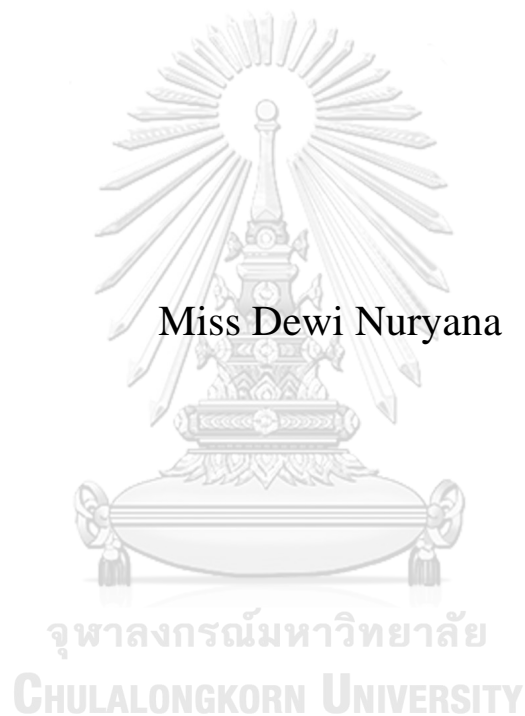


Determinants of Maternal Health Services Utility Among  
Adolescent Mothers in Indonesia: An Analysis of 2017  
Indonesia Demographic and Health Survey



A Thesis Submitted in Partial Fulfillment of the Requirements  
for the Degree of Master of Public Health in Public Health  
Common Course  
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วิเคราะห์จากสำรวจประชากรศาสตร์และสุขภาพของประเทศอินโดนีเซียปี 2560



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By   Miss Dewi Nuryana  
Field of Study                                  Public Health  
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Accepted by the COLLEGE OF PUBLIC HEALTH SCIENCES,  
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เควี เนอร์ยานา : ปัจจัยกำหนดการใช้บริการทางสุขภาพของมารดาในกลุ่มมารดาวัยรุ่น ประเทศอินโดนีเซีย: การวิเคราะห์จากสำรวจประชากรศาสตร์และสุขภาพของประเทศอินโดนีเซียปี 2560. ( **Determinants of Maternal Health Services Utility Among Adolescent Mothers in Indonesia: An Analysis of 2017 Indonesia Demographic and Health Survey**) อ.ที่ปรึกษา  
หลัก : ภก.ดร.ประมณฑ์ วัฒนากุลวานิชย์

อัตราการตายของมารดาในประเทศอินโดนีเซียยังคงสูง โดยมีผู้เสียชีวิต 305 รายต่อ 100,000 การเกิดมีชีวิต ในปี พ.ศ. 2558 ทั้งนี้จำนวนเด็กสาววัยรุ่น (อายุระหว่าง 15-19 ปี) 36 รายจาก 1000 รายในประเทศอินโดนีเซีย พบว่ามีประสบการณ์ในการคลอดบุตรและมีความเสี่ยงสูงที่จะเสียชีวิตมากกว่าผู้หญิงที่มีอายุมากกว่า โดยจุดประสงค์ของงานวิจัยนี้ต้องการประเมินการใช้บริการทางสุขภาพของมารดา (ช่วงฝากครรภ์ ช่วงการคลอดและช่วงการดูแลหลังคลอด) และศึกษาปัจจัยกำหนดการใช้บริการทางสุขภาพของมารดาในกลุ่มมารดาวัยรุ่นประเทศอินโดนีเซีย รูปแบบการวิจัยเป็นการสำรวจแบบตัดขวางโดยใช้ข้อมูลทุติยภูมิจากการสำรวจประชากรศาสตร์และสุขภาพของประเทศอินโดนีเซียปี 2560 โดยประชากรที่ศึกษาเป็นผู้หญิงที่คลอดลูกคนสุดท้ายในช่วงอายุ 15-19 ปี จำนวนทั้งสิ้น 866 ราย โดยใช้สถิติเชิงพรรณนาในการประเมินการใช้บริการทางสุขภาพของมารดา พร้อมทั้งการวิเคราะห์ด้วยสถิติการถดถอยโลจิสติกอย่างง่ายและการถดถอยโลจิสติกเพื่อหาปัจจัยกำหนดที่สำคัญ พบว่ามารดาวัยรุ่นมีการใช้บริการสุขภาพในช่วงการดูแลหลังคลอด (71.5 %) ช่วงการฝากครรภ์ (67.2 %) และช่วงการคลอด (64.5 %) ตามลำดับ ปัจจัยกำหนดในการใช้บริการสุขภาพช่วงการฝากครรภ์ คือ ระดับการศึกษาของสามี อำนาจการตัดสินใจของมารดา ภูมิภาค การติดตามดูแลของสามีระหว่างฝากครรภ์ การปรึกษาหารือระหว่างฝากครรภ์ และความตั้งใจในการคลอดลูกคนสุดท้าย ( $p<0.05$ ) ปัจจัยกำหนดในการใช้บริการสุขภาพช่วงการคลอดคือ ระดับการศึกษาของมารดา การทำงานของมารดา อำนาจการตัดสินใจของมารดา ที่อยู่อาศัย ภูมิภาค ดัชนีความมั่งคั่ง ประกันสุขภาพ การติดตามดูแลของสามีระหว่างฝากครรภ์ และการปรึกษาหารือระหว่างฝากครรภ์ ( $p<0.05$ ) ส่วนปัจจัยกำหนดสำหรับช่วงการดูแลหลังคลอด คือ ความรู้เกี่ยวกับสัญญาณอันตรายระหว่างตั้งครรภ์ ที่อยู่อาศัย ภูมิภาค และการใช้บริการในช่วงการคลอด ( $p<0.05$ ) จากผลการศึกษาดังกล่าวพบว่า ความรู้ หรือ การศึกษาของมารดาวัยรุ่นมีความสัมพันธ์กับการใช้บริการสุขภาพบางส่วนอย่างมีนัยสำคัญ แต่มีแค่ภูมิภาคที่มีความสัมพันธ์กับการใช้บริการสุขภาพทั้งสามช่วงอย่างมีนัยสำคัญ ดังนั้นนโยบายเชิงกลยุทธ์และโปรแกรมสำหรับมารดาวัยรุ่นควรเน้นไปที่ 1) การขยายความครอบคลุมด้านการดูแลสุขภาพในทุกภูมิภาค 2) การให้ความรู้เกี่ยวกับการตั้งครรภ์สำหรับสตรี และ 3) การขยายความคุ้มครองด้านการประกันสุขภาพ

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KEYWOR Maternal health services, Utility, Adolescent mothers, Indonesia  
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Dewi Nuryana : Determinants of Maternal Health Services Utility Among Adolescent Mothers in Indonesia: An Analysis of 2017 Indonesia Demographic and Health Survey. Advisor: PRAMON VIWATTANAKULVANID, Ph.D.

Maternal Mortality Ratio (MMR) in Indonesia remains high with 305 death per 100,000 live birth in 2015. Approximately 36 of 1000 adolescent girls (15-19 years old) in Indonesia experienced childbirth and face the higher risk for maternal mortality than older women. The aims of this study are to assess maternal health services utility (antenatal care (ANC), delivery services, and postnatal care (PNC)) level and to identify determinants of maternal health services utility among adolescent mothers in Indonesia. The design of this study is cross-sectional survey using secondary data from 2017 Indonesia Demographic and Health Survey (IDHS). The study population is women who had last birth at the age of 15-19 years old which total is 866 women. The descriptive statistics was used to assess the utilization of maternal health services level along with a simple logistic regression and multivariable logistic regression to identify the contributing factors. Among adolescent mothers, the highest level of utility is PNC (71.5%) followed by ANC (67.2%) then delivery services (64.5%). Factors that associated with ANC utilization are husband/partner's education, mother's autonomy, region, husband accompanied during ANC, topic discussed during ANC, and intendedness of last birth ( $p < 0.05$ ). Factors contributed to delivery services are mother's education, mother's working status, mother's autonomy, residence, region, wealth index, health insurance, husband accompanied during ANC, and topic discussed during ANC ( $p < 0.05$ ). Whereas, for PNC utilization are knowledge of danger sign during childbirth, residence, region, and delivery services utilization ( $p < 0.05$ ). As the study's results found that knowledge or education of adolescent mothers had significant association with some maternal health services utilization but only region was significantly associated with the three utilizations, therefore strategic policies and programs' approach to adolescent mothers should focus on 1) Expanding health care coverage in every region, 2) Providing maternal education for women and men, and 3) Expanding the health insurance coverage.

Field of Study: Public Health

Student's Signature

Academic 2020

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Year:

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Dewi Nuryana

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background and Rationale

Maternal Mortality Ratio (MMR) in global is still one of major public health issues. There were approximately 295,000 women died from pregnancy and childbirth in 2017. Most of the death (94%) happened in low and lower middle-income countries. In Indonesia, MMR in 2015 is 305 per 100,000 live births (WHO, 2019). It failed to fulfil Millennium Development Goals (MDGs) which targets to decline MMR to 102 deaths per 100,000 live birth in 2015 and still far to achieve Sustainable Development Goals (SDGs) to only 70 maternal deaths per 100,000 live birth by 2030.

Approximately 12 millions of girls in adolescent age (15-19 years old) experience of childbirth every year in developing countries. In global, complications during pregnancies and birth delivery are the crucial factors of death for adolescent girls. The estimation of abortion that happened every year among adolescent girls is 5.6 million. As of 3.9 out of 5.6 million, the abortion was unsafe which caused health problems, morbidity, and maternal mortality. The risks of systemic infections, puerperal endometritis, and eclampsia are higher in adolescent mothers than older women. The adolescent mothers' babies also have higher risks of preterm delivery, low birth weight, and poor neonatal health (WHO, 2020). In Indonesia, approximately 36 of 1000 adolescent girls (15-19 years old) experienced childbirth which makes this country is the second highest rate of childbirth from adolescent girls in ASEAN (Erfina, et al., 2019).

The maternal health services utility has an important role in reducing MMR. Especially in developing countries, the common use intervention to reduce MMR is Antenatal Care (ANC). Having ANC for minimum four visits and delivery by health worker are necessary recommendations to protect mothers from adverse pregnancy outcomes (WHO, 2007). However, the use of maternal health services is still lower than the global's target. Only about 50% pregnancy in developing regions received ANC services and 71% of delivery is performed by health workers in 2014 (United Nations, 2015).

In Indonesia, the use of ANC services shows slightly better achievement than global which is 86% and for the delivery by health worker is 87% in 2014 (BAPPENAS, 2015). However, the childbirth delivery rate in health facility was still low, only about 63% in 2012 (BPS, BKKBN, MOH, ICF International, 2013). This could be caused by the disparity of accessing services of maternal health between urban and rural areas and poor and rich people are still a challenge (Kurniati A, et al., 2017).

A study from several developing countries examined some factors associated to maternal health services utility including age, education level, race, wealth, type of resident, size of household, parity, maternal health knowledge, women autonomy status, and insurance (Caliskan, et al., 2015). A study in Indonesia showed that some factors, such as poor maternal knowledge, low income, residents in rural area, and have a closely spaced and high births orders had associations with lower utilization of ANC (Kurniati A, et al., 2017). Andersen (1973) developed the concept that health care utility can be influenced by individual characteristics (predisposing), factors that would enable the user to receive the services (enabling), and factors that associated

with the needs to health services utility (need). In addition, in maternity health services utilization, the use of previous care is also a contributing factor (Titaley C, 2009).

Assessing the three period of maternity in adolescent which are before, during, and after pregnancy is crucial and relevant with the concept of “Continuum of Care” that pregnant women who received antenatal care are more likely to have a safe delivery, then have a higher chance to receive post-natal care to improve the health of mothers and their babies (Bisin S, 2008). However, there is still lack of studies that focused on the use of three periods of maternity health services especially in adolescent mothers in Indonesia.

As the decline of maternal mortality rate is still important in the Sustainable Development Goals (SDGs) 2030, this is necessary to assess the factors associated with the three period of maternal health services utility using the latest national publication data. Therefore, the aim of this study is to identify factors that associate with the maternal health services utility in Indonesian adolescent mothers. The results of this study is expected to contribute to support strategic policies and programs' approach which focused on the maternal health services utility in adolescent mothers.

## **1.2 Research Questions**

1. What is the maternal health services utility (antenatal care, delivery services, and postnatal care) level in adolescent mothers in Indonesia?
2. What are the determinants of maternal health services utility (antenatal care, delivery services, and postnatal care) in adolescent mothers in Indonesia?

### **1.3 Research Objectives**

1. To assess maternal health services utility (antenatal care, delivery services, and postnatal care) level in adolescent mothers in Indonesia
2. To identify determinants of antenatal care utility in adolescent mothers in Indonesia
3. To identify determinants of delivery services utility in adolescent mothers in Indonesia
4. To identify determinants of postnatal care utility in adolescent mothers in Indonesia

### **1.4 Research Hypothesis**

H1: There are associations between predisposing, enabling, needs factors and antenatal care utility in adolescent mothers in Indonesia

H2: There are associations between predisposing, enabling, needs factors, antenatal care utility and delivery services utility in adolescent mothers in Indonesia

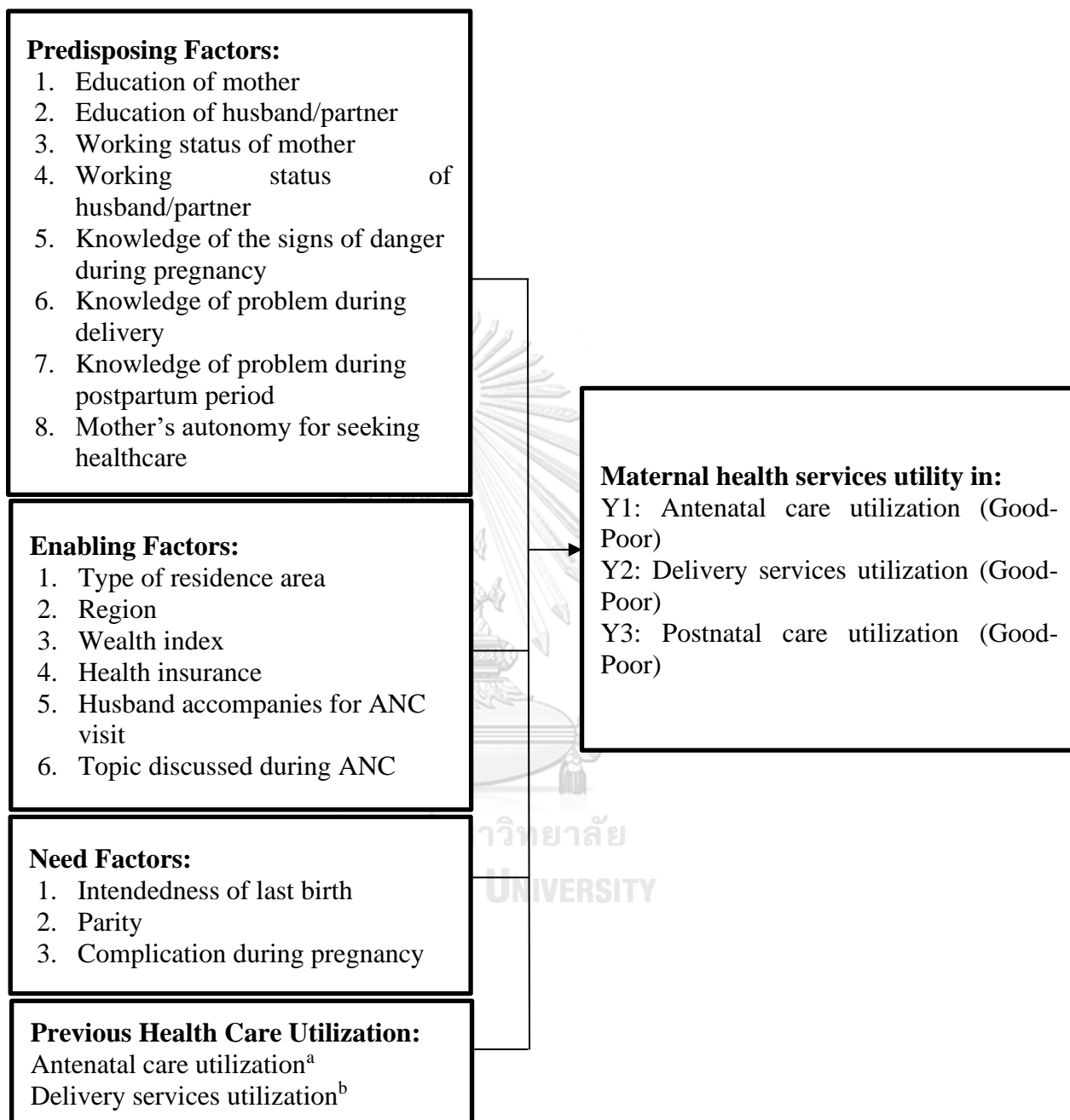
H3: There are associations between predisposing, enabling, needs factors, antenatal care utility, delivery services utility, and postnatal care utility in adolescent mothers in Indonesia

### **1.5 Conceptual Framework**

This study used conceptual framework by Andersen's behavioural model of health care utilization theory (Andersen, 1973). Predisposing factors refer to individual's factors to health services utility, enabling factors refer to resources which could accommodate access to health services, and the need factors refer to potential



needs of the use of health service. The previous utilization of maternal health services is also included in the model. The conceptual framework is illustrated as follows:



<sup>a</sup> This variable will be included as an independent variable for delivery services utilization (Y2) and postnatal care utilization (Y3)

<sup>b</sup> This variable will be included as an independent variable for postnatal care utilization (Y3)

**Figure 1. Conceptual Framework**

## 1.6 Operational Definition

Operational definition of dependent variables are described as follows:

Table 1. Operational Definition of Dependent Variables

Variables	Definition
Antenatal care*	The routine health control of pregnant women in order to diagnose any diseases or obstetric complication, and to provide information to women about healthy maternal lifestyle during pregnancy and childbirth (Backe B, et al., 2014)
Delivery Services**	Process of childbirth that assisted by health care workers and conducted in health care facility (UNICEF, 2020)
Postnatal care	A care given to the mother and her newborn baby immediately after the birth of the placenta and for the 42 days of life (WHO, 2008)

\*This variable will be included as independent variable for delivery services utilization and PNC utilization

\*\* This variable will be included as independent variable for PNC utilization

Operational definition of independent variables are describes as follows:

Table 2. Operational Definition of Independent Variables

Variables	Definition
<b>Predisposing Factors</b>	
Education of mother	Highest level of education that mother achieved
Education of husband/partner	Highest level of education that husband/partner achieved
Working status of	Mother's current working status

respondents	
Working status of husband/partner	Husband/partner's current working status
Knowledge of the danger signs during pregnancy	Mothers know the signs/symptoms of danger that may happen during pregnancy, which are prolonged labor, vaginal bleeding, fever, convulsions, baby in wrong position, swollen limbs, faint, breathlessness, tiredness
Knowledge of problem during delivery	Mothers know the problem that may happen during delivery, which are water breaks too early, excessive bleeding, fever, long labor, faint, convulsions, placenta does not come out, stillbirth
Knowledge of problem during postpartum period	Mothers know the problems that may happen during postpartum period, which are excessive bleeding, faint, convulsions, high fever, foul smelling vaginal discharge, pain in breasts, depressed
Mother's autonomy for seeking healthcare	Decision maker of seeking healthcare for mothers
<b>Enabling Factors</b>	
Type of residence area	Type of place area where the mothers live
Region	Provinces of mothers live which are classified into several regions
Wealth index	Composite measure of household's cumulative living standard on household's ownership of selected assets, such

	as types of water access and sanitation facilities, materials used for housing construction, and television and bicycles
Health insurance	Health insurance ownership status of mothers
Husband accompanies for ANC visit	Mothers accompanied by husband for ANC visit at any time during pregnancy
Topic discussed during ANC	Topic of discussion during pregnancy about delivery and postpartum process, which are (1) place to deliver, (2) transportation, (3) delivery assistant, (4) payment, (5) blood donor, and (6) post-partum family planning
<b>Need Factors</b>	
Intendedness of last birth	Mothers' intendedness of their last birth (whether wanted or unwanted)
Parity	Number of children born by mother
Complication during pregnancy	Any complication that mothers have during pregnancy

## CHAPTER 2

### LITERATURE REVIEW

This chapter will present literature review of the study which consists of some parts as follows:

1. General background of Indonesia
  - a. Demography of Indonesia
2. Maternal health
  - a. Definition of maternal health
  - b. Situation of maternal health
  - c. Maternal health services utility in Indonesia
    - i. Antenatal care
    - ii. Delivery services
    - iii. Postnatal care
3. Adolescent pregnancy
  - a. Risks of adolescent pregnancy
  - b. Factors contributing to adolescent pregnancy
4. Factors affecting the maternal health services utility
  - a. Predisposing factors
    - i. Age
    - ii. Education of mother
    - iii. Education of husband/partner
    - iv. Working status of mother
    - v. Working status of husband/partner

- vi. Knowledge of the danger signs during pregnancy, during delivery, and during postpartum period
- vii. Woman's Autonomy
- b. Enabling factors
  - i. Type of residence
  - ii. Region
  - iii. Wealth index
  - iv. Insurance coverage
  - v. Husband accompanied during ANC
  - vi. Topic discussed during pregnancy
- c. Need factors
  - i. Intendedness of last birth
  - ii. Parity
  - iii. Complication during pregnancy
- d. Previous utilization of maternal health services

## 2.1 General Background of Indonesia

Indonesia is one of the South-East Asia country and the biggest archipelago country in the world. This country has more than 17,000 islands, which only about 7,000 islands are inhabited. Borneo, Sumatra, Papua Java, and Sulawesi are the largest islands. Indonesia is consisted of 34 provinces and 514 districts/cities. The capital city of Indonesia is Jakarta, located in the most populous island which is Java.

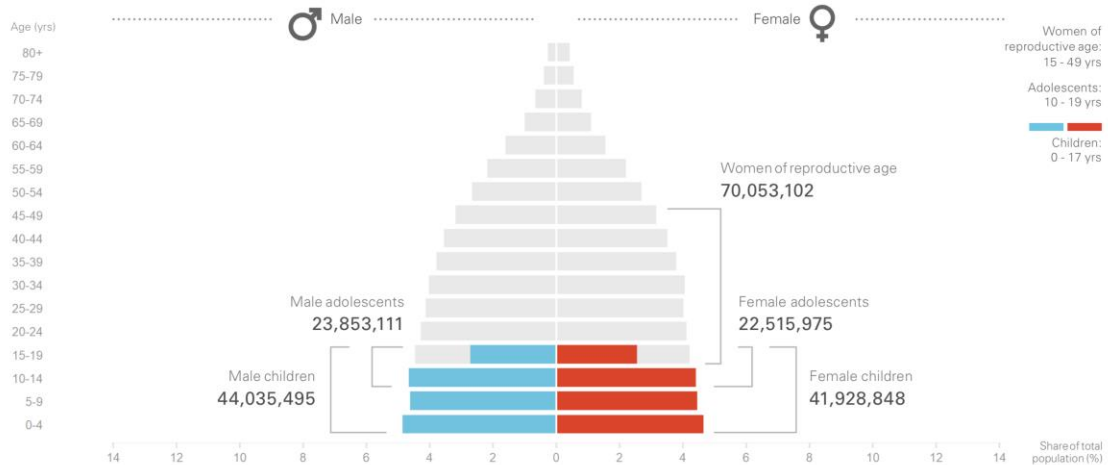
Geographically, Indonesia is located between  $5^{\circ} 54' 08''$  north longitude to  $11^{\circ} 08' 20''$  south longitude and  $95^{\circ} 00'38''$  to  $141^{\circ} 01'12''$  east longitude. The equator line passes through several islands in Indonesia which causes day and night to have

nearly the same time, which is 12 hours. On the basis of its wide geographical location, the territory of Indonesia is divided into 3 time zones, namely WIB (*Waktu Indonesia Barat/Western Indonesian Time*), WITA (*Waktu Indonesia Tengah/Central Indonesian Time*) and WIT (*Waktu Indonesia Timur/Eastern Indonesian Time*). From one island to another there can be a time difference of up to 2 hours. (General Consulate Republic of Indonesia, 2020).

