Original Article

Home or Healthcare Facility: Influence of Antenatal Health Service on the Decision on the Place of Birth in Indonesia

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ABSTRACT

Background: Health facility is an ideal place for child birth to obtain favorable outcomes for maternal and neonatal health. Most of mothers in Indonesia have access to healthcare but 20% of them do not give birth in a healthcare facility. This study aimed to assess the association of the maternal health services and choosing a healthcare facility for birth.

Methods: This research utilized Indonesia’s Survey of Health Indicators (SIRKESNAS) 2016 data and analyzed it using logistic regression model.

Results: Antenatal care (ANC) (OR = 3.696; P-value = 0.004), preparedness of birth budget (OR = 2.291; P-value = 0.007) and having maternal and child health (MCH) handbook (OR = 1.492; P-value = 0.103) were independently associated with the decision of healthcare facility birth. The ANC service particularly the availability of health professional provider as the first birth attendance (OR = 7.563; P-value = 0.00) and maternal examination as in the form of blood pressure test (OR = 5.009; P-value = 0.013) and ultrasonography (OR = 2.341; P-value = 0.001) substantially associated with the decision of the place of birth.

Conclusion: In order to encourage mothers to deliver in a healthcare facility, improving the quality of ANC services including utilization of MCH handbook and expanding the coverage of delivery insurance are the prominent concerns for healthcare policy.

Keywords: Antenatal care, Indonesia, Maternal health, Place of birth

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the handling management in emergency situations. Homebirth either assisted by a health worker or a non-
healthcare worker entails higher risks of morbidity and
mortality for the mother and infant than health-facility birth (9). Moreover, the American Congress of Obstetricians-
Gynecologists (10) and the American Academy of Pediatrics (11) explained that health facilities with the
availability of professional staff and medical devices therein
are the best place to give birth. In line with this, Indonesia
Ministry of Health Act of 2014 P.L No 97 (12) enacted that
the standard for achieving optimum safety for mothers and
infants has been expanded not only to achieve delivery by
skilled birth assistance but also has to be carried out in a
healthcare facility.

The National community-based participatory health
research, Indonesia Basic Health Research (RISKESDAS)
in 2018, showed that 96% of Indonesian mothers have
access to maternal health care but still 20% of them did not
give birth at a healthcare facility (13). The gap shows that
even though they have access to a health professional or
healthcare service, it is not certain that mothers choose a
healthcare facility to give birth.

Previous studies mostly focused on the mothers’
characteristic and the access to a healthcare facility to
determine the decision of the place of birth (14-16).
However, the service on maternal health care is another
determining factor that can affect it (17); yet, few
researchers have studied this issue.

This research aimed to identify the maternal health service
factors affecting a mother’s decision of whether to deliver at
home or in a healthcare facility. Whilst, the primary focus of
this study is on the impact of the maternal health program
including antenatal care (ANC), antenatal classes, the Delivery
Planning and Complication Prevention (DPCP) program, and
the Mother and Child Health handbook (MCH handbook).
Furthermore, it explores the ANC service and its influence on
the probability of giving birth at a healthcare facility.

It is important to know the major determinants of maternal
health care to formulate the most effective and efficient
approach in healthcare services in order to reach the
optimum health status of mothers and babies. With the focus
on the healthcare programs, this paper proposes some
possible policy recommendations to achieve better
outcomes in maternal and neonatal health, particularly in
the scope of pregnancy and delivery services.

Methods

This secondary study was performed on a subset of
Indonesia’s Survey of Health Indicators (SIRKESNAS)
2016 data. SIRKESNAS 2016 is a survey conducted by the
Health Research and Development Agency of the Ministry
of Health with coverage samples from all provinces (18).
The data was composed of various health indicators
including maternal healthcare service.

For the purpose of this study, the samples selected have to
meet the inclusion criteria of a homemaker who has given
birth during the period of 2014–2015. The variables to be
analyzed were healthcare facility birth, as the dependent
variable, and three categories of independent variables
including the predisposing factors; mother’s age, education,
occupation, and authority in making the decision, enabling
factors; region of living, type of residence, ANC, ANC’s
provider, antenatal classes, an MCH handbook, delivery
planning program, availability of skilled birth assistance
(SBA) and health insurance, and need factors; the mothers
health status of diagnosis, comorbid and other complications
as the independent variables. There is a difference between
antenatal class and ANC. Antenatal class sometimes called
parenting class that provide education for pregnant woman
and husband but there is no medical examination on it. But,
antenatal care is dedicated to provide by health worker
doctors or midwives) with medical examination and give
some diagnosis as the outcome.

