KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF BIRTH PREPAREDNESS AND COMPLICATION READINESS IN RELATION TO SKILLED BIRTH ATTENDANT AMONG DELIVERED WOMEN IN SVAY RIENG PROVINCE CAMBODIA

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A Thesis Submitted in Partial Fulfillment of the Requirements
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ความรู้ ทัศนคติ และการปฏิบัติตนต่อการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนของหญิงหลังคลอดต่อการคลอดบุตร โดยผู้ที่ผ่านการอบรมด้านการคลอด ในจังหวัดสวายเรียง ประเทศกัมพูชา

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ยูโกะ ทากาฮาชิ : ความรู้ ทัศนคติ และการปฏิบัติตนต่อการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนของหญิงหลังคลอดต่อการคลอดบุตร โดยผู้ที่ผ่านการอบรมด้านการคลอด ในจังหวัดสวายเรียง ประเทศกัมพูชา (KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF BIRTH PREPAREDNESS AND COMPLICATION READINESS IN RELATION TO SKILLED BIRTH ATTENDANT AMONG DELIVERED WOMEN IN SVAY RIENG PROVINCE CAMBODIA) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ดร. มนทกานติ์ เชื่อมชิต, 139 หน้า.

ความสำคัญของปัญหา

การเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน เป็นหนึ่งในกลยุทธ์การเพิ่มประสิทธิภาพของการคลอดบุตร สิ่งสำคัญที่สุดในการป้องกันภาวะการตายของมารดาคือการคลอดบุตรโดยผู้ที่ผ่านการอบรมด้านการคลอด ประเทศกัมพูชาเป็นหนึ่งในประเทศที่ประสบความสำเร็จในการลดอัตราการตายของมารดา อย่างไรก็ตามยังคงไม่ถึงเป้าหมายการพัฒนาอย่างยืนที่กำหนดไว้ การวิจัยครั้งนี้จึงมีวัตถุประสงค์เพื่อประเมินระดับความรู้ ทัศนคติ และการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน และหาความสัมพันธ์ระหว่างตัวแปรดังกล่าว

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การวิจัยครั้งนี้เป็นการศึกษาภาคตัดขวางในชุมชน กลุ่มเป้าหมายคือผู้หญิงหลังคลอดในช่วง 12 เดือนที่ผ่านมา ดำเนินการเก็บข้อมูลตั้งแต่เดือนมีนาคม – เดือนเมษายน พ.ศ. 2559 ที่อำเภอสวายจรุม จังหวัดสวายเรียง ประเทศกัมพูชา ด้วยการสัมภาษณ์ตัวต่อตัวโดยใช้แบบสอบถาม ในส่วนของการวิเคราะห์ข้อมูล ได้ใช้การวิเคราะห์ถดถอยเชิงเส้นพหุที่ระดับความเชื่อมั่นร้อยละ 95 เพื่อวิเคราะห์ปัจจัยที่เกี่ยวข้องกับการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน

ผลการวิจัย

ผลการวิจัยพบว่า จากกลุ่มตัวอย่าง 250 คน ร้อยละ 98 คลอดบุตรที่สถานบริการสุขภาพโดยผู้ที่ผ่านการอบรมด้านการคลอด มีเพียงหนึ่งรายคลอดที่บ้าน และสี่รายคลอดระหว่างทางที่จะมาสถานบริการ สำหรับระดับความรู้ต่อการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนนั้น พบว่า ร้อยละ 92 มีความรู้ในระดับต่ำ โดยข้อที่ตอบถูกคือ อาการเลือดออกทางช่องคลอดคือสัญญาณอันตราย และการเตรียมพร้อมทางการเงินคือหนึ่งในการเตรียมพร้อมเพื่อการคลอด ในส่วนของทัศนคติต่อการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน พบว่าร้อยละ 70 ของกลุ่มตัวอย่างมีทัศนคติกลางๆ ร้อยละ 60 มีการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนในระดับกลาง งานวิจัยยังพบอีกว่า อาชีพ ความมั่งคั่งของครอบครัว ความรู้ในเรื่องสัญญาณอันตราย จำนวนครั้งของการมาฝากครรภ์ ประวัติการแท้ง และการได้รับผลประโยชน์จากระบบการคลังด้านสุขภาพ มีความสัมพันธ์ในทิศทางเดียวกันกับการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน ในขณะที่ ภาวะเคยคลอดบุตร มีความสัมพันธ์ในทิศทางตรงกันข้ามกับการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน ความมั่งคั่งของครอบครัวคือตัวแปรที่สำคัญที่สุดต่อการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน รองลงมาคือภาวะเคยคลอดบุตร ความรู้ในเรื่องสัญญาณอันตราย และประวัติการแท้ง

สรุป

การวิจัยครั้งนี้พบว่า กลุ่มตัวอย่างมีความรู้เรื่องการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนในระดับต่ำ มีทัศนคติกลางๆ และมีการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนในระดับกลาง ความมั่งคั่งของครอบครัว ภาวะเคยคลอดบุตร ความรู้ในเรื่องสัญญาณอันตรายและประวัติการแท้ง เป็นปัจจัยที่มีผลต่อการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อน ดังนั้นเพื่อให้มีการการเตรียมพร้อมเพื่อการคลอดและการป้องกันภาวะแทรกซ้อนที่มากขึ้น ควรให้ความสำคัญในประเด็นความยากจน ผู้หญิงที่เคยคลอดบุตรในจำนวนไม่มาก และประวัติในการแท้ง โดยการพิจารณาทบทวนถึงผลของการให้ความรู้ในระหว่างการฝากครรภ์ และการเสริมสร้างความเข้มแข็งของการมีส่วนร่วมในครอบครัวและชุมชน ทั้งนี้โครงการและนโยบายต่างๆจำเป็นที่ต้องให้ความสำคัญแก่ผู้หญิงที่ยากจน และระบบประกันสุขภาพถ้วนหน้า

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

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YUKO TAKAHASHI: KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF BIRTH PREPAREDNESS AND COMPLICATION READINESS IN RELATION TO SKILLED BIRTH ATTENDANT AMONG DELIVERED WOMEN IN SVAY RIENG PROVINCE CAMBODIA. ADVISOR: MONTAKARN CHUEMCHIT, Ph.D., 139 pp.

Background

Birth preparedness and complication readiness (BP/CR) is the strategy to enhance timely use of skilled care in childbirth. Delivery assisted by Skilled Birth Attendant (SBA) is the single most important intervention to prevent maternal mortality. Cambodia is one of the success countries to reduce maternal mortality ratio (MMR), but further reduction is required to achieve Sustainable Development Goals (SDGs) by 2030. Since little is known about BP/CR in Cambodia, this study aimed to assess the level of knowledge, attitudes and BP/CR and the associations between knowledge, attitudes and BP/CR.

Methods

A community-based cross-sectional study was conducted among women who have delivered within last 12 months prior to the survey in March to April 2016 at Svay Chrum district, Svay Ring Province, Cambodia. Face-to-face interviews were conducted using a structured questionnaire by the Maternal Neonatal Program of Johns Hopkins Bloomberg University. Factors related to BP/CR were analyzed by multiple liner regression models at 95% confidence level.

Results

Among 250 respondents, 98% of women had delivery at health facility assisted by SBA while only one woman gave birth at home and four on the way to facility assisted by unskilled attendant. 92% of women were classified into low level of knowledge on BP/CR. Severe vaginal bleeding was the most common danger sign and saving money was the most common birth preparedness, answered correctly. 70% of respondents were classified into neutral level of attitude towards BP/CR. 60% of women were classified into moderate level of birth preparedness and complication readiness. Positive associations between occupation, family wealth, knowledge on danger signs, number of ANC visit, history of abortion, beneficiaries of health financing schemes and negative associations between parity and BP/CR were found. Family wealth tends to be the most important variable for BP/CR, followed by parity, knowledge on danger signs and history of abortion.

Conclusion

This study found low level of knowledge, neutral level of attitude and moderate level of BP/CR. Family wealth, parity, knowledge on danger signs and history of abortion were the significant predictors of BP/CR. In order to enhance BP/CR, it is important to focus on the poor, women with lesser parity and history of abortion by reconsidering the impact of ANC education and strengthening family involvement in the community. Programs and policies need to be special focused on the poor women to ensure the new global priority, Universal Health Coverage.

Field of Study: Public Health Student's Signature .....

Academic Year: 2015 Advisor's Signature .....

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LIST OF ABBREVIATIONS

ANC:	Antenatal Care
BEmONC:	Basic Emergency Obstetric and Newborn Care
BP/CR:	Birth Preparedness and Complication Readiness
CDHS:	Cambodia Demographic and Health Survey
CPA:	Complementary Package of Activity
GMIS:	Government Midwifery Incentive Scheme
HEFs:	Health Equity Funds
IWI:	International wealth index
JICA	Japan International Corporation Agency
KAP	Knowledge, Attitude and Practice
MMR:	Maternal Mortality Ratio
MDGs:	Millennium Development Goals
MPA:	Minimum Package of Activity
NGO:	Non-governmental Organization
OD:	Operational District
PBC:	Performance-based contracting
PHD	Provincial Health Department
PMW:	Primary Midwife
SMW:	Secondary Midwife
SBA:	Skilled Birth Attendant
SEZ:	Special Economic Zone
SDGs:	Sustainable Development Goals
TBA:	Traditional Birth Attendant

CHAPTER I
INTRODUCTION

1.1 Background

Birth Preparedness and Complication Readiness is a strategy to promote timely use of skilled maternal care during pregnancy, childbirth, or early postnatal period, especially in women with obstetric complications (JHPIEGO/Maternal and Neonatal Health Program, 2004b).

Obstetric complications are the leading causes of maternal death. Globally, it is estimated nearly 830 women die every day due to preventable causes during pregnancy and childbirth and 99% of all deaths occur in low-income counties (World Health Organization, 2016b). The reduction of maternal mortality has long been a global health priority and was a target of United Nation Millennium Development Goals (MDGs) until 2015 and Sustainable Development Goals (SDGs) with 70 per 100,000 live births by 2030. Two effective strategies to reduce maternal mortality are well known as delivery assisted by skilled birth attendant and emergency obstetric care (Donnay, 2000). It is important to promote facility deliveries in low income countries to reduce maternal mortality (Chatterjee, 2005).

Cambodia is one of the success countries to reduce Maternal Mortality Ratio (MMR). MMR in Cambodia has significantly reduced from 1,200 per 100,000 live births in 1990 to 170 per 100,000 live births in 2014 (National Institute of Statistics, 2014). The successful reduction of MMR in Cambodia is associated with fertility declines, socio-economic and educational improvements, rapid increase in facility-based delivery and SBA, increase the number of facilities which are able to provide Basic Emergency Obstetric and Newborn Care (BEmONC), monetary incentive for midwifes, and an expanding health equity funds scheme and so on. Better road condition has also contributed to considerable improvement of accessibility (World Health Organization, 2015c). Receiving cares from Skilled Birth Attendant (SBA) is the single most important intervention to prevent maternal mortality.

Thaddeus Sereen and Maine Deborah (1994) have provided a model known as The Three Delays Model of maternal death which illustrates maternal mortality attributes

to many different factors not only one single barrier. Maternal deaths are the result of combination of socio-economic, cultural and health system factors that cause by delay in decision making to seek care (first delay), delay in reaching health facility (second delay), and delay in receiving appropriate treatment (third delay). Majority of women regards childbirth is a normal physiological process. But obstetric complications that result in maternal deaths are normally unpredictable, and these events could occur suddenly and severely. Delay in responding such onset of complications has been one of the barriers to reduce maternal mortality.

Birth preparedness and complication readiness is a strategy to anticipate these potential delays. Birth preparedness motivates women to prepare normal delivery and make a plan to deliver with skilled birth attendant. Complication readiness will raise awareness of danger signs for pregnancy-related complications and what to do if they arise, and promote decision to seek appropriate care. Since the primary objective of birth preparedness and complication readiness is to increase care seeking behaviors, birth preparedness and complication readiness of women and family may reduce the first and second delays. The preparedness of health facility would contribute addressing the third delay (JHPIEGO/Maternal and Neonatal Health Program, 2004a). According to World Health Organization (WHO), birth preparedness and complication readiness is an essential part of antennal care including followings: desired place of birth; preferred birth attendant; location of the nearest facility for birth; funds for expenses; supplies and materials to bring to a facility; identified labor and birth companions; identified support persons to take care other children at home; identified transportation to a facility; and identified blood donor if needed (World Health Organization, 2006). It is important not only for women but also family members, community, health care providers and policy maker to be prepared birth and ready for complications. The Maternal Neonatal Program of Johns Hopkins Bloomberg University provided conceptual framework that birth preparedness might reduce the delays to cause maternal death, and it would increase use of skilled birth attendants (JHPIEGO/Maternal and Neonatal Health Program, 2004a). In Cambodia, above components were incorporated into “Safe Motherhood Clinical Management Protocol” (Ministry of Health Cambodia, 2010b, 2013b). Ministry of Health Cambodia considered birth and emergency preparedness as one of the important

elements through antenatal care. Health professionals are required to develop a birth and emergency plan with pregnant women at the first antenatal visit and review it subsequent visits. Intervention to reduce the barrier to seek maternal cares must be addressed in order to reduce maternal mortality.

1.2 Rational

According to Cambodia Demographic and Health Survey (CDHS) published in 2014, the percentage of delivery assisted by SBA and the percentage of delivery in health facilities have increased from 34 % in 2005 to 89% in 2014, and 16% to 83%, respectively (National Institute of Statistics, 2014). In corresponding to its improvement, MMR in Cambodia has reduced dramatically in last decade. Statistically, Cambodia has made a significant progress, however estimated MMR in 2015 was still high of 161 per 100,000 live births compared to that of neighboring countries, 20 per 100,000 live births in Thailand and 54 per 100,000 live births in Vietnam(World Health Organization, 2015d).

WHO has conducted the study on assessing success factors to reduce MMR (World Health Organization, 2015b), and there were several evaluation studies on individual intervention and program. But there were few studies about women's knowledge on obstetric danger signs and birth preparedness. Pregnancy related danger signs are not real obstetric complications, but the symptoms that are easily recognized by non-medical peoples. Every pregnant woman can face unpredictable and life-threatening risk of complications that lead to maternal and neonatal morbidity and mortality. Actions to prepare for normal birth and emergency are expected to contribute to reduce maternal mortality. So this study focused on birth preparedness and complication readiness among rural women in community level.

There are several studies on knowledge and awareness of danger signs and birth preparedness complication readiness in African countries (August et al., 2015; Belda & Gebremariam, 2016; Bintabara, Mohamed, Mghamba, Wasswa, & Mpembeni, 2015; Gebre, Gebremariam, & Abebe, 2015; Hailu, Gebremariam, Alemseged, & Deribe, 2011; Hiluf M & M., 2007; Kabakyenga, Ostergren, Turyakira, & Pettersson,

2011; Markos Desalegn & Daniel, 2014; Mbalinda et al., 2014; Mihret Hiluf & Fantahun, 2007; Muhammedawel Kaso & Addisse, 2014; Pembe et al., 2009; Umar Muhammad Lawan, Idris Usman Takai, & Ishaq, 2015), India (Agarwal S, Sethi V, Srivastava K, Jha PK, & Baqui AH, 2010; Siddharth Agarwal, Vani Sethi, Karishma Srivastava, Prabhat K. Jha, & Baqui, 2010) and Nepal (Karkee, Lee, & Binns, 2013). Low level of knowledge of danger signs and low level of birth preparedness were found in most of the studies. WHO's six month pilot project was conducted to introduce birth preparedness in rural Cambodia, and there found increase of ANC attendance, SBA use and delivery in health facilities after intervention (Skinner & Rathavy, 2009). But little is known about current status of birth preparedness in Cambodia.

This study therefore aims to fill this gap to assess the knowledge, attitude and birth preparedness and complication readiness and its associations, also to find the proportion of delivery assisted by SBA among women who have delivered within 12 months in Svay Rieng Province, Cambodia.

In addition, it is hoped that the results and recommendation of this study will provide useful information to design further programs to achieve the 2030 targets for SGDs in Cambodia.

1.3 Research questions

- What is the proportion of delivery assisted by skilled birth attendant in study population?
- What are socio-demographic factors, knowledge, attitudes, enabling resources, needs factors and birth preparedness and complication readiness among women who delivered within last 12 months in rural Cambodia?
- Is there any association between socio-demographic factors, knowledge, attitudes, enabling resources, need factors and birth preparedness and complication readiness among women who delivered within last 12 months in rural Cambodia?

1.4 Research Objectives

- To identify the proportion of delivery assisted by skilled birth attendant in the study population
- To assess socio-demographic factors, knowledge, attitudes, enabling resources, need factors and birth preparedness and complication readiness among women who delivered within last 12 months in rural Cambodia
- To identify association between socio-demographic factors, knowledge, attitudes, enabling resources, need factors and birth preparedness and complication readiness among women who delivered within last 12 months in rural Cambodia.

1.5 Research hypotheses

- There is association between socio-demographic factors and birth preparedness and complication readiness.
- There is association between knowledge and birth preparedness and complication readiness.
- There is association between attitudes and birth preparedness and complication readiness.
- There is association between enabling resources and birth preparedness and complication readiness.
- There is association between need factors and birth preparedness and complication readiness

1.6 Operational definition

Delivered women refer to women who have delivered last 12 months.

Reproductive age refers to all women aged from 15 to 49 years and at risk of becoming pregnant.

Birth Preparedness and Complication Readiness refers to planning actions for a birth and preparation for emergency of individual woman, which are identifying a

place of birth, identifying skilled birth attendant, preparing funds for emergency, arranging transportation and identifying blood donor (JHPIEGO/Maternal and Neonatal Health Program, 2004a).

Obstetric danger signs refer to the symptoms of obstetric complications that are easily recognized and associated with potentially severe problems. This study focus on major danger signs in three phases. Severe vaginal bleeding, severe headache and blurred vision, swollen hand and face are danger signs in pregnancy. severe vaginal bleeding, prolonged labor, retained placenta and convulsion are danger signs in childbirth, severe vaginal bleeding, high fever, foul selling vaginal discharge are danger signs in postpartum (World Health Organization, 2015b).

Knowledge of obstetric danger signs refers to women's understandings of danger signs in pregnancy, childbirth and postpartum.

Knowledge of birth preparedness and complication readiness refers to women's understandings of birth preparedness and complication readiness.

Attitudes towards birth preparedness and complication readiness refer to the women's positive or negative perception of preparation for normal birth and emergency, utilization of facility delivery and husband involvement to the childbirth.

Enabling resources refers to accessibility of health services and availability.

Accessibility of health services refer to the people's ability to reach a health care practitioner, in terms of location, time, and ease of approach (Starfiel B, 2001).

1. **Geographical accessibility** means distance to the health facility, time and means of transport are acceptable to people.
2. **Financial accessibility** means the expenses for the delivery such as user fee, transportation, medication, gratuities and opportunity cost are affordable for woman's family.
3. **Cultural accessibility** means decision making power among the family and community related to pregnancy and childbirth.

Availability refers to presence of health infrastructure, skilled staff, essential drug, equipment, materials and health care services.

Needs factors refers to perceived severity of danger signs, age of gestation at the first ANC visit, number of ANC visit, history of abortion and history of obstetric complications.

Perceived severity of danger signs refers to women's recognition of symptoms and the assessment that the symptoms are serious enough to justify medical care.

Antenatal Care (ANC) refers to the care and health education provided to a woman during her pregnancy. Current WHO recommendation is each pregnant woman receives minimum four times ANC visits supervised by skilled ANC attendant (World Health Organization, 2007). The timing of the first visit should be before 16 weeks of pregnancy the second visit should be between 24 and 26 weeks, the third visit between 30 and 32 weeks, and the fourth visit between 36 and 38 weeks(World Health Organization, 2015b).

Abortion refers to spontaneous abortion and induced abortion.

Facility delivery refers to delivery occurs in hospital, health center and private clinic assisted by skilled doctor, midwife and nurse.

Delivery with skilled birth attendant refers to delivery at health facility and home with skilled birth attendant.

Skilled Birth Attendant (SBA) defined as "an accredited health professional – such as a midwife, doctor or nurse – who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancy, childbirth and the immediate postnatal period, and in the identification, management and referral of complication in women and newborn" (World Health organization, 2004). This study defines skilled birth attendant as both primary and secondary midwife, doctors and nurses who has been trained and graduated medical school in Cambodia.

Traditional Birth Attendant (TBA) refers to the experienced women who can provide primary midwifery care to pregnant women at the community in low income countries.

1.7 Conceptual framework

The conceptual framework of this study was shown as Figure 1.

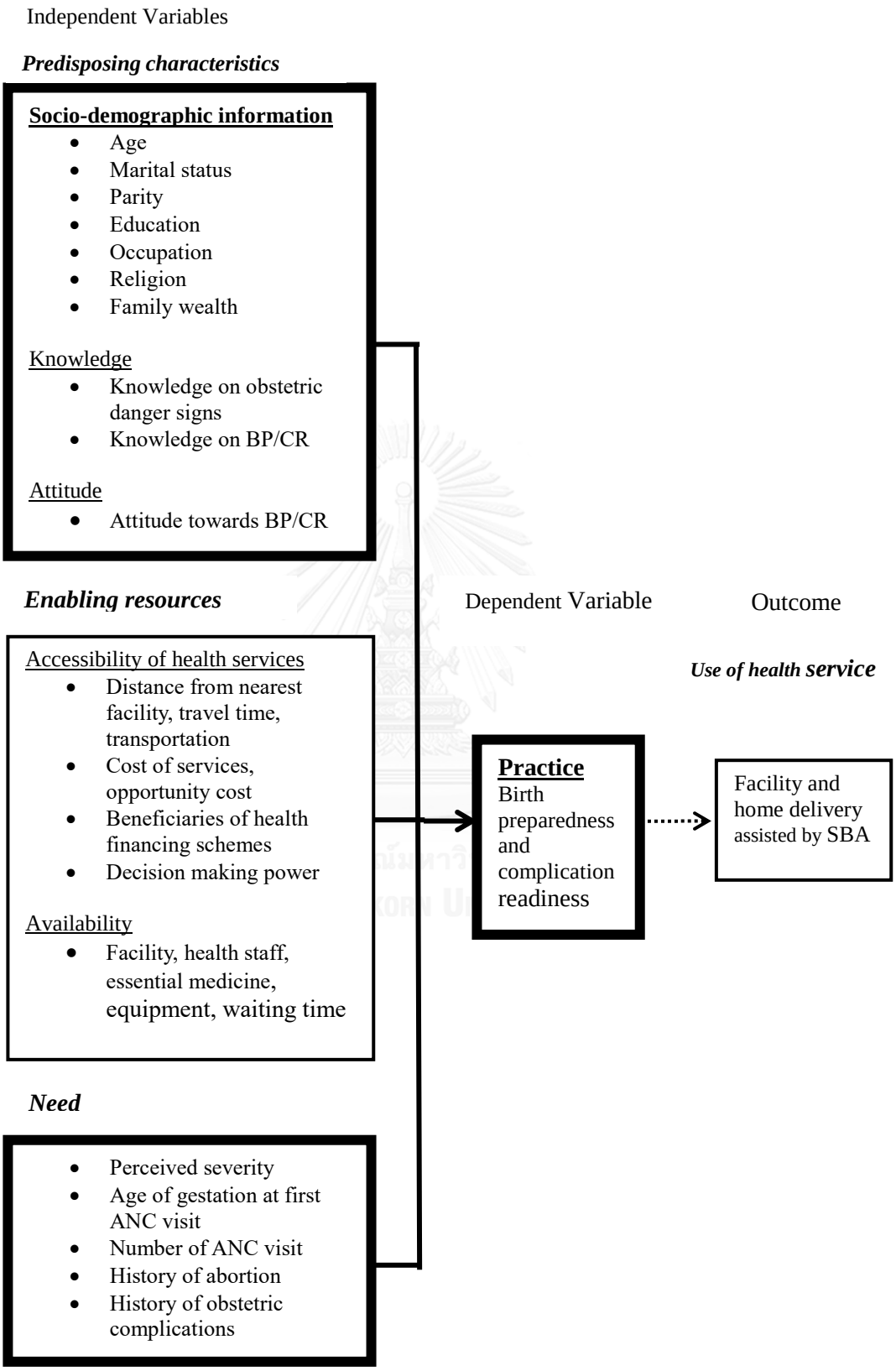

Figure 1: Conceptual framework (Modified Anderson's model)

CHAPTER II

LITERATURE REVIEW

2.1 Global trend of Maternal Mortality Ratio

Maternal Mortality Ratio (MMR) is one of the health indicators which is defined as “the number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births” (World Bank, 2015).