### **2.1.1 Demography of Indonesia**

Based on the projection from 2010 Indonesia Population Census, the total number of populations in Indonesia in 2019 is 268,074,565 which consists of 133,136,131 men and 133,416,946 women. The structure of Indonesia population is considered as a young population due to the pyramid graph in younger group of population is wider than the older group and the average of Indonesian population age is 28.6 years old. (Ministry of Health, 2020). The life expectancy of Indonesia is 71.34 years old. (Statistics of Indonesia, 2020).

The pyramid of the population of Indonesia is a cone with a wide base and a tapered peak. The graph at a young age is wider than the upper part, proving that Indonesia's population has a young structure. The upper part of the pyramid is shorter, indicating that the mortality rate is still high in the elderly population (Ministry of Health, 2020).



**Figure 2. The Population Pyramid of Indonesia**

The population concentration in an area can be studied using population density measures. Population density indicates the level of population distribution of an area. Population density represents the average population size per 1 square kilometer. The greater the population density figure, the more people inhabit the area. Areas that have a high density are generally centers of settlements, centers of civilization, and centers of socio-economic activities. Based on estimation, the average population density in Indonesia in 2019 is 139.85 people per km<sup>2</sup> (Ministry of Health, 2020).

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## 2.2 Maternal Health

### 2.2.1 Definition of Maternal Health

According to WHO, maternal health refers to the health of women at the time of pregnancy, childbirth, and the period of postnatal. Maternal health ensures mothers and their babies have a positive experience in every stage so that they could achieve their full potential for health and well-being. Ensuring health in every stage of maternal is necessary due to every stage of life of each person can affect other stage and will also have an effect for the next generation. Women who stays healthy at



three maternal stages (including during pregnancy, childbirth, and postnatal period) have a higher chance to remain healthy in their lives and have better birth outcomes, affecting infancy, childhood, and adulthood. Thus, Women's health and well-being matter to every person, community, and country. It also has an important role to the achievement of the Sustainable Development Goals (SDGs) (WHO, 2017).

### **2.2.2 Situation of Maternal Health**

In global, there were about 295,000 women died because of pregnancy and giving birth in 2017. Most of the death occurred in less developing regions and they could have been prevented. The bigger part (about 86%) of the global maternal mortality in 2017 are accounted in Sub-Saharan Africa and Southern Asia. Whereas Southern Asia contributed to almost one-fifth of the total of maternal mortality. Southern Asia reached the biggest overall decline in MMR: a reduction of MMR for almost 60% between 2000 and 2017. There are four other sub-regions that cut into half of their MMRs in the same period, which are Eastern Asia, Central Asia, Northern Africa, and Europe. Overall, the MMR in lower economy developed regions reduced by only nearly 50% (WHO, 2019).

In 2015 based on the latest published data, Indonesia has 305 deaths per 100,000 live births which is the second highest of MMR in Southeast Asia (Guspaneza E, 2019). The MMR in Indonesia is failed to achieve the target of Millennium Development Goals which 102 death per 100,000 live births. The MMR in Indonesia is also still far to reach the target of Sustainable Development Goals (SDGs) which is 70 deaths per 100,000 live births in 2030. It needs Government of Indonesia (GoI) to develop strategic planning and policy that focused on maternal health (Azhar, 2020).

### 2.2.3 Maternal Health Services Utility in Indonesia

The survival of both mother and their babies are affected by maternal health services which has been received at the time of pregnancy, delivery, and the period of postpartum. Maternal health care is the major component and priority of global health and national development agenda. The Government of Indonesia has stated in the Year 2015 to 2019 strategic plan (*Renstra*) of the ministry of Health and the Year 2015 to 2019 Medium-Term National Development Plan (RPJMN) to set a goal for increasing the coverage of maternal health care in Indonesia (Statistics of Indonesia, 2018).

In 1990, The Safe Motherhood program was released by government of Indonesia according to four principles: 1) Family planning 2) Antenatal care 3) Safe delivery services, and 4) Essential obstetric services. This program was also reflected in a 2010–2014 Ministry of Health's Strategic Planning to increase the quality of maternal and child health by setting the target that needs to be achieved, such as childbirth deliveries being performed by a qualified health provider, visit for the first ANC, and giving birth a normal weight baby. Achievement of Indonesia in MDGs 2015 resulted that only 12 provinces achieved 90% for at least four ANC visits and 20 of 33 provinces achieved 95% of pregnancy make their first ANC visit (Ministry of Health, 2014; Efendi F, 2016).

In maternal health services utility, the annual trends shows that the use of any ANC services was declining at a rate of 5% each year and the visit for ANC more than 4 times remained the same. Birth in health facility rate increased between 1986 and 2012 from 22% to 73%; the increase in public health facilities was only about 10% and mostly happen in the private health sector (Nababan HY, 2018).

World Bank has a study that emphasizing the poor quality of primary health care level in Indonesia, mostly caused by the lack of adequate equipment and infrastructures in health facilities, especially in the Eastern area of Indonesia. This increasing inadequacy of medicine, supplies, logistic, and human resources actually widen the disparities between geographic locations in Indonesia (Nababan HY, 2018).

According to Ministry of Health's Regulation No. 97/2014, it stated that every women should be ensured about their health and safe delivery by receiving a comprehensive and qualified antenatal care (ANC) (Ministry of Health, 2014). ANC has been recommended by the government to be provided to every women for minimum four visits at the time of their pregnancy, consisting of one visit during the first trimester, one visit during the second trimester, and two visits during the third or last trimester (Ministry of Health, 2014). Providing the best ANC is not the only way to achieve maternal health, there are other key indicators to decrease maternal and neonatal mortality include childbirth in a health facility, and delivery assisted by a professional health provider (Statistics of Indonesia, 2018)

### **2.2.3.1 Antenatal Care (ANC)**

Antenatal care (ANC) is the routine health control of pregnant women without any illness symptoms (by screening), in order to diagnose any diseases or obstetric complication, and to provide information to women about healthy maternal lifestyle during pregnancy and childbirth. Antenatal care coverage (minimum one visit) is defined as the percentage of women aged 15 to 49 with a live birth in a certain period of time that received antenatal care provided by professional health provider (doctor, midwife or nurse) with a minimum one time during pregnancy. Antenatal care coverage (minimum four visits) is defined as the percentage of women aged 15 to 49

with a live birth in a certain period of time that received antenatal care provided by professional health provider (doctor, midwife or nurse) four times or more during pregnancy (UNICEF, 2020).

Professional health provider refers to attendants/workers that are accredited health professionals (such as a doctor, nurse, or midwife) who have been educated and trained to proficiency in the needed skills to manage normal (without complication) pregnancies, delivery and the immediate period of postnatal. They also have competency in the identification, management and administer the complication referral in women and newborns. Traditional birth attendants, both trained and untrained are excluded (UNICEF, 2020).

ANC has an important role in the mother's health during pregnancy. The purposes of ANC implementation are:

1. Monitor the progress of the pregnancy process to ensure the mother's health and the growth as well as development of the fetus.
2. Knowing any pregnancy complications that may occur at the time of pregnancy from an early stage, including a history of surgery and disease.
3. Improve and maintain the health of mother and baby.
4. Prepare for the delivery process so that the baby can be delivered safely and minimize the trauma that may occur during childbirth.
5. Reduce the number of deaths and morbidity in mothers.
6. Prepare the role of the mother and family to accept the birth of a child in order to experience normal growth and development.
7. Prepare the mother to go through childbirth safely and can provide exclusive breastfeeding for her baby (Ministry of Health, 2018).

Antenatal care provide opportunities for providing pregnant women with services that may be vital to their health and well-being and that of their infants. According to the review of the effectiveness of antenatal care in different models, WHO gives a recommends for at least four visits of antenatal care. WHO guidelines are specific on the content of antenatal care services, which should include:

- a. measurement of blood pressure
- b. urine testing to detect proteinuria and bacteriuria
- c. blood testing for severe anaemia and syphilis
- d. measurement of height/weight

In Indonesia, in addition to minimum for four visits of ANC, it is recommended that pregnant women receive ANC standardized services such as the measurement of weight, height, fundal height, blood pressure, mid-upper arm; examination of fetal heart rate; and examination of fetal presentation. Pregnant women also should be given counselling, iron tablets or syrup (after iron supplementation), tetanus toxoid injections, and blood and urine tests (Statistics of Indonesia, 2018).

Antenatal care has also its limitations of measurement. There is no guarantee that receiving antenatal care during pregnancy are effective to improve maternal health. However, receiving antenatal care for minimum four times may have a higher chance of obtaining effective maternal health interventions. Notably, the indicator for ‘minimum one visit’ refers to visits with professional health provider (doctor, midwife, or nurse) and indicator of ‘four visits or more’ refers to visits with *any* provider, since there is no data collection for type of provider in each visit in standardized global national-level household survey programmes. Moreover, develop a standardization of the definition of professional health provider is still facing

difficulties due to differences in health personnel training in every countries (UNICEF, 2020).

The 2017 IDHS results shows that there is an increase from 2007 to 2017 regarding the percentage of pregnant women who obtained antenatal care (ANC) from a professional health provider for a minimum one time and the percentage with minimum four visits or more, ninety-eight percent women aged 15-49 years old who had a live birth in the 5 years before the survey received antenatal care from a professional health provider for their last birth, eighty-two percent of women aged 15-49 years old who had a live birth in the 5 years before the survey received their first visit of ANC for their last birth during pregnancy at the first trimester, and seventy-seven percent of women aged 15-49 years old had a minimum four visits of ANC from a professional health provider (Statistics of Indonesia, 2018).

During pregnancy, mothers are given Tetanus Toxoid (TT) injections to prevent neonatal tetanus, which is the main factor of infant death. If the mother has minimum two doses of TT at the time of pregnancy (five doses provides lifelong protection), her infant can be viewed to be fully protected (WHO 2016). If a woman has been given TT injection in her previous pregnancy, then she needs only one vaccination during the current pregnancy (Statistics of Indonesia, 2018). According to the 2017 IDHS results, 58% of women who had last births in the 5 years preceding the survey and 35% of women received two or more TT injections during their last birth were protected from neonatal tetanus.

### **2.2.3.2 Delivery Services**

Childbirth deliveries in health facility are one of the crucial factors in declining maternal and newborn death. It is necessary that every mothers give childbirth in an

adequate facility which has hygienic conditions and life-saving equipment so that it can help to reduce the complication risk that may lead to illness or mortality for the mother or child (Kesterton et al. 2010).

Based on the 2017 IDHS, there are 74% of women had given birth at health facility – 42% in first-level health facilities including public health centers (*puskesmas*) and their networks, private doctors, midwives, and clinics; and 32% in advanced-level referral health facilities, including hospitals. In addition, 28% of women given birth which assisted by professional health provider, such as obstetricians, general practitioners, skilled nurses, and midwives. Whereas, in the 2012 IDHS reported that the percentage of institutional deliveries is 63%. The numbers show that the increasing of childbirth delivery at health facility and the successfulness in declining delivery at home (Statistics of Indonesia, 2018).

#### **2.2.3.3 Postnatal Care (PNC)**

The period of postpartum is critical and important to ensure the survival of mothers and their babies. Most maternal and neonatal mortality occur within the first month after delivery. Therefore, Postnatal Care (PNC) for the mother and their newborn is necessary to prevent the risk of mortality and illness (WHO, 2014).

WHO gives a recommendation for postnatal care are given by professional health provider such as doctors, nurses, and midwives to mothers within 24 hours after childbirth (WHO, 2014). Postnatal Care (PNC) is recommended to be provided minimum three times to mothers after childbirth, consisting of 6 hours until 3 days after delivery, 4 to 28 days after delivery, and 29 to 42 days after delivery (Ministry of Health, 2013).

Eighty-seven percent or approximately 9 in 10 women with the last birth 2 years before the survey had a PNC within the first 2 days after delivery. However, there are 2% of mothers received first postnatal care within 4 until 42 days after childbirth. Fifty-five percent of the women who had their last birth in the 2 years before the survey had PNC from a village midwife or midwife. Eleven percent of women were examined by a nurse and 22% by a doctor (Statistics of Indonesia, 2018).

### **2.3 Adolescent Pregnancy**

‘Adolescents’ are individuals in the age range of 10-19 years old, ‘Youths’ are individuals in the 10-24 years age group, and ‘Young People’ is defined as individuals in the range of 10-24 years age group (WHO, 2018). According to the Ministry of Health Indonesia Regulation Number 25 of 2014, adolescents are people in the age range of 10-18 years and according to National Family Planning Coordinating Board (BKKBN) the age range for adolescents is 10-24 years (Infodatin, 2015). However, in the IDHS 2017, adolescents are referred to those aged 15-19 years.

In 2016, in the world there were around 1.2 billion adolescents aged 10-19 years (US Census Bureau, 2017). It can be stated that 1 in 6 of the world's population are adolescents aged 10-19 years. The large number of adolescents makes this age group as one of the targets in the Sustainable Development Goals (SDGs) in 2030. The particular target is in the goal 3.7, which is by 2030 ensuring universal access to sexual and reproductive health care, including education and information, family planning, and integration of reproductive health into national programs and strategies.



In this target, there is an indicator 3.7.2 regarding the fertility of youths 10-14 years and 15-19 years (Purbowati A, et al., 2019).

With regard to adolescent fertility, much attention has been focused on young women aged 15-19 years. Age 15-19 years is the initial age when individuals begin to be active in sexual activities, marriage, and birth (Kothari MT, et al., 2012). Every year, there are about 21 million girls in the range of 15–19 years age group in developing countries become pregnant and nearly 12 millions of them had childbirth (Darroch J, et al., 2016). Whereas, At least 777,000 girls younger than 15 years old had childbirth in developing countries (UNFPA, 2015).

Over the past 20 years, the estimation of adolescent-specific fertility rate in global has reduced by 11.6%. However, There are big gap in rates between the regions. For example, the adolescent fertility rate in Central Africa is 129.5, whereas the corresponding rate in East Asia is 7.1 (Ganchimeg T, et al., 2014). The big differences are also found within the regions. In the South-East Asia region, the overall adolescent fertility rate was 47 (UNICEF, 2018). This rate, however, ranged from 2.7 in Singapore to 94.4 in Lao People's Democratic Republic (WHO, 2016). Moreover, there are enormous variations within countries. For example, In Ethiopia, the percentage of adolescent girls in the range 15-19 years old who have pregnant in Addis Ababa is 3% whereas in other region such as Affar is 23% (WHO, 2020).

Even though the global estimation of adolescent fertility rate has decreased, there is no decreased in the actual number of adolescent girls who has given birth. The reason is large population growing of adolescent in the range 15-19 years age group in some parts of the world (WHO, 2016). The biggest number of adolescent births occur in Western Africa (70,423) and Eastern Asia (95,153) (UNFPA, 2018).

According to the 2017 IDHS report, percentage of women in the 15-19 age group who have begun childbearing is 7%, consisting of 5% have given childbirth and 2% are first time pregnancy. The number is actually declined from the 2012 IDHS, which reported 10% of adolescent girls age 15-19 who have begun pregnant (Statistics of Indonesia, 2018).

### **2.3.1 Risks of Adolescent Pregnancy**

Pregnancy among adolescents is a major health concern because of leading to higher chance of mortality and morbidity for the mothers and their babies (Statistics of Indonesia, 2018). Globally, pregnancy and complication during childbirth are the main factors of mortality among adolescent girls aged 15–19 years, with low- and middle-income countries contributed to almost all (99%) of maternal mortality of women aged 15–49 years (Neal S, et al., 2015). Adolescent mothers in the age 10–19 years old have a higher risks of systemic infections, puerperal endometritis, and eclampsia than women in the age 20–24 years old (WHO, 2016). In addition, every year there are about 3.9 million unsafe abortions among adolescent girls in the age 15–19 years old, accounting for maternal death, lasting health problems, and morbidity (Darroch J, 2016).

Early pregnancy is also increase risks for the baby as well as the mother. Babies born to adolescent mothers (under 20 years old) have higher risks of preterm delivery, severe neonatal conditions, and low birth weight (WHO, 2016). In some conditions, too many pregnancy in the near period of time is a concern for young mothers because it leads to further risks of health for the mothers and the babies (WHO, 2017).

Pregnancy in adolescence is also known to have adverse social consequences (Statistic of Indonesia, 2018). Unmarried pregnant adolescents may have social consequences including stigma, violence or rejection by parents, peers, and partners. Adolescent girls who become pregnant under 18 years old are more likely to face violence within a partnership or marriage (Raj A, 2013). Another social consequence is regarding educational attainment, women who become pregnant in the adolescent age often face to drop out of school, although there are efforts in some places to allow them to return to school after delivery, this may have a negative impact to the girls' future education and employment prospects (WHO, 2015).

### **2.3.2 Factors Contributing to Adolescent Pregnancy**

Adolescent pregnancies are a global problem that happens in developed and developing countries. However, adolescent pregnancies are mostly happened in marginalized or less developed communities. It usually caused by lack of education, lack of employment prospects, and poverty (UNICEF, 2013).

Some factors contribute to adolescent pregnancies and childbirths. In many communities, girls have pressure to marry early and bear children in the young age (WHO, 2013; WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division, 2015; Kozuki N, et al., 2013). About 39% of adolescent girls marry under 18 years old and 12% under 15 years of age in least developed countries (World Bank, 2017). Moreover, in many places, adolescent girls choose to marry early and have children because of limited education and lack of employment opportunities. In that particular societies, motherhood is often valued as the best options of the limited choices available (World Bank Group and the United Nations Population Division, 2015).

Adolescent girls who do not want to pregnant in young age may not be able to do so because of limited knowledge and misconceptions about where to receive contraceptive methods and how to use them (WHO, 2011). Regarding access to contraception, adolescents may experience barriers such as rigorous laws and policies to provide contraception according to age, marital status, and health worker bias (poor willingness to understand adolescents' sexual health needs). Adolescents often have constraint related to financial, transportation, and knowledge which make them unable to access contraception. Furthermore, adolescents may have poor autonomy to ensure the consistent and correct use of contraceptive methods. An additional factor that contribute to unintended pregnancy in adolescent girls is sexual violence, which is reported about more than one third of adolescent girls in some countries had their first sexual experience was coerced (Raj A & Boehmer U, 2013).

Adolescent pregnancies are a global problem that happens in developed and developing countries. However, adolescent pregnancies are mostly happened in marginalized or less developed communities. It usually caused by lack of education, lack of employment prospects, and poverty (UNICEF, 2013).

## **2.4 Factors Affecting the Maternal Health Services Utility**

Factors that are affecting the maternal health services utility are classified into three classifications: predisposing, enabling, needs factors, and previous utilization of maternity care (Andersen, 1973).

### **2.4.1 Predisposing Factors**

#### **2.4.1.1 Age**

Age has been assessed in most of studies about maternal health services utility. Similar to the general health services utility, maternal health service utility may also

have the same association with age, for example older woman in reproductive age are more likely to have a better rate for maternal health care utility.

A systematic review study in 32 low- and middle-income countries about maternal health services reported that compared with older women with the same sociodemographic background, adolescent mothers has lower access and utility to Antenatal care and safe delivery services (Banke-Thomas and Ame, 2017). This result was similar with other studies about women at reproductive aged. Mother's age at pregnancy and childbirth had a positive association with delivery at health facility in Bangladesh (Yaya, Bishwajit, and Ekholuenetale, 2017); with Antenatal Care visit in Nigeria (Adewuyi et al., 2018); with Postnatal care services in Pakistan (Agha and Carton, 2011); and with delivery assisted by qualified health providers in Indonesia (Osaki, et al., 2015).

#### **2.4.1.2 Education of mothers**

Generally, the education level of the Indonesian population only achieves secondary education. The 2019 National Economy and Social Survey (SUSENAS) data shows that only one in four people in the age 15 years and over have graduated from high school or equivalent, and only about nine percent have successfully completed their education up to the tertiary level (university) (Statistics of Indonesia, 2019).

Several studies showed that education related to the maternal health care. Young women who had lower education level were less likely to reach the four visit minimum of ANC. Whereas the higher education women were more likely to make their ANC visit, give childbirth in health facility, and receive PNC services within the first week of delivery. Mother's education become the number one predictor for c-

section birth utility and for childbirth in health facility (Efendi F, 2016; Nababan HY, 2018; Kurniati A, 2017).

#### **2.4.1.3 Education of husband/partner**

Education of husband is also influencing the maternal health services utility. The husbands who had higher or same education level as their wives increase the probability of women using maternal health services. Women whose husband's education was higher were nearly two times more likely to obtain the three maternal health services than those whose husbands were at same level of education or lower. Husband's education also has association with the utility of prenatal care, women whose husbands had a higher education level were more likely to have postnatal care than those whose husbands had a lower education level (Kurniati A, 2017; Zhang, 2016).

#### **2.4.1.4 Working status of mothers**

In recent years, the ratio of employment-to-population in Indonesia is higher than the average ratio in global, partly because of a high percentage of the working age population and limited choices of income outside work. However, there are large gap in the ratio of job-population between men and women; and between 15 to 24 age group and more than 35 age group. For example, males aged 25 years old and over had the highest job-population ratio, about 89.5% in February 2015. In comparison, young women had the lowest job-population ratio, only about 32.6% in the same period. This comparatively low employment-population ratio among young people is due to high gap of youth participation in education and training centers between gender and age group. Gender trends show a small increase over time, with women having significantly lower labor force participation rates than men. However, there

are improvement of young women in education, and it may help to increase women's work participation in the future, the persistence of this trend shows the need for more active policies and programs to help women enter the workforce and engage in work outside the home (ILO, 2015).

The increasing trend of working women may influence their maternal health services utility. A study showed that the ANC and PNC services' utilization rates were moderately higher in unemployed women than those with jobs, while the childbirth delivery in health facility rate was higher among working women (Kurniati A, 2017).

#### **2.4.1.5 Working status of husband/partner**

The employment status of husband was not notably associated with the prenatal services utility. The reasonable explanation for this lack of significance of husband's employment status may be because of the unbalances between income and time for family. For example, those with employment status that have higher income may have less time to spend with their wife; those without jobs or have less income, may have more time with their wife. However, pregnant women are less likely to have fatigue and stress related to housework if their husband can have time to help them and concern about their well-being (Zhang, 2016).

#### **2.4.1.6 Knowledge of the danger signs during pregnancy, during delivery, and during postpartum period**

The most common danger signs during pregnancy including severe swollen face/hand, blurred vision, and vaginal bleeding. While the danger signs during childbirth delivery and labor are convulsions, prolonged labor, and severe vaginal

bleeding. The danger signs during the postpartum period are loss of consciousness after delivery, fever, and severe bleeding after delivery (Sufiyan MB, et al., 2016).

One of the factors that affect to the high MMR in Indonesia is poor knowledge about maternal healthcare and poor ability to recognize the signs of obstetric danger, which can lead mothers to have a negative decision to seek care and it has significant associations with the low of maternal health services utility (Titaley C, 2010; Aeni, 2013).

#### **2.4.1.7 Woman's Autonomy**

The influence of women's autonomy on the use of maternal health services has been found in the literature, but there are relatively few studies. A study in Nepal found that education of woman was more important than woman's autonomy for the use of safe delivery services (Bhandari, et al.,2017). Furthermore, another study found that woman's autonomy has no association with delivery at health facility (Freidoony, et al., 2017). However, there was a study in Pakistan reported women with high index of autonomy are at least 3 times more likely to visit for ANC and delivery at health facility compared to those in lower index of autonomy group (Ahga and Carton, 2011).

#### **2.4.2 Enabling Factors**

##### **2.4.2.1 Type of residence**

Every year, Indonesian population lives in urban are is increasing. According to Statistics of Indonesia's estimation, there will be nearly 70% urban living in 2035. This number is a lot higher than the urban living in 2010 which is around 50% of population (Statistics of Indonesia, 2020). Even though the number or rural



population is becoming smaller but there is a big gap between urban and rural area in Indonesia related to access of health services (Laksono AD, et al., 2019).

Women who lives in rural area had notable associations with the low of ANC utility. Urban residents were more likely to obtain ANC and PNC services than rural residents (Titaley C, 2010; Kurniati A, 2017).

#### **2.4.2.2 Region**

Region is classification of the unity of several island in Indonesia. Some regions are more developed in terms of education, infrastructure, and economy than others. The wealthiest and the most urban enjoy better availability and access to basic services including health. Women who lived in Java-Bali region are more likely to use maternal health services than those from other region. Women from Papua and Maluku region used the services the least, about 50% less likely to use any ANC, give birth in health facility and about 20% less likely to give birth by caesarean than women from Java and Bali (Nababan HY, 2018).

