

# The Effect of Health Insurance on Institutional Delivery in Indonesia

## Pengaruh Kepemilikan Jaminan Kesehatan terhadap Persalinan pada Fasilitas Kesehatan di Indonesia

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### Abstract

In Indonesia, institutional delivery increases every year, but there are still 30%-37% mothers who deliver at home. Unfortunately, the increase is not in line with maternal mortality reduction, so that Indonesia does not achieve the fifth MDGs goal. To achieve Universal Health Coverage, Indonesia implements National Health Insurance (NHI). NHI integrates four types of health insurance, namely *Askes/ASABRI*, *Jamsostek*, *Jamkesmas* and *Jamkesda*. One of its benefits is maternal health services. Health insurance can address financial barriers on delivery in health facility. By using secondary data of National Basic Health Research 2013 and Village Potential 2011 data, this study aimed to analyze effect of health insurance on institutional delivery in Indonesia. Samples were 39,942 women aged 15-49 years old who gave birth to their last child during 2010-2013. The study used econometric approach by applying probit and bivariate probit as estimation model to estimate the effect with consideration to endogeneity issue of health insurance. The results found that health insurance was likely to increase institutional delivery by 39.52%. In conclusion, women who have health insurance prefer to deliver birth at health facility compared to those who do not have health insurance.

**Keywords:** Health insurance, institutional delivery, universal health coverage

### Abstrak

Di Indonesia, persalinan di fasilitas kesehatan mengalami peningkatan setiap tahunnya, tetapi masih terdapat sekitar 30% ibu yang bersalin di rumah. Sayangnya, peningkatan pemanfaatan pelayanan persalinan di fasilitas kesehatan tersebut tidak diimbangi dengan penurunan AKI, sehingga Indonesia tidak berhasil mencapai target *MDGs*. Untuk mencapai *Universal Health Coverage*, Indonesia mengimplementasikan program Jaminan Kesehatan Nasional (JKN). JKN mengintegrasikan empat jaminan kesehatan, yaitu *Askes/ASABRI*, *Jamsostek*, *Jamkesmas*, dan *Jamkesda*. Salah satu jaminan tersebut adalah pelayanan persalinan. Jaminan kesehatan dapat mengatasi kendala biaya pada persalinan di fasilitas kesehatan. Dengan menggunakan data Riset Kesehatan Dasar 2013 dan Potensi Desa 2011 sebagai sumber data, penelitian ini bertujuan menganalisis kepemilikan jaminan kesehatan terhadap peningkatan pemanfaatan pelayanan persalinan di fasilitas kesehatan di Indonesia. Sampel penelitian berjumlah 39.942 perempuan berusia 15-49 tahun yang melahirkan anak terakhir dalam periode waktu 2010-2013. Penelitian ini menggunakan pendekatan ekonometri dengan model estimasi probit dan bivariat probit untuk mengestimasi efek jaminan kesehatan dengan mempertimbangkan isu endogenitas pada jaminan kesehatan. Hasil penelitian menunjukkan bahwa kepemilikan jaminan kesehatan meningkatkan persalinan di fasilitas kesehatan sebesar 39,52%. Sebagai kesimpulan, ibu yang memiliki jaminan kesehatan akan lebih memanfaatkan fasilitas kesehatan saat persalinan dibandingkan dengan ibu yang tidak memiliki jaminan kesehatan.

**Kata kunci:** Jaminan kesehatan, persalinan di fasilitas kesehatan, *universal health coverage*

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## Introduction

Institutional delivery plays an important role on maternal mortality rate (MMR) reduction.<sup>1,2</sup> Global Burden of Disease study in 2015 reported that maternal mortality is in the fourth place of all mortality causes.<sup>3</sup> Globally, MMR decreases by 45% from 380 maternal deaths per 100,000 live births in 1990 to 210 maternal deaths per 100,000 live births in 2013. MMR in developing countries is fourteen times higher than developed countries.<sup>4</sup> MMR in Indonesia is still high that is 359 maternal deaths per 100,000 live births.<sup>5</sup> The number does not achieve Millennium Development Goals (MDGs) target and national goal to reduce MMR at 102 per 100,000 live births.<sup>6</sup>

