

National Health Insurance Membership and Economic Status as Determinants of Accessibility of Antenatal Care Service

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ABSTRACT

Background: According to WHO statistics, the maternal mortality rate (MMR) in developed countries is estimated at 12/100,000 live births, while in developing and low-income countries it is 239/100,000 live births. 99% of all maternal deaths are estimated to occur in developing countries, even though the causes of death can be prevented with the right policies considering that one of the goals of the Sustainable Development Goals is to reduce MMR. Antenatal Care (ANC) is the main technique to reduce maternal morbidity and mortality. This study evaluates JKN membership and economic status affecting ANC service coverage.

Subjects and Method: This study is a cross-sectional study using data from the 2017 Indonesian Demographic and Health Survey (IDHS). This data is used to assess the proportion of economic status and national health insurance (JKN) membership and to measure the relationship between the two with ANC coverage. Analysis using Logistic Regression with R software version 3.6.3. and perform Propensity Score Matching (PSM) to reduce self-selection bias by balancing the observed variables between groups of respondents based on economic status with and without JKN.

Results: Of the 5429 respondents, 20.2% were very poor, 20.9% poor, 19.9% middle class, 20.8% rich, and 18.2% very rich. Among these residents, 61.4% have JKN membership and 38.3% do not. The substantial gap in the utilization of maternal health services, especially in ANC4x services, is 30.7 points between the very poor (48.2%) and the very rich (86.9). Respondents who worked as employees were more likely to have JKN membership than those who did not have a job (AOR=2.34; 95% CI = 1.74 to 3.16). Respondents who were exposed to the internet at least once a week were more likely to have JKN membership than those who were not exposed to the internet (AOR=1.46; 95% CI= 1.09 to 1.97).

Conclusion: JKN membership and economic status affect ANC 4x service coverage.

Keyword: Socio-economic, National Health Insurance, ANC, Coverage

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BACKGROUND

In 2015 the Sustainable Development Goals (SDGs) as the agenda of countries around the world were initiated with development targets and will last until 2030. Some of the achievement targets that have been set in order to improve the health and nutrition

status of the community include the Maternal Mortality Rate (MMR) 306/ 100,000 births. life, the Infant Mortality Rate (IMR) is 24/1,000 live births, the prevalence of malnutrition in children under five years of age is 17/100,000, and the prevalence of stunting in children under the age of two is

28/100,000. MMR has decreased by 346 deaths to 305 maternal deaths per 100,000 live births, but is still far from the MDGs target of 102/100,000 live births set in 2015. Indonesia, on the other hand, must strive to exceed the SDG goals by reducing the MMR to below 70 per 100,000 live births, reducing the neonatal mortality rate to 12 per 1000 live births, and reducing the under-five mortality rate to 25 per 1000 live births. Compared to other ASEAN countries, Indonesia's MMR is still 9 times that of Malaysia, 5 times of Vietnam, and almost 2 times of Cambodia. According to WHO statistics, the MMR in developed countries is estimated at 12/100,000 live births, while in under-developed countries it is 239/100,000 live births. 99% of all maternal deaths are estimated to occur in developing countries, even though the causes of death can be prevented with the right policies (Laksono et al., 2016; United Nations, 2021; WHO, 2016)

Maternal death, defined as the death of a woman while pregnant or within 42 days of termination of pregnancy. Since one in three pregnancy-related deaths occur from one week to one year of birth, it is very important to pay attention to maternal deaths that occur not only within six weeks, but also one year (WHO, 2021). Maternal mortality is not only caused by emergencies related to pregnancy and childbirth, but also by poor quality of health services, which can be influenced by socioeconomic status and geographic location. The high MMR occurs in a population that faces socio-economic inequality. Several studies have shown that socioeconomic status is a risk factor for maternal mortality (Lindquist et al., 2013; Novignon et al., 2019).

