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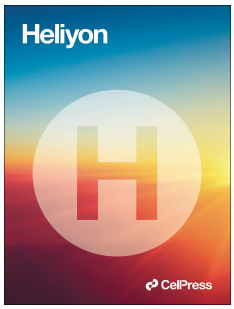

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The choice of delivery place in Indonesia: Does home residential status matter?

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Abstract

Background: To care for their health needs, women in Indonesia who live with their parents or in-laws frequently lose their independence, including the choice of delivery place.
Aim: The study aimed to analyze the effect of home residential status on the choice of delivery place in Indonesia.
Methods: The study design was a cross-sectional study. The study employed secondary data from 2017 Indonesian Demographic and Health Survey (IDHS). The research included 15,357 women aged 15-49 with live births in the last five years. Meanwhile, the study used place of delivery as an outcome variable and home residential status as an exposure variable. Moreover, the research employed nine control variables: type of residence, age group, education level, employment status, marital status, parity, wealth status, health insurance, and antenatal care visits—the final analysis using binary logistic regression.
Findings: The result shows that women with home residential status in the alone category were 1.248 times more likely than those in the joint category to choose to give birth to healthcare facilities (AOR 1.248; 95% CI 1.143-1.361). In addition to home residential status, the study also found seven control variables to have a relationship with the choice of place of delivery. The seven control variables were the type of residence, age group, education level, parity, wealth status, health insurance, and antenatal care.
Conclusion: The study concluded that home residential status affects the choice of delivery place in Indonesia.

Keywords: home residential, delivery place, decision-making, women's health, maternal health.

Introduction

The decline in maternal mortality rate (MMR) is a significant concern worldwide [1]. In Indonesia, until now, MMR is still a severe problem. Indirect causes of MMR are delays in recognizing danger signs of childbirth and making decisions, delays in referring to health facilities, and delays in handling by health workers. In addition, other causes are poor protocol implementation, poor information flow from first-level hospitals to central-level referral hospitals, emergency care delays, and poor patient care [2]. One study found that access and characteristics of health services accounted for 23% of the difference in maternal mortality ratios between high and low-performing provinces [3]. In addition, antenatal care (ANC) levels differ between women in urban and rural areas in Indonesia [4]. We believe adequate ANC reduces indirect causes of death in maternal mortality [5].

Several countries have achieved the SDGs target of less than 70 per 100,000 live births [1,6,7]. Meanwhile, the MMR trend in Indonesia shows a gradual decline but has not reached the SDG's target of less than 70 per 100,000 live births [4]. Indonesia's MMR was still 177 per 100,000 live births in 2017. The decline in the MMR in Indonesia from 2010 to 2017 was 7 to 8 per 100,000 live births, or about 0.03% per year [8]. This insignificant decrease in maternal mortality impacts the slow decline in MMR in Indonesia.

The Indonesian government has made policies to reduce the MMR. The Ministry of Health implemented the Making Pregnancy Safer (MPS) and the village standby program. MPS and village alerts have been known by most of the community and implemented in most health services in Indonesia. MPS has been regulated in legislation and is supported by several policies [9]. The economic and political environmental conditions support implementing program policies to reduce MMR at the Puskesmas level in Indonesia. The obstacle is that many people still have low education [10,11].

A study of policy implementation at the district government level reports policies that pay attention to local wisdom. The procedure is in the form of limiting the authority for the involvement of traditional birth attendants in handling childbirth. The district government provides traditional birth attendants guidance and training on maternal health. The district government involves the Regional Apparatus Work Unit to coordinate village heads with midwives to handle health facilities deliveries [12]. This implementation shows that Indonesia's current policy to reduce MMR encourages deliveries in health facilities [13,14].

A study found that the delivery rate at a health facility in one of the districts in Indonesia was 54.4%. Knowledge of the danger signs of pregnancy, attitudes towards health services, and access to health services are the dominant factors for childbirth in health facilities [15,16]. Women who live in urban areas, are wealthy and have a high socioeconomic position are more likely to give birth in a hospital than are women who don't. Additional factors that affect teenage birthing health services include where you live, your level of education, your income, your insurance, your awareness of the risks of pregnancy, and if you receive ANC [13]. The disparity in the percentage of delivery coverage in healthcare facilities in Indonesia is vast. Maluku Province has the lowest range; meanwhile, Jakarta Province achieved the highest coverage [17,18]. A study in Bangladesh states that one-fifth of women give birth at home, and traditional birth attendants assist with 20% of deliveries. Researchers in Indonesia also reported women from poorer areas were more likely to use delivery services at the Urban Primary Health Care Project than women from non-poor regions [19]. Like India's, household wealth status with maternal mortality was not statistically significant. The situation implies that the government has minimized financial barriers to accessing maternal health services in some countries [20].
The Indonesian government has made significant efforts to support providing healthcare services at medical facilities. Using the Healthy Indonesia Card and direct monetary assistance, the government has made it easier for people to access medical facilities, enhancing maternal