In 2000, the United Nations Member States pledged Millennium Development Goals (MDGs), including a three-quarters reduction of MMR in the 1990 to be achieved by 2015. As an effort, international society has tackled 44% reduction of MMR from 1990 to 2015 (World Health Organization, 2015d).

According to the estimate by WHO, UNICEF, UNFPA and World Bank (World Health Organization, 2015d), approximately 99% (302,000) of the global maternal deaths occur in low-income countries, especially sub-Saharan Africa alone accounts for roughly 66% (201,000) and followed by Southern Asia (66,000). At the country level, Nigeria and India account for over one third of all maternal deaths in worldwide. Sierra Leone is estimated to have the highest MMR at 1,360.

There are nine countries categorized as “Achieved MDG 5A” based on at least 75% of MMR reduction between 1990 and 2015: Bhutan, Cambodia, Cabo Verde, the Islamic Republic of Iran, the Lao People’s Democratic Republic, Maldives, Mongolia, Rwanda and Timor-Leste.

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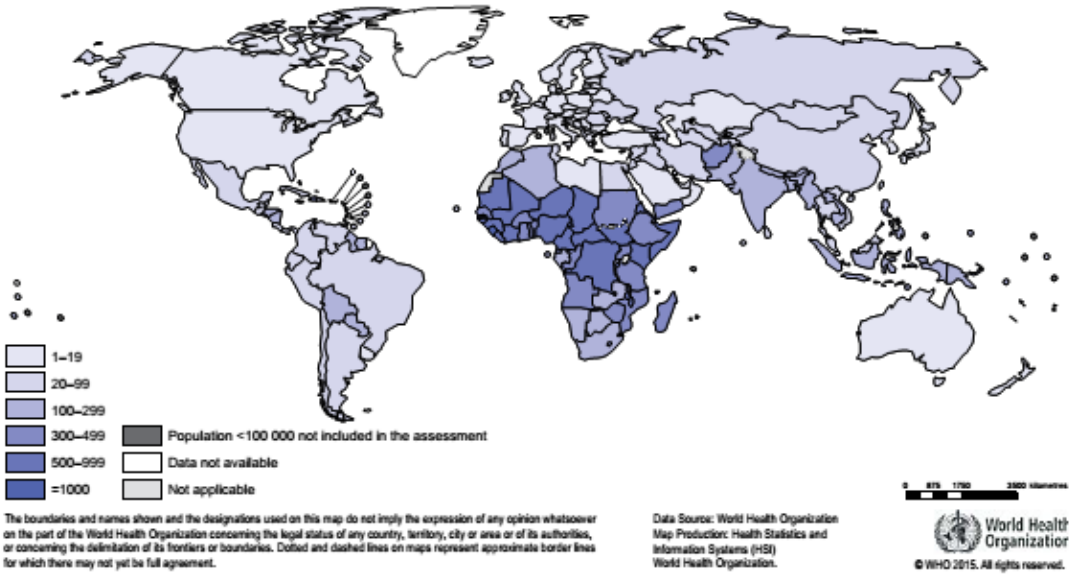

Figure 2: Maternal Mortality Ratio (Maternal death per 100,000 live births) 2015 (World Health Organization, 2015d)

Table 1: Maternal Mortality Ratio among East and South-East Asian countries (UNFPA, 2006)

	MMR (per 100 000 live births)	Range of MMR estimate	Lifetime risk of maternal death (1 in)	Number of maternal deaths	Per cent of deliveries with skilled birth attendants (%)
Lao PDR	650	160–1 200	25	1 300	19
Timor-Leste	600	170–1 200	30	140	24
Cambodia	450	260–620	36	2 100	32
Myanmar	360	91–660	75	4 300	56
Indonesia	230	58–440	150	10 000	68
Philippines	200	120–280	120	4 100	60
Viet Nam	130	32–240	270	2 000	85
Mongolia	110	75–150	300	65	99
DPRK	67	17–130	590	260	97
China	56	28–110	830	11 000	97
Thailand	44	22–88	900	520	99
Malaysia	41	20–81	660	220	97

The study (Souza et al., 2014) proposed that there was a similar pathway and strategy for reducing maternal mortality worldwide, which is described five stages as below;

- **Stage I** (MMR>1000 maternal deaths per 100,000 live births) is characterized very high maternal mortality level with high fertility rate and predominance of direct causes of maternal deaths. There is no country to remain this stage.
- **Stage II** (MMR 999-300 maternal deaths per100,000 live births) is characterized to remain high mortality and fertility. The critical issue of this stage is accessibility and availability. There exists lack of health infrastructure, weak health system, severe shortage of skilled professional and so on. Removing these barriers are need to be address in this stage.
- **Stage III** (MMR 299-50 maternal deaths per 100,000 live births) is the transition stage. Direct cause of maternal death still predominated and issues of accessibility are still remained. More pregnant women can reach health facility and quality of care requires as a health outcome. Quality of care by skilled professional is essential to reduce maternal mortality in this stage.
- **Stage IV** (MMR <50 maternal deaths per 100,000 live births) is moderate or low maternal mortality. Indirect causes of maternal death are becoming issue. Enhancing quality of care and reducing delays in health system are major strategy in this stage. It also has to be considered over medication in this stage such as over Caesarian section rate.
- **Stage V** means all avoidable maternal death can be avoided. MMR is very low. Non communicable disease and indirect causes are main reason of maternal death. Among five transition stages, Cambodia is now on the 3rd stage (MMR 299-50 maternal death per 100,000 live birth) with 170 per 100,000 live births. Improving quality of care supported by SBA and proper management of obstetric complications are the main strategies in this stage.

2.2 Cause of maternal death

Women could die as a result of obstetric complications that may occur during pregnancy, childbirth or the immediate postnatal period. WHO systematic review (Khan KS, Wojdyla D, Say L, Gulmezoglu AM, & PF., 2006) reported hemorrhage and hypertensive disorders were the leading causes of maternal death in low income-countries. A recent WHO systematic analysis (Say et al., 2014) showed nearly 73% of all maternal deaths between 2003 and 2009 were due to direct causes. Hemorrhage was the biggest direct cause of maternal death, representing 27.1%, two third in postpartum period. Hypertensive disorder (14.0%) was the second highest cause. Sepsis (10.7%), abortion (7.9%) and embolism were following. This report also pointed out the increase the proportion of indirect causes accounted for 27.1%. If existing risks such as diabetes, malaria and HIV/AIDS dose not manage properly, it may become sever complications. Globally, approximately 1.6% (4,700) of all maternal deaths was estimated to be AIDS-related indirect maternal deaths. In sub-Saharan Africa, 2.0% of all maternal deaths are estimated to be AIDS-related indirect maternal deaths (World Health Organization, 2015d). In East and South-East Asia region, the patterns of causes of death are similar to the global picture, with the exception of the deaths from unsafe abortion (UNFPA, 2006).

A national surveillance on maternal death audit showed hemorrhage (36%) stayed the biggest single cause of maternal death in Cambodia (Liljestrand & Sambath, 2012). Eclampsia (20%) and other direct causes (21%) were following. Since data was limited, there was no further breakdown of direct causes. According to the health report 2014 by Ministry of Health Cambodia, 14 women died at home, 2 died at private hospital, 58 died at public facility, 6 died on the way while refer from one health facility to another and 7 died while refer from home to health facility (from personal communication with Dr. Kannitha, representative of maternal and child health in WHO Cambodia, only khmer language report available). Since most of these complications are preventable or manageable, it is important that all women need to access to antenatal care during pregnancy and all births are attended by skilled birth attendant to have timely management for saving lives.

2.3 Obstetric danger signs

Pregnancy related danger signs are the symptoms of obstetric complications that are easily recognized and associated with a potentially severe problem. This study focus on danger signs in three phases, during pregnancy, delivery and postpartum (Figure 3). Severe vaginal bleeding is a critical sign for hemorrhage, severe headache and blurred vision for Pregnancy Induced Hypertension (PIH), swollen hand and face for eclampsia. Knowledge on obstetric danger signs among pregnant are important to seek health care for emergency during pregnancy and childbirth.

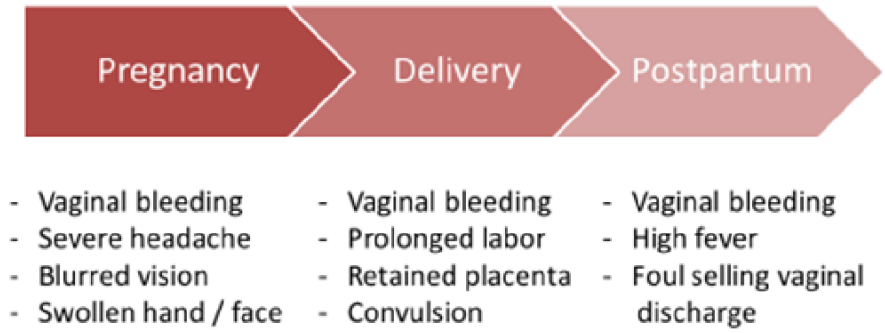

Figure 3: Obstetric danger signs during pregnancy, delivery and postpartum

2.4 Global priority setting on Maternal and Child Health

The number of maternal deaths in the middle of 1980s was estimated around 570,000 during pregnancy and childbirth. It was found that the programs of maternal and child health in low-income countries had mainly benefit for the child and had less attention to the cause of maternal death (Allan Rosenfield & Maine, 1985). From this fact, Safe Motherhood Initiative was launched in 1987 in Nairobi, Kenya in order to raise awareness to the high rate of maternal mortality due to complications during pregnancy and childbirth, and to mobilize the international actions to address this issue. The goal was set to reduce maternal mortality by half until 2000 (Starrs, 1997). The prevention of maternal death was considered to be essential not because the death affects family members but women itself were valuable. After the Declaration of

Alma Ata in 1978, community based intervention has been the priority to promote primary health care with the global commitment of health for all. Based on the strategies of Alma Ata, the early stage of Safe Motherhood Initiative focused on two elements; training for Traditional Birth Attendant (TBA) in sense of utilizing community resources and risk screening through antenatal care (prevention).

By tenth anniversary, this approach was evaluated to have limited effectiveness to reduce maternal mortality (Starrs, 2006). One of lessons from the first decade showed that there was no magic bullet for saving pregnant mother's life because maternal death is not the result by a single cause, but from a long chain of underlying social, economic and cultural problems. Since complications during pregnancy and childbirth are difficult to predict, it found out existing risk screening tools are largely ineffective. It should be more critical that woman can access the quality of maternal care to manage complication. Thus, two effective priorities were newly proposed to ensure access to skilled professionals and Emergency Obstetric and Newborn Care (EmONC).

The United Nations Millennium Declaration has signed in September 2000, international community have agreed to work on Millennium Development Goals (MDGs) in order to eradicate poverty gap. Among 8 MDGs goals, MDG 5 aims to improve maternal health with 75% reduction of MMR between 1990 and 2015. Some achievements have been reported toward this target, but further advance are required with effective health programs.

Post 2015 MDGs, international society adopted the 2030 agenda for Sustainable Development on 25 Sep 2015 (UNDP, 2015). New agenda comprised 17 Sustainable Development Goals (SDGs) for next 15 years. The SDGs established a transformative new agenda for maternal health towards ending preventable maternal mortality; target 3.1 of SDG 3 is to reduce the global MMR to less than 70 per 100,000 live births by 2030 (UNDP, 2015). The reduction of MMR is one of the important global health priorities up to now. Also the Global Strategy for Women's, Children's and Adolescents' Health 2016-2030 was launched during the United Nations General Assembly 2015, in New York (World Health Organization, 2015a). This is a road map for the post MDGs agenda as described by the SDGs. It will address all causes of maternal death, inequity of access to quality of maternal care and ensure universal

health coverage (United Nations, 2015). Post-MDG agenda was focused on Universal Health Coverage which we have to consider not only improvement of health indicators but also addressing inequity.

2.5 Skilled Birth Attendants

Safe motherhood action agenda noted to ensure Skilled Birth Attendants at delivery was the most critical intervention to make pregnancy safer. According to a joint statement by WHO, the International Confederation of Midwifes (ICM) and the International Federation of Gynecology and Obstetrics (FIGO), skilled attendant is defined as “an accredited health professional – such as a midwife, doctor or nurse – who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancy, childbirth and the immediate postnatal period, and in the identification, management and referral of complication in women and newborn” (World Health organization, 2004). ICM defines essential competencies for basic midwifery practices and additional skilled requires in each country’s context.

Ministry of Health in Cambodia passed Prakas on Core Competency framework for midwifes in 2013 following to ICM standard. It covers knowledge, attitude and practice on pregnancy, childbirth, postpartum, newborn care, family planning and abortion (Ministry of Health Cambodia, 2013a). Midwife is mainly responsible for normal delivery, while doctor is in charge of obstetric complications. Available evidence suggested that the presence of skilled birth attendants at birth had contributed to the low rate of MMR (Figure 4).

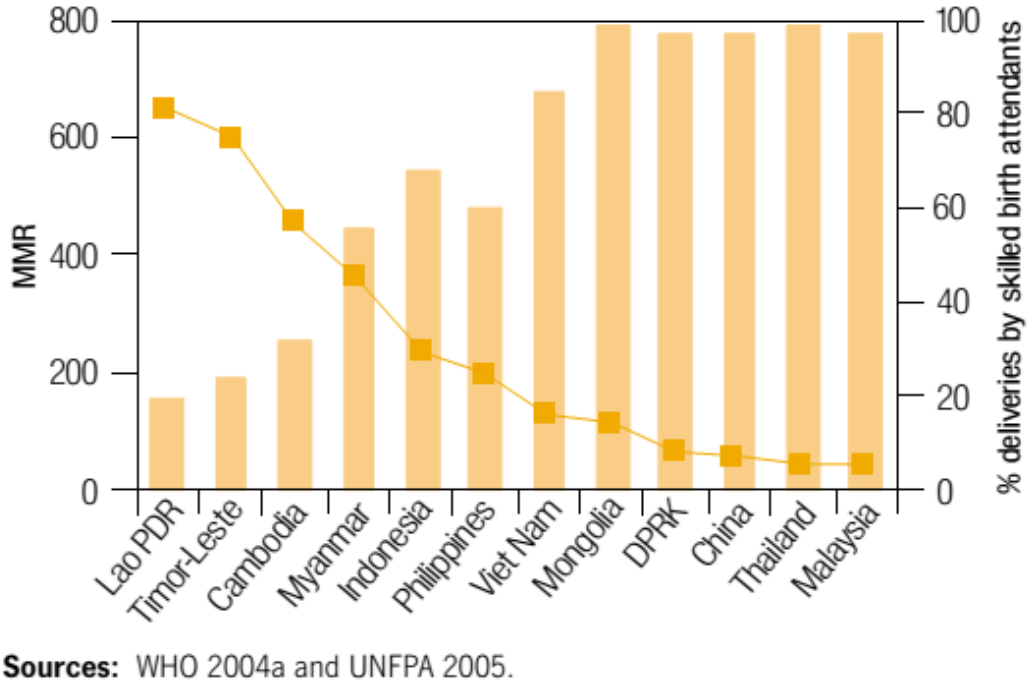

Figure 4: Delivery by skilled birth attendants and Maternal Mortality Ratio (UNFPA, 2006)

2.6 Maternal and Child Health in Cambodia

Cambodia is one of the success countries to reduce MMR in the world and achieved Cambodian Millennium Development Goals (CMDGs) before target year. MMR in Cambodia was the highest among East and South-East Asia, at 472 maternal deaths per 100,000 live births in 2005 (UNFPA, 2006). MMR in Cambodia has significantly decreased from 1200 per 100,000 live births in 1990 to 170 per 100,000 live births in 2014 (World Health Organization, 2015d) and from 472 in 2005 to 170 deaths per 100,000 live births in 2014 (National Institute of Statistics, 2014) (Figure 5).

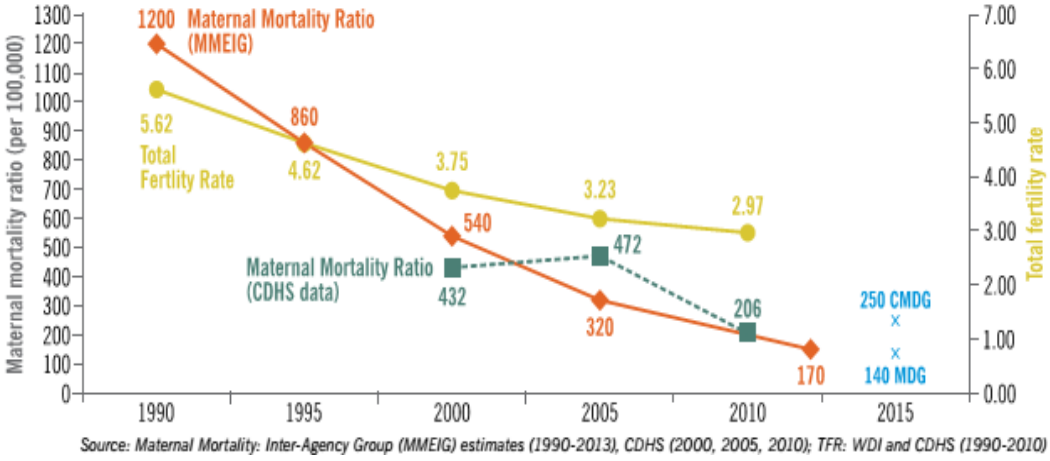

Figure 5: Trend of Maternal Mortality Ratio, Cambodia.
(World Health Organization, 2015c)

The successful reduction of MMR in Cambodia was achieved by fertility declines, socio-economic and educational improvements, rapid increase in facility-based delivery and delivery assisted by SBA, increase the number of health centers and BEmONC facilities, and introduction of health financing schemes. Better road condition has also contributed to considerable improvement of accessibility (World Health Organization, 2015c).

Trend of Cambodian Demographic Health Survey (CDHS) indicated socioeconomic improvements as blow (National Institute of Statistics, 2000, 2005, 2010, 2014).

2.6.1 Economic, educational and environmental improvement

- The proportion of population live below the national poverty line declined from 53.2% in 2004 to 20.5 in 2011
- Gross domestic product per capita increase from 608 in 1993 to 2454 in 2012
- Female literacy increase from 57% in 1998 to 66% in 2009
- Girls net enrollment in primary education increase from 76% in 1997 to 97 % in 2012

- Access to clean water increase from 31% in 1990 to 67% in 2011
- Access to improved sanitation increased from 9% in 1990 to 33% in 2011

2.6.2 Pregnancy factors

- Fertility rate declines from 6 in 1990 to 2.7 in 2014
- Increased the median birth interval to 40 months in 2010 to 43.8 months in 2014.
- The median age at first birth was 22.3 years in 2000 to 22.4 years in 2014
- Reduced the proportion of birth for very young or very old age.

2.6.3 Antenatal care

At least four ANC visits is WHO recommended minimum number of visits during pregnancy (World Health Organization, 2016a). Cambodia applied WHO recommendation as national standards. Recommended schedule of four visits are following;

- 1st visit: before 16 weeks (as soon as possible after a missed menstrual period)
- 2nd visit: 24-28 weeks
- 3rd visit: 30-32 weeks
- 4th visit: 36-38 weeks

There have been significant increases in the proportion of pregnant women who attended at least 4 visits or more, from 9% in 2000 to 76% in 2014 (Figure 5). The median gestational age for first ANC visit declines from 5.8 months in 2000 to 2.5 months in 2014. CDHS 2014 showed 95% of women received ANC from a skilled provider. 79% had first ANC visit in the first trimester as recommended. Among women who received ANC, 82% were informed of pregnancy related complications, 96% had their blood pressure measured, 49% had a urine sample taken and 77% had blood sample taken (National Institute of Statistics, 2014).

2.6.4 Facility-based delivery and delivery assisted by Skilled Birth Attendants

Cambodia has significantly increased the coverage of facility delivery and delivery assisted by skilled birth attendant and reduced MMR in a relatively. Cambodian Demographic Health Survey (CDHS) showed that the coverage of facility delivery

and delivery assisted by skilled birth attendant has increased from 22% and 44% in 2005 to 83% and 89% in 2014, whereas the MMR decreased from 472 to 170, respectively (Figure 6).

In Cambodia, there are two different health indicators for delivery; facility delivery and delivery assisted by skilled birth attendant. Since the distribution of health facility was not enough, at least attending by skilled birth attendant is needed in low-income countries like Cambodia.