#### **2.4.2.3 Wealth index**

The wealth index calculation is according to scores which are given to household based on the kinds and number of consumer goods they own, including a car, a bicycle or a television, and characteristics of housing consisted of flooring materials, toilet facilities, and source of drinking water. The scores are calculated using principal component analysis. In national level, wealth quintiles are combined by giving the household score to every (*de jure*) member of household, ranking each member in the household according to the score, and subsequently dividing the distribution into five categories equally, each category with 20% of the population. The categories are poorest, poorer, middle, rich, and richest (Statistics of Indonesia, 2018).

Young women from the high-income category was three times higher completing four ANC visits and give childbirth in a health facility than among those from the low-income category. Similarly, the richer mothers were more likely to give birth by caesarian than the poor mothers (Efendi F, 2016; Nababan HY, 2018).

#### **2.4.2.4 Insurance coverage**

Indonesia's national health insurance program (JKN) established in 2014 provides a free comprehensive of care for maternal and newborn services, including family-planning counselling and services, antenatal care, normal and complicated pregnancy and delivery services, and postpartum care (Nababan HY, 2018). There is relatively consistent evidence that health insurance is positively correlated with maternal health services utility (Comfort AB, et al., 2013).

#### **2.4.2.5 Husband accompanied during ANC**

Husband's knowledge about the importance of women received at least four ANC services during pregnancy was associated with husbands being physically present at the birth place during childbirth and accompanying their wife during PNC services. Husbands' awareness of at least three pregnancy-related danger signs and at least three newborn danger signs were also associated with their present when their wives received ANC services (Rahman AE, 2018).

#### **2.4.2.6 Topic discussed during pregnancy**

Both men and women needs to be involved in maternal health education during pregnancy. Study from Chikalipo 2018 reported the preferred topics during ANC visit which were preparation for birth and plan of complication readiness, pregnancy description, how to care pregnancy women, complication during pregnancy and after

childbirth, men's role during pregnancy, and baby care after childbirth. Relevant with this study's result that found adolescent mothers that discussed more topics with health providers during pregnancy is 2.24 times more likely to have a good utilization of ANC. It indicates comprehensiveness of discussion between mothers and health providers make mothers be more knowledgeable about maternal health and routinely visit for antenatal care (Chikalipo, 2018).

### **2.4.3 Need Factors**

#### **2.4.3.1 Intendedness of last birth**

Women who wanted the pregnancy were more likely to receive antenatal care than those who reported unwanted pregnancy. Women with unwanted pregnancy were more likely to attend late the first time and have fewer than four antenatal care visits. The mistimed pregnancies were also associated with low frequency of antenatal care visit and late timing of the first visit (Ochako, 2016).

#### **2.4.3.2 Parity**

Young women with higher parity was negatively associated with the use of four ANC visits. Women with four or more children were less likely to go for recommended ANC visits than those with only one child. Women who has birth interval was less than 25 months or those whose birth was the first were less likely to receive 4 or more ANC services compared to those who has birth interval was 37 months and more. (Efendi F, 2016; Ochako, 2016)

#### **2.4.3.3 Complication during pregnancy**

Pregnancy complications are health problems that happen at the time of pregnancy. The problems can involve the mother's health, the infant's health, or both of them.

Women can have health problems that occur during pregnancy or have health problems *before* pregnancy that could lead to complications. It is necessary for women to access health services before and during pregnancy to reduce the risks of pregnancy complications (CDC, 2020).

Women who have pregnancy complication can experience loss of appetite, persistent vomiting, high fever, excessive vaginal bleeding, premature rupture of membranes, and decreased fetal movement. Other health problems that may occur at the time of pregnancy are persistent cough, pain during urination, chest pain or palpitations, difficulty in sleeping, excessive anxiety, and recurrent diarrhea (Statistics of Indonesia, 2018).

Some women without any pregnancy complication did not see the value or benefit of ANC attendance. Similarly, those with a health concern did not perceive the problem can be a major threat to their pregnancy and not seek maternal health services (Mampu, 2015; Wilunda, 2017).

#### **2.4.4 Previous Health Services Utilization**

In maternal health services, the utility of previous health services should be assessed according to the concept of Continuum of Care. The "Continuum of Care" for reproductive, maternal, newborn and child health (RMNCH) includes integrated service delivery for mothers and children from pre-pregnancy to delivery, the immediate postnatal period, and childhood. ANC services utilization may influence the delivery services utilization and PNC utilization. Delivery services utilization may influence the PNC utilization. Such care is provided by families and communities, through outpatient services, clinics and other health facilities. The Continuum of Care recognizes that safe childbirth is critical to the health of both the woman and the

newborn child—and that a healthy start in life is an essential step towards a sound childhood and a productive life.

A study found that poor attendance at postnatal care services was related to poor utilization of antenatal care services. A progressive decrease of postnatal care non-utilization was observed as the percentage of mothers receiving more than four antenatal care services in the cluster increased. A highly significant effect was observed in childbirth by untrained birth attendants. The odds of not utilising postnatal care services for childbirth by untrained birth attendants increased remarkably by almost 31 times the odds for childbirth by doctors. Additionally, the likelihood for not receiving postnatal care also increased among mothers gave childbirth outside of healthcare facilities (Titaley C, 2009).

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Study Design**

The design of this study is cross-sectional survey using secondary data from 2017 Indonesia Demographic and Health Survey (IDHS).

#### **3.2 Study Population**

The study population of this study is women who had their last birth at the age of 15-19 years old.

#### **3.3 Survey Data**

The source of data is from Indonesia Demography and Health Survey (IDHS) 2017. The survey was conducted from July 24 to September 30 2017 by the Statistic Bureau of Indonesia (BPS) in collaboration with the Ministry of Health (MoH) of Indonesia and the National Population and Family Planning Board (BKKBN).

This survey has four questionnaires: the Household Questionnaire, Woman's Questionnaire, Married Man's Questionnaire, and Never Married Man's Questionnaire. In this study, only Woman's Questionnaire was used. The total of women interviewed in the survey was 49,627 women.

##### **3.3.1 Sampling Method of IDHS**

The 2017 IDHS data was collected by interviewing family members in selected household. Every selected household was interviewed using Household Questionnaire. Women age 15-49 years was interviewed using Woman's Questionnaire and married man in the household was interviewed using Married

Man's Questionnaire. If there is a man that never married in the household was interviewed using Never Man's Questionnaire.

The sample of 2017 IDHS consisted of 1,970 census blocks and was estimated to receive 49,250 household responses. The sampled households were identified about 59,100 women age 15-49 and 24,625 never-married men age between 15-24. Each selected census block covered eight households to obtain 14,193 married men between age 15-54 to be interviewed with the Married Man's Questionnaire. The frame for the selection of household sample is the updated list from 2010 population census.

The 2017 IDHS used two-stage stratified sampling as the sampling design:

Stage 1: A systematic sampling proportional to size is used to select a number of census blocks, which size is the list of household's number in the 2010 Population Census. The census blocks were also stratified by urban and rural areas and ordered by wealth index classification.

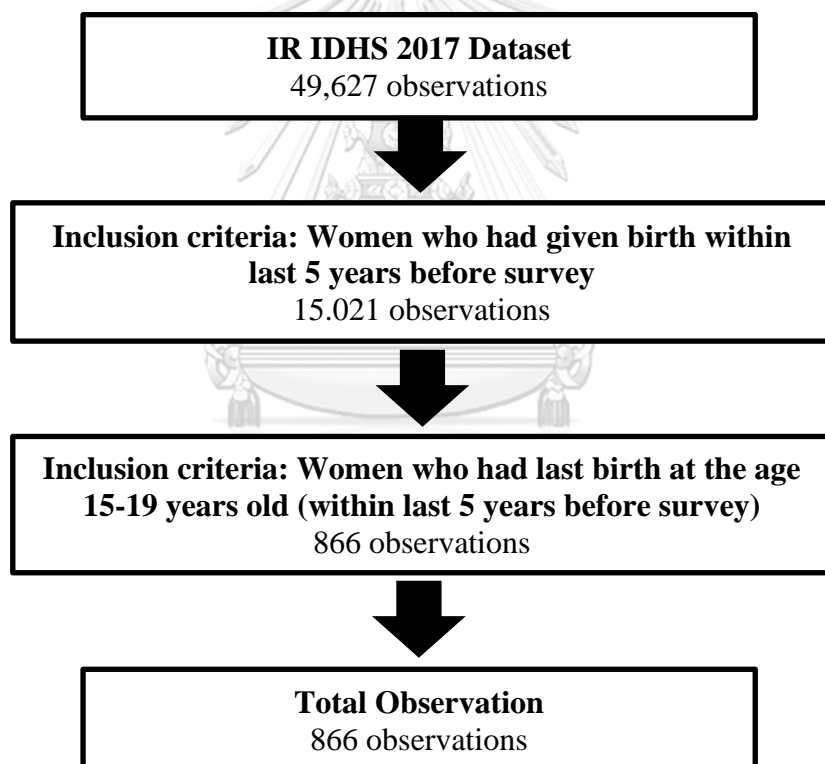
Stage 2: In each selected census block, a systematic sampling from the updated household listing was used to select 25 ordinary households.

### **3.4 Inclusion Criteria**

The inclusion criteria of this study were women who had last birth at the age of 15-19 years old. There were no exclusion criteria in this study. Although, the sample size of this study will not use the whole sample of 2017 IDHS but the results can be represent the country due to IDHS data is providing the latest estimation of basic demographic and health indicators in Indonesia.

### 3.5 Data Cleaning Process

The study used IR dataset from IDHS data. Data cleaning was processed using Stata 16. All data was weighted using function V005/1,000,000 when input to calculation. The total number of women that included in the dataset is 49,627 women. From these women, this study only selected women who had given birth within last five years before survey which is 15,021 observations and those who had last birth at the age of 15-19 years old within 5 years before the survey which is 866 observations. The flow of data cleaning process is as follows:



**Figure 3. Data Cleaning Process**

### 3.6 Measurement Tools

The dependent variable of this study is maternal health services utility which consists of ANC, delivery services, and post-natal care (PNC). For the Antenatal care, the



variable will be composited from three variables such as frequency of ANC visit, timing of the first ANC, and ANC provider.

- Frequency of ANC visit: 0 if ANC visit is less than four times and 1 if ANC visit is four times or more
- Timing of the first ANC visit: 0 if more than three months and 1 if less than equal to three months
- ANC provider: 0 if ANC is not conducted by health service provider and 1 if ANC is conducted by health service provider

Delivery services variable will be composited from two variables which are delivery assistant and place of delivery.

- Delivery assistant: 0 if childbirth did not assist by health worker and 1 if childbirth assisted by health worker
- Place of delivery: 0 if childbirth did not take place at health care facility and 1 if childbirth took place at health care facility

Postnatal care variable will be composited from three variables such as PNC check, first timing of PNC, and person who conducted PNC.

- PNC check: 0 if mothers did not check for PNC and 1 if mothers checked for PNC
- First timing of PNC: 0 if first PNC was done more than 24 hours after childbirth and 1 if done within 24 hours after childbirth

- Person who conducted PNC: 0 if PNC was conducted by non-health providers and 1 if PNC was conducted by health providers

The calculation of the scores is as follows:

Table 3. The Categories of Dependent Variables

Variables	Category
Antenatal care (ANC) utilization*	Classified from the total variables calculation of frequency of ANC visit, first timing of ANC visit, and ANC provider (WHO, 2020; Statistics of Indonesia, 2018). 0: Poor utilization if the total score is 0-2 1: Good utilization if the total score is 3
Delivery services utilization**	Classified from the total variables calculation of delivery assistant and place of delivery (WHO, 2020; Statistics of Indonesia, 2018). 0: Poor utilization if the total score is 0-1 1: Good utilization if the total score is 2
Postnatal care (PNC) utilization	Classified from the total variables calculation of PNC check, first timing of PNC, and person who conducted PNC (WHO, 2020; Statistics of Indonesia, 2018). 0: Poor utilization if the total score is 0-2 1: Good utilization if the total score is 3

\*This variable will be included as independent variable for delivery services utilization and PNC utilization

\*\* This variable will be included as independent variable for PNC utilization

The Independent variables of this study is divided into three groups, which are predisposing factors, enabling factors, and need factors. The definition of each variables are described as follows:

Table 4. The Categories of Independent Variables

Variables	Category
<b>Predisposing Factors</b>	
Education of mothers	0: None or primary school 1: Junior high school 2: Senior high school/University
Education of husband/partner	0: None or primary school 1: Junior high school 2: Senior high school/University
Working status of mothers	0: Not working 1: Working
Working status of husband/partner	0: Not working 1: Working
Knowledge of the danger signs during pregnancy	0: Poor knowledge if mothers know less than equal to mean score ( $<2$ ) 1: Good knowledge if mothers know more than mean score ( $\geq 2$ )
Knowledge of problem during delivery	0: Poor knowledge if mothers know less than equal to mean score ( $<2$ ) 1: Good knowledge if mothers know more than mean score ( $\geq 2$ )
Knowledge of problem during postpartum period	0: Poor knowledge if mothers know less than equal to mean score ( $<1$ )

	1: Good knowledge if mothers know more than mean score ( $\geq 1$ )
Mother's autonomy for seeking healthcare	0: Not at all if mother is not included in the decision making for seeking healthcare 1: Full or partial if decision for seeking health care is made by mothers only or together with husband/partner/other
<b>Enabling Factors</b>	
Type of residence area	0: Rural 1: Urban
Region	0: Java-Bali 1: Sumatera 2: Kalimantan 3: Sulawesi 4: Eastern Indonesia (Nusa Tenggara-Maluku-Papua)
Wealth index	0: Poorest 1: Poorer 2: Middle 3: Richer 4: Richest
Insurance coverage	0: Does not have insurance 1: Have insurance(s)
Discussion during pregnancy	0: Number of topic discussed was none less than equal to mean value (0-4)

	1: Number of topic discussed was more than mean value (5-6)
<b>Need Factors</b>	
Intendedness of last birth	0: Unwanted 1: Wanted
Parity	0: More than one child 1: Only one child
Complication during pregnancy	0: Yes 1: No

### 3.6 Data Analysis

The data analysis of this study was performed using Stata 16 software.

#### Descriptive Analysis

Descriptive analysis was used to describe the dependent variables which are ANC, delivery services, and PNC; and the independent variables which consisting of predisposing, enabling, need factors, and previous utilization of maternal health services (ANC services utilization as an independent variable for delivery services and PNC utilization; delivery services utilization as an independent variable for PNC utilization). Since all variables are categorical, data were presented in the frequency distribution and percentages.

#### Bivariate Analysis

The association of each independent variables and dependent variables were examined by bivariate analysis using simple logistic regression. The variables with the significant level at  $p < 0.25$  were included in further analysis.

#### Multivariable Analysis

The multivariable analysis used multiple logistic regression to assess the association between dependent variables and independent variables. This type of analysis was used because the dependent variables are binary outcome. The variables which in bivariate analysis have  $p < 0.25$  were included in multivariable analysis.

The results were presented using odds ratios (OR) with 95% confident interval (CI). If the odds ratio is lower than one, it is a protective factor for maternal health services utility. If the odds ratio is equal to one, the variables has no association with maternal health services utility. And if the odds ratio is more than one, the variables is a risk factor of maternal health service utility. This study used significant value at  $p < 0.05$ ,  $p < 0.01$ , and  $p < 0.001$ .

### **3.7 Ethical Consideration**

The 2017 IDHS obtained ethical approval from the Institutional Review Board (IRB) of the National Institute of Health Research and Development, Ministry of Health. All participants provided a written informed consent prior interview. This study has obtained the permission to download the dataset from the Demography and Health Survey (DHS) website ([dhsprogram.org](http://dhsprogram.org)). Ethical approval for this study was obtained for the Ethics Review Committee of Chulalongkorn University (COA No. 083/2021 Date: 9 April 2021).

## CHAPTER 4

### RESULTS

A total of 866 respondents of 2017 Indonesia Demography and Health Survey are included in this study. This chapter describes sample characteristics consisting of predisposing, enabling, and need factors; and maternal health utilization consisting of antenatal care, delivery services, and postnatal care.

#### 4.1 Sample Characteristics

Characteristics of mothers are grouped into three factors, which are predisposing factors, enabling factors, and need factors.

##### 4.1.1 Predisposing factors of maternal health services utility

Among predisposing factors, nearly half of the mothers have junior high school as their highest education level, while most of the husbands or partners (36.9%) had senior high school/university as their highest level of education. Seventy percent of mothers were not working, contrast to the husbands or partners which almost all of them were working. Regarding the mother's knowledge, 60.9% had poor knowledge of danger sign during pregnancy, 66.6% had poor knowledge of danger sign during delivery, and 84.6% had poor knowledge of danger sign during postpartum period. Most of the mothers had a full or partial autonomy of seeking healthcare for themselves (86.3%).

Table 5. Distribution of predisposing factors in maternal health services utility among adolescent mothers in Indonesia (N=866)

Variables	n	%
<b>Education of mothers</b>		
None/primary	226	26.2
Junior HS	413	47.7

Senior HS/University	227	26.1
<b>Education of husband/partner</b>		
None/primary	292	33.7
Junior HS	254	29.4
Senior HS/University	320	36.9
<b>Working status of mother</b>		
No	607	70.0
Yes	259	30.0
<b>Working status of husband/partner</b>		
No	15	1.4
Yes	851	98.6
<b>Knowledge of danger sign during pregnancy</b>		
Mean $\pm$ SD	1.2 $\pm$ 1.2	
Poor (<2)	526	60.9
Good ( $\geq$ 2)	340	39.1
<b>Knowledge of danger sign during childbirth</b>		
Mean $\pm$ SD	1.1 $\pm$ 1.0	
Poor (<2)	577	66.6
Good ( $\geq$ 2)	289	33.4
<b>Knowledge of danger sign during postpartum period</b>		
Mean $\pm$ SD	0.6 $\pm$ 0.9	
Poor (<1)	732	84.6
Good ( $\geq$ 1)	134	15.4
<b>Women's autonomy for seeking healthcare</b>		
Not at all	119	13.7
Full or partial	747	86.3

#### 4.1.2 Enabling factors of maternal health services utility

Table 6 shows that most of the mothers lived in rural area (65.4%) and in Java-Bali region (59.0%). More than half of the mothers were in the poorest and poorer wealth quintile while gradually decrease from middle into richest quintile. Mothers who had health insurance were slightly higher than those who did not have health insurance



(51.3% and 48.7%, respectively). During ANC visit, most of the mothers were accompanied by their husband (79%). From the total of 6 discussion topics during ANC visit, 53.8% mothers had discussed 0-4 topic(s) with health providers and 46.2% discussed 5-6 topics.

Table 6. Distribution of enabling factors in maternal health services utility among adolescent mothers in Indonesia (N=866)

Variables	n	%
<b>Type of residence</b>		
Rural	566	65.4
Urban	300	34.6
<b>Region</b>		
Java-Bali	511	59.0
Sumatera	159	18.3
Kalimantan	70	8.1
Sulawesi	71	8.2
Maluku-Papua	55	6.4
<b>Wealth index</b>		
Poorest	262	30.3
Poorer	249	28.8
Middle	202	23.3
Richer	109	12.5
Richest	44	5.1
<b>Health insurance</b>		
Doesn't have	422	48.7
Have	444	51.3
<b>Husband accompanied during ANC</b>		
No	182	21.0
Yes	684	79.0
<b>Topic discussed during ANC</b>		
Mean $\pm$ SD	3.9 $\pm$ 1.7	
0-4 topic(s)	467	53.8
5-6 topics	399	46.2

### 4.1.3 Need factors of maternal health services utility

Table 7 shows that 90.7% of mother's last birth were intended and 97.4% only had one child. Most of the mothers were reported never have any complication (84.8%) compared to 15.2% of mothers ever had complication during their pregnancy.

Table 7. Distribution of need factors in maternal health services utility among adolescent mothers in Indonesia (N=866)

Variables	n	%
<b>Intendedness of last birth</b>		
Not wanted	81	9.3
Wanted	785	90.7
<b>Parity</b>		
>1 child	22	2.6
1 child	844	97.4
<b>Had complication during pregnancy</b>		
No	734	84.8
Yes	132	15.2

### 4.2 Maternal health services utility

Maternal health services utility consisting of the utilization in antenatal care (ANC), delivery services, and postnatal care (PNC).

#### 4.2.1 Antenatal care

Table 8 shows that most of mothers had ANC visit for more than 4 times during pregnancy. For the timing of first ANC, 73.5% visit within the first 3 months of their pregnancy. About 96% mothers visit health provider for health examination during pregnancy. Based on those three indicators, utilization level of ANC was grouped into poor utilization and good utilization. Adolescent mothers who had a good utilization are 67.2% compared to those who had poor utilization which are 32.8%.

Table 8. Distribution of antenatal care service among adolescent mothers in Indonesia (N=866)

Variables	n	%
<b>Frequency of ANC Visit</b>		
<4 visit(s)	83	9.6
≥4 visits	783	90.4
<b>Timing of first ANC visit</b>		
> 3 months	229	26.5
≤3 month(s)	637	73.5
<b>ANC provider</b>		
Non-health providers	37	4.3
Health providers	829	95.7
<b>ANC UTILIZATION</b>		
Mean ± SD	2.6 ± 0.6	
Poor (0-2)	284	32.8
Good (3)	582	67.2

The association of predisposing, enabling, need factors, and antenatal care utility were first analysed using binary logistic regression before proceed to multivariable analysis. Table 9 shows the results of bivariate analysis for each independent variables and ANC utilization. Independent variables that had the *p*-value less than 0.25 continued to test in multivariable analysis.

In utility of ANC, variables that had the association and were passed to multivariable analysis were education of husband/partner, working status of husband/partner, knowledge of danger sign during pregnancy, knowledge of danger sign during childbirth, knowledge of danger sign during postpartum period, women's autonomy for seeking healthcare, region, wealth index, husband accompanies during ANC, topic discussed during pregnancy, intendedness of last birth, and parity.

Table 9. Association between predisposing, enabling, need factors, and ANC utilization among adolescent mothers in Indonesia (N=866)

Variables	N	ANC utilization (%)		p value
		Poor	Good	
<b>PREDISPOSING FACTORS</b>				
<b>Education of mothers</b>				
None/primary (Ref.)	226	29.8	70.2	
Junior HS	413	34.0	66.0	0.282
Senior HS/University	227	33.6	66.4	0.390
<b>Education of husband/partner</b>				
None/primary (Ref.)	292	29.7	70.3	
Junior HS	254	32.0	68.0	0.559
Senior HS/University	320	36.0	64.0	0.096*
<b>Working status of mother</b>				
No (Ref.)	607	32.2	67.8	
Yes	259	34.2	65.8	0.549
<b>Working status of husband/partner</b>				
No (Ref.)	15	51.2	48.8	
Yes	851	32.4	67.6	0.184*
<b>Knowledge of danger sign during pregnancy</b>				
Poor (Ref.)	526	38.1	61.9	
Good	340	24.1	75.9	<0.001*
<b>Knowledge of danger sign during childbirth</b>				
Poor (Ref.)	577	37.3	62.7	
Good	289	23.7	76.3	<0.001*
<b>Knowledge of danger sign during postpartum period</b>				
Poor (Ref.)	732	34.2	65.8	
Good	134	24.9	75.1	0.035*
<b>Women's autonomy for seeking healthcare</b>				
Not at all (Ref.)	119	39.5	60.5	
Full or partial	747	31.7	68.3	0.096*
<b>ENABLING FACTORS</b>				
<b>Type of residence</b>				
Rural (Ref.)	566	33.4	66.6	
Urban	300	31.5	68.5	0.568
<b>Region</b>				
Java-Bali (Ref.)	511	26.9	73.1	
Sumatera	159	37.1	62.9	0.013*
Kalimantan	70	43.7	56.3	0.004*
Sulawesi	71	45.7	54.3	0.001*
Maluku-Papua	55	44.7	55.3	0.006*
<b>Wealth index</b>				
Poorest (Ref.)	262	39.2	60.8	
Poorer	249	29.4	70.6	0.020*
Middle	202	33.8	66.2	0.232
Richer	109	25.8	74.2	0.015*

Richest	44	26.0	74.0	0.096*
<b>Health insurance</b>				
Doesn't have (Ref.)	422	32.6	67.4	
Have	444	33.0	67.0	0.901
<b>Husband accompanied during ANC</b>				
No (Ref.)	182	53.1	46.9	
Yes	684	27.3	72.7	<0.001*
<b>Topic discussed during ANC</b>				
0-4 topic(s) (Ref.)	467	42.6	57.4	
5-6 topics	399	21.4	78.6	<0.001*
<b>NEED FACTORS</b>				
<b>Intendedness of last birth</b>				
Not wanted (Ref.)	81	58.7	41.3	
Wanted	785	30.1	69.9	<0.001*
<b>Parity</b>				
>1 child (Ref.)	22	47.7	52.3	
1 child	844	32.4	67.6	0.135*
<b>Had complication during pregnancy</b>				
No (Ref.)	734	32.6	67.4	
Yes	132	33.6	66.4	0.830

\*Variables will be included in multivariable analysis ( $p < 0.25$ )

The association of predisposing, enabling, and need factors to ANC utilization among adolescent mothers were showed in table below. Compared to mother whose their husband/partner had none and primary education, those with senior high school/university as their highest level of education had lower chance (45%) to have a good utility of antenatal care. Husband/partner's working status had no association with good utility of ANC although the unadjusted OR shows that mothers whom their husband/partner were working have higher chance to have a good ANC utility (no significant difference).