health. However, local community capacity in Indonesia can still influence the decision to use health facilities as the choice of place of delivery. A study in Kutai Kartanegara Regency, East Kalimantan, Indonesia, stated that pregnant women whose birth choices were decided by their husbands, parents, or traditional birth attendants gave birth at home with a traditional birth attendant as a birth attendant [21].

Meanwhile, another study found other people (primarily their husbands) influenced mothers who chose the delivery site in health facilities [22]. Apart from the husband, another person who often influences the decision to give birth is the in-laws. Previous studies in Indonesia indicate that parents and in-laws influence decision-making in families, especially young ones [23–25]. The situation follows the theory of decision-making in social-ecological models that the surrounding environment controls the decision-making process, including the views of those closest to them, especially those considered elders, such as parents or in-laws [26].

We carried out the study to provide the enlightenment that living with other families can influence the household in choosing a delivery place. The decision-making process can be longer and more complicated. Based on the background study, the study analyzes the effect of home residential status on the choice of delivery place in Indonesia.

Methods

Study Design and Data Source

The cross-sectional study used raw data from the 2017 Indonesian Demographic and Health Survey (IDHS). The IDHS was part of the Inner City Fund's international Demographic and Health Survey (DHS) initiative. In Indonesia, Central Statistics Agency carried out the 2017 IDHS collaborating with the National Population and Family Planning Board and the Ministry of Health.

The 2017 IDHS utilized a stratified two-stage sample strategy: Stage one: is a systematic proportionate-to-size probability selection of numerous census blocks based on the number of households obtained from the 2010 population census listing. The survey utilized an implicit stratification technique based on urban and rural areas and sorted census blocks based on the wealth index category of the 2010 population census data. Stage two selects 25 ordinary households in each census block based on an update of each census block's families [27]—The 2017 IDHS was conducted in 34 provinces in Indonesia. This study's sample participants were women aged 15-49 who had given birth in the last five years. The sample size of the 2017 IDHS used in this analysis was 15,357 women.

Outcome Variable

The study employed place of delivery as an outcome variable. The delivery site consists of two categories: nonhealthcare facilities and healthcare facilities.

Exposure Variable

On the other hand, the research used home residential status as an exposure variable. The home residential status consists of two types: Alone and joint. Alone means living in their household—meanwhile, joint means residing with another family (parents, in-laws, or relatives).

Control Variables

Moreover, the study used nine others variables as control variables. The nine were the type of residence, age group, education level, employment status, marital status, parity, wealth status, health insurance ownership, and antenatal care.

There are two types of residences under the type of residence: urban and rural. Statistics Indonesia uses the urban-rural criteria. The age group comprises seven kinds in five years, namely 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, and 45-49. Meanwhile, education level was the respondent's recognition of the last diploma. Education level consists of four types: no education, primary (primary school and junior high school), secondary (senior high school), and higher (diploma and above). The study consists of two groups for employment status: unemployed and employed. Marital status consists of three classifications: never in a union, married or living with a partner, and divorced or widowed. Parity was the number of babies ever born alive. Parity status consists of three types: primiparous (≤ 1), multiparous (2-4), and grand multiparous (> 4) [28].

The 2017 IDHS computed the wealth status using the wealth quintile possessed by the family. Households were graded on the number and type of items they owned, ranging from televisions to bicycles or automobiles, and building qualities, including drinking water sources, toilets, and significant construction materials for the house's floor. The 2017 IDHS used a principal component analysis used to get the score. Based on household scores, national wealth quintiles were created for each household and divided into five groups, accounting for 20% of the population. Wealth status comprises five levels: the poorest, poorer, middle, richer, and richest [28].