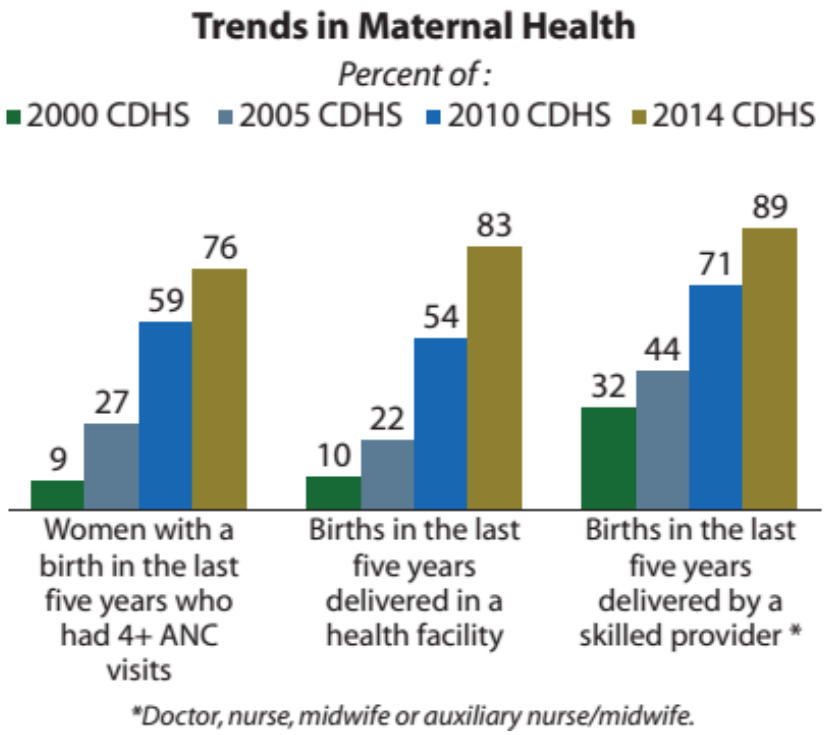

Figure 6: Trend in maternal health services coverage, Cambodia (National Institute of Statistics, 2014)

2.6.5 Health infrastructure

Cambodia has a mixed service delivery system. Public health service delivery is organized through two levels of services, the Minimum Package of Activity (MPA) provided at the health centers, and the Complementary Package of Activity (CPA) provided at the referral hospitals (Ministry of Health Cambodia, 2012).

MPA is minimum level primary health care services mainly for rural populations. One Health Center covers around 10,000-20,000 people each. Services include initial consultations and primary diagnosis, emergency first aid, chronic disease care, maternal and child care (including normal delivery), birth spacing advice, immunization, health education and referral. In 2010, only 43% of health centers provided the full minimum package of services. Constraints include the absence of key personnel, the inadequacy of essential drugs support and the absence of other operational guideline requirements.

CPA classifies by three levels based on number of staff, beds, medicines, equipment and clinical activities:

- CPA1 hospitals have basic obstetric service. There were 33 hospitals in 2011.
- CPA2 hospitals provide basic and emergency care services and other specialized services. There were 31 hospitals at this level in 2011.
- CPA3 hospitals provide large-scale surgery and various specialized services. In 2011 here were 26 hospitals at this level.

The distribution criteria of government health facility were showed in Table 2

Table 2: Distribution criteria of health facilities

Facility	Accessibility	Target population
Referral hospital CPA	• 20-30km between two hospitals • Maximum 3 hours by car /boat	Optimal: 100,000-200,000
Health center MPA	• Within 10km radius or • Maximum 2 hours walk	Optimal: 10,000

(Ministry of Health Cambodia, 2008)

The total number of health facilities increased from 514 to 1,029 of health centers, from 67 to 82 of referral hospitals in 1995 to 2012, respectively (Figure 7). Per information from Svay Ring Provincial Health Department, the number of health centers in Svay Rieng Province increased from 37 to 61, in 1995 to 2015 respectively (Table 3).

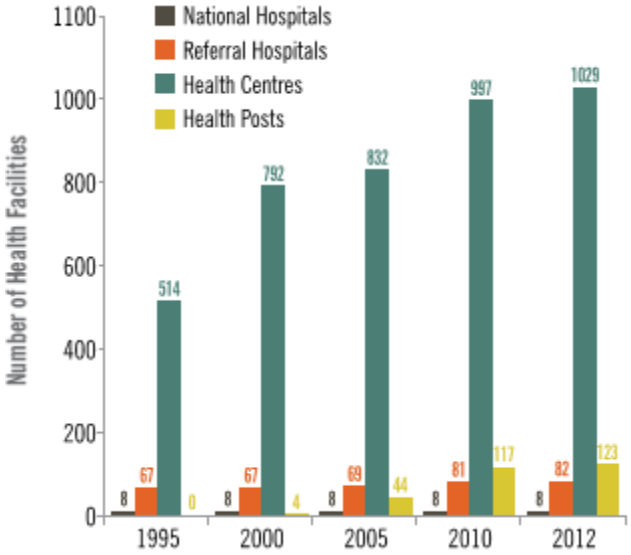

Figure 7: Number of health facilities, Cambodia
(World Health Organization, 2015c)

Table 3: The number of health facilities in Svay Rieng Province

	Operational District			Referral Hospital			Health Center		
year	1995	2007	2015	1995	2007	2015	1995	2007	2015
Svay Rieng	3	3	3	3	3	3	37	37	61

(Svay Ring Provincial Health Department)

2.6.6 Emergency Obstetric and Newborn Care

Emergency Obstetric and Newborn Care (EmONC) is one of the essential programs aimed at reducing maternal and newborn mortality. In Cambodia, the leading causes of maternal deaths are postpartum hemorrhage, infection and complications from abortion and hypertension. EmONC represent a set of clinical interventions including vacuum extraction, manual removal of placenta and antibiotics which address each of the direct causes of maternal deaths. Differences between basic EmONC and comprehensive EmONC are shown in Table 4. Recently, neonatal resuscitation was included in the component of EmONC.

The review of Emergency Obstetric and Newborn Care reported 110 facilities could provide BEmONC, 37 facilities could provide Comprehensive EmONC (CEmONC) in nationwide (Ministry of Health Cambodia, 2009). There are three BEmONC facilities and two CEmONC facility in Svay Rineg province (Dr. Muong Sopha, the representative of Maternal and Child Health UNFPA Cambodia, personal communication, June 2016).

Table 4: Basic components of BEmONC and CEmONC

Basic EmONC	Comprehensive EmONC
• Antibiotics IM and IV	**A Basic EmONC plus:**
• Oxytocics (IM and IV)	• Surgery (caesarean section)
• Anticonvulsants such as magnesium sulphate	• Blood transfusion
• Manually remove the placenta	
• Post Abortion Care (MVA)	
• Assisted vaginal delivery (vacuum extraction, forceps)	
• Perform neonatal resuscitation of newborn	

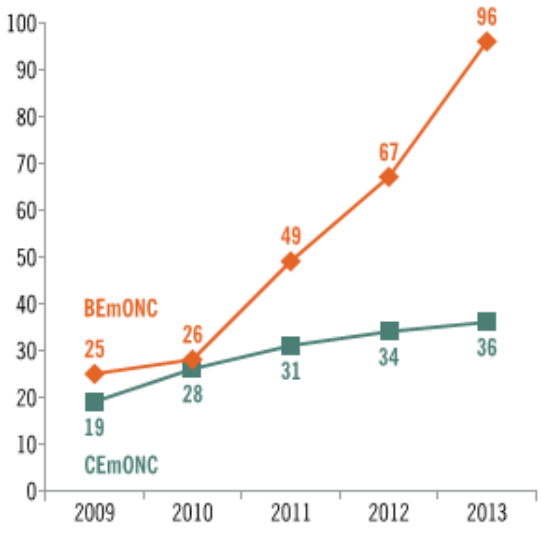

Figure 8: The number of EmONC facilities in Cambodia, 2009-2013 (Ministry of Health Cambodia, 2015)

2.6.7 Health financing schemes

- **Performance-based contracting (PBC)**

Performance-based contracting schemes started in late 2005 as a supply-side financing strategy to improve the performance of public health facilities. Outsourcing management to international organization has implemented in Cambodia since 1990. The contracting has financed by donor or domestic funding. Contracted facilities receive incentives by certain process and output indicators. They also receive incentive for staff's capacity building, basic drug and materials. The performance of contracted facilities has improved to be ensured minimum package of activities (P. Ir, Horemans, Souk, & Van Damme, 2010).

- **Government Midwifery Incentive Scheme**

Government Midwifery Incentive Scheme (GMIS) has introduced in 2007 as a supply-side financing strategy funded by government in nationwide. GMIS aims to boost facility delivery by paying midwifes and other health personnel with cash incentive based on the number of live birth assisted in public health facilities. USD15 for a live birth in health center and USD10 for a live birth in referral hospital will be paid to midwives. Health center is the place for normal delivery, so government provides stronger incentive to assist normal delivery in health center. This is commonly known as supply-side result-based financing (RBF) to motivate midwives to promote facility delivery, thereby contributing the reduction of MMR. It will contribute to improve health system performance and heath outcome such as the proportion of facility delivery.

Recent study conducted impact evaluation and suggested GMIS is an effective mechanism to complement other intervention (P Ir et al., 2015). GMIS brought midwives made change their behavior and practice from promoting home delivery to facility delivery. Key informant interview gave us insights about factors associated to increase of facility delivery. They mentioned improvement of health infrastructure, equipment and supply for delivery, capacity building of midwives, health center with no trained midwife from 223 in 2006 to zero in 2009. Comprehensive review on Health Equity Funds suggested that compensation of low salary of midwives by GMIS brought better attitudes towards the poor (Annear, 2010). Midwife incentive

and PBC contributed the improvement of health provider's performance midwives stayed health center regularly and changed their behavior better than before (P Ir et al., 2015; P. Ir et al., 2010).

- **Health Equity Fund scheme**

Health Equity Funds (HEFs) scheme started in late 2005 as a demand-side health financing mechanism to promote access to public health facility for the poor. The management of HEFs was organized by Non-governmental Organization (NGO) acting as a third party purchaser. HEFs beneficiaries are identified by criteria at community level or at health facilities. HEFs cover user fee, transportation and food of beneficiaries. Comprehensive review of HEFs showed that, overall, coverage of the poor was extensive but not complete and targeting of the poor was accurate and cost-effective (Annear, 2010). Available evidence suggested that hospital-based HEFs contributed for reducing financial barriers and out-of-pocket expenditure of the poor (Hardeman, 2004; Noirhomme et al., 2007).

- **Voucher**

Ministry of Health and Belgian Technical Cooperation started Voucher schemes in 2007 to a complement of existing Health Equity Fund scheme in three districts, the objective of this schemes was to improve access to safe delivery for poor women. The management of voucher scheme was sub-contracted to NGOs operating HEF, Voucher Management Agency. Recipients were poor pregnant women in catchment area. Poor women were identified by village health volunteer by using same questionnaire of HEF. Eligible women could receive a voucher with five detachable coupons, which provide free services at health center (antenatal care, delivery and postnatal care) and transportation cost with five round trips from her home to health center and referral from heath center to referral hospital in complications. The vouchers are only vailed in current pregnancy.

Available evidence showed the number of facility delivery increased sharply after introduction of Voucher and HEF schemes (P. Ir et al., 2010) and suggested the combination of HEF and voucher had a potential for reducing financial barriers and

improve access to SBA among poor women (P. Ir et al., 2010; Van de Poel, Flores, Ir, O'Donnell, & Van Doorslaer, 2014).

2.6.8 Strengthening midwives

Cambodia has faced severe shortage of health professional after Pol Pot regime (1975-1979). Reconstruction of health system was required by producing the number of health personals to provide basic health services. The Ministry of Health started to foster 1 year primary midwife course (PMW), but the quality of PMW were found to be not satisfactory. The first Midwifery Forum was held in 2005 and suggested to increase the number of midwives at health center level, motivate midwives by increasing their salary and incentives and strengthen midwifery education and trainings (Ministry of Health Cambodia, 2006b). In response to the findings, Government funded Midwifery Incentive Schemes was implemented in 2007. “Fast track initiative” was launched in 2008 to prioritize midwifery strengthening (Ministry of Health Cambodia, 2010a). With a slogan “midwives in all health centers”, Ministry of Health accelerated to allocate at least one midwife for each Health Center. Three years direct entry midwifery training was introduced to boost the number of secondary midwife (SMW). All health centers have met at least one primary midwife (with 1 year education) by 2009 and over 50 % of health center had secondary midwife (with 3 years education) for one facility (Ministry of Planning Cambodia, 2010). Approximately 750 midwifes newly graduate school every year, 5128 midwifes is now working in public sector in Cambodia (Ms. Chea Ath, Director of Cambodian Midwife Association, personal communication, Dec 2015).

Midwifery regulation is now on the process to develop in order to control the quality of midwifery care. Previous study identified work sharing of nursing cares among health professional and family in hospital setting (Sakurai-Doi et al., 2014). In Cambodia, the licensing and regulation system for health professional has been under the process and national licensing exam has just started. It is important to foster highly qualified midwifery personnel in next decade. The comprehensive and systematic approach focused on midwifery contributed to increase the number of

midwives working at health centers (Figure 9) and rapid achievement of MMR reduction.

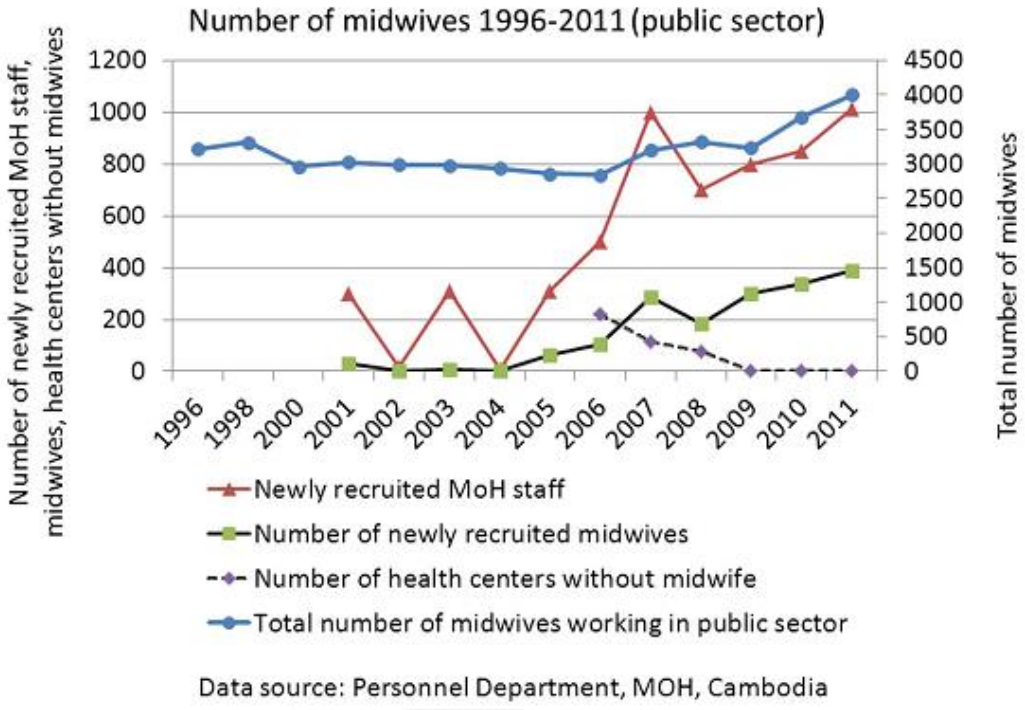

Figure 9: Trend of number of midwives (public sector) 1996-2011 (Fujita et al., 2013)

2.7 The three delays model

Thaddeus and Maine have presented the conceptual framework of the three delays model by multidisciplinary literature review (Figure 10). The model focused on the time between the onset of obstetric complication and its outcome and identified obstacles of quality and timely health service utilization. Maternal death could be preventable, while complex factors affected delays to lead maternal mortality. Phase 1 delay is the delay in deciding to seek care. Factors include the status of women, distance from health facility, financial and opportunity cost, previous experience of health service and perceived quality of care. The phase 2 is the delay in reaching an adequate health care facility. Examples are physical accessibility such as facility

distribution, travel time and road condition. The phase 3 delay is the delay in receiving timely adequate care at the facility. It can result from impolite behavior, a lack of health staff, supply and equipment and poor skilled health professionals. The two mechanisms which quality of care affects the decision to seek care are satisfaction or dissatisfaction with the outcome, and satisfaction or dissatisfaction with the received services. The study has identified factors associated with the decision to seek care which can be constraints in health service utilization. Distance, cost and quality of care are major obstacles in the 1st and 2nd delays.

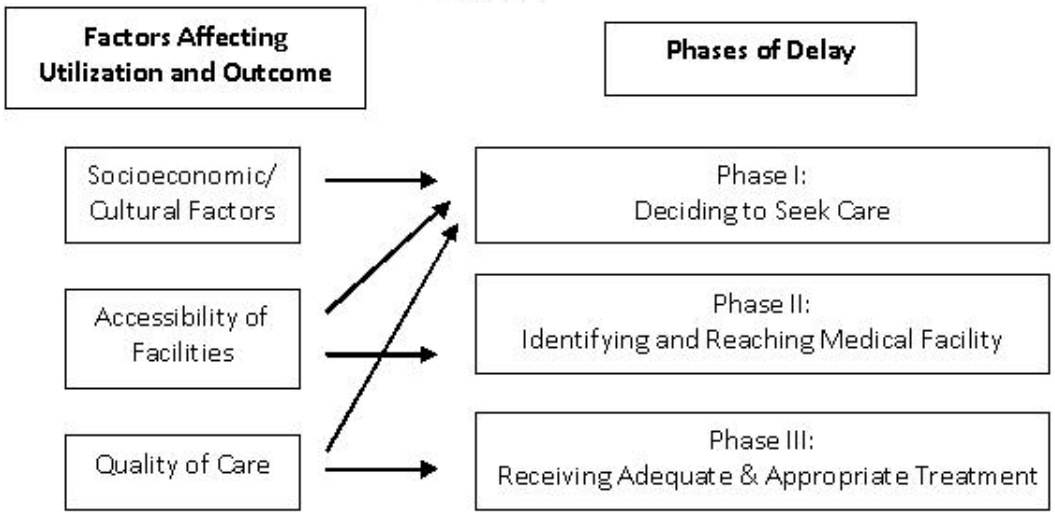

Figure 10: The three delays model.
(Thaddeus Sereen & Maine Deborah, 1994)

2.8 Birth Preparedness and Complication Readiness

Birth Preparedness and Complication Readiness (BP/CR*)* is the strategy to reduce "the three delays" to cause maternal death. Birth Preparedness includes identifying a skilled birth attendant and motivating women to make a plan to give delivery with SBA. Complication readiness will raise awareness of danger signs of pregnancy and promote decision to seek appropriate care (JHPIEGO/Maternal and Neonatal Health Program, 2004b). There are several levels of BP/CR, which are demand side (individual woman, her husband, the community) and supply side (the health facility,

the provider, the policy maker). BP/CR encourage women, husbands and the community to identify transportation, preparing money for emergency, identify blood donor and promote the use of SBA in delivery. It also requires the provider and health facility to be ready for attending delivery and receiving complication cases. Maternal and Neonatal health (MNH) program developed the matrix to standardize the indicators (JHPIEGO/Maternal and Neonatal Health Program, 2004a). Figure 10 is the conceptual framework for BP/CR to increase the SBA utilization.

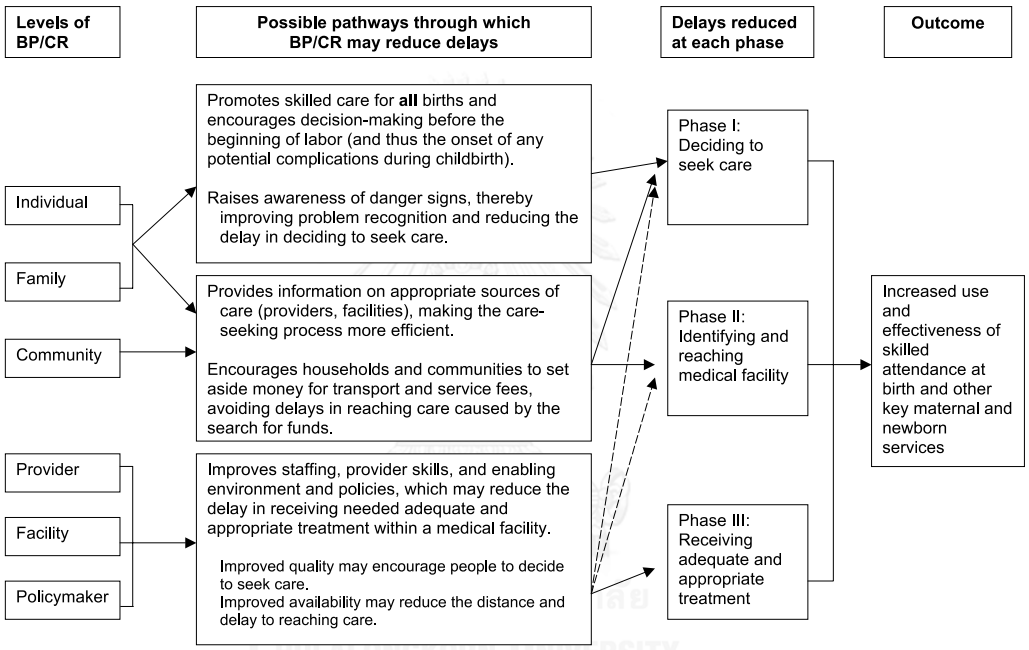

Figure 11: Conceptual framework on how BP/CR may increase the use of skilled care (JHPIEGO/Maternal and Neonatal Health Program, 2004b)

2.9 Anderson's behavioral model of Health Service Utilization

The model was initially developed in late 1960s to measure how and why family use health services, and shifted to the individual as a unit of analysis. The model consists of three domains that affect health service utilization: predisposing, enabling and need factors (Andersen, 1995) (Figure 12).

Among **predisposing** characteristics, demographic factors such as age, gender and marital status represent biological propensity to use health services. Social structure such as education, occupation and ethnicity measures ability of individual to cope with exiting problems, available resources in the community and health status of physical environment. Health beliefs are knowledge, attitudes and value that people have health and health service that influence health service utilization. For example, it includes the attitudes towards facility delivery and childbirth.

Both community and personal **enabling** resources represent actual ability to obtain health service. First of all, health facility and health personnel must be available where people live. Then, there would be important to have transportation, income, health insurance, regular source of care and travel and waiting time. Health insurance benefit is potential important enabling resource.

Need is immediate cause of health service utilization. Need factors consider how people view their own general health status as well as how they experience symptoms of illness, pain and worries and magnitude to seek health professional. Perceived need will be explained by social structure and health beliefs. Need also defines by professional assessment from biological point of view (evaluated need). In this study, need factors depend on the perceived severity of danger signs, antenatal care and history of last pregnancy?