One of the risk factors for maternal death is socioeconomic status. Pre-eclampsia/ eclampsia, anesthetic-related side effects, obstetric complications, or difficult

caesarean section (C-section) cause more than 100 times the maternal mortality ratio in some low-income countries (LICs) than in high-income countries (LICs). Income Countries - HICs). In addition, inequality in the use of maternal health services, such as antenatal care (ANC) services in health facilities or facility-based deliveries, affects the poor quality of maternal health in rural areas. Although maternal mortality in HICs has decreased substantially in recent decades, it still occurs at around 10 per 100,000 births (Ghulmiyyah and Sibai, 2012; Patel et al., 2020).

ANC services are the main technique for reducing maternal morbidity and mortality. The purpose of ANC is to monitor and maintain the health and safety of the mother and fetus, recognize and treat all pregnancy problems, respond to complaints, prepare for delivery, and encourage a healthy lifestyle. ANC visits are very important to detect and prevent pregnancy complications. There has been an increase in the use of maternal health services in under-developed countries, but there are still disparities between demographic groups. Geographic, demographic, social and cultural factors can all contribute to these inequalities (Ali and Chauhan, 2020; Lawn et al., 2016; Zhou et al., 2020)

The high risk of multiple AKI occurs in districts/cities with low coverage of ANC visits, low coverage of deliveries by health workers, low coverage of post-natal care (PNC) visits, high average number of children, average length of schooling, low for women of childbearing age, and high poverty. Equitable and adequate access to maternal health services is an important instrument for countries to achieve the SDGs targets (Patel et al., 2020).

To reduce preventable pregnancy/delivery related deaths, factors that may contribute to maternal mortality, such as

socioeconomic status related to health facility selection, should be identified. Knowing about critical environmental risk factors is expected to help reduce maternal mortality. Therefore, our study aims to further examine the relationship between socioeconomic status and the choice of location for maternal health services.

SUBJECTS AND METHOD

1. Study Design

This study is a cross-sectional study because it uses cross-sectional data from the 2017 Indonesian Demographic and Health Survey (IDHS), which was conducted by the Central Statistics Agency in collaboration with the National Population and Family Planning Agency and the National Population and Family Planning Agency.

2. Population and Sample

The IDHS uses standardized instruments to measure the primary utilization of maternal services to ensure validity and comparability of results within a country. In Indonesia, the survey used a stratified multi-stage design to produce a representative sample of 34 provinces. The 2017 IDHS data was used for the main analysis, with the 2012 IDHS used to determine the use of JKN services in 201. The IDHS data were used to assess the proportion of economic status and JKN membership and to measure the relationship between them with ANC4x coverage and ANC4x with comprehensive services. This main result was chosen because it represents the main intervention that helps reduce MMR (National Population and Family Planning Board, Statistical Indonesia, Ministry of Health, & ICF, 2018)

The sample of female respondents in the 2017 IDHS was 49,627 people. The criteria in this study were women aged 15-49 years, pregnant or postpartum (<6 months), filling out a complete questionnaire. The

sampling technique used is convenient sampling.

3. Study Variables

Independent Variables namely JKN membership status, Dependent Variables consist of Antenatal Care (ANC) from skilled providers and ANC with complete services

4. Operational Definition of Variables

The main independent variable is JKN membership status. The respondent's membership in JKN is determined by the question "Are you covered by health insurance?" and "What form of health insurance do you have?"

Economic status used in this study as an independent variable based on Information on the Poverty Index of the IDHS which describes the socioeconomic status of the household and is used to calculate the household wealth index.

Antenatal care (ANC) from skilled providers is defined as antenatal care received from skilled personnel, such as doctors (general practitioners and/or obstetricians), midwives, and nurses. The next variable is antenatal care at the first visit (K1) which is defined as pregnancy health services received at least once from skilled workers regardless of the time of visit. Antenatal care of at least four visits (ANC 4x) is a pregnancy health service of at least four visits, once in the first trimester, once in the second trimester, and twice in the third trimester. Meanwhile, the other variable is ANC with complete services which the Ministry of Health recommends that pregnant women receive service standards such as height, weight, upper middle arm, blood pressure measurement, fundal height measurement, fetal heart rate examination, and monitoring of fetal presentation (National Population and Family Planning Board, Statistical Indonesia, Ministry of Health, & ICF, 2018).