Health insurance ownership was the respondent's acknowledgment of the health insurance owned and managed by the government or the private sector. Health insurance ownership consists of two types: Uninsured and insured. Even though the 2016 WHO guidelines for antenatal care changed the recommended minimum number of antenatal care (ANC) contacts from four to eight, the Indonesian government uses the basic antenatal care model. The basic antenatal care model includes four ANC visits between 8 and 12 weeks of pregnancy, 24 and 26 weeks, 32 weeks, and 36 and 38 weeks [29]. This study separates the ANC into two categories based on these policies: < four antenatal care visits and ≥ four antenatal care visits.

Data Analysis

The study employed chi-square for bivariate analysis in the first step. The collinearity test was employed in the second stage of the investigation to ensure no tangible link between the independent variables. Because of the nature of the dependent variable, the research used binary logistic regression (enter procedure). The study employed a 95% confidence interval (95% CI) to calculate the adjusted odds ratio (AOR). Moreover, the author used IBM SPSS Statistics 26 software for all statistical analyses.

Ethical Approval

As a materials analysis, the study employed secondary data from the 2017 IDHS. The 2017 IDHS removed all respondents' identities from the dataset. Respondents signed written informed consent to participate in this study, and children's parents or guardians gave their approval (under 16 years). Through the website https://dhsprogram.com, the author has received permission to utilize data for this study.

The 2017 Indonesia DHS follows the Standard D.H.S. survey protocol under The Demographic and Health Surveys Program (DHS-7), approved by The Institutional Review Board of ICF International, which was previously reviewed and approved by the ORC Macro IRB in 2002. DHS surveys that follow the Standard are categorized under the approval of the

DHS-7 Program, and the approval document is attached. The Institutional Review Board of ICF International complied with the United States Department of Health and Human Services requirements for the"Protection of Human Subject" (45 CFR 46).

Results

The analysis results show that the proportion of women who choose to give birth in healthcare facilities is 80.3%. Meanwhile, the proportion of women who live with their parents, in-laws, or relative is 34.5%.

Table 1 is a descriptive statistic of women who gave birth in the last five years in Indonesia. The results show that women delivered in healthcare facilities occupied two categories of home residential status.

Table 1. Descriptive statistics of respondents' characteristics in Indonesia (n=15,357).

Characteristics	Home Residential Status		p-value
	Alone (63.07%)	Joint (36.93%)	
Place of Delivery			< 0.001
- Nonhealthcare Facilities	18.2%	22.7%	
- Healthcare Facilities	81.8%	77.3%	
Place of Residence			< 0.001
- Urban	51.5%	42.8%	
- Rural	48.5%	57.2%	
Age			< 0.001
- 15 - 19	3.2%	1.2%	
- 20 - 24	20.4%	9.2%	
- 25 - 29	27.0%	21.9%	
- 30 - 34	24.3%	27.8%	
- 35 - 39	17.0%	25.8%	
- 40 - 44	6.7%	11.5%	
- 45 - 49	1.4%	2.7%	
Education level			< 0.001
- No education	0.8%	1.3%	
- Primary	23.8%	30.3%	
- Secondary	60.4%	54.2%	
- Higher	14.9%	14.2%	
Employment status			
- Unemployed	55.6%	52.1%	
- Employed	44.4%	47.9%	
Marital status			< 0.001
- Never in union	0.1%	0.0%	
- Married/Living with a partner	95.8%	99.4%	
- Widowed/Divorced	4.1%	0.6%	
Parity			< 0.001
- Primiparous	40.2%	20.3%	
- Multiparous	55.4%	72.3%	
- Grandemultiparous	4.4%	7.4%	
Wealth status			< 0.001
- Poorest	18.4%	22.6%	
- Poorer	20.8%	19.1%	

Characteristics	Home Residential Status		p-value
	Alone (63.07%)	Joint (36.93%)	
- Middle	21.9%	18.2%	
- Richer	21.8%	18.1%	
- Richest	17.2%	22.1%	
Health insurance			< 0.001
- Uninsured	41.6%	40.8%	
- Insured	58.4%	59.2%	
Antenatal care			< 0.001
- < four visits	9.6%	9.1%	
- ≥ four visits	90.4%	90.9%	

Based on the residence type, women living in urban areas ruled home residential status in the alone category. Meanwhile, women in rural areas dominate the joint home residential status category. Women in the 25-29 age group occupied the home residential status category alone. In contrast, women in the 30-34 age group ruled home residential status in the joint category.