Use of health service is outcome measured by a particular condition, type of service, practitioner and linkage of illness episode.

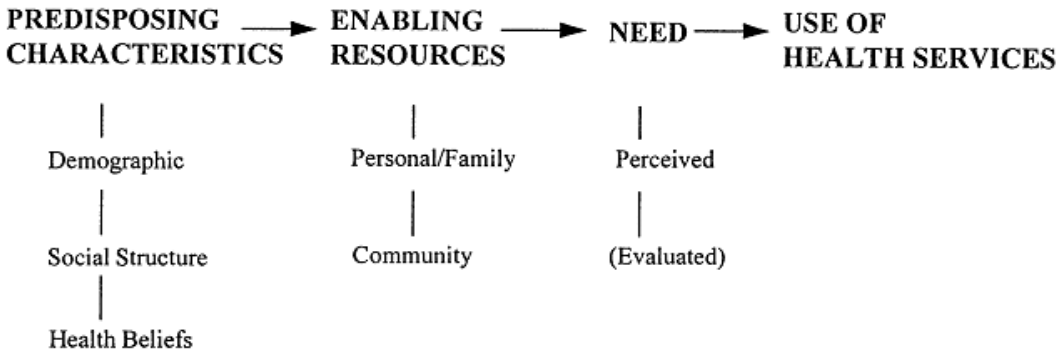

Figure 12: Anderson’s behavioral model

Analytical framework of this study followed modified Anderson's Health Service Utilization model. Outcome (use of health service) is facility and home delivery assisted by skilled birth attendants. Dependent variable is birth preparedness and complication readiness. The factors related to birth preparedness and complication readiness were analyzed in terms of predisposing characteristics, enabling resources and needs factors.

2.10 Previous study

2.10.1 Dependent variable

- **Birth preparedness and complication readiness**

According to WHO, birth preparedness and complication readiness includes 8 following elements; (1) the desired place of birth; (2) the preferred birth attendant; (3) the location of the closest appropriate care facility; (4) funds for birth-related and emergency expenses; (5) a birth companion; (6) support in looking after the home and children while the woman is away; (7) transport to a health facility for the birth; (8) transport in the case of an obstetric emergency and (9) identification of compatible blood donors in case of emergency (World Health Organization, 2006). Since the numbers of components were different in each study, this study account for five components based on literature review(Gebre et al., 2015).

Bintabara et al conducted community based cross sectional study among 428 women who delivered two years prior to survey in chamwino district, central Tanzania. Women was considered well-prepared for birth and its complication if she reported at least three steps among know expected due date, save money, identified skilled birth attendant / health facility, mode of transport and identify two compatible blood donor. 249 (58.2%) of respondents were considered to be well prepared (Bintabara et al., 2015).

Gebre et al conducted community based cross sectional study targeted 578 pregnant women in Duguna fango district, Wolayta zone, Ethiopia. Taking at least 3 steps was considered being well prepared among 5 elements; arrangement for

transportation, save money, identify skilled birth attendant, identify health facility and identify blood donor. 18.3% of women were considered well-prepared for birth and complication (Gebre et al., 2015).

Markos conducted community based cross sectional survey in Goba woreda, Oromia region Ethiopia among 580 women. Only 29.9% of respondents were considered well prepared for birth and its complication if she identified four or more components from seven items; identify place of delivery, plan skilled birth assistant during delivery, saved money, plan a mode of transport to place of delivery, plan blood donor, detect early signs of an emergency and identify institution with 24 hour EmONC service (Markos Desalegn & Daniel, 2014).

Kabakyenga JK (2011) conducted community survey in Mbarara district Uganda among 764 recently delivered women. 35% of respondents were found 3 or more arrangements out of 4 components; save money (91%), identify health professional (61%), identify means of transport (61%) and bought delivery kit (71%) (Kabakyenga et al., 2011).

2.10.2 Independent Variables

Socio-demographic information

- **Parity**

Primipara was the significant predictor of birth preparedness and complication readiness in the studies in Duguna Fango district, Wolayta Zone, Ethiopia (Gebre et al., 2015) among 578 pregnant women (AOR=3.37, 95% Cl: 1.45-7.82) and in Aleta Wondo district in Sidama Zone, South Ethiopia (Hailu et al., 2011) among 743 pregnant women (OR=6.82, 95% CI; 1.27-36.55).

- **Family wealth**

There was no study to assess relationship between family wealth and birth preparedness but there are many previous studies to assess association between wealth and maternal health service utilization. Secondary data analysis on CDHS 2000-2010 showed the gaps of health service utilization among wealth quantile (Dingle Antonia,

Powell-Jackson, & Goodman, 2013). Coverage of maternal health services improved greater among wealthier quintile compared to poorer quantile. The previous study in Cambodia found substantial socioeconomic disparities in use of maternal health services in Cambodia (Wang & Hong, 2015). It reported women from the wealthiest households are over seven times more likely to attend antenatal care and eight times more likely to report both antenatal care and skilled birth attendance compared with women from the poorest households. The study in Southern Ethiopia also showed that women in the 3rd wealth quintiles (OR = 1.73; 95%CI: 1.12, 1.84) and 4th quintiles (OR = 1.28; 95% CI: 1.11, 1.73) were more likely to use skilled maternal care as compared to those in the lowest quintile (Hailu et al., 2011). The study in Nepal showed higher household income determined (2.74, 95% CI; 1.81, 4.15) for institutional delivery of their wives (Bhatta & Aryal, 2015).

- **Health insurance**

There was no study to assess the relationship between health insurance and birth preparedness, but the previous studies to assess the impact of introduction health insurance scheme in relation to maternal health service utilization gave us important insights.

Ir et al reported that introduction of health financing schemes including Health Equity Fund, voucher and Midwife Incentive scheme made dramatic increase in facility delivery and delivery assisted by skilled birth attendant in Cambodia (P Ir et al., 2015). Results from qualitative date also suggested that health financing schemes together with other efforts has brought considerable improvement on utilizing maternal health services.

Knowledge

Low level of knowledge on obstetric danger signs was found in several studies.

The study in chamwino district, central Tanzania (Bintabara et al., 2015) targeted 428 women who delivered 2 years prior to survey reported that 68.7% of respondents were not able to mention any danger signs in three phases. Only 23.6% of respondent who were able to mention five danger signs in three phases were considered knowledgeable on key danger signs in pregnancy, childbirth and postpartum.

The study in Uganda (Mbalinda et al., 2014) showed low level of knowledge on obstetric danger signs and low level of birth preparedness and complication readiness. Only 36.5% of women were able to mention at least two of five components of birth preparedness and complication readiness, saving money, prepare place of birth, identify transportation, identify birth companion and identify a blood donor.

The study in Mbarara district Uganda (Kabakyenga et al., 2011) among 764 recently delivered women showed that only 19% had knowledge of three or more danger signs in three phases. Severe vaginal bleeding was the most common mentioned complication; pregnancy (49%), childbirth (64%) and postpartum (57%)

The study in Gambia (Anya, Hydara, & Jaiteh, 2008) showed very low knowledge on danger signs among 457 pregnant women. The proportion of women who had awareness of danger signs were 28.9% for anemia, 24.6% for hypertension, 14.8% for hemorrhage and no one recognized prolonged labor was a danger sign.

- **Knowledge and years of education**

Some study found significant association between knowledge and education. The study in Rufiji district Tanzania among 1118 who had been pregnant in the past 2 years, it showed having secondary education or more increased awareness of obstetric danger signs (OR=5.8, 95% Cl:1.8-1.9) (Pembe et al., 2009). This is consistent with the study in Mbarara district Uganda among 764 recently delivered women (Kabakyenga et al., 2011). This is the fact that educated women know the importance of planning for birth and ready for complication

Attitude

Attitude is a way of being, a position. This is an intermediate variable between the situation and the response to this situation. It helps explain that among the possible practices for a subject submitted to a stimulus, that subject adopts one practice and not another (USAID, 2011). There was little study about attitude towards birth preparedness and complication readiness.

Enabling factors

- **Accessibility of health services**

Previous studies in Cambodia identified distance, cost, quality of care, knowledge of users, and socio-cultural practices were barriers for accessibility (Bigdeli, 2009; Hardeman, 2004; Jacobs, Ir, Bigdeli, Annear, & Van Damme, 2012). In this study, accessibility of health services was classified into geographical accessibility, financial accessibility and cultural accessibility.

Geographical accessibility means that distance to the health facility, time and means of transportation are acceptable to people. The distance to nearest health facility and inadequate transportation are big barriers to seek health care and actual obstacle to reach health facility (Choulagai Bishnu et al., 2013; Thaddeus Sereen & Maine Deborah, 1994). The study in Nepal (Choulagai Bishnu et al., 2013) showed that women living within 30 minutes to nearest health facility were 1.4 times more likely to use ANC (AOR=1.4, 95% Cl:1.18-1.77) compared to those who had to walk more than 30 minutes to facility, and that women living within 30 minutes to nearest health facility were 1.25 times more likely to use SBA (AOR=1.25, 95% Cl:1.03-1.52) compared to those who lived far. Distance to health facility influenced women's utilization of maternal services. Also the study in Afghanistan (Tappis, Koblinsky, Doocy, Warren, & Peters, 2016) reported common barriers of SBA utilization were physical accessibility like distance to health facility and a lack of transport. The poor road condition makes pregnant women more difficult to get to health facilities. Far distance also makes patient wait until the illness became serious (Rahaman M. Mujibur, K.M.A. Aziz, M.H.Munshi, Yakub Patwari, & Rahman, 1982). A study in rural Cambodia showed that distance to health center (less than 2 km) is 5 times likely to use SBA at birth than the distance more than 5 km(Yanagisawa & Wakai, 2008).

Financial accessibility means delivery costs are affordable for woman's family. Cost is big obstacle for people to utilize health services, which includes user fee, transportation, medication, gratuities and opportunity cost (Ministry of Health Cambodia, 2006a; Thaddeus Sereen & Maine Deborah, 1994). Inflexible payment to health facility made rural Cambodian women prefer to use traditional birth attendant (Matsuoka, Aiga, Rasmey, Rathavy, & Okitsu, 2010). It was common in Cambodia to give additional money to health professionals when people received health services. It sometimes seemed unofficial fee for foreigners, in other word, under-table money, while it was meant to be sorry to touch blood for Cambodian people. Opportunity cost

is also important aspect in terms of time lost from more productive activities such as farming and cooking. When pregnant woman travel to health facility in low income countries, she often takes her upper children with some accompanists. Affordability of all these transportation affects utilization of the facility service.

Cultural accessibility is the decision making power among the family and community to seek skilled birth attendant at birth. In many African countries, a woman has no powers to make decision on their own health issue. That is why husband involvement in health education is effective for improving women's health status. Husband involvement in maternal care services were recommended by studies in Myanmar (Wai et al., 2015) and Tanzania (August et al., 2015). A study in Cambodia gave interesting finding that the key decision maker was a woman herself in deciding whether she deliver with TBA or SBA. Of course many said husbands were involved in their decision making (Ministry of Health Cambodia, 2006a).

- **Availability of health service**

Insufficient and unqualified health facility and health staff, inadequate management of organization, shortage of essential drug, blood, supply and equipment leads to delays in receiving care as they need (Thaddeus Sereen & Maine Deborah, 1994). The lack of emotional support, impolite attitudes of health staff and discomfort in hospital setting contributed women's dissatisfaction with health service in rural Cambodia (Matsuoka et al., 2010). A report on Obstacles to deliveries Trained Health Providers in Cambodian revealed that rural women did not want to use health facility because of negative attitude and absence of health staff (Ministry of Health Cambodia, 2006a)

Needs factors

- **Perceived severity**

Severe vaginal bleeding was the most common obstetric danger sign in many studies; Mbarara district Uganda (Kabakyenga 2011), Mulago hospital Uganda (MbalindaSN 2014) and Rufiji district Tanzania (Pembe AB 2009). It may because it is most visual signs to be recognized as a danger sign. A previous study showed that

cultural beliefs strongly influence on the perception of health condition, that is, what are considered normal and abnormal during pregnancy (White 2002). The perceived severity of symptoms is important to decide whether woman to seek care or not. Some traditional beliefs prevent a pregnant woman from receiving timely interventions. Pregnancy and childbirth is most likely to be considered natural event. But actually every woman has a potential risk of complications. Recognition of danger signs between woman and health professional may not coincide.

Yanagisawa et al. (2008) conducted community survey in rural Cambodia to investigate utilization of skilled care when women faced life threatening obstetric complications. Prolonged labor was the most frequent cause to access professional health care.

In Cambodia, the term of delivery is widely expressed “crossing the river (chlong tonlee)”, which means giving birth can be a dangerous experience for women just like across the Mekong River. Patrice M. White (2002) revealed interesting Khmer women’s beliefs of complications, postpartum bleeding is the desired situation which removes bad things out of the body. However, from biomedical condition, sever bleeding is the dangerous and abnormal signs indicated hemorrhage and anemia.

- **Antenatal care**

Antenatal care (ANC) defined as the care provided to a woman during her pregnancy. ANC is an entry-point to maternal health care system including appropriate risk screening, evidence-based health education, and encouraging women to seek skilled birth attendants at birth (Lincetto O, Mothebesoane-Anoh S, Gomez P, Munjanja S, & S., 2006). Current WHO recommendation is each pregnant woman receives minimum four times ANC visits supervised by skilled ANC attendant (World Health Organization, 2007). The timing of the first visit should be before 16 weeks of pregnancy the second visit should be between 24 and 26 weeks, the third visit between 30 and 32 weeks, and the fourth visit between 36 and 38 weeks (World Health Organization, 2015b). The global ANC indicators are (1) the proportion of women with a recent live birth who report at least one ANC visit with skilled health personnel (ANC 1+) and (2) the proportion of women with a recent live birth who report at least four ANC visit with any providers (ANC 4+) (United Nations, 2016).

One of the objectives of ANC is to offer health information to improve mother and infant health. Even though obstetric emergency cannot be predicted, it is important women to be educated to recognize the symptoms to lead serious conditions and act to prevent it.

Antenatal care is important to reduce morbidity risk for mother and child during pregnancy and delivery. CHDS 2014 showed younger women (less than age 35) were more likely to receive antenatal care from trained health professional (96%) than old women (age 35 and older) (89%). Primimata (98%) also more likely to receive ANC from skilled health personal than for birth order six and more (72%) (National Institute of Statistics, 2014). The use of antenatal care service was strongly associated with women's educational level. Women who have a secondary education or higher were more likely to receive antennal care from trained personal (99%) than women with a primary education (95%) and women without education (86%). Health professional recommend the first antennal care need to within the first three month (first trimester) of the pregnancy. It continue monthly through 28 weeks of pregnancy and then every two weeks up to 36 weeks (or until birth) if women visit antennal care as protocol, it will be 12 to 13 times visits. Every women should be monitored risk of complication through antenatal care; information of danger signs of pregnancy-related complications, blood pressure measurement, weighted, urine and blood sample testing. According to CDHS, urban and rural women were equally informed danger signs of complication.

- **History of abortion**

Global health indicator of safe abortion is the provision of abortion by trained providers in a health facility. The proportion of unsafe abortion has been higher among young women and lower socio-economic status(Malarcher S, Olson LG, & N., 2010). A new study estimated that there were 35 abortions per 1000 women aged 15-44 during the period 2010-2014. This means there were 56 million abortions per year. Abortion rates have declined in the high income countries but not in the low-income counties(Gilda Sedgh et al., 2016). Access to effective contraceptive methods is important to prevent unsafe abortion. But unintended pregnancy may occur among

women using contraceptive methods. In Cambodia, abortion can legally conduct only before the 12th weeks of pregnancy.

- **History of obstetric complications**

The study on determinants of skilled birth attendant in Cambodia (Yanagisawa, Oum, & Wakai, 2006) showed that women who experienced prolonged labor were 6 times more likely deliver at health facility than those who had not.

2.10.3 Association between independent variables and birth preparedness and complication readiness

The significant determinants of birth preparedness were found to be **knowledge of danger signs**. The study in Duguna Fango district, Wolayta Zone, Ethiopia (Gebre et al., 2015), 578 pregnant women showed that significant predictors for well preparedness were knowledge at least two danger signs during pregnancy (AOR=2.81, 95% Cl: 1.69-4.67). The study in chamwino district, central Tanzania (Bintabara et al., 2015), among 428 women who delivered 2 years prior to survey, the odds of birth preparedness and complication readiness were four times greater among women who had knowledge on key danger signs than those who were not (AOR=4.16, 95% Cl: 2.32-7.45). The study in Mbarara district Uganda (Kabakyenga et al., 2011) among 764 recently delivered women also showed statistically significance (OR=1.8, 95% Cl: 1.2-2.6).The study in Uganda (Mbalinda et al., 2014) among 810 women admitted in antepartum period Mulago hospital (AOR=3.9, 95% Cl: 2.0-7.5). The study in Goba woreda, Oromia region Ethiopia(Markos Desalegn & Daniel, 2014) among 580 women showed significant association with knowledge on key danger signs in pregnancy (AOR=1.74, 95% Cl: 1.06-2.88) and knowledge on key danger signs in postpartum (AOR=2.08, 95% Cl: 1.20-3.60).

Also previous studies found statistical association between **ANC visits** and birth preparedness and complication readiness. The study conducted among 578 pregnant women in Duguna Fango district, Wolayta Zone, Ethiopia (Gebre et al., 2015), showed that significant predictors for well preparedness were ANC (AOR=2.95, 95% Cl: 1.62-5.37). The study among 538 women who gave birth in last 12 months

preceding the survey in Adigrat town, north Ethiopia (Hiluf M & M., 2007) women who had advise about birth preparedness during ANC follow up (OR=2.65, 95% Cl: 1.66-4.23). The study among 312 mothers of infants aged 204 months in 11 slum of India (Agarwal S et al., 2010), availing ANC (OR=1.7, 95% Cl: 1.05-2.8). The study among 743 pregnant women in Aleta Wondo district in Sidama Zone, South Ethiopia(Hailu et al., 2011), the adjusted multivariate model showed that significant predictors for being well-prepared were maternal availing of antenatal services (OR=1.91 95% CI; 1.21-3.01). Among 428 women who delivered 2 years prior to survey in chamwino district, central Tanzania (Bintabara et al., 2015) four or more ANC visit (AOR=1.94, 95% CI;1.17-3.21) and in Goba woreda, Oromia region Ethiopia(Markos Desalegn & Daniel, 2014) ANC follow up (AOR=807, 95% CI; 2.41-27.0)

2.10.4 Delivery assisted by skilled birth attendant

Outcome of this study is the delivery assisted by skilled birth attendant.

The study in chamwino district, central Tanzania (Bintabara et al., 2015) among 428 women who delivered 2 years prior showed that birth preparedness and complication readiness was associated with facility delivery (AOR=2.45, 95% Cl; 1.12-5.34). The study in Kaski district Nepal(Karkee et al., 2013) revealed that those who had higher level of birth preparedness and complication readiness were more likely to use skilled birth attendant for birth (OR=1.51, $p<0.001$). Six month pilot project with community participatory approach was conducted to introduce birth preparedness in rural Cambodia. The project scope was well fitted to government strategies; Health Sector Strategic Plan (Ministry of Health Cambodia, 2000) and Family Planning and Safe Motherhood(Ministry of Health Cambodia, 2004). After intervention, there found increase ANC attendance, SBA use and delivery in health facilities in target area (Skinner & Rathavy, 2009). Yanagisawa et al. (2006) conducted household survey of women who had delivered previous 3-month to identify the determinants for skilled and unskilled birth attendant use in rural Cambodia. The result showed that previous contact with a skilled attendant through antenatal care was a significant determinant to give birth at facility, while the types of

birth attendant of previous delivery was a significant factor for home delivery. Client's satisfaction may influence to re-use of health services (Yanagisawa et al., 2006). Advantages of using SBA are safety, trained and specialized in childbirth, good hygiene, ANC and PNC and diagnosis skills. And disadvantages are corruption, discrimination, unofficial fee, inconvenience (no bed), limited service (did not provide24 hour service) (Ministry of Health Cambodia, 2006a).

A recent systematic review showed that birth preparedness and complication readiness can reduce maternal and neonatal mortality (Soubeiga D, Gauvin L, Hatem M , & M., 2014). Another systematic review showed that birth preparedness and complication readiness could increase knowledge of danger signs and preparation for birth, however this did not always bring an increase use in SBA at birth (Solnes Miltenburg et al., 2015).

CHAPTER III

METHDOLOGY

3.1 Research Design

This is a Cross-sectional study using community KAP survey in rural Cambodia.

3.2 Study Area

Cambodia is a low-income country in South East Asia with 14.8 million population. 80% of people live in rural area and engaged in agriculture. This study conducted in Svay Chrum district, Svay Rieng Province which is one of the marginalized area among the nation. Svay Rieng Province is located in the South-East of Cambodia, borders South-East with Viet Nam and West with Prey Veng Province. Svay Rieng province has 8 districts, 80 communes and 689 villages and 578,380 total population (National Institute of Statistics Ministry of Planning, 2013) Svay Chrum district is the most populated district with 16 communes and the inhabitants of 120,318 persons as of 2008. There are 1 Provincial Health Department, 3 Operational District (OD), 2 referral hospitals and 43 health centers.

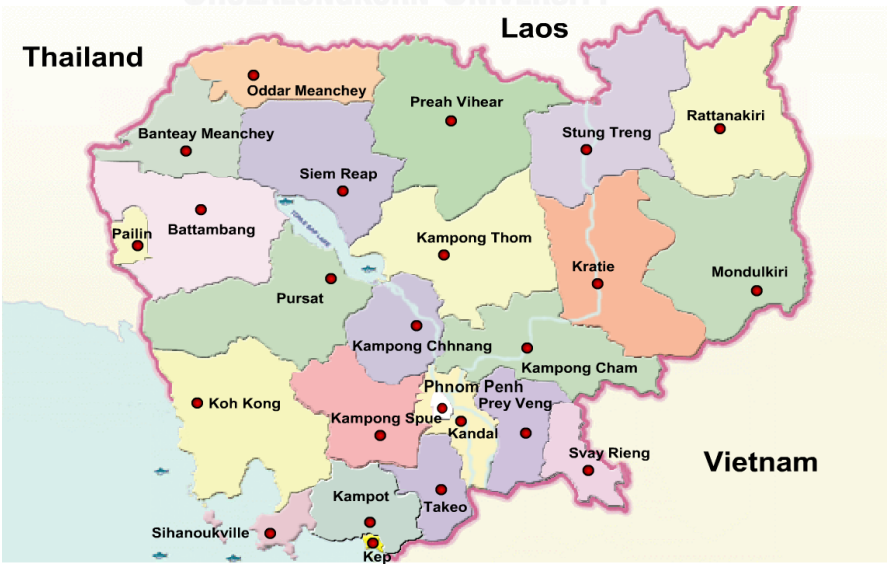

Figure 13: Map of Cambodia

Figure 14: Map of Svay Churn district, Svay Rieng Province

3.3 Study Population

The study population is women of reproductive age (15-49 years old) living in Svay Churun district, Svay Ring province. The proportion of women in reproductive age is approximately 27 % of the population (National Institute of Statistics, 2014), thus there will be estimated 32,486 women in reproductive age in the district. The subjects are women who delivered within last 12 months prior to the survey. The number of delivery in the district during one year is estimated to be 2,439 births based on crude birth rate 2.02% in CDHS 2014 (National Institute of Statistics, 2014).