5. Study Instruments

Data Survei Demografi dan Kesehatan Indonesia (SDKI) 2017 (Indonesia Demographic and Health Survey Data).

6. Data analysis

For data analysis, we used Logistic Regression with R software version 3.6.3. Because health insurance ownership is not a random process and depends on individual characteristics, we used Propensity Score Matching (PSM) to reduce self-selection bias by balancing the observed covariates between groups of women based on economic status with and without JKN. We used the absolute standard mean difference as the most common measure to ensure balance in the treatment and control groups with respect to the independent variables. Next, we apply multiple hypothesis testing using the Bonferroni and Holm procedures to control for inflation type 1 error (probability of rejecting the true null hypothesis) due to simultaneous null hypothesis testing for the three main outcomes.

The determination of the Poverty Index is calculated using easily collected data on household ownership of certain assets, such as televisions and bicycles; materials used for housing construction; and types of access to water and sanitation facilities. Households are scored based on the number and types of consumer goods they own, from televisions to bicycles or cars, and housing characteristics such as sources of drinking water, toilet facilities, and flooring materials. This score is derived using principal component analysis. National wealth quintiles are constructed by assigning a household score to each member of the common household (*de jure*), ranking each person in the household population according to their score, and then dividing the distribution into five equal categories, each with 20% of the population. (National Population and Family Planning Board,

Statistical Indonesia, Ministry of Health, & ICF, 2018).

7. Research Ethics

The 2017 IDHS survey procedures and questionnaires have been reviewed and approved by the ICF International Institutional Review Board (IRB), and the survey protocol has been reviewed by the ICF IRB, the Indonesian Ministry of Health, and the BKKBN for human protection.

RESULTS

1. Sample Characteristics

The characteristics of our research sample can be seen in. Overall, 61% of new mothers had JKN insurance in 2017. The majority of respondents were less than 35 years old, married, with two children or less, had completed secondary education, did not have a job, were not exposed to the internet and newspapers, and lived in the Java-Bali region.

Although the poor and near-poor are eligible for full or partial subsidies through JKN, there is little difference in the distribution of respondents across wealth segments in the insured and uninsured population, with the exception of fewer respondents in the highest wealth quintiles among the uninsured group. The proportion of samples that received maternal health services was higher in the samples included in the JKN program compared to those who were not included in the JKN program (do not have insurance). In the ANC 4+ visit category, there were 78.6% of the sample who had JKN membership and of course the sample who did not have JKN membership had a lower percentage of 71.0%. Meanwhile, in the category of ANC 4+ visits and receiving the ANC clinical component, 23.4% of the sample had JKN membership, while 19.8% who were ANC4+ and received the ANC clinical component did not have JKN membership.