Mothers who had a good knowledge related to the danger sign during pregnancy, childbirth, and postpartum period were more likely to have a good utility of ANC than those who had poor knowledge regarding the issues. However there were no significance difference found in the results between knowledge of danger

signs and ANC utilization. Adolescent mothers who had a full or partial autonomy about seeking health care have 1.61 times higher to had a good utility of ANC than those who did not have authority at all. Compared to mothers who lived in Java and Bali, those who lived in other region were less likely to have a good utility of ANC. The only region that had significant difference was Kalimantan which had 46% lower chance to have a good ANC utility than mothers in Java-Bali. Good utility of ANC also reported in mothers who had a rich or better economy status than those who were poorest.

Adolescent mothers were more likely to have a good utility of ANC in those who accompanied by husband/partner during pregnancy health examination (AOR=2.42) than those who did not accompanied, discussed 5-6 topics with health providers during ANC (AOR=2.24) than those who only discussed 0-4 topic(s), and wanted their last birth (AOR= 3.09) than those who did not. Mothers who only had one child were also more likely to have a good utility in ANC than those who had more than one child. No significant difference was assessed between parity with utilization of ANC.

Table 10. Factors associated to utilization of antenatal care among adolescent mothers

in Indonesia (N=866)

<b>Variables</b>	<b>Unadjusted OR</b>	<b>95% CI</b>	<b>Adjusted OR</b>	<b>95% CI</b>
<b>PREDISPOSING FACTORS</b>				
<b>Education of husband/partner (Ref: None/primary)</b>				
Junior HS	0.89	0.62-1.29	0.79	0.53-1.18
Senior HS/University	0.75	0.53-1.05	0.55**	0.36-0.83
<b>Working status of husband/partner (Ref: No)</b>				
Yes	2.19	0.69-6.97	1.00	0.27-3.72
<b>Knowledge of danger sign during pregnancy (Ref: Poor)</b>				

Good	1.94***	1.43-2.63	1.45	1.00-2.12
<b>Knowledge of danger sign during childbirth (Ref: Poor)</b>				
Good	1.91***	1.39-2.63	1.14	0.76-1.71
<b>Knowledge of danger sign during postpartum period (Ref: Poor)</b>				
Good	1.57*	1.03-2.39	1.11	0.68-1.82
<b>Mother's autonomy for seeking healthcare (Ref: Not at all)</b>				
Full or partial	1.40	0.94-2.09	1.61*	1.03-2.50
<b>ENABLING FACTORS</b>				
<b>Region (Ref: Java)</b>				
Sumatera	0.62*	0.43-0.91	0.68	0.45-1.03
Kalimantan	0.47**	0.28-0.79	0.54*	0.31-0.95
Sulawesi	0.44**	0.26-0.73	0.71	0.40-1.23
Eastern Indonesia	0.45**	0.26-0.80	0.96	0.49-1.86
<b>Wealth index (Ref: Poorest)</b>				
Poorer	1.55*	1.07-2.24	1.21	0.79-1.86
Middle	1.26	0.86-1.85	1.05	0.67-1.64
Richer	1.86*	1.13-3.05	1.57	0.87-2.82
Richest	1.84	0.90-3.77	1.75	0.77-4.00
<b>Husband accompanied during ANC (Ref: No)</b>				
Yes	3.00***	2.15-4.21	2.42***	1.66-3.52
<b>Topic discussed during ANC (Ref: 0-4 topic(s))</b>				
5-6 topics	2.73***	2.02-3.69	2.24***	1.61-3.11
<b>NEED FACTORS</b>				
<b>Intendedness of last birth (Ref: Not wanted)</b>				
Wanted	3.29***	2.06-5.26	3.09***	1.82-5.24
<b>Parity (Ref: &gt;1 child)</b>				
1 child	1.90	0.82-4.43	1.30	0.51-3.27

\*p&lt;0.05

\*\*p&lt;0.01

\*\*\*p&lt;0.001

#### 4.2.2 Delivery Services

Table 11 shows the distribution of delivery services among adolescent mothers in Indonesia. The results shows that most of them (70.7%) were assisted by health providers during childbirth and gave childbirth in health facility (75.6%). Based on those two indicators, the utilization level of delivery services was classified into poor utilization and good utilization. Adolescent mothers who had a good utilization in

delivery services were 64.5% and those who had a poor utilization in delivery services were 35.5%.

Table 11. Distribution of delivery services among adolescent mothers in Indonesia (N=866)

Variables	n	%
<b>Delivery assistant</b>		
Non-health providers	254	29.3
Health providers	612	70.7
<b>Place of delivery</b>		
Non health facility	212	24.4
Health facility	654	75.6
<b>DELIVERY SERVICES UTILIZATION</b>		
Mean $\pm$ SD	1.5 $\pm$ 0.8	
Poor (0-1)	307	35.5
Good (2)	559	64.5

The association of predisposing, enabling, need factors, and delivery services utility were first analysed using binary logistic regression before proceed to multivariable analysis. Table 12 shows the results of bivariate analysis for each independent variables and delivery services utilization. Independent variables that have the *p*-value less than 0.25 continued to test in multivariable analysis.

In delivery services, variables that proceeded to multivariable were education of mother, working status of mother, knowledge of danger sign during pregnancy, knowledge of danger sign during childbirth, knowledge of danger sign during postpartum period, mother's autonomy for seeking healthcare, type of residence, region, wealth index, health insurance, husband accompanied during ANC, topic discussed during pregnancy, parity, and ANC utilization.



Table 12. Association between predisposing, enabling, need factors, and delivery services utilization among adolescent mothers in Indonesia (N=866)

Variables	N	Delivery service utilization (%)		p value
		Poor	Good	
<b>PREDISPOSING FACTORS</b>				
<b>Education of mothers</b>				
None/primary (Ref.)	226	42.6	57.4	
Junior HS	413	35.1	64.9	0.062*
Senior HS/University	227	29.2	70.8	0.003*
<b>Education of husband/partner</b>				
None/primary (Ref.)	292	38.3	61.7	
Junior HS	254	33.8	66.2	0.285
Senior HS/University	320	34.6	65.4	0.346
<b>Working status of mother</b>				
No (Ref.)	607	38.1	61.9	
Yes	259	29.5	70.5	0.016*
<b>Working status of husband/partner</b>				
No (Ref.)	15	44.8	55.2	
Yes	851	35.7	64.3	0.519
<b>Knowledge of danger sign during pregnancy</b>				
Poor (Ref.)	526	38.8	61.2	
Good	340	30.2	69.8	0.009*
<b>Knowledge of danger sign during childbirth</b>				
Poor (Ref.)	577	38.7	61.3	
Good	289	29.3	70.7	0.007*
<b>Knowledge of danger sign during postpartum period</b>				
Poor (Ref.)	732	36.4	63.6	
Good	134	30.9	69.1	0.220*
<b>Mother's autonomy for seeking healthcare</b>				
Not at all (Ref.)	119	44.6	55.4	
Full or partial	747	34.1	65.9	0.028*
<b>ENABLING FACTORS</b>				
<b>Type of residence</b>				
Rural (Ref.)	566	41.5	58.5	
Urban	300	24.4	75.6	<0.001*
<b>Region</b>				
Java-Bali (Ref.)	511	26.8	73.2	
Sumatera	159	46.4	53.6	<0.001*
Kalimantan	70	61.0	39.0	<0.001*
Sulawesi	71	42.6	57.4	0.007*
Eastern Indonesia	55	43.7	56.3	0.010*
<b>Wealth index</b>				
Poorest (Ref.)	262	47.5	52.5	

Poorer	249	38.1	61.9	0.033*
Middle	202	26.6	73.4	<0.001*
Richer	109	22.5	77.5	<0.001*
Richest	44	23.6	76.4	0.004*
<b>Health insurance</b>				
Doesn't have (Ref.)	422	39.8	60.2	
Have	444	31.5	68.5	0.011*
<b>Husband accompanied during ANC</b>				
No (Ref.)	182	50.3	49.7	
Yes	684	31.6	68.4	<0.001*
<b>Topic discussed during ANC</b>				
0-4 topic(s) (Ref.)	467	42.6	57.4	
5-6 topics	399	27.5	72.5	<0.001*
<b>NEED FACTORS</b>				
<b>Intendedness of last birth</b>				
Not wanted (Ref.)	81	32.8	67.2	
Wanted	785	35.8	64.2	0.592
<b>Parity</b>				
>1 child (Ref.)	22	53.4	46.6	
1 child	844	35.1	64.9	0.081*
<b>Had complication during pregnancy</b>				
No (Ref.)	734	36.0	64.0	
Yes	132	32.8	67.2	0.480
<b>ANC UTILIZATION</b>				
Poor (Ref.)	283	42.4	57.6	
Good	583	32.2	67.8	0.004*

\*Variables will be included in multivariable analysis ( $p < 0.25$ )

Table 13 shows the association of predisposing, enabling, and need factors to delivery services utilization among adolescent mothers in Indonesia. Mothers who had senior high school or university as the highest level of education were 1.68 times more likely to have a good utility of delivery services compared to those who had no education or primary school. Working mother were more likely (AOR=1.56) to have a good utility of delivery services than non-working mothers. Regarding the mother's knowledge, those who knows the danger sign during pregnancy are more likely to had a good utility of delivery services than mothers who do not know. Women who had knowledge of danger sign during childbirth also more likely to have a good utility of delivery services than those who did not. However, there were no significant

difference between knowledge of danger sign during pregnancy and childbirth with utilization of delivery services.

Adolescent mothers who had full or partial autonomy for seeking healthcare were 1.68 times higher to have a good utility of delivery services. Compared to mothers who lived in Java and Bali region, those who lived in Sumatera, Kalimantan, Sulawesi, and eastern Indonesia had lower chance to have a good utility of delivery services. Mothers who had higher wealth quintile were more likely to have a good utility of delivery services than those who are in poorest wealth quintile. Those who had health insurance are also more likely (AOR=1.42) to have a good utility of delivery services than those who did not have health insurance.

Mothers who accompanied by their husband/partner during ANC visit were more likely (AOR= 1.69) compared to those who were not accompanied by their husband/partner. Regarding the topic discussion during ANC, mothers who discussed 5-6 topics with health providers were 1.48 times more likely to receive good utility of delivery services than mothers who only have 0-4 discussion topic(s). Similarly, mothers who only had one child were more likely to have a good delivery services utilization than those who had more than one child. At last, adolescent mothers who had a good utilization of ANC were more likely to have a good utility of delivery services (AOR=1.11), although there was no significant different between this variable and utilization of delivery services after adjusted with other variables.

Table 13. Factors associated to utilization of delivery services among adolescent mothers in Indonesia (N=866)

Variables	Unadjusted OR	95% CI	Adjusted OR	95% CI
<b>Education of mother (Ref: None/primary)</b>				
Junior HS	1.37	0.98-1.91	1.21	0.83-1.76

Senior HS/University	1.80**	1.22-2.66	1.68*	1.05-2.68
<b>Working status of mother (Ref: No)</b>				
Yes	1.47*	1.08-2.01	1.56*	1.10-2.20
<b>Knowledge of danger sign during pregnancy (Ref: Poor)</b>				
Good	1.47**	1.10-1.97	1.05	0.72-1.51
<b>Knowledge of danger sign during childbirth (Ref: Poor)</b>				
Good	1.52**	1.12-2.06	1.09	0.74-1.61
<b>Knowledge of danger sign during postpartum period (Ref: Poor)</b>				
Good	1.28	0.86-1.91	0.88	0.55-1.41
<b>Mother's autonomy for seeking healthcare (Ref: Not at all)</b>				
Full or partial	1.55*	1.05-2.30	1.68*	1.09-2.60
<b>Type of residence (Ref: Rural)</b>				
Urban	2.20***	1.61-3.01	1.72**	1.21-2.44
<b>Region (Ref: Java)</b>				
Sumatera	0.42***	0.29-0.61	0.44***	0.29-0.66
Kalimantan	0.23***	0.14-0.39	0.23***	0.13-0.40
Sulawesi	0.49**	0.30-0.82	0.56	0.31-1.00
Eastern Indonesia	0.47*	0.27-0.83	0.59	0.30-1.13
<b>Wealth index (Ref: Poorest)</b>				
Poorer	1.47*	1.03-2.09	1.00	0.67-1.50
Middle	2.49***	1.68-3.70	1.60*	1.02-2.52
Richer	3.11***	1.87-5.20	1.68	0.93-3.04
Richest	2.93**	1.40-6.11	1.39	0.60-3.21
<b>Health insurance (Ref: Doesn't have)</b>				
Have	1.44*	1.09-1.90	1.42*	1.04-1.93
<b>Husband accompanied during ANC (Ref: No)</b>				
Yes	2.19***	1.57-3.05	1.69**	1.15-2.47
<b>Topic discussed during ANC (Ref: 0-4 topic(s))</b>				
5-6 topics	1.96***	1.47-2.61	1.48*	1.07-2.05
<b>Parity (Ref: &gt;1 child)</b>				
1 child	2.12	0.91-4.95	1.66	0.67-4.08
<b>ANC UTILIZATION (Ref: Poor)</b>				
Good	1.54**	1.15-2.07	1.11	0.79-1.55

\*p&lt;0.05

\*\*p&lt;0.01

\*\*\*p&lt;0.001

### 4.2.3 Postnatal Care

Table 14 shows the distribution of postnatal care among adolescent mothers in Indonesia. The percentage of mothers who receive PNC check are 90.2%, first PNC

within 24 hours was 83.3% compared to the percentage of those with more than 24 hours (16.7%) and those who received PNC by health provider was 83%. Based on those three variables, utilization level of postnatal care was grouped into poor utilization and good utilization. Adolescents who had a good utilization of postnatal care are 71.5%, while those who had poor utilization of postnatal care are 28.5%.

Table 14. Distribution of postnatal care (N=866)

Variables	n	%
<b>Postnatal check to mothers</b>		
No	86	9.8
Yes	780	90.2
<b>First timing of PNC</b>		
>24 hours	145	16.7
<=24 hours	721	83.3
<b>Person who conducted PNC</b>		
Non-health provider	148	17.0
Health provider	718	83.0
<b>PNC UTILIZATION</b>		
Mean $\pm$ SD	2.6 $\pm$ 0.8	
Poor (0-2)	247	28.5
Good (3)	619	71.5

The association of predisposing, enabling, need factors, and postnatal care utility were first analysed using binary logistic regression before proceed to multivariable analysis. Table 15 shows the results of bivariate analysis for each independent variables and postnatal care utilization. Independent variables that have the *p*-value less than 0.25 continued to test in multivariable analysis.

Among independent variables that continued to multivariable analysis in utility of PNC were education of mothers, education of husband/partner, working status of mothers, working status of husband/partner, knowledge of danger sign during pregnancy, knowledge of danger sign during childbirth, knowledge of danger

sign during postpartum period, type of residence, region, wealth index, health insurance, husband accompanied during ANC, topic discussed during pregnancy, intendedness of last birth, parity, ANC utilization, and delivery services utilization.

Table 15. Association between predisposing, enabling, need factors, and postnatal care utilization among adolescent mothers in Indonesia (N=866)

Variables	N	Postnatal care utilization (%)		p value
		Poor	Good	
<b>PREDISPOSING FACTORS</b>				
<b>Education of mothers</b>				
None/primary (Ref.)	226	36.7	63.3	
Junior HS	413	25.6	74.4	0.003*
Senior HS/University	227	25.5	74.5	0.010*
<b>Education of husband/partner</b>				
None/primary (Ref.)	292	31.9	68.1	
Junior HS	254	25.5	74.5	0.103*
Senior HS/University	320	27.9	72.1	0.283
<b>Working status of mother</b>				
No (Ref.)	607	30.7	69.3	
Yes	259	23.2	76.8	0.025*
<b>Working status of husband/partner</b>				
No (Ref.)	15	44.8	55.2	
Yes	851	28.4	71.6	0.229*
<b>Knowledge of danger sign during pregnancy</b>				
Poor (Ref.)	526	34.4	65.6	
Good	340	19.0	81.0	<0.001*
<b>Knowledge of danger sign during childbirth</b>				
Poor (Ref.)	577	33.9	66.1	
Good	289	17.7	82.3	<0.001*
<b>Knowledge of danger sign during postpartum period</b>				
Poor (Ref.)	732	30.1	69.9	
Good	134	19.4	80.6	0.013*
<b>Women's autonomy for seeking healthcare</b>				
Not at all (Ref.)	119	31.0	69.0	
Full or partial	747	28.1	71.9	0.513
<b>ENABLING FACTORS</b>				
<b>Type of residence</b>				
Rural (Ref.)	566	34.7	65.3	
Urban	300	16.8	83.2	<0.001*
<b>Region</b>				
Java-Bali (Ref.)	511	17.6	82.4	
Sumatera	159	47.0	53.0	<0.001*
Kalimantan	70	50.7	49.3	<0.001*
Sulawesi	71	33.3	66.7	0.002*

Eastern Indonesia	55	40.9	59.1	<0.001*
<b>Wealth index</b>				
Poorest (Ref.)	262	40.8	59.2	
Poorer	249	25.1	74.9	<0.001*
Middle	202	21.2	78.8	<0.001*
Richer	109	21.5	78.5	<0.001*
Richest	44	24.6	75.4	0.044*
<b>Health insurance</b>				
Doesn't have (Ref.)	422	30.7	69.3	
Have	444	26.4	73.6	0.161*
<b>Husband accompanied during ANC</b>				
No (Ref.)	182	44.3	55.7	
Yes	684	24.3	75.7	<0.001*
<b>Topic discussed during ANC</b>				
0-4 topic(s) (Ref.)	467	35.6	64.4	
5-6 topics	399	20.3	76.7	<0.001*
<b>NEED FACTORS</b>				
<b>Intendedness of last birth</b>				
Not wanted (Ref.)	81	22.9	77.1	
Wanted	785	29.0	71.0	0.248*
<b>Parity</b>				
>1 child (Ref.)	22	45.2	54.8	
1 child	844	28.0	72.0	0.084*
<b>Had complication during pregnancy</b>				
No (Ref.)	734	28.9	71.1	
Yes	132	25.8	74.2	0.463
<b>ANC UTILIZATION</b>				
Poor (Ref.)	284	36.8	63.2	
Good	582	24.4	75.6	<0.001*
<b>DELIVERY SERVICES UTILIZATION</b>				
Poor (Ref.)	308	67.6	32.4	
Good	558	6.9	93.2	<0.001*

\*Variables will be included in multivariable analysis ( $p < 0.25$ )

The association of predisposing, enabling, need factors, ANC utilization, and delivery services utilization to PNC utilization among adolescent mothers are showed in table 16. Higher level education mothers are more likely to have a good utility of PNC than those who had no education or primary school (AOR Junior high school=1.57 and AOR senior high school/university=1.35). Similarly, mothers whom their husband/partner had junior high school and senior high school/university were more likely to have a good utility of PNC than those with no education or primary

level (AOR= 1.11 and 1.01, respectively). Working adolescent mothers and working husband/partner had higher chance to have a good utility of PNC, although there were no significant different between those variables and PNC utilization.

Mothers who had good knowledge of danger sign during childbirth were 1.92 times more likely to have a good PNC service utilization than those who did not have knowledge about this issue. Similarly, mothers who had a good knowledge about danger sign during pregnancy and postpartum care were more likely to have a good utility of PNC service (AOR= 1.43 and 1.11, respectively). Even though there were no significant difference between these variables with postnatal care utilization.

Adolescent mothers who lived in urban area were more likely to have a good utilization of PNC (AOR=1.76) than those living in rural area. Regarding the living region, mothers who lived in region other than Java and Bali had lower chance to have a good PNC service utilization. There were significant different between Sumatera and Kalimantan region with utilization in PNC services compared to Java-Bali (AOR= 0.29 and 0.42, respectively). Compared to those in poorest wealth quintile, adolescent mothers who were in poorer and middle wealth quintile were more likely to have a good PNC utility, while those in richer and richest quintile were less likely. There was no significant different between wealth index and PNC utilization among adolescent mothers in Indonesia.

Mothers who accompanied by their husband/partner during ANC visit had 1.62 times higher chance to have a good utility of PNC services than those who were not accompanied by their husband/partner. Adolescent mothers who discussed 5-6 topics during ANC with health provider were 1.14 more likely to have a high utility of PNC services than those who only discussed 0-4 topic(s). Unexpectedly, this result



shows that adolescent mothers who wanted their last birth were less likely to have a good PNC utilization, although there was no significant different between this variable and PNC utilization.

Compared to mothers who had more than one child, those who only had one child were more likely to have a good utility of PNC services. The result of this study also showed that adolescent mothers who had good utilization in ANC and delivery services were more likely to have a good PNC utilization (AOR=1.26 and 27.4, respectively). Even though, no significant different was found between ANC utilization and PNC utilization after adjusted with other variables.

Table 16. Factors associated to utilization of postnatal care among adolescent mothers in Indonesia (N=866)

Variables	Unadjusted OR	95% CI	Adjusted OR	95% CI
<b>Education of mother</b> (Ref: None/primary)				
Junior HS	1.69**	1.19-2.39	1.57	0.92-2.67
Senior HS/University	1.69*	1.13-2.53	1.35	0.66-2.75
<b>Education of husband/partner</b> (Ref: None/primary)				
Junior HS	1.37	0.94-1.99	1.11	0.64-1.93
Senior HS/University	1.21	0.85-1.71	1.01	0.55-1.87
<b>Working status of mother</b> (Ref: No)				
Yes	1.47*	1.05-2.06	1.45	0.89-2.35
<b>Working status of husband/partner</b> (Ref: No)				
Yes	2.04	0.64-6.55	2.57	0.45-14.8
<b>Knowledge of danger sign during pregnancy</b> (Ref: Poor)				
Good	2.23***	1.61-3.10	1.43	0.86-2.39
<b>Knowledge of danger sign during childbirth</b> (Ref: Poor)				
Good	2.39***	1.69-3.39	1.92*	1.12-3.28
<b>Knowledge of danger sign during postpartum period</b> (Ref: Poor)				
Good	1.78*	0.76-1.75	1.11	0.56-2.19
<b>Type of residence</b> (Ref: Rural)				
Urban	2.63***	1.86-3.73	1.76*	1.07-2.90
<b>Region</b> (Ref: Java)				

Sumatera	0.24***	0.16-0.35	0.29***	0.16-0.52
Kalimantan	0.21***	0.12-0.35	0.42*	0.20-0.88
Sulawesi	0.43**	0.25-0.74	0.73	0.33-1.58
Eastern Indonesia	0.31***	0.17-0.55	0.42	0.17-1.07
<b>Wealth index (Ref: Poorest)</b>				
Poorer	2.06***	1.41-3.00	1.55	0.87-2.77
Middle	2.56***	1.69-3.89	1.01	0.54-1.90
Richer	2.53***	1.50-4.25	0.66	0.28-1.53
Richest	2.11*	1.02-4.38	0.47	0.15-1.54
<b>Health insurance (Ref: Doesn't have)</b>				
Have	2.14	0.92-1.66	0.93	0.61-1.43
<b>Husband accompanied during ANC (Ref: No)</b>				
Yes	2.49***	1.77-3.50	1.62	0.95-2.76
<b>Topic discussed during ANC (Ref: 0-4 topic(s))</b>				
5-6 topics	2.16***	1.59-2.95	1.14	0.73-1.80
<b>Intendedness of last birth (Ref: Unwanted)</b>				
Wanted	0.73	0.42-1.25	0.52	0.23-1.16
<b>Parity (Ref: &gt;1 child)</b>				
1 child	2.11	0.90-4.94	1.01	0.27-3.81
<b>ANC UTILIZATION (Ref: Poor)</b>				
Good	1.80***	1.33-2.45	1.26	0.79-2.02
<b>DELIVERY SERVICES UTILIZATION (Ref: Poor)</b>				
Good	28.4***	18.9-42.6	27.4***	17.3-43.5
*p<0.05	**p<0.01	***p<0.001		

## CHAPTER 5

### DISCUSSION

This study assessed the maternal health services utility consisting of antenatal care, delivery services, and postnatal care and determine the factors that contribute to maternal health services utility among adolescent mothers in Indonesia. According to Andersen's behavioural model of health care utilization theory (Andersen, 1973), predisposing factors refer to individual's factors to health services utility, enabling factors refer to resources which could accommodate access to health services, and the need factors refer to potential needs of the use of health service. In addition, the use of previous maternity care is also influenced the maternal health services utilization. Those factors are important determinants to influence maternal health services utility.