3.4 Sample Size

The following equation (W.G. Cochran) was used to calculate sample size in this study.

$$n=Z^2_{1-\alpha/2} P(1-P) / \varepsilon^2$$

P: the true prevalence of the outcome of interest. The percentage of delivery assisted by skilled birth attendant in Svay Rieng (2014) was 81%.

Z: Reliability of coefficient base on level of significance (0.05 = 95%). Z=1.96

ε: Absolute precision required = 0.05

$n=(1.96)^2 0.81(1- 0.81)/ (0.05)^2 =236.39$

Thus, the sample size is 236+24 (10% of expected refusal data) =260

3.5 Sampling Technique

Multistage sampling technique used for sampling of this study.

1st stage: One province (Svay Rieng province) where researcher had worked before was selected from 25 provinces by convenience sampling.

2nd stage: One district (Svay Chrum district) where researcher had worked before was selected from 8 districts by convenience sampling.

3rd stage: Four communes (Chhoeu Teal, Svay Chrum, Ta Sous and Don Sa commune) where Japanese NGO had targeted were selected from 16 communes by convenience sampling.

4th stage: The estimated number of women in reproductive age is approximately 2000 in one commune and the estimated number of birth is about 150 in one commune. Computer generating random simple sampling technique could not be used, because there was no completed and updated delivery list per village. Hospital based data base was recorded all delivery by time sequence. In the community, first, researcher and assistant went to see a village leader to find the mother's name and address who delivered in last 12 month. Second, researcher and assistant visited one house and another house by motorbike to conduct interview based on village leader's information. All eligible mothers who we met were selected as subjects. Data collection had started from Chhoeu Teal commune, because there were large number of villages and longest history of collaboration with Japanese NGO. After finishing the first commune, we went to second commune (Doun Sa) because there were the

second largest number of commune and second longest history of collaboration. The last commune (Svay Chrun) was ended up with 35 samples because the total samples were reached to 260 samples which were given by formula.

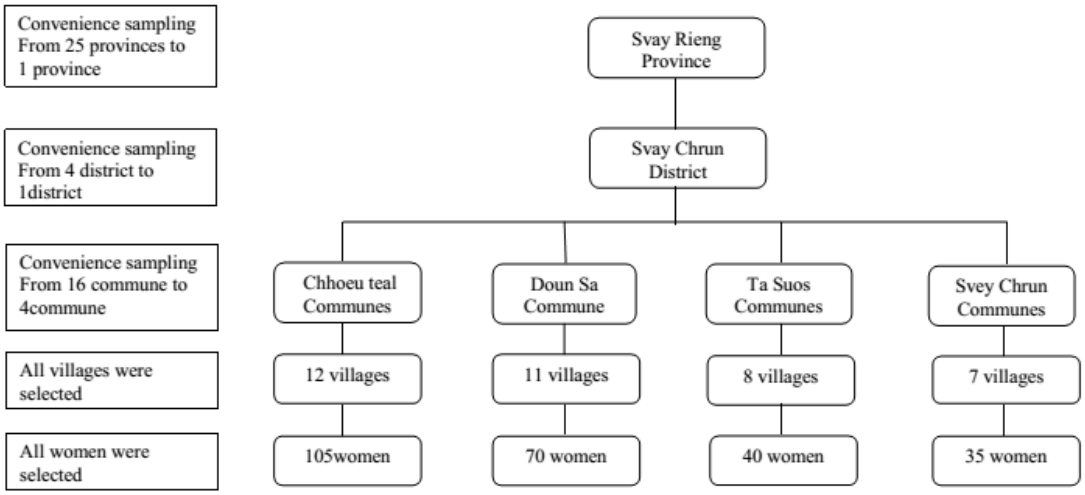

Figure 15: Multistage sampling study setting

The selection criteria of respondents are following.

3.5.1 Inclusion Criteria

- Family registration in Svay Churun district, Svay Rieng Province
- Woman who is 15-49 years old and gave birth within last 12 months prior the study
- Woman who had a still birth

3.5.2 Exclusion Criteria

- Woman who was not willing to participate the study
- Women who was not enable to answer the question due to disability identified by researcher or assistants

3.6 Measurement tools

The questionnaire was adapted from Safe motherhood Survey (SMS) questionnaire by the Maternal Neonatal Program of Johns Hopkins Bloomberg University (JHPIEGO/Maternal and Neonatal Health Program, 2004b). It consists of 5 parts, (1) Socio-demographic information (2) Knowledge (3) Attitudes (4) Personal experience related to last pregnancy (5) Personal experience related to last birth, according to original structure.

Section 1 is about ***Socio-demographic information***, which consists of age, marital status, parity, education, occupation, religion and economic status (14 items). These questions aimed to find the Socio-demographic characteristic of respondents. Cambodia Demographic and Health Surveys (CDHS) were referred to find socio-demographic information (National Institute of Statistics, 2000, 2005, 2010, 2014). The DHS is a national household survey of men and women aged 15-49.

- International wealth index (IWI) is the instrument to measure economic situation of household in low-income countries widely used in DHS Surveys and UNICEF MICS Surveys. IWI is calculated based on household ownership such as televisions, bicycles, materials used for housing construction, and types of water access and sanitation facilities. IWI ranges from 0 to 100, with 0 representing households having none of the assets and 100 representing households having all assets. IWI value in Cambodia is 40.6.
- Rating scale is modified IWI to assess living standard in Cambodia. It was first developed by Annear (Annear P, 1999) and modified and field-tested by Yanagisawa in Cambodian context (Yanagisawa, Mey, & Wakai, 2004; Yanagisawa et al., 2006). Rating scale used in this study, subjects were scored on a scale of 1 to 9 points depending on the ownership of assets as; temporary roof (1 point), permanent roof (2), bicycle (1), motorcycle (1), oxcart (1), radio (1), TV (1), cow (1) and horse (1).

Section 2 is about ***Knowledge*** of key danger signs and birth preparedness and complication readiness. (8 items)

Key obstetric danger signs were grouped under three phases of pregnancy, delivery and postpartum. There are 11 key danger signs, four in pregnancy (severe vaginal bleeding, severe headache, blurred vision and swollen hand and face), four in delivery (severe vaginal bleeding and prolonged labor, retained placenta and convulsion), and three in postpartum (severe vaginal bleeding, foul-smelling vaginal discharge and high fever). These were open-ended question and only spontaneous responses were recorded. The answers were categorized into "Yes" or "No". A correct answer was given "1"score and "0" for incorrect answers and don't know. Knowledge score on key danger signs range from 0 (minimum) to 11 (maximum). Knowledge scores were classified into three levels with Bloom's cut off point.

There are five basic components of birth preparedness and complication readiness, namely, identify place of birth, identify skilled birth attendant, prepare funds for emergency, arrange transportation and identify blood donor. Knowledge score on birth preparedness and complication readiness range from 0 (minimum) to 5 (maximum). Knowledge scores were classified into three levels with Bloom's cut off point.

Overall knowledge was evaluated from the cumulated knowledge score both danger signs and birth preparedness and complication readiness. Overall knowledge score varied from 0 (minimum) to 16 (maximum). Overall knowledge scores were classified into three levels with Bloom's cut off point.

Low level	0-9 scores	(<60%)
Moderate level	10-12 scores	(60-79%)
High level	13-16 scores	(80+ %)

Section 3 is ***Attitude*** towards birth preparedness and complication readiness, facility delivery and childbirth. (7 items)

The attitude score is a summative score derived from Likert scale responses for the hypothetical statement. Responses can range from "strongly agree", "agree", "neither agree or disagree", "disagree" or "strongly disagree". A greater value "5" was

assigned to the most ideal response, “4” for reflected agreement with positive statement or disagreement with negative statement, “3” for neutral response, “2” for disagreement with positive statement or agreement with negative statement and “1” for non-ideal response. Attitude score range from 7 (minimum) to 35 (maximum).

Positive statement		Negative statement	
Choice	Score	Choice	Score
Strongly agree	5	Strongly agree	1
Agree	4	Agree	2
Neither	3	Neither	3
Disagree	2	Disagree	4
Strongly disagree	1	Strongly disagree	5

Total attitude scores were classified into three levels with cut-off point of mean [SD].

Negative attitude 7-25 scores $< -1SD$

Neutral attitude 26-33 scores $-1SD \leq x < 1SD$

Positive attitude 34-35 scores $1SD \leq$

Section 4 is about ***Personal experience related to last pregnancy***, which consist of number of ANC visit, timing of the first ANC visit and history of severe health problems experienced during pregnancy (13 items). These questions aimed to find needs factors during pregnancy.

Section 5 is about ***Personal experience related to last childbirth***, which consist of accessibility to health services, history of obstetric complication during delivery and birth preparedness and complication readiness. The questions about birth preparedness and complication readiness aimed to find the planning actions before starting contraction.

Five components of birth preparedness and complication readiness were categorized into “prepared” or “not prepared”, “1” was given to “prepared” and “0” for “not prepared”. Practice score of birth preparedness and complication readiness

varied from 0 (minimum) to 5 (maximum). The practice scores were classified into three levels with cut-off point of mean [±SD].

Low	0-2 scores	< -1SD
Moderate	3 scores	- 1SD≤ x < 1SD
High	4-5 scores	1SD≤

3.7 Reliability and Validity (data quality control)

The quality of data was controlled using validated questionnaire, translation and pretesting of questionnaire.

3.7.1 Validity

The following questions have already met **content validity** by the JHPIEGO Safe motherhood Survey (SMS) questionnaire by the Maternal Neonatal Program of Johns Hopkins Bloomberg University (JHPIEGO/Maternal and Neonatal Health Program, 2004b).

- Section1: question number 1-2, 7-8 and 12-13
- Section2: question number 1-8
- Section3: question number 1-7
- Section4: question number 1-2, 5-7, 9-13
- Section5: question number 1-16, 19, 22-33

The remaining questions have been validated for content validity by three experts; Dr. Cheang Kannitha, the representative of Maternal and Child Health in WHO Cambodia office, Ms. Chea Ath, Director of Nursing in National Maternal and Child Health Center Cambodia, and Assoc.Prof. Ratana Somrongthong, College of Public Health Science of Chulalongkorn University. **Face validity** was judged by delivered women in National Maternal and Child Health Center Cambodia whether the way of asking questions can really make sense or not. **Construct validity** was based on the JHPIEGO, experts, and literature review.

3.7.2 Reliability

Pretesting was conducted with 20 women who had normal delivery within last two days by using structured questionnaire in National Maternal and Child Health Center (NMCHC) Cambodia in March 2016. NMCHC is the National top referral hospital, where every woman both rich and poor come to delivery. It was considered to share the similar characteristics in terms of normal delivery as target area. Whole interview process was monitored by researcher in order to maintain the clarity of words and to avoid misinterpretation of questions. Reliability test was performed for knowledge and attitude questions parts, Cronbach's alpha coefficient was 0.77 (>0.70). Questionnaire was revised after pretesting.

3.7.3 Translation

The questionnaire was translated from English into Khmer language by Mr. Yun Darith, who is fluent both in English and Khmer language as well as the experienced senior researcher on the field of reproductive health. Questionnaire in Khmer language was back translated to English by Ms. Ing Nary who was not aware of the first version of English questionnaire, and fluent in both languages and health professional in Maternal and Child Health in Cambodia. The first and second version of English questionnaire was checked by researcher to compare its consistency. Then khmer questionnaire was modified based on the original meaning of the JHPIEGO.

3.8 Data collection

Four Cambodian who were researcher's previous colleagues and have worked target villages for long time were selected as research assistants of this study. Prerequisite criteria of research assistants were firstly experiences of community works and secondary those who can drive motorbike to village. Students needed their parent's approval to use family belonging motorbike and many could not get parents' approval with safety reason. Female enumerators were preferable, because the

contents of questionnaire related to women's sexuality. Respondents might hesitate to answer to male enumerator.

Prior to interview, one day training was provided by researcher. The training emphasized on explaining the objective of the research, selection of participants, informed consent and interviewing methodology by using role playing. The first two interviews were mandatory observed by researcher to maintain the consistency among enumerators.

General information of target area was collected from Provincial Health Department in Svay Reing province. Then researcher visited each village to get the information from village leader. Target villages were far from town and road conditions were not good, it took more than one hour by motorbike driving. Based on the information (mother's name and location), researcher and assistant looked around the village by motorbike to identify the target household. After giving self-introduction and explaining research objective, researcher asked to get her sign on the informed consent sheet. Then individual face-to-face interview to the respondents was conducted using a structured questionnaire. All the questionnaires taken by interviewers were checked by a researcher on the day whether there were missed questions or not.

3.9 Data analysis

The questions and answers were coded and scored for data entry. SPSS Version 16 software program was used to do statistical analysis.

3.9.1 Univariate analysis

Descriptive statistics were used to determine frequency, percentage, mean, median, range and standard deviation.

3.9.2 Bivariate analysis

For quantitative (continuous) data, Pearson correlation was employed to find the correlation between age, parity, years of education, number of ANC visit, knowledge

score, attitude score and birth preparedness and complication readiness score. For qualitative (categorical) data, after testing normality by Kolmogorov-Smirnov test, either one way ANOVA or Kruskal Wallis test were employed to compare means or median of birth preparedness score by various characteristics as the followings; occupation, family wealth, distance from respondent house to health facility, beneficiaries of health financing schemes, history of abortion and history of severe health problem during pregnancy.

3.9.3 Multivariate analysis

Regression analysis was performed to find the relationship between all independent variables and birth preparedness and complication readiness (dependent variable). Backward selection was employed to select independent variables significantly related to birth preparedness and complication readiness.

3.10 Ethical Consideration

This study was conducted with ethical approval from National Ethics Committee for Health Research, Ministry of Health Cambodia.

Enumerator gave a clear verbal explanation about the objectives of this study to the respondents. Respondent's signature was obtained on written informed consent sheet with confidentiality and privacy measures to ensure that their data would be safeguarded and not utilized for any purpose outside the purpose of this study.

CHAPTER lV
RESULTS

This study was aimed to assess the knowledge, attitude and birth preparedness and complication readiness and its associations among women who have delivered within last 12 months in Svay Churun district, Svay Rieng Province, Cambodia. It also aimed to identify the proportion of delivery assisted by skilled birth attendant in target population. Face-to- face interview was conducted at the field, 250 women has participated in this study. The data was analyzed by SPSS version 16.

4.1 The proportion of delivery assisted by skilled birth attendant

4.1.1 Birth assistant

This study found that 98.0% of women delivered with skilled birth attendant in health facility and 2.0% of women delivered with unskilled birth attendant at home or on the way to health facility (Table 5).

Table 5. Birth assistant of 250 women who have delivered within last 12 months

Birth assistant	Number	Percent
Skilled birth attendant	245	98.0
Unskilled attendant	5	2.0

4.1.2 Place of birth

About half of respondents (45.6%) delivered at health center in Svay Rieng, followed by Provincial Hospital in Svay Rieng (33.6%). Only one woman delivered at home and four women delivered on the way to facility. 80.4% of women delivered at planned place, while 19.6% changed the place when she had onset of labor. The common reasons to change place of birth were found by interview, which were accessibility (it was difficult to get to planned facility during midnight, so they went

easier accessed facility) and complication (when contraction started, her family were worried and bring her to provincial hospital).

Table 6. Place of birth of 250 women who have delivered within last 12 months

Place of birth	Number	Percent
Place of birth		
Provincial Hospital in Svay Rieng	84	33.6
Referral Hospital in Svay Rieng	38	15.2
Health Center in Svay Rieng	114	45.6
Private clinic in Svay Rieng	1	0.4
Health facility in Phnom Penh	6	2.4
Other provinces and Thailand	2	0.8
Home	1	0.4
On the way to facility	4	1.6
Delivery at planned place		
No	49	19.6
Yes	201	80.4

Table 7 showed the comparison of place of first ANC visit and place of delivery. Of two women with no ANC visit, one delivered at health center and the other delivered on the way to facility. Majority of women visited health center in Svay Rieng for the first ANC, but only half of among those selected health center in Svay Rieng as delivery place. Overall, only 33% of respondents used the same levels of facilities between ANC and delivery.

Table 7. Comparison of place of first ANC visit and place of delivery of 250 women who have delivered within last 12 months

Place of first ANC visit	Total samples	Place of delivery													
		Provincial Hospital in SVR		Refferal Hospital in SVR		Health Center in SVR		Phnom Penh		Other provinces		home		On the way to facility	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
No ANC	2	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
Provincial Hospital in Svay Rieng	8	3	37.50	0	0.00	4	50.00	1	12.50	0	0.00	0	0.00	0	0.00
Health Center in Svay Rieng	155	56	36.10	23	14.80	73	47.10	0	0.00	0	0.00	1	0.60	2	1.30
Health facility in Phnon Penh	72	21	29.20	14	19.40	30	41.70	5	6.90	1	1.40	0	0.00	1	1.40
Others	13	4	30.80	1	7.70	6	46.20	0	0.00	2	15.40	0	0.00	0	0.00

4.2 The status of independent variables and birth preparedness and complication readiness

4.2.1 Characteristics of sample women

Socio-demographic characteristics of 250 women who have delivered within last 12 months are shown in Table 5. The mean [standard deviation] age of respondents was 27.47 [5.81]. Of 250 respondents, 244 women were currently married. Approximately half of respondents (48.8%) were primipara and 25 (10%) of respondents had experienced four or more times of delivery. 69 (27.6%) women were house wives, while 181(72.4%) women were with occupation. 127 (50.8%) of women had secondary or higher education, while 16 (6.4%) women had no education. 24 (98%) respondents were Buddhist. 129 (51.6%) of family were in fourth wealth quintile by rating scale scores from 1 to 9 points (Table 8).

Table 8. Characteristics of 250 women who have delivered within last 12 months

Characteristics	Number	Percent
Age (years)		
Mean[SD]	27.49[5.81]	
<20	10	4.0
20-24	81	32.4
25-29	74	29.6
30-34	51	20.4
>35	34	13.6
Marital status		
Married	244	97.6
Others	6	2.4
Parity		
1	122	48.8
2	76	30.4
3	27	10.8
4+	25	10.0
Occupation of household		
Labor	131	52.4
Farmer	82	32.8
Merchant	22	8.8
Government officer	12	4.8
Others	3	1.2
Occupation		
Farmer	97	38.8
Factory worker	71	28.4
House wife	69	27.6
Merchant	11	4.4
Others	2	0.8

Table 8. Characteristics of 250 women who have delivered within last 12 months (cont.)

Years of school attendance (years)		
None	16	6.4
1-3	31	12.4
4-6	76	30.4
7+	127	50.8
Husband years of school attendance (years)		
None	8	3.2
1-3	19	7.6
4-6	47	18.8
7+	170	68.0
Don't know	6	2.4
Religion		
Buddhist	245	98.0
Muslim	4	1.6
Christian	1	0.4
Wealth quintile (Rating scale*)		
Lowest (<20%) (1 rating scale)	3	1.2
Second (20-39%) (2-3 rating scale)	67	26.8
Middle (40-59%) (4-5 rating scale)	50	20.0
Fourth (60-79%) (6-7 rating scale)	129	51.6
Highest (80+ %) (8-9 rating scale)	1	0.4

*This scale scores from 1 to 9 points as follow: temporary roof (1 point), permanent roof (2), bicycle (1), motorbike (1), oxcart (1), radio (1), television (1), cow (1) and horse (1).

4.2.2 Knowledge

Level of knowledge among sample women

Low level of knowledge on obstetric danger signs (92.8%) and low level of knowledge on birth preparedness and complication readiness (45.6%) were found in this study. Overall, 92.4% of respondents were classified into low level of knowledge on birth preparedness and complication readiness. (Table 9)

Table 9. Level of knowledge of 250 women who have delivered within last 12 months

Knowledge	Low		Moderate		High	
	Number	Percent	Number	Percent	Number	Percent
Danger signs	232	92.8	14	5.6	4	1.6
Birth preparedness	114	45.6	97	38.8	39	15.6
Overall	231	92.4	16	6.4	3	1.2

Knowledge on obstetric danger signs

Table 10 showed knowledge on obstetric danger signs, where multiple responses were allowed. Severe vaginal bleeding was the most commonly mentioned danger sign, during pregnancy (55.2%), childbirth (42.8%) and postpartum (46.8%), followed by prolonged labor (46.4%) and swollen (32.4).

Table 10. Knowledge of obstetric danger signs of 250 women who have delivered within last 12 months

Knowledge of danger signs	Answered correctly	
	Number	Percent
Key danger signs during pregnancy*		
Severe bleeding	138	55.2
Severe headache	15	6.0
Blurred vision	26	10.4
Swollen	81	32.4
Key danger signs during delivery*		
Severe bleeding	107	42.8
Prolonged labor	116	46.4
Retained placenta	46	18.4
Convulsion	26	10.4
Key danger signs during postpartum*		
Severe bleeding	117	46.8
High fever	46	18.4
Foul selling vaginal discharge	10	4.0

* Multiple responses

Knowledge on birth preparedness and complication readiness

Table 11 showed knowledge of birth preparedness and complication readiness, where multiple responses were allowed. 94.8% of women knew saving money for delivery and in case of emergency was an important birth preparation. On the other hand, only 2.0% mentioned the need to identify blood donor. 66.8% women thought they needed to identify the place of birth, 64.4% for identifying means of transportation for facility when contraction started, and 20.0% for identifying skilled birth attendant to assist her birth.

Table 11. Knowledge of birth preparedness and complication readiness of 250 women who have delivered within last 12 months

Knowledge of birth preparedness and complication readiness	Answered correctly	
	Number	Percent
Five components of birth preparedness and complication readiness*		
Save money	237	94.8
Identify place of birth	167	66.8
Identify transportation	161	64.4
Identify skilled birth attendant	50	20.0
Identify a blood donor	5	2.0

* Multiple responses

Table 12 showed source of information on birth preparedness and complication readiness. 89.2% of women got information on birth preparedness and complication readiness from their family, 78.4% reported from ANC, and 36.4% from TV and media.