Data was analyzed with descriptive and logistic regression.
The descriptive analysis firstly focused on the sample
characteristics based on the place of childbirth. Secondly, it
goes deeper on the respondents with ANC regarding to the
services provided and the place of birth. Further analysis was
conducted with multivariate logistic regression by connecting
all independent variables to the dependent variable.

Two logistic regression models were used. The first logistic
regression model identified the variables of sources of
information in healthcare services, namely, ANC, MCH
handbook, and birth planning, with the probability of a
woman giving birth at a healthcare facility as dependent
variable. Birth planning was described in two different
variables: planned of health professional as the birth helper
and preparedness of the financial needs of the childbirth
process. The second model analyzed the service of ANC
which supports the provision of health information for
pregnant women. The included variables were pregnancy
age at the first ANC visit, ANC provider, maternal
healthcare education for delivery process preparation,
maternal education for an emergency in pregnancy, blood
pressure test, ultrasonography test, complication during
pregnancy, and first birth attendance. The model goodness
of fit was assessed using Omnibus test and the Hosmer and
Lemeshow test. Data analysis was performed using SPSS,
Version 22 (IBM Corp., Armonk, NY, USA).

Results

This study examined 708 women who gave birth in the
period of 2014 to late 2015. The majority of the respondents
belonged to the age range of 20–35 years (74.01%), had
secondary school-level education (54.1%), and had no job
(66.67%). The percentage of mothers who gave birth at a
health facility was 76.98%.

As shown in table 1, there was a gap of the proportion of
healthcare facility birth according to the region. In urban
area, the percentage of mother who gave birth at a
healthcare facility was 89.9%, which was 25% greater than
in rural areas. The data also shows a gap among the islands
where 38.1% of mothers in Papua and 56.3% in Maluku had
given birth in a healthcare facility; meanwhile, in the other
five islands, the proportion was above 70%. Moreover,
based on educational category the data shows that lower
education women were more likely to give birth at non-
health facility than higher education.

Regarding health-seeking behavior, table 2 shows that
majority of mothers received ANC service (95.5%), 77.7%
had an MCH handbook, and 89.1% had a birth plan, but
only a few of them (13.7%) participated in the antenatal classes. In the planning process for delivery, 75.1% of the mothers were involved in the decision-making process indicating that participation in the maternal health program was quite high. However, data analysis on the choice of place of delivery shows that more than 20% or one out of five mothers continued to deliver at home. A deeper analysis of the planned financial source for the delivery showed that mothers with well financial preparedness were more likely to give birth at a health facility. People with delivery insurance had a higher probability to give birth at a healthcare facility than those who plan to pay with their own money. However, only 28.95% of mothers had health insurance. Mothers who did not have any budget plan for delivery, which was half of the total number of mothers in Indonesia, were more likely to give birth at home compared to those with a birth-financial plan.

Table 3 provides a deeper exploration of the 676 respondents who received ANC services according to the place of childbirth. From these restricted sample, 79.14% of women gave birth in a healthcare facility while the rest gave birth at home. Based on the characteristics of region and residence, there was a gap between islands in the utilization of a healthcare facility as the place of birth. Moreover, regarding the type of residence, 90.6% of urban mothers with ANC gave birth at a healthcare facility compared to 68% of mothers in rural area. Another interesting finding is that 80.77% of mothers received ANC service in their first trimester of pregnancy. This showed that the awareness of people to do immediate check for pregnancy is quite good. Mothers in this group are more likely to give birth at a healthcare facility compared to those who first availed ANC service in the second and third trimesters of pregnancy.

