0.001
Parity: Multiparous	1.688	1.530	1.861	***<0.001	1.844	1.829	1.859	***<0.001
Parity: Grand multiparous (ref.)	–	–	–	–	–	–	–	–
Delayed ANC: No	2.720	2.574	2.875	***<0.001	2.330	2.322	2.339	***<0.001
Delayed ANC: Yes (ref.)	–	–	–	–	–	–	–	–

*p-value<0.05; **p-value<0.01; ***p-value<0.001, OR=odds ratios, 95% CI= 95% confidence intervals, NHI=National Health Insurance, ANC=antenatal care

health insurance provides financial protection and catalyzes positive changes in health-seeking behavior[14,20,21].

NHI is effective, but having both NHI and privately run insurance is the most effective way to reduce the incidence of home deliveries. The condition suggests that supplementary private insurance may offer additional benefits, such as broader coverage, better service quality, or easier access to healthcare facilities, further incentivizing institutional deliveries. The implication is that integrating and encouraging public and private health insurance schemes can enhance maternal healthcare utilization. Policymakers may consider promoting complementary

insurance options or public–private partnerships to maximize coverage and improve maternal health outcomes. This dual–insurance approach could be fundamental in ensuring that financial, logistical, and quality–related barriers to facility–based deliveries are comprehensively addressed[22,23].

Regarding the type of residence, pregnant women in urban areas were more likely than those in rural areas to have no home delivery. This finding suggests that urban residents may have better access to healthcare infrastructure, transportation, and information about the benefits of skilled birth attendance. In contrast, rural women may face challenges such as limited access to health services, longer distances to facilities, and cultural or financial barriers, which contribute to higher rates of home delivery. The implication is that targeted interventions are necessary in rural areas to enhance access to maternal healthcare, including expanding health facility coverage, strengthening referral systems, and increasing community awareness[24–26]. Addressing these rural–urban disparities is essential for achieving equitable maternal health outcomes across regions.

Moreover, five maternal characteristics — age group, marital status, education level, employment status, and wealth status — were associated with home delivery. The association between maternal characteristics and the likelihood of home delivery underscores the complex social and economic factors that shape maternal health behaviors. For instance, younger or unmarried women may face social stigma or a lack of support that discourages them from seeking facility–based care. Similarly, women with lower levels of education or without formal employment may have limited knowledge about the benefits of skilled birth attendance or lack the financial means to access health services. These findings imply that health policies must consider the broader social determinants of health when addressing maternal care practices[27,28].

Interventions should be tailored to address these specific maternal characteristics to effectively reduce the number of home deliveries. Expanding educational opportunities for women, promoting economic empowerment, and providing targeted support for vulnerable groups, such as low–income or unmarried mothers, can play a crucial role in shifting childbirth from home to health facilities[29]. Additionally, community–based programs that raise awareness and reduce stigma around facility–based deliveries, especially for marginalized groups, can help bridge the gap. Overall, addressing these underlying socio–demographic disparities is key to ensuring equitable access to maternal healthcare services and improving outcomes for all women[30–32].

According to parity, all types were more likely than grand multiparous women to give birth outside the home. Grand multiparous women, who have had five or more previous births, may feel more confident in managing labor at home due to past experiences, or they may perceive less risk in giving birth without medical assistance. This trend could also be influenced by cultural norms or beliefs that view childbirth as a routine event, particularly among women with many previous deliveries. The implication is that experience alone does not always translate into safer practices, and that complacency among grand multiparous women could increase health risks for both mother and child[31,33,34].

Based on ANC, pregnant women who did not perform delayed ANC were more likely than those who did to have an outside home delivery. Timely ANC enables healthcare providers to educate expectant mothers on the importance of delivering in a healthcare facility, assess pregnancy risks, and foster trust between patients and the healthcare system. Women who engage with ANC services early are more likely to receive guidance and support, which encourages them to plan for facility–based delivery. The implication is that promoting early ANC attendance can effectively reduce home births, particularly in areas where such practices remain prevalent. Public health efforts should therefore focus on increasing awareness of

the benefits of early ANC and on lowering barriers, such as cost, distance, or lack of information, all of which may delay care-seeking[35,36].

Strengths and limitations

The author analyzed secondary data from the 2022 GDHS, focusing on variables from the ICF. Various factors identified in other studies also affect the unexamined prevalence of home maternal deliveries, including the significance of pregnancy, child, childbirth, and family[37].

Conclusion

Health insurance ownership is significantly associated with a lower likelihood of home delivery in Indonesia, particularly among women with both public and private coverage. However, these findings should be interpreted as associative rather than causal, given the cross-sectional nature of the data. Persistent social and geographic disparities further suggest that financial access alone may not fully address structural barriers to facility-based delivery. Future research using longitudinal or experimental designs is needed to better understand causal pathways. In the meantime, policies that expand insurance coverage alongside efforts to improve healthcare accessibility, quality, and equity may help reduce inequalities in maternal health service utilization.

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Conflict of interest

The authors declare that they have no conflict of interest.

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