Table 12. Sources of Information on birth preparedness and complication readiness of 250 women who have delivered within last 12 months

Sources	Number	Percent
Family	223	89.2
ANC	196	78.4
TV / Media	91	36.4
Workplace	81	32.4
NGO	22	8.8

* Multiple responses

4.2.3 Attitude

70.4% of respondents were classified into neutral attitudes towards birth preparedness and complication readiness. (Table 13) The result showed that safety was more important than expensive payment (69.2%), difficulty to access health facility (distance, road condition) (73.2%) and health staffs' bad behavior (66.8%). However, more than three times of women raised health staff bad attitude as a barrier of using health facility than geographical and financial accessibility. (Table 14).

Table 13. Attitude towards birth preparedness and complication readiness of 250 women who have delivered within last 12 months

Attitude	Number	Percent
Level of attitude		
Negative (7-25)	43	17.2
Neutral (26-33)	176	70.4
Positive (34-35)	31	12.4

Table 14. Percentage of attitudes items of 250 women who have delivered within last 12 months

Attitude items	Percent				
	Strongly agree	Agree	Neither	Disagree	Strongly disagree
A woman should plan ahead of time where she will give birth to her baby.	59.6	38.4	1.6	0.0	0.4
A woman should plan ahead of time how she will get to the place where she will give birth.	56.0	42.4	0.4	0.4	0.8
When women do not go to a health facility to give birth, it is mainly because it is too expensive. *	2.4	6.4	22.0	36.8	32.4
When women do not go to a health facility to give birth, it is mainly because it is too difficult to get there. *	2.8	6.4	17.6	38.0	35.2
When women do not go to a health facility to give birth, it is mainly because the staff there do not treat women respectfully.*	9.2	6.4	17.6	30.8	36.0
It is not necessary for a husband/partner to accompany his wife when she is giving birth.*	2.8	4.8	10.8	34.8	46.8
Giving birth is mostly a woman's matter. Husbands/partners have little to contribute.*	3.6	2.0	1.2	29.6	63.6

* Negative statement

4.2.4 Accessibility

About half of women could access the nearest health facilities less than 5 km distance (52.0%), and about 40% of women within 5-9 km distance. Only 7.6% of women lived more than 10 km distance from nearest health facility. More than half of women could access nearest health facility within 30 minutes, while it took more than 60 minutes for 11.2% of women. Motorbike was the common means of transportation especially in Cambodia. Those who had no own motorbike used moto-dop (motorbike taxi) to the facility. 15.2% of women used own car or taxi, 1.2% reported ambulance use. Most common companion was husband (81.6%), followed by respondents' mother (70.4%), sister (49.6%) close relatives (46.8%). The mean [SD] number of companions was 3.5 [±1.36], minimum 1 and maximum 9 persons. Final decision of place of birth was done mostly by respondent's mother (36.8%), respondents and husband together (36.0%), respondent (28.0) and husband (21.6%) (Table 15).

Table 15. Accessibility to health services of 250 women who have delivered within last 12 months

Characteristics	Number	Percent
Geographical accessibility		
Distance from respondent's house to nearest health facility		
<5 km	130	52.0
5-9 km	101	40.4
10+ km	19	7.6
Travel Time to health facility for delivery**		
<30 min	146	58.4
30-59 min	74	29.6
60+ min	28	11.2
Means of transportation to health facility for delivery**		
Moto	204	81.6
Car	27	10.8
Others	18	7.6

**248 valid cases

Table 15. Accessibility to health services of 250 women who have delivered within last 12 months (cont.)

Characteristics	Number	Percent
Financial accessibility		
Affordability* **		
User fee	245	98.0
Medication	245	98.0
Transportation	245	98.0
Gratuities	245	98.0
Opportunity cost	245	98.0
Beneficiaries of Health Equity Fund and vouchers (Poorest certificate)** **		
Yes	37	14.8
No	212	84.8
Number of Companions for delivery*		
Mean [SD]	3.5 [1.36]	
Minimum-Maximum	1 - 9	
Companions for delivery*		
Husband	204	81.6
Respondent's mother	176	70.4
Sister	124	49.6
Close relative	117	46.8
Neighbor	80	32.0
Respondent's father	79	31.6
Mother in law	52	20.8
Father in law	22	8.8
SBA	9	3.6
TBA	8	3.2

*multiple responses ***245 valid cases ****249 valid cases

Table 15. Accessibility to health services of 250 women who have delivered within last 12 months (cont.)

Characteristics	Number	Percent
Cultural accessibility		
Final decision to decide the place of birth*		
Respondent's mother	92	36.8
Respondent and husband	90	36.0
Respondent	70	28.0
Husband	54	21.6
Respondent's father	32	12.8
Skilled birth attendant	14	5.6
Mother in law	10	4.0
Father in law	2	0.8
TBA	2	0.8

*multiple responses

4.2.5 Availability

Majority 64.0% of women could receive maternal care within 10 minutes after arriving at health facility, while only 6.4% were awaited more than 30 minutes. (Table 16)

Table 16. Availability to health services of 248 women who have delivered within last 12 months

Waiting time to receive health service after arrival at health facility	Number	Percent
<10 min	160	64.0
11-29 min	72	28.8
30+ min	16	6.4

**248 valid cases

4.2.6 Perceived severity

Table 17 showed perceived severity of 250 women who have delivered within last 12 months. 96.0% of women thought women can die from obstetric complications, while 4 % of women had never thought about it. 51.6% of women considered vaginal bleeding was the most severe danger signs to lead maternal death, prolonged labor (15.6%) was following. Some women raised “hypertension” as a danger signs, but only few women could answer major symptoms of “hypertension” were severe headache and blurred vision.

Table 17. Perceived severity of 250 women who have delivered within last 12 months

Perceived severity	Number	Percent
Women can die from obstetric complication		
No	10	4.0
Yes	240	96.0
Perceived severity of danger signs		
Severe bleeding	129	51.6
Prolonged labor	39	15.6
Swollen	19	7.6
Hypertension	18	7.2
Convulsion	9	3.6
Placenta not deliver	7	2.8
Severe headache	6	2.4
High fever	6	2.4
Blurred vision	1	0.4
Others	3	1.2
Don't know	3	1.2

4.2.7 Antenatal care

A total of 250, 92.8% of respondents attended antenatal care (ANC) more than 4 times in their pregnancy. The mean ± s.d of number of ANC was 7.39 ±2.21, minimum 0 and maximum 15 times. Only two respondents had no ANC during last pregnancy. 77.2% of women visit their first ANC visit during second month of pregnancy (4-7weeks of gestation). Most respondents realized that she was pregnant when she missed a menstrual period. The mean age of gestation at first ANC visit was 2.3 months. The place of first ANC visit was Provincial hospital in Svay Rieng (3.2%), health center in Svay Rieng (62.0%), health facility in other provinces (34.0%). The biggest reason to select the place of ANC was the short distance (90.0%). Majority 93.6% of respondents reported to received health advice on birth preparedness and complication readiness during ANC. 78.4% of respondents were given advice on danger signs, identifying place of birth (64.4%), preparing money (30.4%), preparing transportation (26.8%), identifying skilled birth attendant (23.2%) and none of them on blood donor (Table 18).

Table 18. Antenatal care of 250 women who have delivered within last 12 months

Characteristics	Number	Percent
Number of ANC visit		
None	2	0.8
1-3	9	3.6
4-6	65	26
7-9	148	59.2
10-15	26	10.4
Mean ± s.d	7.39 ± 2.21	
Age of gestation at first ANC visit (month)		
No ANC visit	2	0.8
2	193	77.2
3	42	16.8
4	8	3.2
5	3	1.2
6	2	0.8
Mean ± s.d	2.3 ± 0.668	

Table 18. Antenatal care of 250 women who have delivered within last 12 months (cont.)

Characteristics	Number	Percent
Place of first ANC visit		
Provincial Hosipital in Svay Rieng	8	3.2
Health Center in Svay Rieng	155	62.0
Health facility in Phnon Penh	73	29.2
Other provinces	12	4.8
No ANC	2	0.8
Reason to select the place of first ANC*		
Near	225	90.0
Safe	130	52.0
Skilled staff	127	50.8
Staff treat women with respect	102	40.8
Staff always stand by	87	34.8
Have necessary medicine	84	33.6
Family/friend recommend	77	30.8
Cheap	69	27.6
Not a long wait	63	25.2
Facility always open	58	23.2
Have enough materials	41	16.4
Health education about birth preparedness during ANC*		
Knowledge of danger signs	196	78.4
Identify place of birth	161	64.4
Visit hospital when she has danger signs	76	30.4
Prepare money	75	30.0
Prepare transportation for delivery	67	26.8
Identify skilled birth attendant	58	23.2
Identify blood donor	0	0.0

* Multiple responses

4.2.8 History of obstetric complications

Among 250 respondents, 69.6% women had no history of abortion, while 2.4% have experienced both spontaneous and induced abortion. And 10.4% of women had severe health problem during her pregnancy. Types of severe heath problem experienced during pregnancy were swollen (3.2%), weakness (3.2%), vaginal bleeding (2.8%), hypertension (2.4%) and so on. Number of health problem experienced during pregnancy varied from 1 to 5. Only one woman experienced five severe health problems during her last pregnancy. All women who faced severe health problem could seek assistance for health professional. Among 28 women, 4.8% decided to go to see health professional in health facility by herself, 3.6% of women decided with husband, 1.6% of women were recommended by skilled birth attendant and 1.2% of women were followed decision of her mother (Table 19).

Table 19. History of obstetric complications during pregnancy of 250 women who have delivered within last 12 months

Characteristics	Number	Percent
History of abortion		
None	174	69.6
Spontaneous	45	18.0
Induced abortion	25	10.0
Both spontaneous and induced abortion	6	2.4
History of severe health problem during pregnancy		
No	222	89.6
Yes	28	10.4

Table 19. History of obstetric complications during pregnancy of 250 women who have delivered within last 12 months (cont.)

Characteristics	Number	Percent
Severe health problem experienced during pregnancy*		
Swollen hand and face	8	3.2
Weakness	8	3.2
Vaginal Bleeding	7	2.8
Hypertension	6	2.4
Severe abdominal pain	6	2.4
Difficult breathing	5	2.0
Blurred vision	4	1.6
Severe headache	4	1.6
Loss of consciousness	1	0.4
Number of severe health problem experienced during pregnancy**		
1	17	6.8
2	5	2.0
3	4	1.6
4	1	0.4
5	1	0.4
Seek assistance for health problem during pregnancy**		
Yes	28	100.0
No	0	0.0
Final decision to seek assistance*		
Respondent	12	4.8
Respondent and husband	9	3.6
SBA	4	1.6
Respondent's mother	3	1.2
Husband	2	0.8
Others	3	1.2

* Multiple responses **28 valid cases

4.2.9 Birth preparedness and complication readiness

More than half of respondents (59.6%) were classified into moderate level of birth preparedness and complication readiness. (Table 20) Among 250 mothers, 99.6% of women saved money for delivery and emergency, 93.6% prepared transportation for delivery to health facility, 80.4% identified place of birth, 21.2% identified skilled birth attendant and no one prepared blood donor. (Table 21)

Table 20. Level of birth preparedness and complication readiness of 250 women who have delivered within last 12 months

Level of preparedness	Number	Percent
Low (0-2)	53	21.2
Moderate (3)	149	59.6
High (4-5)	48	19.2

Table 21. Birth preparedness and complication readiness of 250 women who have delivered within last 12 months

Birth preparedness and complication readiness	Number	Percent
Save money	249	99.6
Identify transportation	234	93.6
Identify place of birth	201	80.4
Identify skilled birth attendant	53	21.2
Identify a blood donor	0	0

*multiple responses

4.3 Factors related to birth preparedness and complication readiness

For quantitative (continuous) independent variables, Pearson correlation was employed to measure an association between each of the independent variables and birth preparedness and complication readiness.

Knowledge, parity and number of ANC visit were significantly related to birth preparedness and complication readiness (p=0.001, 0.043, 0.009), respectively. The association trend were positive little correlation (r= 0.208), negative little correlation (r= -0.128) and positive little correlation (r=0.166), respectively. The more the knowledge, the better the birth preparedness and complication readiness. The higher the parity, the lesser the birth preparedness and complication readiness. The more number of ANC visit, the better birth preparedness and complication readiness. However, attitude, age and years of education were not significantly related to birth preparedness and complication readiness (p=0.158, 0.091, 0.090), respectively. The lesser attitude, the better birth preparedness and complication readiness. The lesser the age, the better birth preparedness and complication readiness. The higher years of education, the better birth preparedness and complication readiness. (Table 22)

Table 22. Pearson correlation between quantitative independent variables and birth preparedness of 250 women who have delivered within last 12 months

Variables	Pearson correlation	p-value
Knowledge	0.208	0.001
Attitude	-0.089	0.158
Age	-0.107	0.091
Parity	- 0.128	0.043
Years of education	0.108	0.090
Number of ANC visit	0.166	0.009

For qualitative (categorical) independent variables, either one way ANOVA or Kruskal Wallis test were performed to compare means and median of knowledge, attitude and birth preparedness and complication readiness by various characteristics.

There were significant differences of birth preparedness and complication readiness between those with and without occupation ($p<0.001$), among rich and poor family ($p<0.001$) and those with and without poorest certificate ($p=0.006$). Those having occupation had better birth preparedness and complication readiness than those without occupation. Those whose family was wealthier had better birth preparedness and complication readiness than poorer family. And those not having poorest certificate had better birth preparedness and complication readiness than those having it. However, there were no significant differences of birth preparedness and complication readiness by history of abortion, history of severe health problem during pregnancy, distance from respondent's house to health facility. (Table23)

Table 23.Comparison of birth preparedness by various characteristic of 250 women who have delivered within last 12 months

	Total samples	Birth preparedness			
		Mean	Median	SD	p-value
Occupation					<0.001
Without occupation	69	2.62	3.00	0.71	
With occupation	181	3.07	3.00	0.68	
Family wealth					<0.001
Low (1-3)	70	2.79	3.00	0.68	
Medium (4-6)	133	2.87	3.00	0.64	
Good (7-9)	47	3.40	4.00	0.77	
Distance from respondent's house to health facility					0.213
<5km	130	2.91	3.00	0.68	
5-9km	101	3.03	3.00	0.77	
10+ km	19	2.79	3.00	0.63	
Beneficiaries of Health Equity Fund and vouchers *					0.006
Yes	37	2.65	3.00	0.75	
No	212	3.00	3.00	0.69	
History of abortion					0.070
No	174	2.90	3.00	0.71	
Yes	76	3.07	3.00	0.70	
History of severe health problem during pregnancy					0.450
No	224	2.97	3.00	0.66	
Yes	26	2.73	3.00	1.04	

a. one way ANOVA, Kruskal Wallis Test *249 valid cases

Regression analysis was performed to find the relationship between birth preparedness and complication readiness and multiple independent variables. The final model suggested that parity, family wealth, knowledge on danger signs and history of abortion were the significant predictors of birth preparedness and complication readiness. (Table 24)

- The higher the parity, the lesser the birth preparedness and complication readiness.
- The wealthier the family, the better the birth preparedness and complication readiness.
- The higher the knowledge on danger signs, the better the birth preparedness and complication readiness.
- The more history of abortion, the better the birth preparedness and complication readiness.

The modeled relationship was following.
Birth preparedness and complication readiness = 2.501+ (-0.146) (Parity) + 0.109 (Family wealth) + 0.053 (Knowledge in danger signs) + 0.176 (History of abortion).

13.8 % of total variation can be explained by this regression model. Family wealth tends to be the most important variable for birth preparedness and complication readiness, followed by parity, knowledge on danger signs and history of abortion from Bstd.

Table 24. Factors significantly related to birth preparedness and complication readiness of 250 women who have delivered within last 12 months

	B	SE(B)	Bstd	95% CI for B	
				LB	UB
(Constant)	2.501	0.142		2.221	2.782
Parity	-0.146	0.044	-0.202	-0.233	-0.059
Family wealth	0.109	0.025	0.267	0.06	0.158
Knowledge on danger signs	0.053	0.021	0.15	0.011	0.096
History of abortion (0=No, 1=Yes)	0.176	0.093	0.114	-0.008	0.359

R^2=0.138 R^2_{adj} =0.124 Sqrt of MSE=0.666 p-value<0.001

CHATER V

DISCUSSION, CONCLUSION AND RCOMMENDATION

This was a retrospective cross sectional study carried out amongst 250 women of reproductive age who have delivered last 12 months in Svay Rieng Province, Cambodia.

The objectives of this study were as below;

1) To identify the proportion of delivery assisted by skilled birth attendant in the study population
2) To assess socio-demographic factors, knowledge, attitude, enabling resources, need factors and birth preparedness and complication readiness among women who delivered within last 12 months in rural Cambodia
3) To identify association between socio-demographic factors, knowledge, attitude, enabling resources, need factors and birth preparedness and complication readiness among women who delivered within last 12 months in rural Cambodia.

5.1 Discussion

5.1.1 The proportion of delivery assisted by skilled birth attendant

For objective 1, this study revealed that 98% of delivery was assisted by skilled birth attendant and occurred in health facility. Health system seemed to be worked well based on the proportion of delivery in each referral level; Provincial hospital, CPA3 (33.6%), referral hospital, CPA2 (15.2%) and health center, MPA (45.6%). About 90% of women raised “skilled staff” as the reason to decide facility delivery, and about half of respondents raised “staff treat with respect” and “necessary medicine”. According to CDHS 2014, the proportion of delivery assisted by skilled birth attendant and facility delivery were 89 % and 80%, respectively (National Institute of Statistics, 2014). Per information Provincial Health Department in Svay Ring, the proportion of delivery assisted by skilled birth attendant in Svay Rieng Province was 81% in 2014. Previous study reported that urban women used

reproductive and maternal health services more than rural women in general (Houweling, Ronsmans, Campbell, & Kunst, 2007; Lale Say & Rosalind Raine, 2007; Zere Eyob et al., 2010). Contrary to this, finding in Svay Rieng was unexpected to be much higher than both national and provincial data.

The high proportion of facility delivery can be explained by Cambodian government's comprehensive efforts resulted in remarkable reduction of MMR in last decade (World Health Organization, 2015c). Synergy efforts among several interventions brought better outcome to even in rural Cambodia after 2014. Trend of CDHS showed that general socio-economic and educational situation surrounding pregnant women in Cambodia has changed in better way (National Institute of Statistics, 2000, 2005, 2010, 2014). CDHS also showed huge improvement on coverage of maternal health services including antenatal care, facility delivery and delivery assisted by skilled birth attendants over the last decade. Both demand and supply sides health financing intervention also linked to the improvement in coverage of maternal health service utilization. Demand-side health financing schemes promoted access to public health facility for the poor, while supply-side health financing schemes contributed to the availability of midwives at health centers and health provider's performance (P Ir et al., 2015; P. Ir et al., 2010). "Paid by Results" is the types of public policy where payment is done by outcome. It was originally introduced in British and widely used among high-income countries. Results-based financing programs have been implemented under the funds by Department for International Development (DIFT) and World Bank in low-income countries. Cambodia is the success low-income country where result-based financing has been worked well. The number of health centers and BEmONC facilities have increased nationwide (Ministry of Health Cambodia, 2015). Public health facilities are better equipped and cleaner than before. Also the number of midwives has increased and achieved allocation of at least one midwife in all health center in nationwide with standing by 24 hours on call. The number of health centers with no trained midwives was 223 in 2006 and zero by 2009. Midwifery trainings both in-service and pre-service training were strengthen. JICA Maternal and Child Health project reported midwives worked more friendly to women after 5 years intervention (JICA MCH Project, 2015). In many villages, TBAs were old enough or there were no more TBA.

TBAs have been prohibited to attend delivery at home, but when they refer women to health center they will receive fair compensation (P Ir et al., 2015). Introduction of health financing schemes brought substantial outcome in short span. So far, the management of HEFs and vouchers were organized by a third party, but it have to be managed by own self in the near future. Management and sustainability of these monetary incentives are the challenges for continuous improvement on maternal health. The high proportion of delivery assisted by skilled birth attendants in target population may be influenced by Japanese NGO's interventions on enhancing women's association activities and vegetable marketing for 15 years (IVY, 2006, 2012).

In Cambodia, two different indicators on delivery has been used, namely the proportion of delivery assisted by skilled birth attendant and the proportion of facility delivery. These two indicators were equal to in this study population. Delivery assisted by skilled birth attendant was recommended whether women delivered in health facility or at home before, because of insufficient number of health facility. Due to government commitment, the gap between these two indicators was becoming narrow. The proportion of delivery assisted by skilled birth attendant will merge into the proportion of facility delivery in the future. Cambodia regards one of success country to reduce MMR in the world. Cambodia's successful experiences gave us important insights for other low income countries where is struggling high maternal mortality ratio. It can be said that Cambodia was the first country to success.

5.1.2 The characteristics of respondents and the status of knowledge, attitudes, enabling factors, needs factors and birth preparedness and complication readiness

- **Characteristics of respondents**

Mean age of respondents was 27.49 years old and half of them were primipara. Age of first birth and birth interval are important for both mother and baby health. Early age childbearing is at risk of delivery, it leads longer reproductive span contributing to

higher fertility rate. CDHS showed fertility rate declines from 6 in 1990 to 2.7 in 2014, the median birth interval became longer from 40 months in 2010 to 43.8 months in 2014, and the median age at first birth was 22.4 years in 2014 (National Institute of Statistics, 2014). Finding of this study were similar to the trend of CDHS data, which suggested improvement of health status among Cambodian women in reproductive age.

About half of respondents completed primary education, while 6.4 % had no education. This was similar to percentage distribution of educational attainment of women in Svay Rieng province (National Institute of Statistics, 2014), which showed 43.3% of women have secondary or higher education, while 6.0 % were no education.

Majority 72.4% of women were with occupation, of those having occupation 28.4% were factory worker. According to International Labor Organization, more than 600,000 workers were employed by garment industry (ILO, 2016). There are two Special Economic Zone (SEZ) in Cambodia - Vietnam border. Foreign investment accelerated economical activities and created job opportunity for residence in Svay Rieng.

The characteristics of respondents were similar to CDHS information. Income generating activity among women may be more active than other province because Svay Rieng is near to SEZ.