Institutional delivery becomes priority in Indonesia due to accessibility to equipment and supplies or due to immediate referral to secondary or tertiary health facilities if there is any complication. Another reason is that delivery at health facility is handled by health professionals who are able to anticipate and detect signs and symptoms of complication.<sup>7</sup> Therefore, several countries including Indonesia change their policy from delivery at health professionals to delivery at health facilities. Indonesia's target for institutional delivery is 85% delivery at health facilities by 2019.<sup>8</sup>

Globally, there is 63% institutional delivery during 2009-2013. Southeast Asian countries, such as Singapore, Brunei Darussalam, and Thailand achieve 100% for institutional delivery followed by Malaysia (99%) and Cambodia (83%).<sup>7</sup> Based on National Basic Health Research 2013, Indonesia is at the sixth position with 70.4% delivery at health facilities.<sup>9</sup>

There are mothers who still delivered at home that are on lowest economic status.<sup>9</sup> According to Comfort, Peterson and Hatt,<sup>10</sup> financial barriers play an important role affecting access to maternal health services. Indonesia Demographic and Health Survey (IDHS) 2012 reported that approximately 76.6% mothers discussed childbirth costs and 15.2% mothers stated that costs became problem in health care seeking during pregnancy and childbirth.<sup>5</sup> Therefore, costs play an important role on maternal delivery. In order to address the financial barriers, health insurance is implemented. Health insurance can address factors that affect utilization and provision of maternal health services, particularly on increasing maternal delivery at health facilities.<sup>10</sup>

By increasing access to health services, health insurance has potential to increase maternal and child outcome. A recent systematic review concluded that there was a consistent relation between health insurance and institutional delivery.<sup>10</sup> The review was also supported by recent studies.<sup>11-13</sup> In Ghana, health insurance increases institutional delivery by 32.3%.<sup>11</sup> Another study also found that health insurance was a significant factor de-

termining delivery at public health facilities and the ownership of health insurance during pregnancy tends to increase 2.5 times to deliver at health facilities.<sup>12</sup>

There were several types of health insurance in Indonesia before National Health Insurance (NHI) was implemented in 2014, which were *Askes*, *Jamsostek*, *Jamkesmas*, *Jamkesda*, private health insurance and health benefits from company. National Basic Health Research 2013 reported that 50.5% Indonesian citizens did not have health insurance.<sup>9</sup> *Jamkesmas* held the greatest proportion (28.9%). The study only covered four types of health insurance integrated in NHI namely *Askes*, *Jamsostek*, *Jamkesmas* (not including *Jampersal*) and *Jamkesda*.

Each health insurance has different benefit packages. One of its benefit packages is maternal delivery service. With the assurance of maternal delivery service, the use of institutional delivery is expected to increase. Thus, the expected has an impact on maternal health outcome. To analyze that health insurance has an effect on institutional delivery in Indonesia, this study was conducted.

## Method

This study was a cross-sectional design using National Basic Health Research 2013 and Village Potential 2011 data. National Basic Health Research provides individual data, meanwhile Village Potential provides health facilities, health professionals and distance to health facilities data. The population was 53,765 women aged 10-54 years old. Samples were 39,942 women aged 15-49 years old who delivered last child, live birth or still birth in three years before the survey. The exclusion criteria were women who were never in labor, had private insurance and company insurance, were pregnant during interview, and had incomplete data.

The study used Grossman's Health Capital and Demand for Health theory, Principal-Agent relationship theory and Andersen's The Behavioral Model and Access to Medical Care theory.<sup>14-17</sup>

Probit and bivariate probit (biprobit) model were used to meet the study objective. Probit model used the Equation 1 and Equation 2 where  $y$  is whether women delivery at health facilities or otherwise;  $C$  is whether women has health insurance or otherwise;  $X$  is set variable of predisposing (age, parity, and education), enabling resources (economic status, travel time and cost to health facility, living in urban area and Java-Bali, health facilities and health professional ratio, and distance to

Equation 1.

$$C = X_i' \beta_i + \varepsilon_1$$

Equation 2.

$$y = X_i' \beta_i + \gamma C + \varepsilon_2$$

health facilities), and need factor (intended pregnancy, antenatal care, pregnancy and childbirth complication).  $\beta$  and  $\gamma$  are parameters.