According to education level, women with secondary education dominated in both categories of home residential status. Meanwhile, unemployed women ruled in both types of home residential status based on employment status. Based on marital status, married women dominated in both categories of home residential status. Moreover, grand multiparous women dominated in both types of home residential status.

Table 1 shows women in the middle wealth status occupied the home residential status category alone. Meanwhile, the poorest women ruled home residential status in various joints. In addition, insured women occupied both types of home residential status. Moreover, women who underwent antenatal care four visits during pregnancy ruled in both categories of home residential status.

The following analysis was a series of co-linearity tests. The results show that there is no collinearity between the independent variables. The tolerance value for all variables is more significant than 0.10. In contrast, all variables' VIF values are less than 10.00. Then, based on the decision-making basis in the multicollinearity test, it is possible to conclude that there were no symptoms of a strong relationship among independent variables in the regression model.

Table 2 shows the binary logistic regression results to analyze the effect of home residential status on the choice of delivery place in Indonesia. For reference, the selected category was "nonhealthcare facilities."

Table 2. The result of binary logistic regression of the place of delivery in Indonesia (n=15,357).

Predictor	p-value	Healthcare Facilities		
		AOR.	95% CI	
			Lower Bound	Upper Bound
Home residential: Alone	**< 0.001	1.248	1.143	1.362
Home residential: Joint (Ref.)	-	-	-	-
Residence: Urban	**< 0.001	2.274	2.067	2.503
Residence: Rural (Ref.)	-	-	-	-
Age: 15 - 19 (Ref.)	-	-	-	-
Age: 20 - 24	0.077	1.253	0.976	1.607

Predictor	p-value	Healthcare Facilities		
		AOR.	95% CI	
			Lower Bound	Upper Bound
Age: 25 - 29	*0.002	1.497	1.161	1.929
Age: 30 - 34	**< 0.001	1.709	1.313	2.224
Age: 35 - 39	**< 0.001	2.059	1.568	2.703
Age: 40 - 44	**< 0.001	2.322	1.726	3.122
Age: 45 - 49	*0.002	1.843	1.251	2.717
Education: No education (Ref.)	-	-	-	-
Education: Primary	0.062	1.362	0.985	1.883
Education: Secondary	**< 0.001	1.899	1.373	2.627
Education: Higher	*0.001	1.833	1.296	2.593
Employment: Unemployed	0.311	1.046	.959	1.140
Employment: Employed (Ref.)	-	-	-	-
Marital: Never in union	0.270	1.627	0.685	3.863
Marital: Married/Living with a partner	0.359	1.113	0.885	1.399
Marital: Widowed/Divorced (Ref.)	-	-	-	-
Parity: Primiparous	**< 0.001	3.069	2.537	3.713
Parity: Multiparous	**< 0.001	1.926	1.651	2.248
Parity: Grand multiparous (Ref.)	-	-	-	-
Wealth: Poorest (Ref.)	-	-	-	-
Wealth: Poorer	**< 0.001	1.943	1.742	2.167
Wealth: Middle	**< 0.001	2.558	2.261	2.894
Wealth: Richer	**< 0.001	3.179	2.755	3.669
Wealth: Richest	**< 0.001	6.172	5.072	7.512
Health insurance: Uninsured (Ref.)	-	-	-	-
Health insurance: Insured	**< 0.001	1.418	1.303	1.543
Antenatal care: < 4 visits (Ref.)	-	-	-	-
Antenatal care: ≥ 4 visits	**< 0.001	2.945	2.628	3.299

Note: *p < 0.01; **p < 0.001; AOR: adjusted odds ratio; CI: confidence interval.

Women with home residential status in the alone category are 1.248 times more likely than those in the joint category to choose to deliver to healthcare facilities (AOR 1.248; 95% CI 1.143-1.361). This analysis shows that women in Indonesia who live in their own homes (do not live with their parents, in-laws, or relatives) have a better chance of giving birth in healthcare facilities.

In addition to home residential status, the study also found seven control variables to have a relationship with the choice of place of delivery. The seven control variables are the type of residence, age group, education level, parity, wealth status, health insurance, and antenatal care.

Table 2 shows that women in urban areas are 2.274 times more likely than women in rural areas to deliver to healthcare facilities (AOR 2.274; 95% CI 2.067-2.503). This information shows that living in an urban area is more likely for women in Indonesia to give birth in healthcare facilities.