### Table 1. Baseline Characteristics of Respondents by Place of Delivery According to Predisposing Factors, Sirkesnas 2016 (N = 708)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Place of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healthcare Facility</td>
</tr>
<tr>
<td>Type of Residence</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>540 (50.05)</td>
</tr>
<tr>
<td>Rural</td>
<td>539 (49.95)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
</tr>
<tr>
<td>Sumatera</td>
<td>194 (27.40)</td>
</tr>
<tr>
<td>Jawa</td>
<td>185 (26.13)</td>
</tr>
<tr>
<td>Bali and Nusa Tenggara</td>
<td>61 (8.62)</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>81 (11.44)</td>
</tr>
<tr>
<td>Sulawesi</td>
<td>134 (18.93)</td>
</tr>
<tr>
<td>Maluku</td>
<td>32 (4.52)</td>
</tr>
<tr>
<td>Papua</td>
<td>21 (2.97)</td>
</tr>
<tr>
<td>Age Category</td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years old</td>
<td>37 (5.23)</td>
</tr>
<tr>
<td>20-35 years old</td>
<td>524 (74.01)</td>
</tr>
<tr>
<td>&gt; 35 years old</td>
<td>147 (20.76)</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
</tr>
<tr>
<td>&lt; = Elementary School</td>
<td>230 (32.49)</td>
</tr>
<tr>
<td>Secondary School</td>
<td>383 (54.10)</td>
</tr>
<tr>
<td>Tertiary School</td>
<td>95 (13.42)</td>
</tr>
<tr>
<td>Main Job</td>
<td></td>
</tr>
<tr>
<td>No Job</td>
<td>472 (66.67)</td>
</tr>
<tr>
<td>Have a Job (worker)</td>
<td>236 (33.33)</td>
</tr>
<tr>
<td>Source of Budget</td>
<td></td>
</tr>
<tr>
<td>Out of Pocket</td>
<td>368 (51.98)</td>
</tr>
<tr>
<td>Insurance</td>
<td>205 (28.95)</td>
</tr>
<tr>
<td>No Plan</td>
<td>135 (19.07)</td>
</tr>
<tr>
<td>Total</td>
<td>708</td>
</tr>
</tbody>
</table>
This can be related to earlier health information received and the number of visits since the earlier the mothers come the more chances of getting in contact with a healthcare worker. The result of regression analysis as in table 4 shows some significant variables related to the choice of delivery place. Firstly, mothers who live in rural areas has a negative relationship with healthcare facility birth (OR = 0.3; 95% CI = 0.19 - 4.78; P-value = 0.001). This shows that mothers in rural areas are 30% less likely to give birth at a healthcare facility than urban mothers’. Second is about the level of education where mothers with a low level of education (elementary school or below it) are less likely to choose a healthcare facility for giving birth than those with a tertiary level of education (OR = 0.496; 95% CI = 0.226, 0.923; P-value = 0.042). Thirdly, this study found that ANC has a positive significant correlation with delivery at a healthcare facility with a probability of 3.69 times than mothers without ANC. Besides, the ownership of an MCH handbook has 1.5 times more probable to give birth at a healthcare facility than those who do not have an MCH handbook. Additionally, mothers with a financial plan also have a strong relationship with the choice of a healthcare facility as the place of birth (OR = 2.291; 95% CI = 1.257, 4.178; P-value = 0.007). In general, ANC has the biggest influence on the decision of a healthcare facility birth. Mothers who have undergone a blood pressure examination are five times more likely to give birth at a healthcare facility (95% CI = 1.4, 17.8; P-value = 0.013) while those who have experienced USG maternal examination are 2.34 times more likely to deliver at a healthcare facility than those who have not (95% CI = 1.397, 3.922; P-value = 0.001). This empirical statistic shows that this important maternal examination could encourage mothers to utilize a healthcare facility for delivery.

**Discussion**

This study examined the association between maternal health services and the decision of where to give birth. More than 20% of the mothers were found to give birth somewhere other than a healthcare facility even though they had access to a medical professional through ANC. This shows maternal health behavior in the utilization of maternal health care especially in place of delivery still needs to be improved. There are some activities that might provide information and education about pregnancy and child birth such as ANC, MCH handbooks, and guidance by healthcare workers in planning for delivery and prevention of complications. By frequently visit the healthcare provider in the form of ANC, they could facilitate preventive actions, early diagnosis, and prompt treatment of complications, and also provide a consultation session and imbed maternal health education such as the importance of nutrition, pregnancy health care, emergencies in pregnancy, delivery preparation, and the family planning program (19, 20).
This study shows that mothers with ANC are 3.69 times more likely to choose a healthcare facility for giving birth than those who did not. This finding is consistent with the previous research by Rai et al. (21), Gabrysich et al. (15), and Owili et al. (22) that ANC increases the likelihood of delivery by SBA or having an institutional delivery and continuing maternal health care in postnatal period. Quality service may affect the utilization of complete maternal healthcare. In the case of ANC, the type of maternal examination, intensity of contact with healthcare workers, and availability of medical equipment are some measurements of quality services (23, 24). In the deeper investigation of ANC services, this study found that the treatment during prenatal-care services and the role of healthcare workers as antenatal providers had a significant association with the number of incidents of healthcare-facility birth. Ultrasound examinations that can provide health information about the baby’s condition, and blood pressure tests that can detect early complications in pregnancy also increase the probability of the mother to give birth at a healthcare facility. At the same time, the data showed that not all ANC service in Indonesia provided blood pressure tests and USG tests. Thus, this should be a special concern of the quality service of ANC. Indeed, these maternal examinations might increase the degree of trust and satisfaction in the healthcare service.