#### **5.1 Maternal health services utility level among adolescent mothers in Indonesia**

This study aims to assess maternal health services utility (antenatal care, delivery services, and postnatal care) level in adolescent mothers in Indonesia. According to the results, the highest level of maternal health services utility was utilization of PNC (71.5%) followed by utilization of ANC (67.2%) then utilization of delivery services (65.5%). It is similar with findings in Kenya 2017 which also reported utilization of PNC was the highest among the three (92%) (Mekonnen T, 2019). Adolescent mothers may still receive postnatal care by health provider although they gave birth at home, which indicated in this study's results about one of four mothers does not give birth in health facility. Some studies explained the barrier of ANC and delivery services utilization in adolescent mothers due to unable to pay the services and fear of disclosing their pregnancies (Chaibva CN, at al., 2009).

Findings from the Basic Health Research (*Riskesdas*) 2018 in Indonesia indicated that maternal mortality most happened at the time of childbirth due to direct complication and actually can be prevented if there are no delays in seeking services for delivery. The seeking of care to Traditional Birth Attendant (TBA) in adolescent mothers also reduced the perceived need to access the institutional birth delivery assisted by health provider (Chaibva CN, et al., 2009). The low utilization of delivery services in the result of this study emphasizes the reason of why the maternal mortality is still high and most occurred in childbirth period in Indonesia.

## **5.2 Association between predisposing, enabling, and need factors towards antenatal care utility**

Another objective of this study is to identify the determinants of antenatal care utility in adolescent mothers in Indonesia. In predisposing factors, it is reported that adolescent mothers who had high education of husband had 45% lower chance to get a good utilization of ANC than those who had low education husband. This finding is contrast to other studies that found the positive correlation of husband/partner's education with ANC utilization (Rai R, et al, 2013). Husband/partner with high education should be more aware of the health needs of their wives, however they may be busier with work or were in college when their adolescent wives got pregnant resulting no time to accompany during ANC visit which is one of the influential factors to ANC utilization. Even though, in this study working husband/partners were not significantly related to utilization of ANC but other findings showed that mothers whom their husbands were working and cannot accompany them for prenatal check are less likely to use ANC services (Rahman AE, 2018; Probandari, 2017).

Mother's autonomy to seek healthcare for themselves was a significant factor in this study. In some places, adolescent mothers who lived in traditional family may have less authority to make decision on their own about ANC visit and delivery services (Sychareun V, et al., 2018). Adolescent mothers who were able to make decision about their own health will encourage to gain maternal knowledge when they get pregnant and will not hesitate to decide for seeking ANC services. It is relevant with the result that shows mother who had full or partial autonomy for seeking healthcare had 1.61 times more likely to have a good utilization of ANC.

In enabling factors, adolescent mothers who lived outside Java-Bali region had lower chance to get a good utilization of ANC. This reflects the disparity of healthcare between regional in Indonesia. Average of distances from home to hospital are widely vary from only 0.5 kilometre in Jakarta to 29.0 kilometres in Central Sulawesi (Acuin CS, et al., 2011). In term of economic and infrastructure, Java-Bali region is more developed than other regions. In addition, number of health facilities and health providers are disproportionately clustered in Java particularly in urban area and are often inaccessible to the poor (Hatt L, et al., 2007; Nababan HY, 2018). These barriers may give a difficulty for many adolescent mothers outside Java-Bali to access ANC services during pregnancy.

Good utilization of ANC was also more likely in adolescent mothers who had been accompanied by their husband/partner during ANC visit (AOR=2.42). Adolescent mothers tend to be reluctant to access maternal health services especially during pregnancy due to negative stigma of adolescent pregnancy in the community. Support from husband/partner in accompany them during pregnancy health check will encourage mothers to be routinely visit for ANC. Another study also found that

mothers who had been accompany by their husband/partner has positive association with receiving antenatal care from a health trained provider (AOR=4.5). This study indicated that male involvement is one of key factors with adolescent mother's utilization of skilled maternal health services during pregnancy (Rahman AE, 2018).

Both men and women need to be involved in maternal health education during pregnancy. Study from Chikalipo 2018 reported the preferred topics during ANC visit which were preparation for birth and plan of complication readiness, pregnancy description, how to care pregnancy women, complication during pregnancy and after childbirth, men's role during pregnancy, and baby care after childbirth. Relevant with this study's result that found adolescent mothers that discussed more topics with health providers during pregnancy was 2.24 times more likely to have a good utilization of ANC. It indicates comprehensiveness of discussion between mothers and health providers make mothers be more knowledgeable about maternal health and routinely visit for antenatal care (Chikalipo, 2018).

In need factors, adolescent mothers who wanted their last birth were more likely to have a good antenatal care utilization (AOR= 3.09). Similarly, other studies also found that unwanted pregnancies are associated with a late first timing of ANC visit and less frequent visit compared to pregnancies which were wanted. Furthermore, mothers who had mistimed pregnancy had lower average to use of antenatal care (Eggleston E, et al., 1999; Santelli J, et al., 2003; Kost K, et al., 1998). A pregnancy that occurs at an early age of under 20 years makes women psychologically not ready to get pregnant. At that period, the mother may not want to have offspring, so she refuses the pregnancy (Global A, 2003). Adolescent mothers who had mistimed and unwanted pregnancy may be reluctant to initiate antenatal care

in attempts to conceal it and in the hope that the pregnancy will disappear. Therefore, they were less likely to seek antenatal care and when they do, report a late timing of the first antenatal care visit (Islam MM & Rashid M, 2004; Weller RH, et al., 1987; Ganguly S & Singh N, 2009).

### **5.3 Association between predisposing, enabling, need factors, and ANC utilization towards delivery services utility**

The next objective of this study is to identify determinants of delivery services utility in adolescent mothers in Indonesia. In predisposing factors, the higher education of adolescent mothers increased the odds to have a good delivery services utilization. Adolescent mothers who had senior high school or university as their highest level of education was 1.68 times more likely to get a good utilization of delivery services.

This is in line with the results of other studies that reported women's education is the main contributing factor of the utilization of ANC, delivery at health facility by qualified health providers and postnatal care services. Mothers with higher education had higher chance to have knowledge of the advantages of the utilization of qualified maternal health services and the required empowerment to access care (Mekonnen T, 2019; Shabuddin 2015). They may also be more aware of maternity risks and seek to safe delivery services.

Adolescent mothers who had full or partial autonomy for seeking health care was 1.68 times more likely to have a good delivery services utilization compared to those who has no autonomy at all. Those with the authority can decide better about seeking health care including delivery services. Since pregnancy, they could plan about the place of delivery and whom they want to be assisted in childbirth. If mothers have no authority then family members will decide about their seeking health

care and in some rural areas often expect them to give birth with traditional birth attendance at home (Chowdury S, 2003).

In enabling factors, adolescent mothers who lived in urban area had higher chance to have a good utilization of delivery services. This is likely due to proximity of distance, number of health facility, and number of health providers which are more well distributed in urban than in rural areas. When the signs of childbirth come, urban mothers tend to get treatment faster because they have closer access and more options to health services. Meanwhile, adolescent mothers in rural areas if they are not well prepared for delivery and are far from the health facilities they may tend to deliver at home. Furthermore, adolescent mothers may be less exposed with maternal services and more familiar with traditional birth attendants especially in rural areas (Sarker BK, et al., 2016). Previous studies also have reported that most women in rural areas, rate the services of the traditional birth attendants (TBAs) as being of higher quality than that of medical healthcare practitioners, particularly with regards to interpersonal communications and relationships (Svanemyr J, et al., 2012). TBAs have been reported to be more considerate and to provide more compassionate care (Nair M, et al., 2015).

Similar with ANC utilization, adolescent mothers who lived outside Java-Bali region were less likely to have a good utilization of delivery services. Regions that significantly lower were Sumatera (AOR= 0.44) and Kalimantan (AOR= 0.23). In Java, the large number of midwives has been found to be a strong determinant of delivery assisted by skilled health providers (Cameron, 2019). The proximity of access and a lot of referral health facilities can provide more easiness to seek delivery



services for adolescent mothers who lived in Java-Bali, especially if they deliver with complications.

Utilization of delivery services is also influenced by the wealth index or economic status of adolescent mothers. Mothers who had higher quintile of wealth index are more likely to have a good delivery services. It is easier for rich women to get access to health facilities and health workers because they can cover the costs of transportation, delivery service cost and cost of postnatal services. They may be less worried about the cost of delivery even if they experience complications.

Similarly, a study also found that economic status of the adolescent mother was found to be positively associated with the use of maternal health care with adolescents in the wealthier group reporting better engagement with maternity care compared to the poorer ones. The study suggested that poor adolescents lack resources to spend on healthcare. Also, poor adolescents are more likely to be disengaged from social networks, thus, less likely to be reached by programs aiming to improve maternal health service utilisation of adolescent mothers (Rani M, et al., 2004).

In terms of economic factors, adolescent mothers who have health insurance do not need to worry about accessing childbirth services. Indonesia has *Jaminan Kesehatan Nasional* or National Health Insurance (JKN) which also covers the cost of childbirth. Indonesia also has a special insurance for delivery services called *Jampersal*, but its utilization is still not optimal. However, the results show that with ownership of health insurance, adolescent mothers in Indonesia would have a higher utilization of delivery services.

Comprehensive health insurance programs to cover the poor may help to counteract the extent to which cost acts as a barrier to maternal health care seeking

and could be an intermediate consideration (Mbugua, 2018). Insurance coverage had significant association with utilization of maternal and child health care from pregnancy to childhood period. Respondents with higher education level, higher wealth index and have insurance more likely to have maternal and child health care from adequate antenatal care to completed immunization (Saptarini, 2018).

Another factor that associated with good utilization of delivery services was husband/partner's role in accompanying their wives during ANC visit. Adolescent mother who accompanied by their husband/partner during ANC was 1.69 times more likely to get a good delivery services utilization. This is in line with the study which also found that husbands accompanying their wives was positively associated with women give birth at a health facility (AOR= 1.5) (Rahman AE, 2018).

This proves the advantages of support from partners in seeking delivery services. Adolescent mothers who are accompanied by their husbands during ANC visit are also have a good utilization of ANC which can also gain a sense of awareness to take part in using childbirth services. This is also likely for the mothers and their husband/partner to prepare and plan better for whatever is needed for delivery, such as place of delivery, transportation, and who will be assisted in delivery.

The importance of planning since pregnancy for utilization of delivery services emphasize the association between ANC utilization and delivery services utilization. Adolescent mothers who had good ANC utilization was more likely to have a good delivery services. Although the result is not statistically significant, this shows that the concept of continuum of care regarding mothers who use ANC services will tend to be good at use of childbirth services. Mothers who visit for ANC will have better knowledge about safe delivery services for themselves and their babies and will be

better prepared for delivery. Other studies also identified the influence of frequent ANC visits were attending at least four times significantly influenced young women's utilisation of skilled birth delivery care (Rai R, et al., 2012; Simkhada B, et al., 2008).

#### **5.4 Association between predisposing, enabling, need factors, ANC utilization, and delivery services utilization towards postnatal care**

The next objective of this study is to identify determinants of postnatal care utility in adolescent mothers in Indonesia. In predisposing factors, adolescent mothers who had a good knowledge of danger sign during pregnancy, childbirth, and postpartum were more likely to have a good PNC utilization. Although, only knowledge of danger sign during childbirth has significant association. Another study found that low attendance at postnatal care services was associated with high birth rank, low household wealth index, poor maternal knowledge of complications during pregnancy, childbirth or postnatal period and no maternal exposure to mass media such as newspapers, radio or television (Titaley C, 2009). If mothers have a good knowledge of danger signs, they will be able to understand better that pregnancy, childbirth, and postpartum period are risky times, thus they will continue to use PNC services properly and seek services.

In enabling factor, Urban mothers were 1.76 times more likely to have a good utilization of PNC. It is similar with other low and middle-income countries that postnatal care utilization in the rural area is lower than in the urban area (Langlois EV, et al., 2015). Another study in Indonesia reported postnatal care uses were higher among urban mothers and in Java-Bali and Sumatera region. By geographic location and using Java and Bali as the reference, there was lower propensity of women from other regions to use maternal health care services. Inequity between regions, rich-

poor, and urban-rural characterize the health care situation in Indonesia. The capital city Jakarta and several big cities in Java and Bali have higher density of health facilities and health workers (Nababan HY, 2018). Moreover, the richest and living in urban settings have bigger propensity to access health facilities than their poorest counterparts (World Bank & UKAid, 2010).

Urban area has more facilities and access in services. The number of health workers and access to technological sophistication is also better, thus urban mothers are able to give birth assisted by health workers and get immediate care afterward. It is different with mothers who live in rural areas where the number of health workers is smaller and mostly are still being cared for by traditional birth attendants which is not recommended.

Similar with ANC and delivery services utilization, PNC utilization among adolescent mothers who lived in Sumatra, Kalimantan, and eastern Indonesia was lower than those who lived in Java-Bali region. Another study found similar results, women from eastern Indonesia used the maternal health services the least than women from Java and Bali. This is likely due to some regions in Indonesia, especially Java-Bali, are more developed than the others in terms of economic activity, infrastructure, and population (Suryadarma D, et al., 2006) which has created differences in availability and access to basic services such as education and health (Hodge A, et al., 2014).

Outside Java-Bali region, the number of health workers is less and the sophistication of telecommunications is lower than Java-Bali, which makes it more difficult to get health workers to perform care at home after childbirth. Difficulty of access and lower quality of maternal health care makes the lack of ANC, delivery

services and PNC utilization. This shows that health development in Indonesia is still playing the old song, namely Java-Bali centric and has not been evenly distributed in every region in Indonesia.

The utilization of previous health services which are ANC and delivery services is also a crucial factor in the PNC utilization. Regarding delivery services, adolescent mothers who had a good delivery services were more likely to have a good PNC utilization. Giving birth in a health facility will often get PNC services directly. It shows that there is a continuum of care that mothers who use childbirth services will be more will to use the PNC service.

Another study found that, other indicators of access to healthcare services which were associated with non-utilization of postnatal care services included few antenatal care checks, use of untrained birth attendants and births outside healthcare facilities. The analysis of that study showed highly significant associations between delivery healthcare services and the utilization of postnatal care services. Infants delivered outside a healthcare facility and by untrained birth attendants were significantly less likely to utilize postnatal care services. This finding might reflect lack of access and availability of local delivery healthcare services or maternal choice. These factors indicate a strong need to improve the access, the coverage and acceptability of all maternity care services and increase community awareness about the importance of delivery at healthcare services (Titaley C, 2009).

Other than delivery services, ANC utilization also had a positive association with utilization of PNC, although from this study's result was not statistically different. Other studies revealed that that having at least four antenatal care (ANC) visits (Birungi H, et al., 2011) increased utilization of safe or skilled birth delivery

care (Rai R, et al., 2013) and had shown a substantial effect on the use of PNC service. These findings suggest the need to integrate maternal health care service to better improve adolescent mother's utilization of maternity care. This is also important for improving child health as children whose mothers received maternity care were more likely to receive full immunization (Rai R, et al., 2014).

### **5.5 Strength and limitations**

As using a national survey data, this study is representative for adolescent mothers in Indonesia. This study assessed the maternal health services utility in all maternal period, during pregnancy, delivery, and postnatal in vulnerable population, which is adolescent age 15-19 years old. From the results found the association between region and maternal health services that can be used to develop strategic planning and program, especially as health system in Indonesia is decentralization.

The Indonesia Demographic Health Survey (IDHS) provided limited information on certain topics and variables. This may have resulted not all determinants can be assessed using this data. One example is for assessing the PNC utilization, this study was only able to assess the first timing of PNC check whereas the second and third time cannot be assessed due to data unavailability in the questionnaire. In addition, all variables were assumed to be fixed over a period of five years prior to the survey. This study used a cross-sectional design, which limited the assessment of causality among the variables.

## CHAPTER 6

### CONCLUSION AND RECOMMENDATION

#### 6.1 Conclusion

Based on the objective, this study concludes that among adolescent mothers in Indonesia, the highest level of utility is PNC (71.5%) followed by ANC (67.2%) then delivery services (64.5%).

Table 17. Factors associated with maternal health services utilization

ANC Utilization	Delivery Services Utilization	PNC Utilization
<ul style="list-style-type: none"> <li>• Husband/partner's education</li> <li>• Mother's autonomy for seeking health care</li> <li>• Region</li> <li>• Husband accompanied during ANC</li> <li>• Topic discussed during ANC</li> <li>• Intendedness of last birth</li> </ul>	<ul style="list-style-type: none"> <li>• Mother's education</li> <li>• Mother's working status</li> <li>• Mother's autonomy for seeking health care</li> <li>• Residence</li> <li>• Region</li> <li>• Wealth index</li> <li>• Health insurance</li> <li>• Husband accompanied during ANC</li> <li>• Topic discussed during ANC</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge of danger sign during childbirth</li> <li>• Residence</li> <li>• Region</li> <li>• Delivery services utilization</li> </ul>

As the study's results found that knowledge or education of adolescent mothers had significant association with some maternal health services utilization and region was significantly associated with the three utilization of maternal health services which are ANC, delivery services, and PNC utilization, there should be programs which focused to improve mother's knowledge related maternal health

especially for adolescent mothers. Furthermore, programs or policies that specifically directed to every region are necessary due to every region has their own characteristics and special needs for health care development.

## **6.2 Recommendation**

### **6.2.1 Policy Recommendation**

The recommendations that can be suggested by this study are as follows:

#### *1. Expanding health care coverage in every region*

As Indonesia uses the decentralization in the health system it is recommended that local health officers in districts/cities to make strategic policies and programs' approach that focused on adolescent mothers since the disparity in regions is still happening. Region outside Java-Bali which has lower maternal health services utility needs to improve their access and quality of care for maternal health services. It can be met by extending the coverage of health care by adding the number of health facilities and health providers, providing the training for health providers particularly about ANC, delivery services, and PNC, and giving massive information about maternal health in community as well as in youth-friendly health centre.

#### *2. Providing maternal education for women and men*

In adolescent mothers, support from their husband/partner gives a big impact in using maternal health services. It can be seen that male involvement in maternal health is essential and needs to encourage more. Education related to maternal health can be provided not only for women but also for men in order to improve their knowledge and gives more support to their wives/partners during pregnancy, childbirth, and postpartum period. In addition, program to provide education



about high-risk pregnancy should be implemented in national level until district/city level in order to prevent the early age pregnancy and improve the knowledge of mothers especially adolescent mothers about maternal health.

### 3. *Extending the health insurance coverage*

Another factor that has contribution to improve the utilization of maternal health services is health insurance. There were a lot of health insurance provided by Government of Indonesia such as *Askes*, *Jamkesmas*, *Jamkesda*, etc. Health insurance program that focused on maternal health services is *Jaminan Persalinan (Jampersal)* or Childbirth Insurance that has been launched in 2011. Then in 2014, Government launched *Jaminan Kesehatan Nasional (JKN)* which is an Universal Health Coverage in Indonesia and all other insurances are merged in this scheme. However, as still not 100% of Indonesian people have JKN yet and the budget allocation of *Jampersal* is still provided. It can be managed that *Jampersal* can be used for poor women and do not have JKN or in the future *Jampersal* can be used for referral of complication cost only.

#### **6.2.2 Recommendation for Future Studies**

Regarding the topic, future studies should emphasis and explore more related to the disparity of every region in maternal health services among adolescent mothers as every region has their own unique characteristic and regulations that bind the people. In addition, qualitative study also can be an appropriate method in order to gain a deeper understanding of why adolescent mothers are able or not able to use the maternal health services.

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### Appendix A: Data Map

#### Data map to IDHS 2017 questionnaire and dataset

Variable	Number in Questionnaire	Number in Dataset	Coding
<b>Predisposing Factors</b>			
Education of mother	107 108	S108	No education Primary Junior high Senior high Academy/DI/DII/DIII University
Education of husband/partner	903 904	S904 V701	No education Primary Junior high Senior high Academy/DI/DII/DIII University
Working status of mother	912	V714	Yes No
Working status of husband/partner	907	V704a	Yes No
Knowledge of the sign of danger during pregnancy	714C	S714C S714da – s714dx	Prolonged labor Vaginal bleeding Fever Convulsions Baby in wrong position Swollen limbs Faint Breathlessness Tiredness Other Don't know
Knowledge of danger sign during delivery	714F	S714fa – s714fz	Water breaks too early Excessive bleeding Fever Long labor Faint Convulsions Placenta does not come out Stillbirth Other Don't know
Knowledge of danger sign during postpartum period	714H	S714ha – s714hz	Excessive bleeding Faint Convulsions

			High fever Foul smelling vaginal discharge Pain in breasts Depressed Other Don't know
Mother's autonomy for seeking health care	922	V743a	Women Women and husband Women and other Husband/partner Someone else Other
<b>Enabling Factors</b>			
Type of residence area	5	V025	Urban Rural
Region	1	V024	Name of province *will be classified in island group
Wealth index	Composited from HH Questionnaire	V190	Poorest Poorer Middle Richer Richest
Health insurance	1109	V481	Yes No
Husband accompanied during ANC	410A	S4101_1	Yes No
Topic discussed during ANC	413F	S413fa_1 – s413ff_1	Yes/No Place to deliver Transportation Delivery assistant Payment Blood Donor Post-Partum FP
<b>Need Factors</b>			
Intendedness of last birth	405	V367	Wanted then Wanted later No
Parity	224	V208	Number of birth
Complication during pregnancy	413C	S413C_1	Yes No
<b>Maternal Health Services Utilization</b>			
<b>ANC utilization</b>			
Number of ANC received	412	M14_1	Number of times

First timing of ANC	411	M13_1	Number in month
Person to see when ANC	409	M57m_1 – m57x_1	Health personnel Other person (TBA) Other
<b>Delivery services utilization</b>			
Delivery assistant	429	M3a – M3n	Health personnel Other person (TBA) No one
Place of delivery	430	M15_1	Home Community-based health care Public sector Private-medical sector
<b>PNC utilization</b>			
Post-natal check	435	M62_1	Yes No
Timing of first PNC for mothers at facility	436 442	M63_1 M67_1	Time: Hours, Days, Weeks
Person who conducted PNC	437 443	M64_1 M68_1	Time: Hours, Days, Weeks



**Appendix B: IDHS Women's Questionnaire**  
**2017 IDHS Women's Questionnaire**



17IDHS-W

**2017 INDONESIA DEMOGRAPHIC AND HEALTH SURVEY**  
**WOMAN'S QUESTIONNAIRE**

Confidential

I. IDENTIFICATION				CODE	
1. PROVINCE _____					
2. REGENCY/CITY *) _____					
3. SUB-DISTRICT _____					
4. VILLAGE _____					
5. URBAN/RURAL **) URBAN - 1      RURAL - 2					
6. CENSUS BLOCK NUMBER _____					B
7. IDHS SAMPLE CODE 2017 _____					
8. HOUSEHOLD SAMPLE NUMBER _____					
9. NAME OF HOUSEHOLD HEAD _____					
10. NAME OF RESPONDENT _____					
11. RESPONDENT'S LINE NUMBER _____					
12. RESPONDENT'S MOBILE PHONE NUMBER _____					
II. INTERVIEWER VISITS					
	1	2	3	FINAL VISIT	
DATE OF INTERVIEW				DATE	
				MONTH	
				YEAR	2 0 1 7
INTERVIEWER'S NAME				INT. NUMBER	
RESULT ***)				RESULT	
NEXT VISIT DATE				TOTAL NO. OF VISIT	
TIME					
***) RESULT CODES 1 COMPLETED                      4 REFUSED 2 NOT AT HOME                      5 PARTLY COMPLETED 3 POSTPONED                          6 INCAPACITATED                      7 OTHER _____ (SPECIFY)					
NAME	FIELD EDITOR	SUPERVISOR	OFFICE EDITOR	KEYED BY	
DATE					

\*) Cross out category not used  
 \*\*) Circle selected category

**SECTION 1. RESPONDENT'S BACKGROUND**

**INTRODUCTION AND CONSENT**

Hello. My name is \_\_\_\_\_. I am working with Statistics Indonesia. We are conducting a survey about the health of women, men and children in Indonesia. We would very much appreciate your participation in this survey. I would like to ask you about your health (and the health of your children). The information we collect will help the government to plan health services. The survey usually takes about 30 to 40 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team.