Women in the 25-29 age group are 1.497 times more likely to deliver to healthcare facilities than women in the 15-19 age group (AOR 1.497; 95% CI 1.161-1.929). Women in the 35-39 age group are 2.059 times more likely than women in the 15-19 age group to deliver to healthcare facilities (AOR 2.059; 95% CI 1.568-2.703). Moreover, women in the 45-49 age

group are 1.843 times more likely than women in the 15-19 age group to deliver to healthcare facilities (AOR 1.843; 95% CI 1.251-2.717). This analysis informs the tendency for women of older age in Indonesia to have a better chance of giving birth in healthcare facilities.

Women with secondary education are 1.899 times more likely than no-education women to choose to deliver to healthcare facilities (AOR 1.899; 95% CI 1.373-2.627). Women with higher education are 1.833 times more likely than no-education women to choose to deliver to healthcare facilities (AOR 1.833; 95% CI 1.296-2.593). This study found that a better education level is more likely for women in Indonesia to give birth in healthcare facilities.

Women with 0-1 children are 3.069 times more likely than grand multiparous women to deliver to healthcare facilities (AOR 3.069; 95% CI 2.537-3.713). Women with 2-4 children are 1.926 times more likely than grand multiparous women to deliver to healthcare facilities (AOR 1.926; 95% CI 1.651-2.248). This analysis informs that having a small number of children is more likely to give birth in healthcare facilities in Indonesia.

Women with poorer wealth status are 1.943 times more likely than the most impoverished women to choose to deliver to healthcare facilities (AOR 1.943; 95% CI 1.742-2.167). Women with median wealth status are 2.558 times more likely than the poorest women to choose to deliver to healthcare facilities (AOR 2.558; 95% CI 2.261-2.894). Women with a more prosperous wealth status are 3.179 times more likely than the poorest women to choose to deliver to healthcare facilities (AOR 3.179; 95% CI 2.755-3.669). Moreover, the wealthiest woman is 6.172 times more likely than the poorest woman to choose to deliver to healthcare facilities (AOR 6.172; 95% CI 5.072-7.512). This analysis found that the better the wealth status of a woman in Indonesia, the higher the possibility of giving birth to healthcare facilities.

Regarding health insurance, insured women are 1.418 times more likely than uninsured women to choose to deliver to healthcare facilities (AOR 1.418; 95% CI 1.303-1.543). This information shows that having health insurance is more likely to provide deliveries to healthcare facilities in Indonesia.

According to antenatal care, women with four antenatal care visits or more are 2.945 times more likely than women with antenatal care less than four visits to choose delivery to healthcare facilities (AOR 2.945; 95% CI 2.628-3.299). This study found that four antenatal care visits or more are more possibilities for women in Indonesia to deliver to healthcare facilities in Indonesia.

Discussion

Although Indonesia's MMR trend shows a progressive drop, it has not yet attained the SDG's target of less than 70 per 100,000 live births [4]. The MMR achievement is also still far adrift compared to several other countries. The MMR in Italy is 9.8 per 100,000 live births [6]. MMR in China has decreased from 23.2 per 100,000 live births in 2013 to 18.3 per 100,000 live births in 2018 [1]. Meanwhile, the MMR in South Korea was at 13.5 deaths per 100,000 live births in 2009 and decreased to 7.8 in 2017 [7]. The Indonesian government needs to explore further information about the many things that can affect shifting deliveries only to healthcare facilities.

The analysis found that women in Indonesia who live in their own homes (do not live with their parents, in-laws, or relatives) are more likely to deliver in healthcare facilities. As a result, women with solid autonomy over their maternal health will use medical facilities more frequently [30]. Indonesia is one example of a nation with a very patriarchal society where women do not exclusively choose reproductive health desires [31]. Women with advanced degrees find it challenging to justify their decision of where to give birth due to the current circumstance. Most women with only a junior or secondary education follow their husband's

instructions when he decides to have a baby at home [32]. So, the husband's education influences the decision on where to give birth. According to a study conducted in Ghana, the husband, mother-in-law, and next of kin, all impact the intra-family decision about the place of birth [33].