Table 1 Sample Characteristics

Variable	All		JKN		Without JKN	
	N	%	N	%	N	%
Overall Sample	5429	100.0	3332	61.4	2097	38.6
Outcomes variables:						
ANC 4+	4107	75.6	2618	78.6	1489	71.0
ANC 4+ and get comprehensive services	1194	22.0	780	23.4	414	19.8
Delivery by skilled personnel	5045	92.9	2892	94.4	1900	90.6
Delivery at Health Care Facilities	4531	83.5	3145	86.8	1639	78.1
PNC	4795	88.4	3004	90.2	1791	85.4
PNC by skilled personnel	4729	87.1	2097	89.3	1756	83.7
Control Variable						
Age (year):						
15-24	1364	25.1	764	22.9	600	28.6
25-34	2819	51.9	1745	52.4	1074	51.2
35-42	1140	21.0	747	22.4	392	18.7
42-49	107	2.0	76	2.3	31	1.5
Marital Status						
Unmarried	104	1.9	54	1.6	50	2.4
Married	5325	98.1	3277	98.4	2047	97.6
Parity						
1	1776	32.7	1081	32.4	695	33.2
2	1918	35.3	1139	34.2	778	37.1
3	1027	18.9	648	19.5	379	18.1
4	437	8.0	279	8.4	158	7.5
>5	271	5.0	184	5.5	87	4.2
Education						
<Primary school	352	6.5	212	6.4	140	6.7
Primary Education (graduate)	979	18.0	562	16.9	417	19.9
Junior high school (not graduate)	1535	28.3	852	25.6	683	32.6
Junior high school (graduate)	1684	31.0	1029	30.9	655	31.2
≥Senior high school	879	16.2	677	20.3	202	9.6
Occupation						
Unemployment	3076	56.7	1755	52.7	1320	63
Farmer	367	6.8	206	6.2	160	7.6
Labor	1352	24.9	849	25.5	503	24
Employee	634	11.7	520	15.6	114	5.4
Exposure to internet						
Not at all	3351	61.7	1916	57.5	1435	68.4
<1x a week	1645	30.3	1090	32.7	556	26.5
>1x a week	433	8.0	326	9.8	107	5.1
Reading newspaper:						
Not at all	220	4.1	128	3.8	92	4.4
<1x a week	702	12.9	443	13.3	259	12.3
>1x a week	4506	83.0	2760	82.9	1746	83.3
Poverty index						
Very poor	1098	20.2	650	19.5	448	21.4
Poor	1135	20.9	640	19.2	495	23.6
Middle	1079	19.9	640	19.2	439	20.9
Rich	1129	20.8	688	20.6	442	21.1
Very Rich	987	18.2	714	21.4	273	13.0
Residence						
Rural	2818	51.9	1610	48.3	1208	57.6
Urban	2611	48.1	1721	51.7	890	42.4
Residential Area:						
East Indonesia	192	3.5	131	3.9	62	2.9
Sulawesi	402	7.4	297	8.9	105	5
Kalimantan	326	6.0	174	5.2	152	7.2
Nusa Tenggara	263	4.9	151	4.5	113	5.4
Sumatra	1235	22.7	765	22.9	470	22.4
Java & Bali	3010	55.4	1814	54.4	1196	57

2. Bivariate analysis

Table 2. shows that the type of work and internet access are the most important predictors of participation status in JKN. Respondents who worked as employees were more likely to have JKN membership than women who did not have a job (AOR= 2.34; 95% CI= 1.74 to 3.16). Respondents

who were exposed to the internet at least once a week were more likely to have JKN membership than women who were not exposed to the internet (AOR= 1.46; 95% CI= 1.09 to 1.97). However, there is no significant difference in JKN membership status based on the poverty index (the poorest group as a reference).

Table 2 Factors related to membership in the 2017 National Health Insurance (JKN)

Variable	AOR	95% CI		P
		Lower Limit	Upper Limit	
Occupation				
Unemployee (references)				
Farmer	0.96	0.74	1.27	0.794
Labor	1.17	0.99	1.40	0.073
Employee	2.34	1.74	3.16	<0.001
Internet Access				
Not at all (references)				
<1x a week	1.26	1.07	1.47	0.004
>1x a week	1.46	1.09	1.97	0.012
Poverty index				
Very poor (references)				
Poor	0.85	0.67	1.08	0.173
Middle	0.89	0.68	1.15	0.365
Rich	0.82	0.62	1.08	0.150
Very rich	1.04	0.75	1.44	0.812

AOR – adjusted odds ratio, CI – confidence interval

Table 3 Maternal Health Services by Economic Status

Group	JKN %	Without JKN %	ATT	95% CI		P
				Upper Limit	Lower Limit	
ANC4x						
Very poor (references)	56.2	46.2	10.0	4.4	15.6	<0.001
Poor	70.2	61.6	8.7	2.2	15.1	0.009
Middle	78.4	71.0	7.4	1.4	13.4	0.072
Rich	80.6	78.1	2.4	-3.8	8.8	0.426
Very Rich	86.9	83.2	3.7	-3.8	11.3	0.508
ANC with Comprehensive Examination						
Very poor (references)	10.3	7.6	2.7	0.0	5.4	0.059
Poor	18.8	13.3	5.5	0.8	10.1	0.02
Middle	20.8	17.6	3.2	-2.5	8.9	0.268
Rich	32.0	20.6	11.4	4.8	17.9	0.001
Very Rich	28.0	19.8	8.2	-0.1	16.5	0.052