You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know.  
Do you have any questions?  
May I begin the interview now?

SIGNATURE OF INTERVIEWER \_\_\_\_\_ DATE \_\_\_\_\_

RESPONDENT AGREES TO BE INTERVIEWED .. 1      RESPONDENT DOES NOT AGREE TO BE INTERVIEWED .. 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
106	How old were you at your last birthday?  COMPARE AND CORRECT 105 AND/OR 106 IF INCONSISTENT.	AGE IN COMPLETED YEARS ..... <input type="text"/>	
107	Have you ever attended school?	YES ..... 1 NO ..... 2	→ 111
108	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY ..... 1 JUNIOR HIGH SCHOOL ..... 2 SENIOR HIGH SCHOOL ..... 3 ACADEMY/DI/DII/DIII ..... 4 DIV/UNIVERSITY ..... 5	
109	What is the highest [GRADE/YEAR] you completed at that level?  IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'. COMPLETED = 7	GRADE/YEAR ..... <input type="text"/> DON'T KNOW ..... 8	
110	CHECK 108:  CODE '1' CIRCLED <input type="checkbox"/> CODES '2', '3' '4' OR '5' CIRCLED <input type="checkbox"/>		→ 113
111	Now I would like you to read this sentence to me.  SHOW CARD TO RESPONDENT.  IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL ..... 1 ABLE TO READ ONLY PART OF THE SENTENCE ..... 2 ABLE TO READ WHOLE SENTENCE ..... 3 BLIND/VISUALLY IMPAIRED ..... 4	
112	CHECK 111:  CODE '2' OR '3' CIRCLED <input type="checkbox"/> CODE '1' OR '4' CIRCLED <input type="checkbox"/>		→ 114
113	Do you read a newspaper or magazine at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK ..... 1 LESS THAN ONCE A WEEK ..... 2 NOT AT ALL ..... 3	
114	Do you listen to the radio at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK ..... 1 LESS THAN ONCE A WEEK ..... 2 NOT AT ALL ..... 3	

SECTION 2. REPRODUCTION

Now I would like to ask about all the births you have had during your life.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP								
201	Have you ever given birth?	YES ..... 1 NO ..... 2	→ 206								
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES ..... 1 NO ..... 2	→ 204								
203	a) How many sons live with you? b) And how many daughters live with you? IF NONE, RECORD '00'.	a) SONS AT HOME ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> b) DAUGHTERS AT HOME ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>									
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES ..... 1 NO ..... 2	→ 206								
205	a) How many sons are alive but do not live with you? b) And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	a) SONS ELSEWHERE ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> b) DAUGHTERS ELSEWHERE ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>									
206	Have you ever given birth to a boy or girl who was born alive but later died?  IF NO, PROBE: Any baby who cried, who made any movement, sound, or effort to breathe, or who showed any other signs of life even if for a very short time?	YES ..... 1 NO ..... 2	→ 208								
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> GIRLS DEAD ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>									
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL BIRTHS ..... <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr></table>									
209	CHECK 208:  ONE OR MORE LIVE BIRTH <input type="checkbox"/> ↓ Just to make sure that I have this right: you have had in TOTAL ____ births during your life. Is that correct?  YES <input type="checkbox"/> ↓	NO LIVE BIRTH <input type="checkbox"/> ↓ Just to make sure that I have this right: you had no live births during your life. Is that correct?  NO <input type="checkbox"/> ↓ PROBE AND CORRECT 201-208 AS NECESSARY.									
210	CHECK 208:  ONE OR MORE BIRTHS <input type="checkbox"/> ↓	NO BIRTHS <input type="checkbox"/>	→ 226								

SECTION 4. PREGNANCY AND POSTNATAL CARE

401	CHECK 224: ONE OR MORE BIRTHS SINCE JANUARY 2012 <input type="checkbox"/>	NO BIRTHS SINCE JANUARY 2012 <input type="checkbox"/>	648
402	CHECK 215. RECORD THE BIRTH HISTORY NUMBER IN 403 AND THE NAME AND SURVIVAL STATUS IN 404 FOR EACH BIRTH SINCE JANUARY 2012. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH. IF THERE ARE MORE THAN 2 BIRTHS, USE LAST COLUMN OF ADDITIONAL QUESTIONNAIRE(S). Now I would like to ask some questions about your children born in the last five years. (We will talk about each separately.)		
403	BIRTH HISTORY NUMBER FROM 212 IN BIRTH HISTORY.	LAST BIRTH BIRTH HISTORY NUMBE ..... <input type="text"/>	NEXT-TO-LAST BIRTH BIRTH HISTORY NUMBER..... <input type="text"/>
404	FROM 212 AND 216:	NAME ..... LIVING <input type="checkbox"/> DEAD <input type="checkbox"/>	NAME ..... LIVING <input type="checkbox"/> DEAD <input type="checkbox"/>
405	When you got pregnant with (NAME), did you want to get pregnant at that time?	YES ..... 1 (SKIP TO 407A) ← NO ..... 2	YES ..... 1 (SKIP TO 407A) ← NO ..... 2
406	CHECK 208: ONLY ONE BIRTH <input type="checkbox"/> MORE THAN ONE BIRTH <input type="checkbox"/> a) Did you want to have a baby later on, or did you not want any children? b) Did you want to have a baby later on, or did you not want any more children?	LATER ..... 1 NO MORE/NONE ..... 2 (SKIP TO 407A) ←	LATER ..... 1 NO MORE/NONE ..... 2 (SKIP TO 407A) ←
407	How much longer did you want to wait?	MONTH ..... 1 <input type="text"/> YEARS ..... 2 <input type="text"/> DONT KNOW ..... 998	MONTHS ..... 1 <input type="text"/> YEARS ..... 2 <input type="text"/> DONT KNOW ..... 998
407A	Do you have a document that certifies his birth? Has (NAME)'s birth been registered?	YES ..... 1 NO ..... 2 (SKIP TO 407D) ← DONT KNOW ..... 8	YES ..... 1 NO ..... 2 (SKIP TO 407D) ← DONT KNOW ..... 8
407B	May I see the document? CHECK THE DOCUMENT(S) PRODUCED BY THE RESPONDENT. IF THERE ARE MORE THAN ONE DOCUMENT, CIRCLE THE HIGHEST CODE	NOT SEEN ..... 1 HOSPITAL RECORD ..... 2 VILLAGE RECORD ..... 3 PROOF OF BIRTH ..... 4 (SKIP TO 408) ← BIRTH CERTIFICATE ..... 5	NOT SEEN ..... 1 HOSPITAL RECORD ..... 2 VILLAGE RECORD ..... 3 PROOF OF BIRTH ..... 4 (SKIP TO 408) ← BIRTH CERTIFICATE ..... 5
407C	How old was (NAME) when you registered his/her birth?	DAYS ..... 1 <input type="text"/> WEEEEKS ..... 2 <input type="text"/> MONTHS ..... 3 <input type="text"/> YEARS ..... 4 <input type="text"/> DONT KNOW ..... 998 (SKIP TO 408) ←	DAYS ..... 1 <input type="text"/> WEEEEKS ..... 2 <input type="text"/> MONTHS ..... 3 <input type="text"/> YEARS ..... 4 <input type="text"/> DONT KNOW ..... 998 (SKIP TO 408) ←

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____
407D	Why was (NAME) not registered?	THE COST IS EXPENSIVE 1 THE PLACE IS FAR AWAY 2 DONT KNOW TO BE REGISTERE 3 LATE, DID NOT WANT TO PAY FINE ..... 4 DO NOT KNOW WHERE TO REGISTER ..... 5 OTHER ..... 6	THE COST IS EXPENSIVE 1 THE PLACE IS FAR AWAY 2 DONT KNOW TO BE REGISTERE 3 LATE, DID NOT WANT TO PAY FINE ..... 4 DO NOT KNOW WHERE TO REGISTER ..... 5 OTHER ..... 6
408	Did you see anyone for antenatal care for this pregnancy?	YES ..... 1 NO ..... 2 (SKIP TO 414) ←	
409	Whom did you see?  Anyone else?  PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	<b>HEALTH PERSONNEL</b> GENERAL PRACTITIONER A OBSTETRICIAN ..... B NURSE ..... C MIDWIFE ..... D VILLAGE MIDWIFE ..... E  <b>OTHER PERSON</b> TRADITIONAL BIRTH ATTENDANT ..... F OTHER ..... X (SPECIFY)	
409A	CHECK 409:  CODE 'A', 'B', 'C', 'D' <input type="checkbox"/> OR 'E' CIRCLED CODE 'A', 'B', 'C', 'D', 'E' NOT CIRCLED <input type="checkbox"/> (SKIP TO 413C)		
409B	Were you given an MCH book for this pregnancy?  IF YES: May I see it, please?	YES, SEEN ..... 1 YES, NOT SEEN ..... 2 NO ..... 3 DONT KNOW ..... 8	
410	Where did you receive antenatal care for this pregnancy?  Anywhere else?  PROBE TO IDENTIFY THE TYPE OF SOURCE.  IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.  _____ (NAME OF PLACE)	<b>HOME</b> RESPONDENT'S HOME ... A OTHER HOME ..... B  <b>COMMUNITY-BASED HEALTH CARE</b> VILLAGE HEALTH POST/ VILLAGE MATERNITY POST C INTEGRATED HEALTH SERVICE POST ..... D OTHER ..... E (SPECIFY)  <b>PUBLIC SECTOR</b> HOSPITAL ..... F CLINIC ..... G PRIMARY HEALTH CENTER H SUB/MOBILE PRIMARY HEALTH CARE ..... I VILLAGE MIDWIFE ..... J OTHER ..... K (SPECIFY)  <b>PRIVATE MEDICAL SECTOR</b> HOSPITAL/MOTHER AND CHILD HOSPITAL/ MATERNITY HOSPITAL ... L PRIVATE CLINIC/MATERNITY CLINIC ..... M PRIVATE OBSTETRICIAN AND GYNECOLOGIST ... N PRIVATE GENERAL PRACTITIONER ..... O PRIVATE MIDWIFE ..... P PRIVATE NURSE ..... Q OTHER ..... X (SPECIFY)	

NO.	QUESTIONS AND FILTERS	LAST BIRTH		NEXT-TO-LAST BIRTH																																		
		NAME _____		NAME _____																																		
410A	Did your husband/partner accompany you in any antenatal care visits during this pregnancy?	YES .....	1																																			
		NO .....	2																																			
411	How many months pregnant were you when you first received antenatal care for this pregnancy?	MONTH .....	<input type="text"/>																																			
		DONT KNOW .....	98																																			
412	How many times did you receive antenatal care during this pregnancy?	NUMBER OF TIMES .....	<input type="text"/>																																			
		DONT KNOW .....	98																																			
412A	CHECK 412: NUMBER OF TIMES RECEIVED ANTENATAL CARE.																																					
	MORE THAN ONCE <input type="checkbox"/> ONCE <input type="checkbox"/> (SKIP TO 413)																																					
412B	You made (NUMBER IN 409) antenatal care visits during this pregnancy. How many times did you receive antenatal care in: a. The first 3 months? b. Between the fourth and sixth month? c. Between the seventh month and delivery? THE SUM IN a., b., and c. MUST BE THE SAME AS IN 412.	NUMBER OF ANTENATAL VISITS 0 - 3 MONTHS ... <input type="text"/> 4 - 6 MONTHS ... <input type="text"/> 7 <sup>th</sup> MONTH TO DELIVERY <input type="text"/>																																				
412C	How many months pregnant were you at last antenatal care check up?	MONTH .....	<input type="text"/>																																			
		DONT KNOW .....	98																																			
413	As part of your antenatal care during this pregnancy, were any of the following done at least once:	<table border="0"> <thead> <tr> <th></th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr> <td>a) Was your weight measured?</td> <td>1</td> <td>2</td> </tr> <tr> <td>b) Was your height measured?</td> <td>1</td> <td>2</td> </tr> <tr> <td>c) Was your blood pressure measured?</td> <td>1</td> <td>2</td> </tr> <tr> <td>d) Was your mid-upper arm circumference measured?</td> <td>1</td> <td>2</td> </tr> <tr> <td>e) Was your fundus measured?</td> <td>1</td> <td>2</td> </tr> <tr> <td>f) Was your stomach examined?</td> <td>1</td> <td>2</td> </tr> <tr> <td>g) Was your baby's heart examined?</td> <td>1</td> <td>2</td> </tr> <tr> <td>h) Did you give a blood sample?</td> <td>1</td> <td>2</td> </tr> <tr> <td>i) Did you give a urine sample?</td> <td>1</td> <td>2</td> </tr> <tr> <td>g) Consultation?</td> <td>1</td> <td>2</td> </tr> </tbody> </table>					YES	NO	a) Was your weight measured?	1	2	b) Was your height measured?	1	2	c) Was your blood pressure measured?	1	2	d) Was your mid-upper arm circumference measured?	1	2	e) Was your fundus measured?	1	2	f) Was your stomach examined?	1	2	g) Was your baby's heart examined?	1	2	h) Did you give a blood sample?	1	2	i) Did you give a urine sample?	1	2	g) Consultation?	1	2
	YES	NO																																				
a) Was your weight measured?	1	2																																				
b) Was your height measured?	1	2																																				
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h) Did you give a blood sample?	1	2																																				
i) Did you give a urine sample?	1	2																																				
g) Consultation?	1	2																																				
413A	During (any of) your antenatal care visit(s), were you told about things to look out for that might suggest problems with the pregnancy?	YES .....	1																																			
		NO .....	2																																			
		(SKIP TO 413C) ←	8																																			
		DONT KNOW	8																																			
413B	Were you told where to go if you had these complications?	YES .....	1																																			
		NO .....	2																																			
		DONT KNOW	8																																			
413C	Did you have any complications during this pregnancy (NAME)?	YES .....	1																																			
		NO .....	2																																			
		(SKIP TO 413F) ←	8																																			

NO.	QUESTIONS AND FILTERS	LAST BIRTH		NEXT-TO-LAST BIRTH																						
		NAME _____	NAME _____	NAME _____	NAME _____																					
413D	<p>What are the signs of danger or complications?</p> <p>Anything else?</p> <p>RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.</p>	LABOR BEFORE 9 MONTHS ... A VAGINAL BLEEDING ..... B HIGH FEVER ..... C CONVULSIONS AND FAINTING ..... D VOMITTING AND NUMB IN FACE OR HEADACHE WITH CONVULSIONS ..... F WATER BROKE EARLY ..... G OTHER _____ X SPECIFY _____																								
413E	<p>What did you do to overcome the complication?</p> <p>Anything else?</p>	NOTHING ..... A REST ..... B TAKE MEDICATIO ..... C TAKE HERBAL DRINK ..... D SEE TBA ..... E SEE MIDWIFE ..... F SEE DOCTOR ..... G GO TO A HEALTH FACILITY . H OTHER ..... X DONT KNOW ..... Z																								
413F	<p>During your pregnancy with (NAME), did you discuss with anyone about:</p> <p>a) Where you plan to deliver?                      b) Transportation to the place of delivery?                      c) Who is going to assist the delivery?                      d) Payment for the delivery?                      e) Identifying a possible blood donor?                      f) Post partum family planning?</p>	<table border="0"> <tr> <td></td> <td>YES</td> <td>NO</td> </tr> <tr> <td>PLACE TO DELIVER</td> <td>1</td> <td>2</td> </tr> <tr> <td>TRANSPORTATION</td> <td>1</td> <td>2</td> </tr> <tr> <td>DELIVERY ASSISTANT</td> <td>1</td> <td>2</td> </tr> <tr> <td>PAYMENT</td> <td>1</td> <td>2</td> </tr> <tr> <td>BLOOD DONOR</td> <td>1</td> <td>2</td> </tr> <tr> <td>POST PARTUM FF</td> <td>1</td> <td>2</td> </tr> </table>		YES	NO	PLACE TO DELIVER	1	2	TRANSPORTATION	1	2	DELIVERY ASSISTANT	1	2	PAYMENT	1	2	BLOOD DONOR	1	2	POST PARTUM FF	1	2			
	YES	NO																								
PLACE TO DELIVER	1	2																								
TRANSPORTATION	1	2																								
DELIVERY ASSISTANT	1	2																								
PAYMENT	1	2																								
BLOOD DONOR	1	2																								
POST PARTUM FF	1	2																								
414	<p>During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?</p>	YES ..... 1 NO ..... 2 (SKIP TO 417) ← DONT KNOW ..... 8																								
415	<p>During this pregnancy, how many times did you get a tetanus injection?</p>	TIMES ..... <input type="text"/> DONT KNOW ..... 8																								
416	CHECK 415:	ONCE OR DK <input type="checkbox"/> 2 OR MORE TIMES <input type="checkbox"/> (SKIPTO 420) ←																								
417	<p>At any time before this pregnancy, did you receive any tetanus injections?</p>	YES ..... 1 NO ..... 2 (SKIP TO 420) ← DONT KNOW ..... 8																								
418	<p>Before this pregnancy, how many times did you receive a tetanus injection?</p> <p>IF 7 OR MORE TIMES, RECORD '5'.</p>	TIMES ..... <input type="text"/> DONT KNOW ..... 8																								
419	<p>CHECK 418:</p> <p>ONLY ONE <input type="checkbox"/> MORE THAN ONE <input type="checkbox"/></p> <p>a) How many years ago did you receive that tetanus injection?                      b) How many years ago did you receive the last tetanus injection prior to this pregnancy?</p>	YEARS AGO ..... <input type="text"/> <input type="text"/>																								

NO.	QUESTIONS AND FILTERS	LAST BIRTH		NEXT-TO-LAST BIRTH	
		NAME _____		NAME _____	
429	<p>Who assisted with the delivery of (NAME)?</p> <p>Anyone else?</p> <p>PROBE FOR THE TYPE(S) OF PERSON(S) AND RECORD ALL MENTIONED.</p> <p>IF RESPONDENT SAYS NO ONE ASSISTED, PROBE TO DETERMINE WHETHER ANY ADULTS WERE PRESENT AT THE DELIVERY.</p>	<p><b>HEALTH PERSONNEL</b></p> <p>GENERAL PRACTITIONER A</p> <p>OBSTETRICIAN ..... B</p> <p>NURSE ..... C</p> <p>MIDWIFE ..... D</p> <p>VILLAGE MIDWIFE ..... E</p> <p><b>OTHER PERSON</b></p> <p>TRADITIONAL BIRTH ATTENDANT ..... F</p> <p>RELATIVE/FRIEND ..... G</p> <p>OTHER _____ X</p> <p>(SPECIFY) _____</p> <p>NO ONE ASSISTED ..... Y</p>		<p><b>HEALTH PERSONNEL</b></p> <p>GENERAL PRACTITIONER A</p> <p>OBSTETRICIAN ..... B</p> <p>NURSE ..... C</p> <p>MIDWIFE ..... D</p> <p>VILLAGE MIDWIFE ..... E</p> <p><b>OTHER PERSON</b></p> <p>TRADITIONAL BIRTH ATTENDANT ..... F</p> <p>RELATIVE/FRIEND ..... G</p> <p>OTHER _____ X</p> <p>(SPECIFY) _____</p> <p>NO ONE ASSISTED ..... Y</p>	
430	<p>Where did you give birth to (NAME)?</p> <p>PROBE TO IDENTIFY THE TYPE OF SOURCE.</p> <p>IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.</p> <p>_____</p> <p>(NAME OF PLACE)</p>	<p><b>HOME</b></p> <p>RESPONDENT'S HOME ..... 11</p> <p>(SKIP TO 434) ←</p> <p>OTHER HOME ..... 12</p> <p><b>COMMUNITY-BASED HEALTH CARE</b></p> <p>VILLAGE HEALTH POST</p> <p>VILLAGE MATERNITY POST 21</p> <p>INTEGRATED HEALTH SERVICE POST ..... 22</p> <p>OTHER _____ 23</p> <p>(SPECIFY) _____</p> <p><b>PUBLIC SECTOR</b></p> <p>HOSPITAL ..... 31</p> <p>CLINIC ..... 32</p> <p>PRIMARY HEALTH CENTER ..... 33</p> <p>SUB/MOBILE PRIMARY HEALTH CARE ..... 34</p> <p>VILLAGE MIDWIFE ..... 35</p> <p>OTHER _____ 36</p> <p>SPECIFY _____</p> <p><b>PRIVATE MEDICAL SECTOR</b></p> <p>PRIVATE HOSPITAL/ MATERNITY HOSPITAL ... 41</p> <p>PRIVATE CLINIC MATERNITY CLINIC ... 42</p> <p>PRIVATE OBSTETRICIAN AND GYNECOLOGIST ... 43</p> <p>PRIVATE GENERAL PRACTITIONER ..... 44</p> <p>PRIVATE MIDWIFE ..... 45</p> <p>PRIVATE NURSE ..... 46</p> <p>OTHER _____ 47</p> <p>(SPECIFY) _____</p> <p>OTHER _____ 96</p> <p>SPECIFY _____</p> <p>(SKIP TO 434) ←</p>		<p><b>HOME</b></p> <p>RESPONDENT'S HOME ..... 11</p> <p>(SKIP TO 434) ←</p> <p>OTHER HOME ..... 12</p> <p><b>COMMUNITY-BASED HEALTH CARE</b></p> <p>VILLAGE HEALTH POST</p> <p>VILLAGE MATERNITY POST 21</p> <p>INTEGRATED HEALTH SERVICE POST ..... 22</p> <p>OTHER _____ 23</p> <p>(SPECIFY) _____</p> <p><b>PUBLIC SECTOR</b></p> <p>HOSPITAL ..... 31</p> <p>CLINIC ..... 32</p> <p>PRIMARY HEALTH CENTER ..... 33</p> <p>SUB/MOBILE PRIMARY HEALTH CARE ..... 34</p> <p>VILLAGE MIDWIFE ..... 35</p> <p>OTHER _____ 36</p> <p>SPECIFY _____</p> <p><b>PRIVATE MEDICAL SECTOR</b></p> <p>PRIVATE HOSPITAL/ MATERNITY HOSPITAL ... 41</p> <p>PRIVATE CLINIC MATERNITY CLINIC ... 42</p> <p>PRIVATE OBSTETRICIAN AND GYNECOLOGIST ... 43</p> <p>PRIVATE GENERAL PRACTITIONER ..... 44</p> <p>PRIVATE MIDWIFE ..... 45</p> <p>PRIVATE NURSE ..... 46</p> <p>OTHER _____ 47</p> <p>(SPECIFY) _____</p> <p>OTHER _____ 96</p> <p>SPECIFY _____</p> <p>(SKIP TO 434) ←</p>	
431	<p>How long after (NAME) was delivered did you stay there?</p> <p>IF LESS THAN ONE DAY, RECORD HOURS;</p> <p>IF LESS THAN ONE WEEK, RECORD DAYS.</p>	<p>HOURS ..... 1</p> <p>DAYS ..... 2</p> <p>WEEKS ..... 3</p> <p>DONT KNOW ..... 998</p>			
431A	<p>Was your husband/partner with you when you delivered (NAME)?</p>	<p>YES ..... 1</p> <p>NO ..... 2</p>			
432	<p>Was (NAME) delivered by caesarean, that is, did they cut your belly open to take the baby out?</p>	<p>YES ..... 1</p> <p>NO ..... 2</p> <p>(SKIP TO 434) ←</p>		<p>YES ..... 1</p> <p>NO ..... 2</p> <p>(SKIP TO 434) ←</p>	