Another interesting finding in this study is that having a health insurance increase the probability of mother to do hospital birth. However, the number of people who have health insurance is only a few. There are only 28.95% mothers who have insurance. Having a financial plan for delivery, either from insurance or other sources, statistically increase the likelihood to give birth at a healthcare facility twice. Additionally, the data showed that not all ANC service in Indonesia provided blood pressure tests and USG tests. Thus, this should be a special concern of the quality service of ANC. Indeed, these maternal examinations might increase the degree of trust and satisfaction in the healthcare service.

Conclusion
This study found that the decision of place of birth was associated with maternal health service. The most significant influences factor was found to be ANC. Some maternal examination found to be the leveraging factors in utilizing healthcare facility as the place of birth such as blood pressure examination and USG test. The availability of a healthcare worker at the time of delivery also one of variable that could encourage mother to give birth at healthcare facility. Another important factor is the

Table 4. Result of Multivariate Regression Model

<table>
<thead>
<tr>
<th>Type of Residence</th>
<th>Model 1. Woman choice of Health Facility Birth</th>
<th></th>
<th>Model 2. Woman choice of Health Facility Birth Restricted to Those with Antenatal Care service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>B coefficient</td>
<td>P-value</td>
<td>OR</td>
</tr>
<tr>
<td>Rural</td>
<td>-1.205</td>
<td>0.001</td>
<td>0.3</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papua</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sumatera</td>
<td>1.303</td>
<td>0.026</td>
<td>3.679</td>
</tr>
<tr>
<td>Jawa</td>
<td>1.937</td>
<td>0.002</td>
<td>6.935</td>
</tr>
<tr>
<td>Bali Nusa Tenggara</td>
<td>2.121</td>
<td>0.002</td>
<td>8.337</td>
</tr>
<tr>
<td>Kalimantan</td>
<td>1.099</td>
<td>0.078</td>
<td>3.001</td>
</tr>
<tr>
<td>Sulawesi</td>
<td>1.213</td>
<td>0.043</td>
<td>3.363</td>
</tr>
<tr>
<td>Maluku</td>
<td>0.483</td>
<td>0.483</td>
<td>1.621</td>
</tr>
<tr>
<td>Educational Attainment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tertiary school</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary school</td>
<td>-0.273</td>
<td>0.447</td>
<td>0.469</td>
</tr>
<tr>
<td>Antenatal Care</td>
<td>1.307</td>
<td>0.004</td>
<td>3.696</td>
</tr>
<tr>
<td>MCH Handbook ownership</td>
<td>0.4</td>
<td>0.103</td>
<td>1.492</td>
</tr>
<tr>
<td>Plan of the Childbirth attendance</td>
<td>-0.204</td>
<td>0.557</td>
<td>0.816</td>
</tr>
<tr>
<td>Budget Plan for Delivery</td>
<td>0.829</td>
<td>0.007</td>
<td>2.291</td>
</tr>
<tr>
<td>Pregnancy Age at the first ANC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not in the first trimester</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Trimester</td>
<td>0.643</td>
<td>0.025</td>
<td>1.902</td>
</tr>
<tr>
<td>ANC Provider</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midwifes or Nurse</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor</td>
<td>0.845</td>
<td>0.061</td>
<td>2.328</td>
</tr>
<tr>
<td>Education about Preparedness for Delivery</td>
<td>-0.104</td>
<td>0.781</td>
<td>0.901</td>
</tr>
<tr>
<td>Education of Emergency in Pregnancy</td>
<td>0.059</td>
<td>0.869</td>
<td>1.061</td>
</tr>
<tr>
<td>Blood Pressure test</td>
<td>1.611</td>
<td>0.013</td>
<td>5.009</td>
</tr>
<tr>
<td>USG test</td>
<td>0.85</td>
<td>0.001</td>
<td>2.341</td>
</tr>
<tr>
<td>Complication</td>
<td>0.464</td>
<td>0.066</td>
<td>1.591</td>
</tr>
<tr>
<td>First Birth Attendance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health worker</td>
<td>2.023</td>
<td>0.001</td>
<td>7.563</td>
</tr>
<tr>
<td>Traditional skilled birth attendance</td>
<td>-1.154</td>
<td>0.025</td>
<td>0.315</td>
</tr>
</tbody>
</table>

Abbreviation: CI, confidence interval; OR, odds ratio; MCH, maternal and child health; ANC, antenatal care; USG, ultrasonography
preparedness of financial budget for delivery which is about ownership of insurance. Therefore, improving the quality of the maternal healthcare system including the quality of healthcare workers, medical devices and supporting infrastructure, and also expanding the coverage of delivery insurance is very important in health strategize and prominent concerns for healthcare policy.

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Ethical consideration
This research was derived from the master’s degree of public policy thesis. The study protocol has been approved by National Graduate Institute for Policy Studies in Tokyo, Japan.

Conflicts of interests
Authors declared no conflict of interest.

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