ATT: average treatment effect on the treated

Based on economic sub-groups, it shows that the difference in outcomes associated with JKN enrollment is greater for the very poor compared to the very rich. At the

national level, Table 3 shows the differences in the utilization of maternal health services between respondents who have JKN membership and those who do not, as evaluated

by the average treatment effect in the treatment group (Average Treatment Effect on the Treated - ATT). Substantial disparities in the utilization of maternal health services between the very poor and the very rich still exist, especially in the ANC 4x coverage which is much lower for the very poor (48.2%) compared to the very rich (86.9%) for women with JKN membership.

DISCUSSION

Ministerial Regulation No. 97/2014 mandates that women receive quality and comprehensive antenatal care (ANC) services to ensure a healthy and safe delivery. The government recommends at least four ANC visits during pregnancy, one during the first trimester, one during the second trimester, and two during the third trimester. Key indicators of maternal health services in an effort to reduce maternal and newborn mortality include ANC, deliveries in health facilities, and deliveries by skilled birth attendants (Ministry of Health, 2014).

In 2018, the proportion of ANC visits for women aged 10 to 54 years, namely the first visit increased to 96.1% from 95.2% in 2013, while the fourth ANC visit increased to 74.1% from 70.0% in 2013, but still far from the 76.0% target set out in the 2017 Strategic Plan (Ministry of Health, 2019). However, the quality of services to ensure early detection and adequate care for pregnant women should be improved. Midwives lead the task of prenatal care, identify difficulties or indicators of complications, assist with delivery, and conduct postpartum evaluations. If the midwife sees indicators of difficulties that cannot be overcome, she must immediately make a referral for the mother to a health center that offers Basic Emergency Neonatal Obstetric Services. According to 2018 Ministry of Health data, midwives supported 62.7% of deliveries carried out in independent practice midwives

(29%), but many were still carried out at home (16%) (Ministry of Health, 2019).

ANC coverage data is dominated by female respondents who have JKN membership. On the other hand, female respondents who do not have JKN membership have lower ANC utilization. This finding is in line with the goal of JKN issued by the Indonesian government to provide universal access to health care facilities (Agustina et al., 2019). Social insurance policies to improve public access to health care facilities have also been adopted by other countries. The results of other studies that have evaluated this show positive results, although there are still some obstacles encountered in its implementation (Laksono et al., 2016; Miraldo et al., 2018).

The possibility of accessibility as another major obstacle that arises, including issues such as distance to health facilities, poor referral system, and expenses that may arise should be considered. Previous study has shown that proximity to health facilities is a major factor for pregnant women in choosing delivery services (Franchi et al., 2020; Ganchimeg et al., 2014). Problems such as lack of transport options and poor transport infrastructure can result in increased costs of health care visits. For families who fall into the category of poor with limited financial capacity, distance problems are a commonly noted reason for not using health services properly. This is interesting to be investigated in the next research. Health insurance programs should encourage women to travel to health facilities by providing coverage for referral transportation and hospitalization, especially for households with limited financial capacity. The quality of maternal health services to ensure early detection and adequate care for pregnant women should be improved. This study shows that the JKN membership scheme in Indonesia and

economic status are closely related to ANC coverage. This finding adds to the growing body of data that health insurance ownership is related to ANC service coverage.

AUTHOR CONTRIBUTION

All authors play a role in writing the manuscript, the second author plays a role in analyzing the data, All authors provide input on the manuscript according to their respective competencies. And all authors read and approve the submitted manuscript.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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