NO.	QUESTIONS AND FILTERS	LAST BIRTH		NEXT-TO-LAST BIRTH	
		NAME _____		NAME _____	
433	Was the decision to have the caesarean section made prior to the operation?	YES ..... 1 NO ..... 2		YES ..... 1 NO ..... 2	
434	Immediately after the birth, was (NAME) put on your chest?	YES ..... 1 NO ..... 2 (SKIP TO 434B) ←		YES ..... 1 NO ..... 2 (SKIP TO 459) ←	
434A	Was (NAME)'s bare skin touching your bare skin?	YES ..... 1 NO ..... 2 DONT KNOW ..... 8		YES ..... 1 NO ..... 2 DONT KNOW ..... 8	
434B	When was the baby first bathed?	< 1 HOUR AFTER BIRTH ..... 1 1-6 HOURS AFTER BIRTH ..... 2 > 6 HOURS AFTER BIRTH ..... 3 DONT KNOW ..... 8		< 1 HOUR AFTER BIRTH ..... 1 1-6 HOURS AFTER BIRTH ..... 2 > 6 HOURS AFTER BIRTH ..... 3 DONT KNOW ..... 8	
434C	CHECK 430: PLACE OF DELIVERY  OTHER THAN CODE 11, '12, OR '96 CIRCLED <input type="checkbox"/>  CODE 11, '12, OR '96 CIRCLED <input type="checkbox"/> (SKIP TO 449) ←				
435	I would like to talk to you about checks on your health after delivery, for example, someone asking you questions about your health or examining you. Did anyone check on your health while you were still in the facility?	YES ..... 1 NO ..... 2 (SKIP TO 438) ←			
436	How long after delivery did the first check take place?  IF LESS THAN ONE DAY, RECORD HOURS;	HOURS ..... 1 <input type="text"/> DAY ..... 2 <input type="text"/> DONT KNOW ..... 998			
437	Who checked on your health at that time?  PROBE FOR MOST QUALIFIED PERSON.	<b>HEALTH PERSONNEL</b> OBSTETRICIAN ..... 11 GENERAL PRACTITIONER ..... 12 MIDWIFE/ VILLAGE MIDWIFE ..... 13 NURSE ..... 14  <b>OTHER PERSON</b> TRADITIONAL BIRTH ATTENDANT ..... 21 OTHER ..... 96 (SPECIFY)			
438	Now I would like to talk to you about checks on (NAME)'s health after delivery – for example, someone examining (NAME), checking the cord, or seeing if (NAME) is OK. Did anyone check on (NAME)'s health while you were still in the facility?	YES ..... 1 NO ..... 2 (SKIP TO 441) ← DONT KNOW ..... 8			
439	How long after delivery was (NAME)'s health first checked?  IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS ..... 1 <input type="text"/> DAY ..... 2 <input type="text"/> DONT KNOW ..... 998			

NO.	QUESTIONS AND FILTERS	LAST BIRTH	NEXT-TO-LAST BIRTH												
		NAME _____	NAME _____												
440	Who checked on (NAME)'s health at that time?  PROBE FOR MOST QUALIFIED PERSON.	<b>HEALTH PERSONNEL</b> PEDIATRICIAN ..... 11 OBSTETRICIAN ..... 12 GENERAL PRACTITIONER ... 13 MIDWIFE/ VILLAGE MIDWIFE ..... 14 NURSE ..... 15  <b>OTHER PERSON</b> TRADITIONAL BIRTH ATTENDANT ..... 21  OTHER _____ 96 (SPECIFY)													
441	Now I want to talk to you about what happened after you left the facility. Did anyone check on your health after you left the facility?	YES ..... 1 NO ..... 2 (SKIP TO 445) ←													
442	How long after delivery did that check take place?  IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS ..... 1 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> DAY ..... 2 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> WEEKS ..... 3 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table> DON'T KNOW ..... 998													
443	Who checked on your health at that time?  PROBE FOR MOST QUALIFIED PERSON.	<b>HEALTH PERSONNEL</b> OBSTETRICIAN ..... 11 GENERAL PRACTITIONER ..... 12 MIDWIFE/ VILLAGE MIDWIFE ..... 13 NURSE ..... 14  <b>OTHER PERSON</b> TRADITIONAL BIRTH ATTENDANT ..... 21  OTHER _____ 96 (SPECIFY)													

NO.	QUESTIONS AND FILTERS	LAST BIRTH	NEXT-TO-LAST BIRTH						
		NAME _____	NAME _____						
444	<p>Where did the check take place?</p> <p>PROBE TO IDENTIFY THE TYPE OF SOURCE.</p> <p>IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.</p> <p>_____</p> <p>(NAME OF PLACE)</p>	<p><b>HOME</b></p> <p>RESPONDENT'S HOME ... 11</p> <p>OTHER HOME ..... 12</p> <p><b>COMMUNITY-BASED HEALTH CARE</b></p> <p>VILLAGE HEALTH POST/ VILLAGE MATERNITY POST 21</p> <p>INTEGRATED HEALTH SERVICE POST ..... 22</p> <p>OTHER _____ 23</p> <p>(SPECIFY)</p> <p><b>PUBLIC SECTOR</b></p> <p>HOSPITAL ..... 31</p> <p>CLINIC ..... 32</p> <p>PRIMARY HEALTH CARE ... 33</p> <p>SUB/MOBILE PRIMARY HEALTH CARE ..... 34</p> <p>VILLAGE MIDWIFE ..... 35</p> <p>OTHER _____ 36</p> <p>SPECIFY</p> <p><b>PRIVATE MEDICAL SECTOR</b></p> <p>PRIVATE HOSPITAL/MOTHER AND CHILDREN HOSPITAL/ MATERNITY HOSPITAL 41</p> <p>PRIVATE CLINIC/BIRTH CENTER CLINIC ..... 42</p> <p>PRIVATE OBSTETRICIAN 43</p> <p>PRIVATE GENERAL PRACTITIONER ..... 44</p> <p>PRIVATE MIDWIFE ..... 45</p> <p>PRIVATE NURSE ..... 46</p> <p>OTHER _____ 96</p> <p>(SPECIFY)</p>							
445	<p>I would like to talk to you about checks on (NAME)'s health after you left (FACILITY IN 430). Did any health care provider or a traditional birth attendant check on (NAME)'s health in the two months after you left (FACILITY IN 430)?</p>	<p>YES ..... 1</p> <p>NO ..... 2</p> <p>(SKIP TO 457) ←</p> <p>DON'T KNOW ..... 8</p>							
446	<p>How many hours, days or weeks after the birth of (NAME) did that check take place?</p> <p>IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.</p>	<p>HOURS ..... 1</p> <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table> <p>DAY ..... 2</p> <p>WEEKS ..... 3</p> <p>DON'T KNOW ..... 998</p>							
447	<p>Who checked on (NAME)'s health at that time?</p> <p>PROBE FOR MOST QUALIFIED PERSON.</p>	<p><b>HEALTH PERSONNEL</b></p> <p>PEDIATRICIAN ..... 11</p> <p>GENERAL PRACTITIONER 12</p> <p>OBSTETRICIAN ..... 13</p> <p>MIDWIFE/ VILLAGE MIDWIFE ..... 14</p> <p>NURSE ..... 15</p> <p><b>OTHER PERSON</b></p> <p>TRADITIONAL BIRTH ATTENDANT ..... 21</p> <p>OTHER _____ 96</p> <p>(SPECIFY)</p>							

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____
448	<p>Where did this check of (NAME) take place?</p> <p>PROBE TO IDENTIFY THE TYPE OF SOURCE.</p> <p>IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.</p> <p>_____ (NAME OF PLACE)</p>	<p><b>HOME</b></p> <p>RESPONDENT'S HOME . . . 11</p> <p>OTHER HOME . . . . . 12</p> <p><b>COMMUNITY-BASED HEALTH CARE</b></p> <p>VILLAGE HEALTH POST/ VILLAGE MATERNITY POST 21</p> <p>INTEGRATED HEALTH SERVICE POST . . . . . 22</p> <p>OTHER _____ 23 (SPECIFY)</p> <p><b>PUBLIC SECTOR</b></p> <p>HOSPITAL . . . . . 31</p> <p>CLINIC . . . . . 32</p> <p>PRIMARY HEALTH CARE . . . 33</p> <p>SUB/MOBILE PRIMARY HEALTH CARE . . . . . 34</p> <p>VILLAGE MIDWIFE . . . . . 35</p> <p>OTHER _____ 36 SPECIFY</p> <p><b>PRIVATE MEDICAL SECTOR</b></p> <p>PRIVATE HOSPITAL/MOTHER AND CHILDREN HOSPITAL/ MATERNITY HOSPITAL 41</p> <p>PRIVATE CLINIC/BIRTH CENTER CLINIC . . . . . 42</p> <p>PRIVATE PEDIATRICIAN 43</p> <p>PRIVATE OBSTETRICIAN AND GYNECOLOGIST 44</p> <p>PRIVATE GENERAL PRACTITIONER . . . . . 45</p> <p>PRIVATE MIDWIFE . . . . . 46</p> <p>PRIVATE NURSE . . . . . 47</p> <p>OTHER _____ 48 (SPECIFY) ← (SKIP TO 457)</p>	
449	<p>I would like to talk to you about checks on your health after delivery, for example, someone asking you questions about your health or examining you. Did anyone check on your health after you gave birth to (NAME)?</p>	<p>YES . . . . . 1</p> <p>NO . . . . . 2 (SKIP TO 453) ←</p>	
450	<p>How long after delivery did the first check take place?</p> <p>IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.</p>	<p>HOURS . . . . . 1</p> <p>DAY . . . . . 2</p> <p>WEEKS . . . . . 3</p> <p>DONT KNOW . . . . . 998</p>	
451	<p>Who checked on your health at that time?</p> <p>PROBE FOR MOST QUALIFIED PERSON.</p>	<p><b>HEALTH PERSONNEL</b></p> <p>OBSTETRICIAN . . . . . 11</p> <p>GENERAL PRACTITIONER . . 12</p> <p>MIDWIFE / VILLAGE MIDWIFE . . . . . 13</p> <p>NURSE . . . . . 14</p> <p><b>OTHER PERSON</b></p> <p>TRADITIONAL BIRTH ATTENDANT . . . . . 21</p> <p>OTHER _____ 96 (SPECIFY)</p>	

NO.	QUESTIONS AND FILTERS	LAST BIRTH		NEXT-TO-LAST BIRTH							
		NAME _____		NAME _____							
452	<p>Where did this first check take place?</p> <p>PROBE TO IDENTIFY THE TYPE OF SOURCE.</p> <p>IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.</p> <p>_____</p> <p>(NAME OF PLACE)</p>	<p><b>HOME</b></p> <p>RESPONDENT'S HOME . . . 11</p> <p>OTHER HOME . . . . . 12</p> <p><b>COMMUNITY-BASED HEALTH CARE</b></p> <p>VILLAGE HEALTH POST/ VILLAGE MATERNITY POST 21</p> <p>INTEGRATED HEALTH SERVICE POST . . . . . 22</p> <p>OTHER _____ 23</p> <p>(SPECIFY)</p> <p><b>PUBLIC SECTOR</b></p> <p>HOSPITAL . . . . . 31</p> <p>CLINIC . . . . . 32</p> <p>PRIMARY HEALTH CARE . . . 33</p> <p>SUB/MOBILE PRIMARY HEALTH CARE . . . . . 34</p> <p>VILLAGE MIDWIFE . . . . . 35</p> <p>OTHER _____ 36</p> <p>SPECIFY</p> <p><b>PRIVATE MEDICAL SECTOR</b></p> <p>PRIVATE HOSPITAL/MOTHER AND CHILDREN HOSPITAL/ MATERNITY HOSPITAL 41</p> <p>PRIVATE CLINIC/BIRTH CENTER CLINIC . . . . . 42</p> <p>PRIVATE OBSTETRICIAN AND GYNECOLOGIST . . . 43</p> <p>PRIVATE GENERAL PRACTITIONER . . . . . 44</p> <p>PRIVATE MIDWIFE . . . . . 45</p> <p>PRIVATE NURSE . . . . . 46</p> <p>OTHER _____ 47</p> <p>(SPECIFY)</p>									
453	<p>I would like to talk to you about checks on (NAME)'s health after delivery – for example, someone examining (NAME), checking the cord, or seeing if (NAME) is OK. In the two months after (NAME) was born, did any health care provider or a traditional birth attendant check on (NAME)'s health?</p>	<p>YES . . . . . 1</p> <p>NO . . . . . 2</p> <p>(SKIP TO 457) ←</p> <p>DON'T KNOW . . . . . 8</p>									
454	<p>How many hours, days or weeks after the birth of (NAME) did the first check take place?</p> <p>IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.</p>	<p>HOURS . . . . . 1</p> <p>DAY . . . . . 2</p> <p>WEEKS . . . . . 3</p> <p>DON'T KNOW . . . . . 998</p>	<table border="1"> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table>								
455	<p>Who checked on (NAME)'s health at that time?</p> <p>PROBE FOR MOST QUALIFIED PERSON.</p>	<p><b>HEALTH PERSONNEL</b></p> <p>PEDIATRICIAN . . . . . 11</p> <p>OBSTETRICIAN . . . . . 12</p> <p>GENERAL PRACTITIONER 13</p> <p>MIDWIFE / VILLAGE MIDWIFE . . . . . 14</p> <p>NURSE . . . . . 15</p> <p><b>OTHER PERSON</b></p> <p>TRADITIONAL BIRTH ATTENDANT . . . . . 21</p> <p>OTHER _____ 96</p> <p>(SPECIFY)</p>									

**SECTION 7. MARRIAGE AND SEXUAL ACTIVITY**

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
701	Are you currently married or living together with a man as if married?	YES, CURRENTLY MARRIED ..... 1 YES, LIVING WITH A MAN ..... 2 NO, NOT IN UNION ..... 3	→ 704
702	Have you ever been married or lived together with a man as if married?	YES, FORMERLY MARRIED ..... 1 YES, LIVED WITH A MAN ..... 2 NO ..... 3	→ 711C
703	What is your marital status now: are you widowed, divorced, or separated?	WIDOWED ..... 1 DIVORCED ..... 2 SEPARATED ..... 3	→ 709
704	Is your (husband/partner) living with you now or is he staying elsewhere?	LIVING WITH HER ..... 1 STAYING ELSEWHERE ..... 2	
705	RECORD THE HUSBAND'S/PARTNER'S NAME AND LINE NUMBER FROM THE HOUSEHOLD QUESTIONNAIRE. IF HE IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'.	NAME _____ LINE NO. .... <input type="text"/> <input type="text"/>	
709	Have you been married or lived with a man only once or more than once?	ONLY ONCE ..... 1 MORE THAN ONCE ..... 2	→ 710
709A	What was the main reason you have been married/living together more than once?	HUSBAND/PARTNER DEAD ..... 01 UNFAITHFUL ..... 02 DOMESTIC VIOLENCE ..... 03 HUSBAND UNABLE TO FULFILL MATERIAL NEEDS ..... 04 HUSBAND/PARTNER UNABLE TO FULFILL BIOLOGICAL NEEDS ..... 05 FREQUENT QUARRELS ..... 06 LONG SEPARATION ..... 07 NO CHILDREN ..... 08 OTHER ..... 96 (SPECIFY)	
710	CHECK 709:  MARRIED/ LIVED WITH A MAN ONLY ONCE <input type="checkbox"/> ↓ a) In what month and year did you start living with your (husband/partner)?  MARRIED/ LIVED WITH A MAN MORE THAN ONCE <input type="checkbox"/> ↓ b) Now I would like to ask about your first (husband/partner). In what month and year did you start living with him?	MONTH ..... <input type="text"/> <input type="text"/> DONT KNOW MONTH ..... 98 YEAR ..... <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> DONT KNOW YEAR ..... 9998	→ 711A
711	How old were you when you first started living with him?	AGE ..... <input type="text"/> <input type="text"/>	
711A	Did you receive tetanus toxoid (TT) injection?	YES ..... 1 NO ..... 2 DONT KNOW YEAR ..... 8	→ 711C

**SECTION 7. MARRIAGE AND SEXUAL ACTIVITY**

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
711B	a) How many TT injections did you receive before you got married?  a. How many TT injections have you received after you get married/started living together?  NEVER HAD TT INJECTION, RECORD '0' IF 5 OR MORE TIMES, RECORD '5' IF DON'T KNOW RECORD '8'	a) NUMBER OF INJECTIONS BEFORE MARRIED ..... <input type="text"/>  b) NUMBER OF INJECTIONS AFTER MARRIED ..... <input type="text"/>	
711C	<p>DETERMINE MONTHS MARRIED LIVING TOGETHER SINCE JANUARY 2012. ENTER "X" IN COLUMN 4 OF CALENDAR FOR EACH MONTH MARRIED OR "B" FOR EACH MONTH LIVING TOGETHER, AND ENTER "0" FOR EACH MONTH NOT MARRIED, SINCE JANUARY 2012.</p> <p><b>K</b> FOR WOMEN WITH MORE THAN ONE UNION: PROBE FOR DATE WHEN CURRENT UNION STARTED AND, IF APPROPRIATE, FOR STARTING AND TERMINATION DATES OF ANY PREVIOUS UNIONS.</p> <p>FOR WOMEN NOT CURRENTLY IN UNION: PROBE FOR DATE WHEN LAST UNION STARTED AND FOR TERMINATION DATE AND, IF APPROPRIATE, FOR THE STARTING AND TERMINATION DATES OF ANY PREVIOUS UNIONS.</p>		
<p><b>712 CHECK FOR PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.</b></p>			
713	Now I would like to ask some questions about sexual activity in order to gain a better understanding of some important life issues. Let me assure you again that your answers are completely confidential and will not be told to anyone. If we should come to any question that you don't want to answer, just let me know and we will go to the next question. How old were you when you had sexual intercourse for the very first time?	NEVER HAD SEXUAL INTERCOURSE ..... 00  AGE IN YEARS ..... <input type="text"/> <input type="text"/>  FIRST TIME WHEN STARTED LIVING WITH (FIRST) HUSBAND/PARTNER ..... 95	→ 731
714	I would like to ask you about your recent sexual activity. When was the last time you had sexual intercourse?  IF LESS THAN 12 MONTHS, ANSWER MUST BE RECORDED IN DAYS, WEEKS OR MONTHS. IF 12 MONTHS (ONE YEAR) OR MORE, ANSWER MUST BE RECORDED IN YEARS.	DAYS AGO ..... 1 <input type="text"/> <input type="text"/> WEEKS AGO ..... 2 <input type="text"/> <input type="text"/> MONTHS AGO ..... 3 <input type="text"/> <input type="text"/> YEARS AGO ..... 4 <input type="text"/> <input type="text"/>	
714A	Can you say 'no' to your husband/partner if you don't want to have sexual intercourse?	YES ..... 1 NO ..... 2 DONT KNOW ..... 8	
714B	Can you ask your husband/partner to use condom?	YES ..... 1 NO ..... 2 DONT KNOW ..... 8	
714C	Do you know the signs of danger during pregnancy?	YES ..... 1 NO ..... 2	→ 714F
714D	What kind of health problems can a woman have when she is pregnant?  Any other problems?  RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.	PROLONGED LABOR ..... A VAGINAL BLEEDING ..... B FEVER ..... C CONVULSIONS ..... D BABY IN WRONG POSITION ..... E SWOLLEN LIMBS ..... F FAINT ..... G BREATHLESSNESS ..... H TIREDNESS ..... I OTHER ..... X	

**SECTION 7. MARRIAGE AND SEXUAL ACTIVITY**

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP												
714E	<p>What should she do if she experienced this problem?</p> <p>Any other way?</p> <p>RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.</p>	<p>NOTHING ..... A</p> <p>REST ..... B</p> <p>TAKE MEDICATION ..... C</p> <p>TAKE HERBS ..... D</p> <p>SEE TBA ..... E</p> <p>SEE MIDWIFE ..... F</p> <p>SEE DOCTOR ..... G</p> <p>GO TO A HEALTH FACILITY ..... H</p> <p>OTHER ..... X</p> <p>DON'T KNOW ..... Z</p>													
714F	<p>Can you tell me what kind of problems can happen to a woman during labor and delivery?</p> <p>Any other problems?</p> <p>RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.</p>	<p>WATER BREAKS TOO EARLY ..... A</p> <p>EXCESSIVE BLEEDING DURING AND AFTER DELIVERY ..... B</p> <p>FEVER ..... C</p> <p>LONG LABOR ..... D</p> <p>FAINT ..... E</p> <p>CONVULSIONS ..... F</p> <p>PLACENTA DOES NOT COME OUT ..... G</p> <p>STILLBIRTH ..... H</p> <p>OTHER ..... X</p> <p>DON'T KNOW ..... Z</p>	→ 714H												
714G	<p>What action should be taken to the woman?</p> <p>Any other way?</p> <p>RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.</p>	<p>NOTHING ..... A</p> <p>REST ..... B</p> <p>TAKE MEDICATION ..... C</p> <p>TAKE HERBS ..... D</p> <p>SEE TBA ..... E</p> <p>SEE MIDWIFE ..... F</p> <p>SEE DOCTOR ..... G</p> <p>GO TO A HEALTH FACILITY ..... H</p> <p>OTHER ..... X</p> <p>DON'T KNOW ..... Z</p>													
714H	<p>Can you tell me what kind of problems can happen to a woman during postpartum period?</p> <p>Any other problems?</p> <p>RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.</p>	<p>EXCESSIVE BLEEDING DURING AND AFTER DELIVERY ..... A</p> <p>FAINT ..... B</p> <p>CONVULSIONS ..... C</p> <p>HIGH FEVER ..... D</p> <p>FOUL SMELLING VAGINAL DISCHARGE ..... E</p> <p>PAIN IN BREASTS ..... F</p> <p>DEPRESSED ..... G</p> <p>OTHER ..... X</p> <p>DON'T KNOW ..... Z</p>	→ 731												
714I	<p>What action should be taken to the woman?</p> <p>Any other way?</p> <p>RECORD ALL MENTIONED. DO NOT READ OUT RESPONSES.</p>	<p>NOTHING ..... A</p> <p>REST ..... B</p> <p>TAKE MEDICATION ..... C</p> <p>TAKE HERBS ..... D</p> <p>SEE TBA ..... E</p> <p>SEE MIDWIFE ..... F</p> <p>SEE DOCTOR ..... G</p> <p>GO TO A HEALTH FACILITY ..... H</p> <p>OTHER ..... X</p> <p>DON'T KNOW ..... Z</p>													
731	<p>CHECK FOR PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.</p>	<table border="1"> <thead> <tr> <th></th> <th>YES</th> <th>NO</th> </tr> </thead> <tbody> <tr> <td>CHILDREN &lt; 10 YEARS</td> <td>1</td> <td>2</td> </tr> <tr> <td>ADULT MALE</td> <td>1</td> <td>2</td> </tr> <tr> <td>ADULT FEMALE</td> <td>1</td> <td>2</td> </tr> </tbody> </table>		YES	NO	CHILDREN < 10 YEARS	1	2	ADULT MALE	1	2	ADULT FEMALE	1	2	
	YES	NO													
CHILDREN < 10 YEARS	1	2													
ADULT MALE	1	2													
ADULT FEMALE	1	2													



**SECTION 9. HUSBAND'S BACKGROUND AND WOMAN'S WORK**

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
901	CHECK 701: CURRENTLY MARRIED/ LIVING WITH A MAN <input type="checkbox"/>	NOT IN UNION <input type="checkbox"/>	→ 909
902	How old was your (husband/partner) on his last birthday?	AGE IN COMPLETED YEARS ..... <input type="text"/>	
903	Did your (husband/partner) ever attend school?	YES ..... 1 NO ..... 2	→ 906
904	What was the highest level of school he attended: primary, secondary, or higher?	PRIMARY ..... 1 JUNIOR HIGH SCHOOL ..... 2 SENIOR HIGH SCHOOL ..... 3 ACADEMY/DI/DII/DIII ..... 4 DI/UNIVERSITY ..... 5 DONT KNOW ..... 8	→ 906
905	What was the highest [GRADE/YEAR] he completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'. COMPLETED = 7	GRADE/YEAR ..... <input type="text"/> DONT KNOW ..... 8	
906	Has your (husband/partner) done any work in the last 7 days?	YES ..... 1 NO ..... 2 DONT KNOW ..... 8	→ 908
907	Has your (husband/partner) done any work in the last 12 months?	YES ..... 1 NO ..... 2 DONT KNOW ..... 8	→ 909
908	What is your (husband's/partner's) occupation? That is, what kind of work does he mainly do?  _____  _____  _____ <input type="text"/> <input type="text"/> (FILLED BY BPS)	PROFESSIONAL, TECHNICAL ..... 01 MANAGERS AND ADMINISTRATION ..... 02 CLERICAL ..... 03 SALES ..... 04 SERVICE ..... 05 AGRICULTURAL WORKER ..... 06 INDUSTRIAL WORKER ..... 07 OTHER ..... 96 (SPECIFY) DONT KNOW ..... 98	
909	Now I want to ask you about your activities in the last seven days. Aside from your own housework, have you done any work in the last seven days?	YES ..... 1 NO ..... 2	→ 913
910	As you know, some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. In the last seven days, have you done any of these things or any other work?	YES ..... 1 NO ..... 2	→ 913
911	Although you did not work in the last seven days, do you have any job or business from which you were absent for leave, illness, vacation, maternity leave, or any other such reason?	YES ..... 1 NO ..... 2	→ 913
912	Have you done any work in the last 12 months?	YES ..... 1 NO ..... 2	→ 917

**SECTION 11. OTHER HEALTH ISSUES**

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1109	Are you covered by any health insurance?	YES ..... 1 NO ..... 2	→ 1201
1110	What type of health insurance are you covered by?  RECORD ALL MENTIONED.	REGIONAL HEALTH ..... A HEALTH SECURITY INSURANCE ..... B HEALTH SECURITY INSURANCE NON CONTRI ..... C PRIVATE HEALTH INSURANCE ..... D EMPLOYER'S INSURANCE ..... E  OTHER _____ X (SPECIFY)	
1110A	CHECK 1110: HAS HEALTH INSURANCE  CODE 'B' <input type="checkbox"/> CIRCLED ↓	CODE 'B' <input type="checkbox"/> NOT CIRCLED →	1201
1110B	What type of services did you use the health insurance card (JKN/BPJS PBI) for?	ANTENATAL CARE ..... A DELIVERY CARE ..... B POSTPARTUM CARE ..... C NEWBORN CARE ..... D FAMILY PLANNING ..... E INPATIENT CARE ..... F OUTPATIENT CARE/CHECK UP ..... G NEVER USED ..... H	

## Appendix C: Authorization Letter



Apr 06, 2021

Dewi Nuryana  
University of Indonesia  
Indonesia  
Phone: 082113508326  
Email: dewinuryana94@gmail.com  
Request Date: 04/06/2021

Dear Dewi Nuryana:

This is to confirm that you are approved to use the following Survey Datasets for your registered research paper titled: "Determinants of Maternal Health Services Utility Among Adolescent Mothers in Indonesia: An Analysis of 2017 Indonesia Demographic and Health Survey":

### **Indonesia**

To access the datasets, please login at: [https://www.dhsprogram.com/data/dataset\\_admin/login\\_main.cfm](https://www.dhsprogram.com/data/dataset_admin/login_main.cfm). The user name is the registered email address, and the password is the one selected during registration.