- **Family wealth**

The result showed half of respondents were in fourth wealth quintiles. According to CDHS 2014, percent distribution by wealth quintiles in Svay Rieng were lowest (23.4%), second (30.0%), middle (24.7%), fourth (14.9%) and highest (6.9%) (National Institute of Statistics, 2014). Finding of this study indicated that respondents were in better family wealth status compared to provincial information. It can be explained by above-mentioned SEZ and possibly explained by NGO's intervention. In 2002, Japanese NGO has started women empowerment project in this target area, because most of men went for Phnom Penh to generate cash income and women were stayed in villages (IVY, 2006). From field observation, researcher found both young husband and wife went for work out of the villages and only their children and old

grandparents stayed in villages. Women's income generating activities positively contributes to better family wealth. On the other hand, newborn's nutritious status would be concerned because grandmother gave artificial milk and snacks instead of breastfeeding.

- **Knowledge**

Low level of knowledge on birth preparedness and complication readiness among women who delivered within last 12 months was found in this study (92.4%). Overall knowledge scores were classified into three levels with Bloom's cut off point. Overall knowledge was evaluated from cumulated scores between knowledge on obstetric danger signs and knowledge on birth preparedness and complication readiness. Low levels of knowledge of obstetric danger signs among pregnant women or delivered women were also found in other studies; central Tanzania (Bintabara et al., 2015), Goba woreda, Ethiopia (Markos Desalegn & Daniel, 2014), Mulago hospital Uganda (Mbalinda et al., 2014), Mbarara Uganda (Kabakyenga et al., 2011), rural Tanzania (Pembe et al., 2009) and Gambia (Anya et al., 2008).

Though overall level of knowledge was low, more than half of women could correctly answer vaginal bleeding was the severe danger sign during pregnancy (55.2%), childbirth (42.8%) and postpartum (46.8%). Severe vaginal bleeding was the most common obstetric danger sign found in other studies; Mbarara district Uganda (Kabakyenga et al., 2011), Mulago hospital Uganda (Mbalinda et al., 2014) and Rufiji district Tanzania (Pembe et al., 2009). It may be because vaginal bleeding is most visual signs to be recognized as a danger sign. Half of respondents reported vaginal bleeding was the most severe obstetric danger signs, 17.2% reported hypertensive disorder (headache, swollen) and 15.6% reported prolonged labor was the most severe danger sign. This severity orders exactly fit to the prevalence of maternal deaths by National surveillance on maternal death audit 2011 which showed hemorrhage (36%) and eclampsia (20%) were the leading causes of maternal death in Cambodia (Liljestrand & Sambath, 2012).

Low level of knowledge can be linked to women's educational status. Only half of respondents had secondary or higher education and about 6% had no formal

education. Positive association between education and knowledge on birth preparedness and complication readiness was observed in other studies; Mbarara district Uganda(Kabakyenga et al., 2011) and Rufiji district Tanzania (Pembe et al., 2009). This is the fact that educated women know the importance of planning for birth and ready for complication. When women become educated, they might have better access to information from different sources. Further, CDHS 2014 reported that women with primary education and with secondary education were more likely selected skilled birth attendant than no education (National Institute of Statistics, 2014). Women's educational attainment are also linked to utilization of maternal health services.

The more women reported severe bleeding during pregnancy was the key danger sign than during postpartum. This can be explained by interesting Khmer women's belief that postpartum bleeding was the desired situation which removes bad things out of the body (White Patrice M, 2002). "Knowledge" normally refers to scientific facts. In contrast, people's beliefs were based on traditional ideas. Sometimes it was incorrect from the biomedical perspective and obstacles to appropriate care seeking behavior (Good B, 1994). In addition, delivery tend to be regarded as normal physiological phenomenon, some women had never be at risk of complications. However, every pregnancy can face any risks of complication to lead maternal mortality.

- **Attitude**

Neutral level of attitude towards birth preparedness and complication readiness was found in 70% of respondents of this study. It was found that health staffs' bad attitude influenced pregnant women's intention to use health center for delivery rather than physical and financial accessibility. Previous study in Cambodia suggested the lack of emotional support, impolite attitudes of health staff and discomfort in hospital setting were the barrier of maternal health service utilization (Matsuoka et al., 2010). Another study also reported that rural women did not want to use health center because of negative attitude and absence of health staff (Ministry of Health Cambodia, 2006a). It indicates attitude of health staff has been important factor for

clients to use maternal health services in health facility. Recently, barrier of physical accessibility was much improved in Cambodia, while quality issues were still remained as a barrier of utilizing health services

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- **Accessibility to health service**

Geographical accessibility

The result showed that half of respondents lived within 5 km radius to nearest health facility, while about 8% of women lived more than 10km far from nearest health facility. According to the criteria of health center distribution by Ministry of Health Cambodia, there should be one health center less than radium 10km (Ministry of Health Cambodia, 2008). The number of health center increased rapidly from 37 in 2007 to 61 in 2015 (Personal communication with Svay Rieng Provincial Health Department). Increasing the number of health centers contributed to reduce barrier of geographical accessibility in rural Cambodia.

Financial accessibility

The study showed 98% of respondents and family have paid for user fee, transportation, medication and opportunity cost. Saving money was the most common birth preparedness and complication readiness reported by respondents. Good preparation made family to afford necessary payments. In Cambodia, user fee system was introduced to have standard price for delivery; normal delivery costs 60,000 riel (15 USD) in Provincial hospital and 30,000 riel (7.5USD) in referral hospital and health center. Health Equity Fund (HEF) and vouchers helped the poor to exempt from health expenditures. Combination of HEF which covers user fee and vouchers which covers transportation and food together contributed removing barrier for the poor (P Ir et al., 2015). User fees are one of the main barriers to access government health services in low income countries (Bigdeli, 2009; Palmer, Mueller, Gilson, Mills, & Haines, 2004). This study revealed the biggest amount of payment related to delivery was the payment to companions, which average 3.5 persons and maximum 9 persons. More than 80% of respondents used motorbike to go to health facility. The drivers were mostly men; husband, father, close relative and neighbor, they were in

charge of keeping moto and buying things from outside. Answers to one of the attitude question suggested that delivery was the matter of family not only pregnant woman. Mother, sister and female close relatives commonly stay with pregnant women in delivery room and encourage her.

Cultural accessibility

Cultural accessibility explained by decision making power. In some countries, women have no power for decision making even though about their own health problem. This study showed the final decision of place of delivery was mainly done by respondent's mother (36.8%) and husband (36.0%). But key finding about decision making in Cambodia in terms of delivery was not a single person had a dominant power but several family members were involved to make consensus. Cambodian women had autonomy to express own expect that affects family decision. This may be because of matrilineal family.

- **Availability**

This study showed more than 60% of women could receive maternal care within 10 minutes after arrival at health facility. Most women reported midwife working in health center gave her mobile phone number to respondents and let them call when she started contraction. This enable midwives to prepare their work by on-call system. The study conducted in 2006 suggested that Cambodian women hesitated to go to health center because of unavailability and poor performance (Ministry of Health Cambodia, 2006a). Low staff income was one of the main causes of poor performance which leads to low proportion of facility delivery. Thanks to midwifery trainings and Midwife incentive schemes, performances of health professionals has much improved and more women came to use health facility representing the coverage of maternal health services in Cambodia (National Institute of Statistics, 2014). Three delay models explain the phase 3 delays as the delay in receiving timely adequate care at the facility which results from impolite behavior, a lack of health staff, supply and equipment and poor skilled health professionals. The strategy of strengthening midwifery could ensure quality of care to reduce the 3rd delays.

- **Antenatal care**

About 93.0% of respondents attended antenatal care more than 4 times, and mean month pregnant at first ANC visit was 2.3 month. 78.4% of respondent reported to be informed obstetric danger signs during ANC. As reference, CDHS showed that coverage of four or more ANC visits has increased dramatically, from 9.0% in 2000 to 75.6% (urban 85.4%, rural 73.9%) in 2014. Midian months pregnant at first visit was 2.5 months and 78.7% of women were informed danger sign in pregnancy (National Institute of Statistics, 2014).

The findings of this study were almost similar to CDHS results. Only the proportion of ANC (4+) was higher in target population than national data. The results can be explained by the same reasons of high proportion of facility delivery in this area.

- **History of abortion**

As few as, 10.0% of women experienced induced abortion and 18.0% experienced spontaneous abortion. The percentage distribution of induced abortion was almost same as CDHS data, which was 11.9% in Svay Rieng (National Institute of Statistics, 2014). Overall coverage of abortion with skilled providers was 84.5% in 2010 (National Institute of Statistics, 2010). This study did not ask the types of assistant of abortion.

- **Birth preparedness and complication readiness**

Moderate level of birth preparedness and complication readiness was found in this study (59.6%). Other studies in Africa found low level of birth preparedness and complication readiness; in Duguna Fango, Ethiopia (18.3%) (Gebre et al., 2015), in Goba woreda, Ethiopia (29.9%) (Markos Desalegn & Daniel, 2014), in Mulago hospital Uganda (Mbalinda et al., 2014) and in Mbarara Uganda (35%) (Kabakyenga et al., 2011). This difference can be explained by different method of evaluation on level of birth preparedness and complication readiness. In this study, levels of birth preparedness and complication readiness were classified by mean [SD] into three levels, namely, low, moderate and high. On the other hand, study in Tanzania

(Bintabara et al., 2015) used 3 out of 5 components, study in India (Agarwal S et al., 2010) takes 3 steps out of 4 (identified a trained birth attendant, identified a health facility, arranged for transport, and saved money for emergency) was considered to be well-prepared. Though integrated management of pregnancy and childbirth (IMPAC) provided standard components of birth preparedness and complication readiness (World Health Organization, 2006), the number of components accounted for were actually different from each study. Differences in findings may also be explained by subject characteristic, whether they were pregnant women or mothers who had delivery. Pregnant women may report less number of key components because some pregnant women have not faced any needs for preparation. Also classification of practice level was different in each study.

Saved money was the most common element of birth preparedness and complication readiness reported by majority of respondents (99.6%). This finding was similar to studies conducted in Mbarara district Uganda (91%) (Kabakyenga et al., 2011) and Koupéla district Burkina Faso (83.3%) (Moran et al., 2006). This can be explained women and her family understand they need money for delivery and in case of emergency. On the other hand, no one identified blood donors in this study. This is similar finding to the study in Duguna Fango district, Wolayta Zone, Ethiopia (3%) (Gebre et al., 2015). This may be because blood transfusion is a critical condition and blood preparation is hospital matter. Provincial hospital (CPA3) is the only one hospital in Svay Rieng province where can manage blood transfusion. Several referral cases were observed from health center to provincial hospital due to severe bleeding during field interview. For preparing a transport, some poor women said that she needed to book moto-dop (moto taxi) to go to health facility because her family did not have own motorbike. In case one moto-dop would not available, she had to keep several phone numbers of moto-dop drivers. It is important to prepare transportation especially for those who have no motorbike in order to reduce delay in reaching health facility.

5.1.3 Factors related to birth preparedness and complication readiness

There found significant associations between parity, occupation, family wealth, knowledge on danger signs, beneficiaries of health financing schemes, number of ANC visit, history of abortion with birth preparedness and complication readiness in this study.

This study found that those who were lesser **parity** had better birth preparedness and complication readiness. This may be because those who are higher age and parity have more experiences on pregnancy and delivery, while those who are the first pregnancy have not experienced delivery yet. Primipara may have higher risk perception than multipara. This indicated that increasing risk perception among primipara might help to improve birth preparedness and complication readiness. The significant association between parity and birth preparedness and complication readiness was found in other studies; among 578 pregnant women in Duguna Fango district, Wolayta Zone, Ethiopia (Gebre et al., 2015), and among 743 pregnant women in Aleta Wondo district Sidama Zone, South Ethiopia (Hailu et al., 2011). Previous studies also found strong negative association between parity and maternal health services utilization. Systematic review on utilization of ANC (Simkhada, Teijlingen, Porter, & Simkhada, 2008) reported that women with higher parity generally used ANC lesser than those who were lower parity. CDHS 2014 reported that primipara were more likely had delivery assisted by skilled birth attendant than subsequent births (National Institute of Statistics, 2014). The study on determinants of skilled birth attendants in Cambodia (Yanagisawa et al., 2006) showed that delivery with unskilled birth attendant in previous delivery had greater influence to choose the same assistance in following delivery. This implies primiparas are particularly important as a target of health education during ANC to identify skilled attendant for the first deliveries.

This study found that those who have **occupation** had better birth preparedness and complication readiness than those who without occupation. About 28% of respondents worked as factory workers. Exposure by information from company and coworkers may give positive influence to pregnant women on birth preparedness and complication readiness. Women who earn own money were more likely independent

than housewife. There were several studies to find the association between spouse's occupation and birth preparedness and complication readiness, rather than women's occupation. The study in Southwest Ethiopia (Tura Gurmesa, Mesganaw Fantahun Afework, & Yalew, 2014) showed women whose husbands were employed were more likely to use skilled care than those whose husbands were farmers. Having occupation is linked to family wealth.

This study found that **wealthier families** had better birth preparedness and complication readiness. One of key components of birth preparedness and complication readiness is saving money in case of emergency. Family has to pay not only for user fee but also gratuities, medication, transportation, food for all companions and so on. It is obvious that these expenses are affordable for richer families than poorer families. There was little study to find significant association between family wealth and birth preparedness and complication readiness. Some studies indicated there existed inequity of utilizing maternal health services by wealth quintile (Amin, Shah, & Becker, 2010; Chowdhury et al., 2006; L. Say & R. Raine, 2007). Secondary data analysis on DHS in Cambodia (Dingle Antonia et al., 2013) showed the gap of health service utilization among wealth quantiles. The coverage of maternal health services have improved greater among wealthier quintile compared to poorer quantile. It means wealthiest households have better use of maternal health services than poorest group. This result was consistent with the study in Nepal (Bhatta & Aryal, 2015) in terms of institutional delivery, and in Southwest Ethiopia that women in the 3rd wealth quintiles and 4th quintiles were more likely to use skilled care as compared to those in the lowest quintile (Tura Gurmesa et al., 2014). The previous study in Cambodia also found substantial socioeconomic disparities in use of maternal health services including antenatal care and delivery with skilled birth attendant (Wang & Hong, 2015). Family wealth is one of the important determinants of maternal health service utilization so as to birth preparedness and complication readiness especially in low-income countries.

This study also found those not having **poorest certificate** had better birth preparedness and complication readiness. This can be linked to above mentioned family wealth that wealthier families were better-off. Cambodian government has been committed to address health inequities with a specific focus on maternal and

newborn health. Health Equity Fund (HEFs) and vouchers were introduced to promote for the poor to access health services by user fee exemptions. However, the impact on out-of-pocket spending may be small to be remained high (Ministry of Health Cambodia, 2007). This is reasonable explanation why wealthier family had better birth preparedness than poorer family.

This study revealed that women who had **better knowledge** on obstetric danger signs had better birth preparedness and complication readiness. Knowing obstetric danger signs may encourage women to be prepared for birth because they know what they had to prepare and what they had to do in case of emergency. The association between knowledge on danger signs and birth preparedness and complication readiness were statistically significant within the studies; among 578 pregnant women in Duguna Fango district, Wolayta Zone, Ethiopia (Gebre et al., 2015), among 428 women who delivered 2 years prior to survey in chamwino district, central Tanzania (Bintabara et al., 2015), among 810 women admitted in antepartum period Mulago hospital in Uganda (Mbalinda et al., 2014), and among 580 women in Goba woreda, Oromia region Ethiopia (Markos Desalegn & Daniel, 2014).On the other hand, there was no clear association between knowledge on danger signs and birth preparedness and complication readiness within the study conducted among 764 recently delivered women in Mbarara district Uganda (Kabakyenga et al., 2011), among slum women in India (Agarwal S et al., 2010) and North Ethiopia (Hiluf M & M., 2007) by multivariate analysis. This contradictory finding imply that women might prepare some components of birth preparedness and complication readiness without having any knowledge and its rationale. Where birth preparedness was not knowledge based planning actions but actions in the nature of things, their preparedness could not be ensured under the knowledge gap.

The important finding of this study was women who attended **ANC** more frequently were well birth prepared than those who less attended. Early and frequent ANC visits are the opportunity for pregnant women to receive health related information. Cambodia has achieved great increase of coverage of ANC in last decade. Finding from this study showed about 93% of respondents attended four or more times of ANC, which was WHO minimum recommendation. The primary objective of ANC is to provide health information during pregnancy. The protocol of

clinical health professional (Ministry of Health Cambodia, 2010b, 2013b) suggested that birth preparedness was required to be informed at the first ANC visit and follow up during subsequent visits. About 78% of respondents in this study reported they received information about birth preparedness during their last pregnancy. Health education allows women to be more knowledgeable on obstetric danger signs and birth preparedness and complication readiness. ANC visits could be pre-experiences of delivery with skilled attendant for pregnant women. Pregnant women could estimate the time to the facility with a specific mode of transport, judge quality of services and identify place of birth based on her experiences of ANC visits. During field research, it was observed that midwives gave their mobile phone number to pregnant women to request to call her when she come to health center for delivery. This surely contributed to increase the presence of midwives, and women to identify place of birth and skilled birth attendant before delivery. Further, needs factors may influence frequent ANC visits and birth preparedness. Although it was said that risk screening during ANC was ineffective in terms of reducing maternal mortality (Starrs, 2006), safe delivery has been the desired outcome for all pregnant women and their family. Those who were pointed out possible complications may prepare money and identify hospital rather than health center from their worry or concern. The significant association between number of ANC visit and birth preparedness and complication readiness was found in other studies; conducted among 578 pregnant women in Duguna Fango district, Wolayta Zone, Ethiopia (Gebre et al., 2015), among 538 women who gave birth in last 12 months preceding the survey in Adigrat town, north Ethiopia (Hiluf M & M., 2007), among 312 mothers of infants aged 204 months in 11 slum of India (Agarwal S et al., 2010), among 743 pregnant women in Aleta Wondo district in Sidama Zone, South Ethiopia (Hailu et al., 2011), among 428 women who delivered 2 years prior to survey in chamwino district, central Tanzania (Bintabara et al., 2015) and in Goba woreda, Oromia region Ethiopia (Markos Desalegn & Daniel, 2014). But this is inconsistent with study among 1118 women who had been pregnant in the past two years in Rufiji district Tanzania (Pembe et al., 2009). This Tanzania's result is linked to the finding of this study that although about 93% of women had four or more times of ANC visits, almost 93% of women was classified into low level of knowledge on birth preparedness and complication readiness. These contradictory

findings may give us the question on the impact of ANC. It is most possibly to say that birth preparedness and complication readiness were not explained effectively during ANC. Recent Cochrane review of antenatal education (Gagnon AJ & J, 2007) concluded that effectiveness of antenatal education on childbirth remained largely unknown. The study in Gambia (Anya et al., 2008) reported that even though women attend ANC many times, they were not benefiting from effective information and communication with health staff with few minutes consultation. Studies in Gambia, Nepal (Jahn Albrecht, Maureen Dar Iang, Usha Shah, & H.J. Diesfeld, 2000), Tanzania (von Both, Flessa, Makuwani, Mpembeni, & Jahn, 2006) reported that it took less than 3 minutes for antenatal counseling. CDHS 2014 (National Institute of Statistics, 2014) showed about 79% of pregnant women in Svay Rieng were informed the symptoms of pregnancy complications but there were no study to assess counseling time and methodologies in Cambodia. In addition, another interesting finding towards the impact of ANC was only 33% of respondents have used the same level of facility between ANC and delivery. It was observed that not a few pregnant women changed the place of first visit of ANC, subsequent ANC visit and place of delivery. This implies there are no continues follow up from pregnancy to delivery, and which influence to the failure of effective antenatal education. The study in Cambodia (Wang & Hong, 2015) reported that receiving better quality of antenatal care positively affect continuum use of skilled maternal care. Better ANC could enhance birth preparedness and complication readiness and skilled birth attendant use.

This study found that those who had **history of abortion** had better birth preparedness and complication readiness. This can be explained that abnormal experiences during pregnancy may increase the readiness for complications. Those having abortion care at health facility regard to be already identified at least two components of birth preparedness and complication readiness, which are place of birth and skilled birth attendant. There were no study to find significant association between abortion and birth preparedness and complication readiness, but some study found significant association between history of past obstetric complication and birth preparedness and complication readiness (Gebre et al., 2015).

5.1.4 Association between birth preparedness and complication readiness and skilled birth attendant

The statistical association test between birth preparedness and complication readiness and delivery with skilled birth attendant was not performed in this study because the proportion of delivery assisted by skilled birth attendant was already met 98% and calculated sample size was not large enough. The significant relation between birth preparedness and complication readiness and delivery assisted by skilled birth attendant was found within the studies; in Chamwino district, Central Tanzania (Bintabara et al., 2015) Southwest Ethiopia (Tura Gurmesa et al., 2014) and Kaski district Nepal (Karkee et al., 2013). Birth preparedness and complication readiness is one of the strategies to promote delivery assisted by skilled birth attendant in low-income countries.

5.2 Strength

- Community based study was conducted to find the real situation of women living in rural area.
- Actual experiences were collected from women who had delivered not from pregnant women who have not experienced birth preparations yet.

5.3 Limitation

- The statistical test between birth preparedness and complication readiness and delivery assisted by skilled birth attendant could not be performed. Because the given sample size was small (260) and the proportion of delivery assisted by skilled birth attendant was found to be very high (98%).
- It would be hard to generalize the findings of this study to province level nor national level because sample size was not large enough. Cluster collection factor was not used in the sample size calculation formula. The true prevalence of the outcome (P) was not corresponded to actual situation in Cambodia. Also convenience sampling was conducted because of time and

budget limitations and because there were no completed and updated delivery lists per village.

- Recall bias was attempted to be minimized by selecting already delivered women, women who delivered within last 12 months were included as samples because of limited data collection period. Their birth experiences especially negative episode might be modified and expressed as different direction and magnitude.
- Leading questions by enumerators were sometimes observed at the field, although researcher had conducted one day training before data collection.
- Real family affordability related to delivery was not revealed clearly. Affordability was counted as both those who were actually paid and those who were considered to be paid by exemption of health expenditure.

5.4 Conclusion

Community based cross sectional study has conducted among 250 women who have delivered within last 12 months in Svay Rieng Province, Cambodia. This study concluded that;

1. The high proportion of delivery assisted by skilled birth attendant was found.
2. Low level of knowledge, moderate level of attitude and moderate level of birth preparedness and complication readiness were found.
3. Positive associations between occupation, family wealth, knowledge on danger signs, number of ANC visit, history of abortion, beneficiaries of health financing schemes, and negative associations between parity and birth preparedness and complication readiness were found. Family wealth tends to be the most important variable for birth preparedness and complication readiness, followed by parity, knowledge on danger signs and history of abortion.

It was confirmed that government commitments to reduce MMR has brought substantial improvements of coverage of maternal health services including delivery assisted by skilled birth attendant and four or more times of ANC visits.