The study shows that women in urban areas were more likely than women in rural areas to deliver to healthcare facilities. Due to this issue, mothers who reside in cities refrain from giving birth at home. According to the Guinea-Bissau study, moms in urban regions are more likely than mothers in rural areas to obtain information through radio, television, and the internet. Maternal health can be determined thanks to simple data access [34]. The situation is consistent with research from India, which indicates that moms in rural areas, as opposed to those in urban areas, prefer to give birth at home [35]. Mothers who live in remote locations face a challenge when giving birth in a medical facility because of the distance to those facilities [36,37]. In addition, mothers living in rural areas cannot achieve reproductive health [4,14,38,39].

The study found a tendency for women of older age in Indonesia to have a better chance of giving birth in healthcare facilities. Older women with complications giving birth will opt to use medical assistance to deliver [40–42]. This study's results differ from a study in Bangladesh which explained that mothers aged 30 years and over had twice the tendency to give birth at home compared to mothers aged between 20-29 years [43,44]. In the Indonesian context, older women tend to be more independent in making decisions, allowing them to choose which situation is best for them [45].

The study results found a tendency that a better level of education is more likely for women in Indonesia to give birth in healthcare facilities. The condition states that a woman cannot give birth in a non-medical setting due to her higher education background. The results of this study are consistent with those of research conducted in Tanzania, which found that women who complete their secondary education prefer to give birth in health facilities to those who complete their primary education [43]. Mothers without educational backgrounds and low education are more familiar with giving birth at home. Education is closely related to choosing childbirth services because a mother with excellent academic experience will be aware of maternal health, have higher self-efficacy, and better health care and behavior [13,46,47]. In general, several studies report better education level is a strong determinant for a positive result in the health field; on the contrary, poor education is a barrier to a positive effect [48–50].

The study results show that having a small number of children is more likely to give birth in healthcare facilities in Indonesia. Due to the current circumstances, mothers who give birth to fewer children will select delivery in a medical facility over those who give birth to multiple. Many children have consequences of the high expense of childbirth in healthcare, the length of time needed for treatment in healthcare, which is seen as a "waste of time," and the consideration of previous childbirth experiences when deciding where to give birth [43]. The condition is in line with a study in Bangladesh which states that high parity is a predisposing factor for giving birth at home [51].

The analysis found that the better the wealth status of a woman in Indonesia, the higher the possibility of giving birth to healthcare facilities. The circumstances indicate that choosing a birthplace is influenced by high wealth standing [32,44,46]. According to Indian studies, the willingness of a location to establish health facilities is correlated with wealth status. High-income mothers select private care for delivery services because they believe that these providers will provide higher-quality care than government-run facilities [34,35].

On the other hand, the study found that having health insurance is more likely to deliver deliveries to healthcare facilities in Indonesia. The current state of affairs demonstrates that women with health insurance will pick hospitals to give birth in more often than women without

health insurance. This study's findings are consistent with several earlier studies that explain how having health insurance is related to the decision to give birth in a hospital [52–54].

Finally, the study results found that four antenatal care visits are more likely for women in Indonesia delivered to healthcare facilities in Indonesia. Due to the condition, women who have had ANC for four visits or more will obtain recommendations from medical professionals to give delivery in a hospital [51,55]. The situation, however, goes against a study from Nigeria that claims that choosing to give birth in a hospital is not related to receiving adequate ANC during pregnancy [56,57].

Strength and Study Limitations

The study analyzes big data to offer information on a national scale. Meanwhile, we conducted the study using a quantitative approach, and the study could not explore why women chose the place of delivery. The value of children, pregnancy, birth, and other health attitudes that make it challenging to promote safe births in medical facilities are only a few of the pregnancy and childbirth-related topics covered in several qualitative research conducted in Indonesia [58–60].

Conclusions

Based on the results, the study concluded that home residential status affects the choice of delivery place in Indonesia. Women in Indonesia who live in their own homes (not with their parents, in-laws, or relatives) have a better chance of giving birth in healthcare facilities.

Following up on the results, we recommend the government encourage more intensive assistance to women or pregnant women who still live in large families. Assistance intervention efforts are not only for pregnant women but also for their families.

Author contribution statement:

Agung Dwi Laksono: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper. </p>

Ratna Dwi Wulandari: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper. </p>

Ratu Matahari: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper. </p>

Nikmatur Rohmah: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper. </p>

Data availability statement:

Data associated with this study has been deposited at https://dhsprogram.com/data/new-userregistration.cfm.

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The corresponding authors are one of the editors of this journal.

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