The IRB-approved procedures for DHS public-use datasets do not in any way allow respondents, households, or sample communities to be identified. There are no names of individuals or household addresses in the data files. The geographic identifiers only go down to the regional level (where regions are typically very large geographical areas encompassing several states/provinces). Each enumeration area (Primary Sampling Unit) has a PSU number in the data file, but the PSU numbers do not have any labels to indicate their names or locations. In surveys that collect GIS coordinates in the field, the coordinates are only for the enumeration area (EA) as a whole, and not for individual households, and the measured coordinates are randomly displaced within a large geographic area so that specific enumeration areas cannot be identified.

The DHS Data may be used only for the purpose of statistical reporting and analysis, and only for your registered research. To use the data for another purpose, a new research project must be registered. All DHS data should be treated as confidential, and no effort should be made to identify any household or individual respondent interviewed in the survey. Also, be aware that re-distribution of any DHS micro-level data, either directly or within any tool/dashboard, is not permitted. Please reference the complete terms of use at: <https://dhsprogram.com/Data/terms-of-use.cfm>.

The data must not be passed on to other researchers without the written consent of DHS. However, if you have coresearchers registered in your account for this research paper, you are authorized to share the data with them. All data users are required to submit an electronic copy (pdf) of any reports/publications resulting from using the DHS data files to: [references@dhsprogram.com](mailto:references@dhsprogram.com).

Sincerely,

*Bridgette Wellington*

Bridgette Wellington  
Data Archivist  
The Demographic and Health Surveys (DHS) Program

## Appendix D: Ethical Approval



The Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University  
 Jamjuree 1 Building, 2th Floor, Phayathai Rd., Patumwan district, Bangkok 10330, Thailand,  
 Tel: 0-2218-3202, 0-2218-3049 E-mail: eccu@chula.ac.th

AF 01-12

COA No. 083/2021

### Certificate of Approval Exemption for Ethics Review

Study Title No. 084/64 : DETERMINANTS OF MATERNAL HEALTH SERVICES UTILITY AMONG ADOLESCENT MOTHERS IN INDONESIA: AN ANALYSIS OF 2017 INDONESIA DEMOGRAPHIC AND HEALTH SURVEY

Principal Investigator : DEWI NURYANA

Place of Proposed Study/Institution : College of Public Health Sciences,  
 Chulalongkorn University

This Research proposal is exempted for ethics review in compliance with the Office for Human Research Protections (OHRP Exempt Categories) 45 CFR part 46.101(b).

Certified under condition: To conduct this research project, the researcher (s) must strictly adhere to research proposal approved by the committee. If there is any amendment, it must be sent to the committee for review before carrying on the project.

Signature: Prida Tasanapradit  
 (Associate Professor Prida Tasanapradit, M.D.)  
 Chairman

Signature: Raveenan Mingpakane  
 (Assistant Prof. Raveenan Mingpakane, Ph.D.)  
 Secretary



Date of Exemption : 9 April 2021

*Remark: Final report (AF 01-15) and abstract is required for a one year (or less) research/project and report within 30 days after the completion of the research/project.*

## Appendix E: Analysis Output

### ANC

ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edumother2						
Junior	.8251666	.1474136	-1.08	0.282	.5814025	1.171133
Senior/Uni	.8404076	.1700084	-0.86	0.390	.5653247	1.249344
_cons	2.355381	.3422816	5.90	0.000	1.771599	3.131532
edupartner2						
Junior	.8972128	.1667087	-0.58	0.559	.6233558	1.291383
Senior/Uni	.749019	.1298841	-1.67	0.096	.5331995	1.052194
_cons	2.372423	.3042463	6.74	0.000	1.845149	3.050371
1.workmother						
_cons	.9100418	.1430003	-0.60	0.549	.6688164	1.238271
	2.110498	.1834947	8.59	0.000	1.779829	2.502601
workpartner						
Yes	2.190204	1.293257	1.33	0.184	.6884507	6.967813
_cons	.9519965	.5577744	-0.08	0.933	.3019372	3.001609
dangerpregnant2						
Good knowledge	1.936233	.3012612	4.25	0.000	1.427309	2.62662
_cons	1.622609	.1456386	5.39	0.000	1.360861	1.934702
dangerdelivery2						
Good knowledge	1.914111	.3117032	3.99	0.000	1.391083	2.633788
_cons	1.679682	.1446576	6.02	0.000	1.418795	1.98854
dangerpost2						
Good knowledge	1.571221	.3374367	2.10	0.035	1.031413	2.393547
_cons	1.922482	.1497635	8.39	0.000	1.650262	2.239608
1.healthauto						
_cons	1.402916	.2856825	1.66	0.096	.941234	2.091058
	1.534742	.2882948	2.28	0.023	1.06204	2.217839
residence						
urban	1.09135	.1669286	0.57	0.568	.8086631	1.472857
_cons	1.990557	.1773543	7.73	0.000	1.671608	2.370363

ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
region						
Sumatra	.6215068	.1195059	-2.47	0.013	.4263569	.9059797
Kalimantan	.4736275	.1236356	-2.86	0.004	.2839484	.7900133
Sulawesi	.4369099	.1129303	-3.20	0.001	.2632556	.725114
Other	.4541361	.1306752	-2.74	0.006	.258379	.7982055
_cons	2.724615	.2720522	10.04	0.000	2.240334	3.31358
ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
v190						
poorer	1.549499	.2913732	2.33	0.020	1.071836	2.240032
middle	1.262544	.246446	1.19	0.232	.8611792	1.850969
richer	1.85621	.4704405	2.44	0.015	1.129529	3.0504
richest	1.838752	.673265	1.66	0.096	.8971252	3.768715
_cons	1.550121	.1961356	3.46	0.001	1.209661	1.986403
ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
v481						
yes	.9821552	.1422919	-0.12	0.901	.7393676	1.304667
_cons	2.070167	.2151326	7.00	0.000	1.688683	2.53783
ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
s410a_1						
yes	3.009033	.5164275	6.42	0.000	2.149507	4.212259
_cons	.8835102	.1313124	-0.83	0.405	.6602388	1.182285
ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
discuss2						
5-6 topics	2.728779	.4200324	6.52	0.000	2.018113	3.689701
_cons	1.345821	.1261513	3.17	0.002	1.119953	1.617243
ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
wantedbirth						
Wanted	3.293734	.787163	4.99	0.000	2.061871	5.261571
_cons	.7046701	.1592327	-1.55	0.121	.4525241	1.097311
ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
parity						
One child	1.90366	.8207151	1.49	0.135	.8177403	4.431631
_cons	1.096894	.4659594	0.22	0.828	.4770627	2.522053

ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
compli						
Yes	.9576989	.1923472	-0.22	0.830	.6460573	1.419669
_cons	2.06468	.1624985	9.21	0.000	1.769538	2.409049

ANC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edupartner2						
Junior	.7915918	.1622235	-1.14	0.254	.5297388	1.18288
Senior/Uni	.5508329	.1167229	-2.81	0.005	.3636203	.8344333
workpartner						
Yes	1.000843	.6699427	0.00	0.999	.2695194	3.716566
dangerpregnant2						
Good knowledge	1.453171	.2801491	1.94	0.053	.995905	2.120388
dangerdelivery2						
Good knowledge	1.142923	.2359334	0.65	0.518	.7626117	1.712893
dangerpost2						
Good knowledge	1.10952	.2810084	0.41	0.682	.6753849	1.822717
1.healthauto	1.605296	.3641992	2.09	0.037	1.029058	2.504207
region						
Sumatra	.6777788	.1450705	-1.82	0.069	.4455519	1.031045
Kalimantan	.5444125	.1539995	-2.15	0.032	.3127132	.9477851
Sulawesi	.7053682	.2023757	-1.22	0.224	.4019754	1.237748
Other	.9559326	.3250847	-0.13	0.895	.490861	1.861641
v190						
poorer	1.214602	.2648685	0.89	0.373	.7921585	1.862326
middle	1.049586	.2396761	0.21	0.832	.6708778	1.642073
richer	1.567478	.4700811	1.50	0.134	.8708218	2.82146
richest	1.751437	.7399963	1.33	0.185	.765165	4.008982
s410a_1						
yes	2.418855	.4624866	4.62	0.000	1.662875	3.518521
discuss2						
5-6 topics	2.235193	.3763005	4.78	0.000	1.60699	3.108973
wantedbirth						
Wanted	3.09057	.8314933	4.19	0.000	1.82402	5.236578
parity						
One child	1.29725	.6124507	0.55	0.581	.5142315	3.272566
_cons	.1581941	.1413577	-2.06	0.039	.0274525	.9115902

## Delivery

delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edumother2						
Junior	1.37192	.2324093	1.87	0.062	.9843092	1.912168
Senior/Uni	1.803147	.3580393	2.97	0.003	1.221837	2.661024
_cons	1.34517	.1807898	2.21	0.027	1.033656	1.750564

delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edupartner2						
Junior	1.211282	.2169669	1.07	0.285	.8526616	1.720735
Senior/Uni	1.172132	.1975876	0.94	0.346	.8423425	1.63104
_cons	1.614169	.1945339	3.97	0.000	1.274574	2.044244

delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
1.workmother	1.471833	.2352041	2.42	0.016	1.076052	2.013184
_cons	1.622717	.1357054	5.79	0.000	1.377393	1.911734
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
workpartner	1.465401	.8693443	0.64	0.519	.458125	4.687367
Yes	1.231455	.7252026	0.35	0.724	.3882817	3.905622
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
dangerpregnant2	1.471281	.2184945	2.60	0.009	1.099732	1.96836
Good knowledge	1.574862	.1409138	5.08	0.000	1.321538	1.876746
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
dangerdelivery2	1.522717	.2359275	2.71	0.007	1.12392	2.063018
Good knowledge	1.584878	.1355853	5.38	0.000	1.34022	1.874199
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
dangerpost2	1.28211	.2595353	1.23	0.220	.8622196	1.906481
Good knowledge	1.74707	.1342301	7.26	0.000	1.502834	2.030997
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
1.healthtauto	1.552961	.3108885	2.20	0.028	1.048957	2.299128
_cons	1.243664	.2297178	1.18	0.238	.8659188	1.786195
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
residence	2.202988	.3510866	4.96	0.000	1.611972	3.010695
urban	1.410618	.1203837	4.03	0.000	1.193347	1.667446
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
region	.4233745	.0795649	-4.57	0.000	.2929261	.6119151
Sumatra	.234577	.0621141	-5.48	0.000	.1396028	.3941637
Kalimantan	.4943283	.1285733	-2.71	0.007	.296907	.8230201
Sulawesi	.4726516	.1366638	-2.59	0.010	.2681774	.8330287
Other	2.726877	.2723304	10.04	0.000	2.24211	3.316456
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
v190	1.467807	.2640197	2.13	0.033	1.031717	2.088227
poorer	2.491177	.5022298	4.53	0.000	1.678029	3.698365
middle	3.114407	.8138338	4.35	0.000	1.866146	5.197626
richer	2.928296	1.100796	2.86	0.004	1.401632	6.117811
richest	1.107154	.1370564	0.82	0.411	.8686336	1.411171
_cons						
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
v481	1.435717	.2047669	2.54	0.011	1.085595	1.89876
yes	1.513348	.1505788	4.16	0.000	1.245214	1.83922
_cons						



delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
s410a_1						
yes	<b>2.186</b>	<b>.3708027</b>	<b>4.61</b>	<b>0.000</b>	<b>1.567704</b>	<b>3.048149</b>
_cons	<b>.9882105</b>	<b>.146595</b>	<b>-0.08</b>	<b>0.936</b>	<b>.7388885</b>	<b>1.321661</b>
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
discuss2						
5-6 topics	<b>1.960093</b>	<b>.2866614</b>	<b>4.60</b>	<b>0.000</b>	<b>1.471598</b>	<b>2.610742</b>
_cons	<b>1.347899</b>	<b>.1263604</b>	<b>3.18</b>	<b>0.001</b>	<b>1.121658</b>	<b>1.619774</b>
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
wantedbirth						
Wanted	<b>.8752878</b>	<b>.2174123</b>	<b>-0.54</b>	<b>0.592</b>	<b>.5379246</b>	<b>1.424231</b>
_cons	<b>2.046357</b>	<b>.4849204</b>	<b>3.02</b>	<b>0.003</b>	<b>1.286098</b>	<b>3.256032</b>
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
parity						
One child	<b>2.123676</b>	<b>.9162102</b>	<b>1.75</b>	<b>0.081</b>	<b>.9117113</b>	<b>4.946741</b>
_cons	<b>.8715712</b>	<b>.3707208</b>	<b>-0.32</b>	<b>0.747</b>	<b>.3786573</b>	<b>2.006132</b>
delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
compli						
Yes	<b>1.152525</b>	<b>.2317909</b>	<b>0.71</b>	<b>0.480</b>	<b>.7770702</b>	<b>1.709387</b>
_cons	<b>1.775203</b>	<b>.1364767</b>	<b>7.47</b>	<b>0.000</b>	<b>1.526891</b>	<b>2.063897</b>



delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
ANC	1.54486	.2307987	2.91	0.004	1.152714	2.070412
_cons	1.360962	.1636154	2.56	0.010	1.075261	1.722573

delivery	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edumother2						
Junior	1.208995	.2315049	0.99	0.322	.8306763	1.759613
Senior/Uni	1.676677	.4008472	2.16	0.031	1.049423	2.678849
1.workmother	1.55842	.2753327	2.51	0.012	1.102298	2.203281
dangerpregnant2						
Good knowledge	1.045167	.1970201	0.23	0.815	.7223195	1.512315
dangerdelivery2						
Good knowledge	1.089925	.2162452	0.43	0.664	.7387798	1.607971
dangerpost2						
Good knowledge	.8800554	.2122794	-0.53	0.596	.5485175	1.411983
1.healthauto	1.684019	.3740484	2.35	0.019	1.089635	2.602632
residence						
urban	1.716838	.3079863	3.01	0.003	1.2079	2.440213
region						
Sumatra	.4372713	.0928939	-3.89	0.000	.2883512	.6631019
Kalimantan	.2273978	.0657675	-5.12	0.000	.1290041	.4008379
Sulawesi	.5596542	.1659186	-1.96	0.050	.3130165	1.000627
Other	.5859279	.1974135	-1.59	0.113	.3027286	1.134057
v190						
poorer	.9988451	.2065874	-0.01	0.996	.6659587	1.498128
middle	1.601471	.3694839	2.04	0.041	1.018905	2.517122
richer	1.684662	.5077787	1.73	0.084	.9331463	3.041416
richest	1.387847	.5940704	0.77	0.444	.5997677	3.211441
v481						
yes	1.418136	.2227432	2.22	0.026	1.042369	1.929363
s410a_1						
yes	1.687123	.3267381	2.70	0.007	1.154246	2.466014
discuss2						
5-6 topics	1.48091	.2449518	2.37	0.018	1.070865	2.047966
parity						
One child	1.655963	.7613664	1.10	0.273	.6724991	4.077649
compli						
Yes	1.062841	.2387716	0.27	0.786	.6842939	1.650799
ANC						
Good	1.107597	.1905068	0.59	0.552	.7906326	1.551631
_cons	.220486	.1239693	-2.69	0.007	.0732468	.6637019

## PNC

PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edumother2						
Junior	1.688656	.3008525	2.94	0.003	1.190941	2.394374
Senior/Uni	1.693534	.3481143	2.56	0.010	1.131945	2.533744
_cons	1.723937	.2377218	3.95	0.000	1.315665	2.258903

PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edupartner2						
Junior	1.366059	.2610052	1.63	0.103	.9393666	1.986569
Senior/Uni	1.209725	.2144419	1.07	0.283	.8546697	1.71228
_cons	2.139867	.2690246	6.05	0.000	1.672529	2.73779

PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
1.workmother	1.468776	.2518565	2.24	0.025	1.049535	2.055485
_cons	2.254927	.1984762	9.24	0.000	1.897626	2.679503
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
workpartner	2.044094	1.213776	1.20	0.229	.6383517	6.54548
Yes	1.231455	.7252026	0.35	0.724	.3882817	3.905622
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
dangerpregnant2	2.234484	.3716513	4.83	0.000	1.612875	3.095663
Good knowledge	1.910334	.1753612	7.05	0.000	1.595778	2.286896
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
dangerdelivery2	2.390883	.4244528	4.91	0.000	1.688281	3.385883
Good knowledge	1.950452	.1716331	7.59	0.000	1.641469	2.317598
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
dangerpost2	1.789233	.4170476	2.50	0.013	1.133085	2.825343
Good knowledge	2.32007	.1869048	10.45	0.000	1.9812	2.716901
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
1.healthtauto	1.15078	.2469346	0.65	0.513	.7556863	1.752441
_cons	2.227091	.4421458	4.03	0.000	1.509205	3.286454
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
residence	2.633534	.4689545	5.44	0.000	1.857656	3.733471
urban	1.884909	.1664868	7.18	0.000	1.585284	2.241165
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
region	.241055	.0474761	-7.22	0.000	.1638592	.3546186
Sumatra	.2077548	.0552547	-5.91	0.000	.1233572	.349895
Kalimantan	.4277827	.1186585	-3.06	0.002	.24838	.7367664
Sulawesi	.3090925	.0916692	-3.96	0.000	.1728395	.5527563
Other	4.67356	.5427475	13.28	0.000	3.722173	5.868122
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
v190	2.059954	.397132	3.75	0.000	1.411748	3.005785
poorer	2.560663	.5454406	4.41	0.000	1.686708	3.887449
middle	2.526087	.6710709	3.49	0.000	1.500795	4.251825
richer	2.114435	.7859722	2.01	0.044	1.020441	4.381277
richest	1.449624	.1821965	2.95	0.003	1.133109	1.854551
_cons						
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
v481	1.235476	.1863527	1.40	0.161	.9192713	1.660447
yes	2.259922	.2386687	7.72	0.000	1.837378	2.779638
_cons						

PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
s410a_1						
yes	2.485146	.4322506	5.23	0.000	1.767255	3.494657
_cons	1.255894	.1875113	1.53	0.127	.9372695	1.682836
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
discuss2						
5-6 topics	2.164514	.3413636	4.90	0.000	1.588979	2.94851
_cons	1.812785	.1755548	6.14	0.000	1.499387	2.191689
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
wantedbirth						
Wanted	.72685	.2007228	-1.16	0.248	.4230404	1.248843
_cons	3.362184	.8900486	4.58	0.000	2.001191	5.648777
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
parity						
One child	2.114893	.9161348	1.73	0.084	.9048213	4.943267
_cons	1.214202	.5176684	0.46	0.649	.5264844	2.800245
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
compli						
Yes	1.171389	.252334	0.73	0.463	.7679625	1.786743
_cons	2.454957	.1997572	11.04	0.000	2.093064	2.879422
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
ANC						
_cons	1.801363	.2817797	3.76	0.000	1.325718	2.44766
	1.718735	.2116019	4.40	0.000	1.350247	2.187784
PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
delivery						
_cons	28.37104	5.879814	16.14	0.000	18.90019	42.58771
	.4795468	.058418	-6.03	0.000	.3776925	.6088687

PNC	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
edumother2						
Junior	1.568529	.4253493	1.66	0.097	.9218623	2.668818
Senior/Uni	1.346014	.4899578	0.82	0.414	.6594877	2.747214
edupartner2						
Junior	1.108316	.3147776	0.36	0.717	.6351998	1.933824
Senior/Uni	1.013405	.3171262	0.04	0.966	.5488014	1.871331
1.workmother	1.445273	.3589029	1.48	0.138	.8883257	2.351407
workpartner						
Yes	2.569462	2.298813	1.05	0.292	.4449389	14.8383
dangerpregnant2						
Good knowledge	1.430578	.3733545	1.37	0.170	.8577558	2.38594
dangerdelivery2						
Good knowledge	1.917711	.524273	2.38	0.017	1.122219	3.277093
dangerpost2						
Good knowledge	1.108386	.3846866	0.30	0.767	.5613906	2.18835
residence						
urban	1.760992	.4485939	2.22	0.026	1.068865	2.901295
region						
Sumatra	.2907889	.0858653	-4.18	0.000	.1630165	.5187094
Kalimantan	.4228689	.1577991	-2.31	0.021	.2035021	.8787043
Sulawesi	.7276803	.2881342	-0.80	0.422	.3348857	1.581192
Other	.4230467	.1995237	-1.82	0.068	.167854	1.066215
v190						
poorer	1.551949	.4582662	1.49	0.137	.8700239	2.768369
middle	1.009981	.3255261	0.03	0.975	.5369859	1.899605
richer	.6598241	.2838389	-0.97	0.334	.2839643	1.533178
richest	.4741534	.2845544	-1.24	0.214	.1462467	1.537276
v481						
yes	.9324668	.2020916	-0.32	0.747	.6097534	1.425977
s410a_1						
yes	1.621081	.4410151	1.78	0.076	.9511204	2.762957
discuss2						
5-6 topics	1.143912	.2655259	0.58	0.562	.72579	1.802911
wantedbirth						
Wanted	.5221221	.2127277	-1.60	0.111	.2349459	1.160316
parity						
One child	1.009561	.6836133	0.01	0.989	.2677632	3.8064
ANC						
Good	1.261998	.3040765	0.97	0.334	.7869784	2.023738
delivery						
Good	27.41616	6.47297	14.02	0.000	17.25987	43.54876
_cons	.117274	.1427077	-1.76	0.078	.0107993	1.273522

## VITA

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**DATE OF BIRTH** 24 December 1994

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