Health insurance is suspected to be endogenous because health insurance choice could be affected by unobservable characteristics.<sup>18</sup> Endogeneity bias is likely in Equation 2. Health insurance variable is endogenous due to correlation between  $\epsilon_1$  and  $\epsilon_2$  ( $\rho \neq 0$ ). Endogeneity could lead to estimator inconsistent on probit model, so that biprobit model was used, which is more consistent.<sup>19</sup> Biprobit model was selected because dependent variable on main equation and endogenous regressor were binary.<sup>19,20</sup> Endogeneity test in this study followed Waters,<sup>18</sup> which is significance of  $\rho$  (*rho*) on biprobit model. Health insurance variable is endogenous if value of *rho* has p value less than 0.05.

Endogeneity test of health insurance needs instrumental variable (IV)  $z$  to clear relation between health insurance ( $x$ ) and  $\epsilon$ .<sup>21</sup> Following Cercone, Pinder, Jimenez, and Briceno,<sup>22</sup> respondent's occupation (whether respondents were employed or otherwise) was used as instrumental variable. The appropriateness of instrumental variable was tested through Kleibergen-Paap LM statistic of under identification test and F statistic of weak identification.<sup>19</sup>

The study conducted heteroscedasticity test. The importance of heteroscedasticity test is because it could lead to bias and inconsistent result on probit and biprobit model, so that a Huber-White-Sandwich correction needed to address this issue.<sup>18</sup>

## Results

The test for potential endogeneity of health insurance confirmed that health insurance is endogenous, so that parameter estimations from probit model could lead to bias. Wald test of rho of exogeneity test was 20,1558 (p value < 0.01). Therefore, estimation from biprobit model was used. Kleibergen-Paap LM statistics show that instrumental variable adequate to identify the equation (25,665; p value < 0.01). F test for weak identification test show that instrumental variable was not weak (25,666; p value < 0.01). Instrument exogeneity could not be examined because the model only has one instrument (just identified)<sup>19</sup>. Model also has heteroskedastic issue (p value < 0.01) so that Huber-White-Sandwich correction was used.

Table 1 demonstrates descriptive statistics of respondent characteristics. The results showed that 72% sample had institutional delivery and 45% had health insurance. Variables on predisposing, enabling and need factors were also shown in Table 1.

Table 2 presents effect of health insurance on institutional delivery on two models. Probit model showed that health insurance increased institutional delivery by 2.97%, while biprobit model increased institutional delivery by 39.52%. Difference in effect also shows on other variables.

## Discussion

The study used National Basic Health Research 2013 and Village Potential 2011 data, which was conducted in 33 provinces. Missing data was 0.9% due to unclear an-

Table 1. Descriptive Statistics

Variables	Category	Mean	95% CI	Min	Max
Institutional delivery		0.725	0.714 – 0.735	0	1
Health insurance		0.450	0.441 – 0.459	0	1
Age (years)		28.26	28.17 – 28.35	13	49
Parity	≥ 3 children	0.321	0.314 – 0.328	0	1
	2 children	0.350	0.343 – 0.357	0	1
	1 child	0.329	0.322 – 0.337	0	1
Education	≤ Elementary school	0.365	0.356 – 0.374	0	1
	Junior high school	0.266	0.259 – 0.273	0	1
	≥ High school	0.369	0.360 – 0.378	0	1
Economic status	Lowest	0.131	0.125 – 0.137	0	1
	Low-middle	0.182	0.176 – 0.188	0	1
	Middle	0.228	0.221 – 0.235	0	1
	Upper-middle	0.266	0.258 – 0.274	0	1
	Highest	0.194	0.187 – 0.201	0	1
One-way travel time to health facility < 60 minutes		0.929	0.924 – 0.935	0	1
One-way travel cost to health facility < USD 1		0.836	0.828 – 0.843	0	1
Living in urban area		0.517	0.503 – 0.532	0	1
Living in Java-Bali		0.586	0.573 – 0.599	0	1
Health facility ratio		5.49	5.41 – 5.57	0.930	21.25
Health professional ratio		5.23	5.18 – 5.29	0.243	18.77
Long distance to health facility (km)		5.12	5.11 – 5.13	1.808	7.420
Intended pregnancy		0.850	0.844 – 0.855	0	1
Complete antenatal care visit		0.733	0.725 – 0.740	0	1
Pregnancy complication		0.138	0.132 – 0.144	0	1
Childbirth complication		0.126	0.121 – 0.132	0	1

**Table 2. The Effect of Health Insurance on Institutional Delivery**

Variables	Probit-ME		Biprobit-ME	
	Coeff	SE	Coeff	SE
Instrument variable: employment				
Health insurance	0.0297***	(0.00591)	0.3952***	(0.0261)
Constant	-1.901***	(0.106)	-2.260***	(0.104)
Wald chi2(21)	3519.35			
Prob > chi2	< 0,01			
Pseudo R2	0.1747			
Log pseudolikelihood	-19443.123			
Wald chi2(42)			9401.13	
Prob > chi2			0,0001	
Log pseudolikelihood			-45627.721	
Wald test of rho=0: chi2(1) dan p value			24.8778 (< 0,01)	
Observations	39,942		39,942	
Robust standard errors in parentheses				

Notes:

SE = Standard Error; ME = Marginal Effect; Coeff = Coefficient

\*\*\*p value &lt; 0.01, \*\*p value &lt; 0.05, \*p value &lt; 0.1

swers and leap questions on age, travel costs to health facility and antenatal care visit. Endogeneity issue on health insurance variable was addressed by instrumental variable approach. Biprobit model was used to obtain consistent estimates on binary dependent and endogenous variables.<sup>19,20</sup>

The results found that proportion of institutional delivery was 72.3%. The number was not far different from National Basic Health Research 2013, that was 70.4%.<sup>9</sup> Institutional delivery target by government is 85%.<sup>8</sup> Therefore, it is necessary to encourage the approximately 27.7% of mothers who do not deliver at health facilities.

Government, in this case Ministry of Health, has been carrying out efforts which relate to maternal health. Such efforts are placing midwife in the village in order to increase accessibility of maternal and neonatal health services; conducting Making Pregnancy Safer (MPS) Program focusing on birth attendant, complication management and unintended pregnancy prevention; carrying out Expanding Maternal and Neonatal Survival program in six provinces that have high maternal and neonatal ratio; and conducting Birth Planning and Prevention of Birth Complication with Sticker Program that involves family through community leaders.

Home delivery and traditional birth attendant (TBA) restriction become important, as the rule applied by the Philippines. The restriction give results on the low MMR and the high institutional delivery for region that implementing the restriction.<sup>2</sup> The availability and access to maternal health services, especially maternal delivery, also contributed to the increasing institutional delivery in Bangladesh.<sup>1</sup>

The results also found that proportion of health insurance ownership was 45%. The number was not far

different from National Basic Health Research 2013, that was 49.5% (with addition to company and private health insurance). There are still mothers who have health insurance that do not deliver at health facility. It is assumed that there are other factors influencing the decision to deliver at health facilities, such as decision maker, and tradition and TBA interpersonal skill.<sup>23</sup>

Health insurance effect the increase in institutional delivery by 39.52%. The result is in line with previous studies.<sup>11-13</sup> Health insurance can overcome financial barrier that plays an important role in access to maternal health services.<sup>10</sup> The increase in institutional delivery through health insurance becomes important, considering that delivery at health facilities plays an important role to reduce maternal mortality.<sup>1,2</sup> By increasing access to health facility, health insurance has potential to increase maternal and child outcome.

The increasing of MMR reported in IDHS 2012, which was 359 deaths, compared to 228 maternal mortality per 100,000 live births.<sup>5</sup> However, the increase could not be explained in this study. This can be caused by an increase in the volume of services and workload due to increased access, so it reduces service quality and has an impact on maternal mortality or other factors.<sup>10</sup>

For other variables, in general, the results were in line with previous studies which had positive relation to institutional delivery, except for distance to health facility and health professional ratio. Related to distance to health facility, the use of maternal health services often depends not only on distance, but also on quality of services.<sup>23</sup> Health professional ratio has negative association to institutional delivery. The negative association is assumed due to the higher options on health professionals and rationalization of care where health professionals as agents do not initiate the demand.<sup>25</sup>

## Conclusion

The study analyzes the effect of health insurance on institutional delivery and concludes that health insurance tends to increase delivery at health facilities by 39.52% due to increasing access to maternal delivery service. The increase is expected to give benefits to maternal outcome.

The increasing volume of services due to health insurance could give bad impact to quality of care because of the increasing workload, so it is necessary to guarantee the quality of care, particularly delivery at health facilities. Health insurance proves to improve institutional delivery, but its association with maternal mortality needs to be studied further, i.e. quality of services received by mothers. There are still mothers who have health insurance that do not deliver at health facilities. Factors behind it need to be studied further.

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