Recognizing obstetric danger signs are the key factor for seeking maternal health care, but knowledge level on birth preparedness and complication readiness among respondents were remained very low. In order to improve knowledge on danger signs, it is important to strengthen health education through ANC and community with special focused on the poor, those who lesser parity, and those who have history of abortion. Increasing knowledge alone would not improve care seeking behavior, it is closely related to structural, geographical and cultural factors (Bohren Meghan A et al., 2014) and especially financial factors. Addressing health inequities by family wealth need to be considered in line to new global priority, Universal Health Coverage.

5.5 Recommendation

5.5.1 Recommendation for future research

- Since the association between birth preparedness and complication readiness and skilled birth attendant did not examine in this study, another study could be conducted in different area with low proportion of delivery assisted by skilled birth attendant with stratified random sampling technique. The larger sample size will be required to generalize the findings with appropriate formula.
- Two weeks recall period is recommended in interview survey (Kroeger A, 1985), while two to five years recall was used in population based pregnancy related survey (Yanagisawa et al., 2006). Though one year recall was fair, shorter recall period would be recommended.
- Appropriate length of training and pilot field interview for enumerators should be provided to avoid leading questions and inconsistency among several enumerators.

- Real affordability related to delivery need to be investigated to find out real financial accessibility.
- The study on assessing the factors associated remaining barriers for reduction of MMR need to be conducted in order to formulate meaningful programs for achieving SDGs. Also the study on assessing quality of care at the stage III (Souza et al., 2014) need be investigated in the hospital setting study.
- It must be important to identify the causes of maternal deaths by strengthening maternal death audit surveillance system and further qualitative research, which could find under-reported risks or errors.

5.5.2 Recommendation for programs

- In order to enhance birth preparedness and complication readiness, it is important to focus on the poor, women with lesser parity and history of abortion. Special considerations to those who have poorest certificate are required. Strengthening health education at the first ANC visit would be effective especially for primipara. Health education after abortion care is also critical both for mentally and physically.
- Firstly, effectiveness of health education though ANC by health staff need to be reconsidered. Improving the way of health education using existing visual aids such as poster may enable to provide adequate and appropriate information to pregnant women. Health center midwives trainings have just renewed in 2015. Training unit in National Maternal and Child health Center would be able to provide training with the sense of effectiveness of health education during ANC.
- Secondary, family involvement need to be strengthened. Community health education supported by village health volunteers and NGOs would be available with participatory methods such as drama, songs and dances. The provision of health information through mass media and campaigns would be also supportive. Improving knowledge on danger signs not only pregnant women but spouse and women's mother would be prerequisite for proper decision making for safer delivery.

- Furthermore, in order to achieve SDG goals, the quality of care need to be ensured. Ministry of Health Cambodia and JICA had implemented the project on improving the quality of midwifery care by strengthening training system in ahead of other donor agencies (JICA MCH Project, 2015). Guideline and basic concept of midwifery care which the project had developed are expected to expand from fostered midwives to other midwives.
- Lastly, it is important to work on not only achieving health indictors but also addressing health inequities for SDGs. Available evidence suggested that there still remained considerable room for improvement on inequity (Dingle Antonia et al., 2013) in terms of maternal health service utilization. Priority setting is an essential enabling process for Universal Health Coverage.

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APPENDIX1 English questionnaire

Informed consent

Part I: Information

Good morning, my name is Yuko Takahashi. I am working for "The project to assess knowledge, attitudes and practice on birth preparedness and complication readiness in relation to skilled birth attendant among delivered women in rural Cambodia". Women's knowledge of danger signs and preparation for birth are important to address preventable maternal mortality. We believe that you could help us by telling your perception and experience on delivery. I will have interview to you. It will take about 20 minutes of your time. Based on this result, we will have ideas how to improve quality of midwifery care program. We would appreciate it very much if you would kindly take sometimes to answer for this interview. Your participation in this study is definitely voluntary. It is totally up to your choice to participate or not. You can change your mind later and stop participation even if you agreed earlier.
This study will be completely anonymous. Your name is not disclosure in our answer sheet. We will not share any information about you to anyone outside of this study. The information that we collect from this research project will be kept confidence. You can ask any questions at any time of the research study.

Part II: Certificate of Consent

Do you understand and agree to participate? Yes_____ No_____
If your answer is Yes, please sign below.

Signature: _____ Date:
If illiterate,
Signature of witness _____ Date:

Chief Researcher
Yuko Takahashi Collage of Public Health Science, Chulalongkorn University

Questionnaire

Date : **Time:** **Village name:** **Commune name:**

ID Number: **delivery date** **birth weight** **sex**

Section1: Socio-demographic Information

I would like to ask you some questions about yourself and the pregnancy you've had.

Q.#	Question	Code		Go to
1.1	How old are you now?	age		
1.2	What is your marital status now?	Married	1	
		Single	2	
		Widowed	3	
		Divorced	4	
		Separated	5	
1.3	How many children do you have?	1	1	
		2	2	
		3	3	
		more than 4	4	
1.4	How many times did you have pregnancy?	1	1	
		2	2	
		3	3	
		more than 4	4	
1.5	Have you ever experience spontaneous abortion?	Yes	1	
		No	2	
1.6	Have you ever experience induced abortion?	Yes	1	
		No	2	
1.7	Have you ever attended school?	Yes	1	
		No	2	1.9
1.8	What is the highest grade you have completed?	None	1	
		1-3	2	
		4-6	3	
		more than 7 years	4	

1.9	Have your spouse ever attended school?	Yes	1	
		No	2	1.11
1.10	What is the highest grade your spouse has completed?	None	1	
		1-3	2	
		4-6	3	
		more than 7 years	4	
1.11	What is the occupation of household head?	Farmer	1	
		Merchant	2	
		Government official	3	
		Sell labor	4	
		other	97	
1.12	What was (is) your occupation?	Farmer	1	
		Merchant	2	
		House wife	3	
		Factory worker	4	
		other	97	
1.13	What is your religion?	Buddhism	1	
		Muslim	2	
		Christian	3	
		Others	4	
1.14	What do you have in your household? (Rating)	Temporary roof	1	
		Permanent roof	2	
		Bicycle	1	
		Motorcycle	1	
		Oxcart	1	
		Radio	1	
		TV	1	
		Cow	1	

Section2: knowledge

I would like to ask you some questions about pregnancy and childbirth.

Q	Question	Code				Go to.
2.1	In your opinion, what are some serious health problems that can occur **during pregnancy** that could endanger the life of a pregnant woman? Please raise examples.	Severe Bleeding		Yes	1	
				No	2	
		Severe headache		Yes	1	
				No	2	
		blurred vision		Yes	1	
				No	2	
		swollen hand and face		Yes	1	
				No	2	
		Other (specify)			97	
2.2	**during childbirth**?	Severe Bleeding		Yes	1	
				No	2	
		Prolonged labor		Yes	1	
				No	2	
		Placenta not delivered 30 min after baby		Yes	1	
				No	2	
		Convulsion		Yes	1	
				No	2	
		Other (specify)			97	
2.3	**during postpartum** (first 2 days after birth) ?	Severe Bleeding		Yes	1	
				No	2	
		High fever		Yes	1	
				No	2	
		foul selling vaginal discharge		Yes	1	
				No	2	
		Other (specify)			97	
2.4	In your opinion, could a woman die from any of these problems?	Yes			1	
		No			2	
2.5	What is the most severe danger sign?	Severe Bleeding			1	
		Severe headache			2	

		blurred vision			3	
		swollen hand and face			4	
		Prolonged labor			5	
		Placenta not delivered 30 min after baby			6	
		Convulsion			7	
		High fever			8	
		foul selling vaginal discharge			9	
		Hypertension			10	
2.6	Have you ever heard "Birth preparedness"	Yes			1	
		No			2	
2.7	In your opinion, what are some things a woman can do to prepare for birth?	Identify Skilled provider		Yes	1	
				No	2	
		Arrange of transport		Yes	1	
				No	2	
		Prepare money		Yes	1	
				No	2	
		Identify blood donor		Yes	1	
				No	2	
		Identify place of birth		Yes	1	
				No	2	
		Other (specify)			97	
2.8	Does your community provide services to assist women in preparing for birth? For instance, are there: Transportation services for women? Ways to get money to help families pay for birth?	Transport	Yes		1	
			No		2	
		Financial	Yes		1	
			No		2	
		Other (specify)				

Section 3 : Attitudes

I would like to know whether you strongly agree (SA), agree (A), neither (N), disagree (D), strongly disagree (SD) with these statement. There is no right or wrong answer.

Q.#	Question	SA	A	N	D	SD
3.1	A woman should plan ahead of time where she will give birth to her baby.					

3.2	A woman should plan ahead of time how she will get to the place where she will give birth.					
3.3	When women do not go to a health facility to give birth, it is mainly because it is too expensive.					
3.4	When women do not go to a health facility to give birth, it is mainly because it is too difficult to get there.					
3.5	When women do not go to a health facility to give birth, it is mainly because the staff there do not treat women respectfully.					
3.6	It is not necessary for a husband/partner to accompany his wife when she is giving birth.					
3.7	Giving birth is mostly a woman's matter. Husbands/partners have little to contribute.					

Section4: Personal experience related to last pregnancy

I am going to ask you about your experiences related to last pregnancy.

Q.#	Question	Code		Go to.
4.1	How many times did you attend ANC during last pregnancy?	0	1	
		1	2	
		2	3	
		3	4	
		more than 4	5	
4.2	How many months pregnant were you when you <u>first</u> received antenatal care for this pregnancy?			
4.3	**Where** did you go for the first ANC?	Provincial hospital in Svay Rieng	1	
		Referral hospital in Svay Rieng	2	
		Health center in Svay Rieng	3	
		Traditional birth attendant	4	
		Others	97	
4.4	**Why** did you go there for ANC check up?	1.Near	Yes 1 No 2	
		2.Appropriate price	Yes 1 No 2	
		3.Safe	Yes 1 No 2	
		4.staff always stand by	Yes 1 No 2	

		5.facility always open	Yes 1 No 2	
		6.skilled staff	Yes 1 No 2	
		7.Have necessary medicine	Yes 1 No 2	
		8.Have enough material/ quipment	Yes 1 No 2	
		9.not long wait	Yes 1 No 2	
		10.staff treat with respect	Yes 1 No 2	
		11.Family/ friend's recommend	Yes 1 No 2	
		12. Ashamed to go to health facility	Yes 1 No 2	
		Others	97	
4.5	Whom did you first see for a checkup on this pregnancy? Anyone else? PROBE FOR THE TYPE OF PERSONAND RECORD ALL PERSONS SEEN.	Doctor	1	
		Midwife	2	
		Nurse	3	
		TBA	4	
		Others	5	
		Don't know	6	
4.6	How many months pregnant were you when you <u>last</u> received antenatal care for this pregnancy?			
4.7	During last pregnancy, did a health worker advise you about any of the following at least once? Danger signs of serious health Where to go if you had danger signs of serious health problems? Where you should give birth? Arrangements for transportation? Arrangements for funds/finances? Arrangements for a blood donor? Arrangements for a healthcare Professional to deliver your child?	Danger signs	Yes 1 No 2	
		Where to go	Yes 1 No 2	
		Place of birth	Yes 1 No 2	
		Transport	Yes 1 No 2	
		Money	Yes 1 No 2	
		Blood donor	Yes 1 No 2	
		Health professional	Yes 1 No 2	
4.8 ★	From what other sources, did you get above information?	Family	Yes 1 No 2	
		TV/ Media	Yes 1 No 2	
		NGO	Yes 1 No 2	
		Work place	Yes 1	

				No 2	
		Others		97	
4.9	During last pregnancy, did you experience any serious health problems related to the pregnancy?	Yes		1	
		No		2	Section 5
4.10	What kind of obstetric complications did you have in last pregnancy?	1.Vaginal Bleeding	Yes 1 No 2	Severe	
		2.severe headache	Yes 1 No 2	Severe	
		3.blurred vision	Yes 1 No 2	Severe	
		4.swollen hand and face	Yes 1 No 2	Severe	
		5.High fever	Yes 1 No 2	Severe	
		6.Loss of consciousness	Yes 1 No 2	Severe	
		7.Difficult breathing	Yes 1 No 2	Severe	
		8.Severe abdominal pain	Yes 1 No 2	Severe	
		9.Reduce fetal movement	Yes 1 No 2	Severe	
		10.Weakness	Yes 1 No 2	Severe	
		11. Hypertension	Yes 1 No 2	Severe	
		Other (specify)			
4.11	Did you seek assistance for this problems?	Yes		1	Go to4.11
		No		2	
4.12	Why did you not seek assistance for this problem? PROBE FOR OTHER REASONS AND RECORD ALL REASONS MENTIONED.	Respondent didn't think necessary		1	
		Husband/family didn't think necessary		2	
		Facility too far		3	
		No transport		4	
		No childcare		5	
		Too expensive		6	
		Poor services		7	
		Used home remedy		8	
		Don't know where to go		9	
		No time to go		10	
		Other (specify)		97	

4.13	Who made the final decision about whether or not to seek assistance for this problem?	No one	1	
		Respondent	2	
		Respondent and husband	3	
		Husband	4	
		Respondent's mother	5	
		Respondent's father	6	
		Mother in law	7	
		Father in law	8	
		Sister/Sister in law	9	
		Friend/ Neighbor	10	
		SBA	11	
		TBA	12	
		Other (specify)	13	

Section 5: Personal Experience related to Last Birth

I am going to ask you about your birth experiences.

Q.#	Question	Code		Go to
5.1	**Where did you give birth** to your last child?	Provincial hospital	1	
		District hospital in Svay Rieng (Government)	2	
		Health center in Svay Rieng (Government)	3	
		Private clinic in Svay Rieng	4	
	_____	At home	5	
	_ (NAME OF PLACE)	Health facility in Phnom Penh	6	
		Health facility in Vietnam	7	
		Other (specify)	97	
5.2	Did you plan to give birth this place?	Yes	1	
		No	2	
5.3	Prior to this birth, did you or your family make any arrangements for the birth?	Yes	1	
		No	2	5.11
5.4	Which arrangements did you or your family makes for the birth of this child? (CIRCLE ALL RESPONSES GIVEN.) THEN PROBE: Did you [ANY	Identify transport	1	
		Save money	2	
		Identify blood donor	3	
		Identify SBA	4	

	REMAINING ARRANGEMENTS]?	Other (specify)	5	
5.5	Identify a mode of transport?	No		Go to 5.7
		Yes ↓		
5.6	Did you use the transport that you identified?	Yes	1	
		No	2	
5.7	Save money?	No		Go to 5.9
		Yes ↓		
5.8	Did you use the money that you saved?	Yes	1	
		No	2	
5.9	Identify blood donor?	No		Go to5.11
		Yes ↓		
5.10	Did you use the blood donor that you identified?	Yes	1	
		No	2	
5.11	Who made the final decision about where you would give birth?	No one	1	
		Respondent	2	
		Respondent and husband	3	
		Husband	4	
		Respondent's mother	5	
		Respondent's father	6	
		Mother in law	7	
		Father in law	8	
		Midwife, doctor, nurse	9	
		Private practitioner	10	
		TBA	11	
		Other (specify)	97	
5.12	Give birth in facility	No		Go to5.24
		Yes↓		
5.13	Can you tell me why you gave birth in a facility than elsewhere?	1. Safe *	Yes 1 No 2	
		2. experienced skilled staff	Yes 1 No 2	
		3.Have necessary medicine	Yes 1 No 2	
		4.Have necessary Material and equipment (operation)	Yes 1 No 2	

		5.staff always stand by	Yes 1 No 2	
		6.staff treat with respect	Yes 1 No 2	
		7.Family/ friend's recommend	Yes 1 No 2	
		8.Used preceeding delivery	Yes 1 No 2	
		9.Obstetric complication, risk pregnancy	Yes 1 No 2	
		10.Near	Yes 1 No 2	
		11.Appropriate price	Yes 1 No 2	
		12.Government dose n't allow	Yes 1 No 2	
		13.No child care	Yes 1 No 2	
		others	97	
5.14	How did you go to the health facility? PROBE: What type of transportation did you mainly use to get to the health facility?	Ambulance	1	
		Private car	2	
		Taxi	3	
		Cart	4	
		Motorbike	5	
		Bicycle	6	
		On foot	7	
		tuktuk	8	
		Other (specify)	97	
5.15	Who accompanied you to the place where you gave birth? Record all persons	No one	1	
		Husband	2	
		Respondent's mother	3	
		Respondent's father	4	
		Mother in law	5	
		Father in law	6	
		Sister/Sister in law	7	
		Friend/ Neighbor	8	
		Midwife, doctor, nurse	9	
		Private practitioner	10	
		TBA	11	
		Close relative	12	

		Other (specify)		97	
5.16	How long did it take to reach the health facility? IF LESS THAN 2 HOURS, RECORD IN MINUTES. OTHERWISE, RECORD IN HOURS	Hours Minutes			
5.17	How far to the nearest health center?	<2km		1	
		2-5 km		2	
		5km<		3	
5.18	How far to the nearest district hospital?	<2km		1	
		2-5 km		2	
		5km<		3	
5.19	How long after reaching the health facility did it take for you to get services from health personnel?				
5.20	Did you and your family have enough money to pay for • User fee • Transportation • Medication • Unofficial fee • Opportunity cost	User fee	Yes	1	
			No	2	
		Transportation	Yes	1	
			No	2	
		Medication	Yes	1	
			No	2	
		Unofficial fee	Yes	1	
			No	2	
		Opportunity cost	Yes	1	
			No	2	
5.21	Did you use Health Equity Fund?	Yes		1	
		No		2	
5.22	In your opinion, how are the services in this facility?	Very good		1	
		Good		2	
		Fair		3	
		Poor		4	
		Very bad		5	
5.23	Can you tell me why you have ranked the services as previous question? PROBE: What else?	1.Staff always there		1	
		2.Facility always open		2	
		3.Skilled staff		3	
		4.Have necessary medicine		4	

	RECORD ALL RESPONSES.	5.Not a long wait	5	
		6.Staff treat women with respect	6	
		7.Often staff are not there	7	
		8.Often facility is close	8	
		9.Insufficient skilled staffs	9	
		10.A lack of necessary medicines	10	
		11.Long wait	11	
		12.Staff treat women badly	12	
		Other (specify)		
5.24	Give birth at facility	Yes		Go to5.25
		No ↓		
5.25	Can you tell me the reason why you did not give birth in a health facility?	Respondent didn't think necessary	1	
		Husband/family didn't think necessary	2	
		Facility too far	3	
		No transport	4	
		No childcare	5	
		Too expensive	6	
		Poor services	7	
		Used home remedy	8	
		Don't know where to go	9	
		No time to go	10	
		Other (specify)		
5.26	**Who assisted with the birth**? Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS	Doctor	1	
		Midwife / Nurse	2	
		Private practitioner	3	
		Traditional Birth Attendant	4	
		Other (specify)	5	
5.27	What was the way of childbirth?	Vaginal delivery	1	
		Cesarean section	2	
		Forceps	3	
		Vacuum extraction	4	

5.28	During labor and birth, did you experience any serious health problems related to birth?	Yes	1	
		No	2	End
5.29	What kind of obstetric complications did you have during childbirth?	Severe bleeding	1	
		Severe headache	2	
		Prolonged labor >12h	3	
		Placenta not delivered 30 min after baby	4	
		Convulsion	5	
		Loss of consciousness	6	
		High fever	7	
		Other (specify)	8	
5.30	Where were you develop this problem	Provincial hospital	1	
		Referral hospital	2	
		Health center (Government)	3	
		Private clinic	4	
		At home	5	
		Other (specify)		
5.31	Did you seek assistance for this problem?	Yes	1	Go to5.33
		No	2	
5.32	Why did you not seek assistance for this problem? PROBE FOR OTHER REASONS AND RECORD ALL REASONS MENTIONED.	Respondent didn't think necessary	1	
		Husband/family didn't think necessary	2	
		Facility too far	3	
		No transport	4	
		No childcare	5	
		Too expensive	6	
		Poor services	7	
		Used home remedy	8	
		Don't know where to go	9	
		No time to go	10	
		Other (specify)	97	
5.33	Who made the final decision whether or not you would go	No one	1	
		Respondent	2	

	somewhere for assistance?	Respondent and husband	3	
		Husband	4	
		Respondent's mother	5	
		Respondent's father	6	
		Mother in law	7	
		Father in law	8	
		Midwife, doctor, nurse	9	
		Private practitioner	10	
		TBA	11	
		Other (specify)	97	
5.34	Did you do roasting	Yes No	1 2	

Thank you. This is the end of the question.

APPENDIX 2 Khmer questionnaire

បញ្ជាក់ពីការយល់ស្របរបស់អ្នកចូលរួមក្នុងការសិក្សា

កម្រងបញ្ជីសំនួរសម្រាប់ស្ត្រី

ផ្នែកទី១: ពត៌មាន

សួរស្តីខ្ញុំឈ្មោះ តាកាហាស៊ី យូកុ។ ខ្ញុំធ្វើការក្នុងគម្រោងអង្កេតលើចំណេះដឹង ឥរិយាបថ និងការអនុវត្តស្តីពីការត្រៀមជុំវិញកំណើត និងផលវិបាកដែលអាចកើតឡើង ដែលមានទំនាក់ទំនងទៅនឹងឆ្លងជំនាញក្នុងចំណោមស្ត្រីដែលបាន សម្រាលកូននៅជនបទក្នុងប្រទេសកម្ពុជា។ចំណេះដឹងរបស់ស្ត្រីគឺជាកត្តាសំខាន់ក្នុងការពារមរណភាពមាតាដែលអាចការពារបាន។ ខ្ញុំជឿជាក់ថាអ្នកអាចជួយខ្ញុំក្នុងគម្រោងនេះបានដោយគ្រាន់តែផ្តល់ ចម្លើយស្តីពីការយល់ឃើញ និងបទពិសោធន៍ របស់អ្នកជុំវិញការសម្រាល។ ខ្ញុំសុំពេលវេលារបស់អ្នក ប្រហែល ២០នាទីសម្រាប់ធ្វើការសម្ភាសន៍។

ផ្អែកលើលទ្ធផលនៃការអង្កេតនេះ យើងនឹងមានគំនិតដើម្បីធ្វើឱ្យប្រសើរឡើងនូវគុណភាពកម្មវិធីថែទាំផ្នែកឆ្លង។ ខ្ញុំពិតជាសាទរយ៉ាងខ្លាំងបើអ្នកចំណាយពេលវេលាផ្តល់ចម្លើយក្នុងការសម្ភាសន៍នេះ។

ការចូលរួមរបស់អ្នកក្នុងការស្រាវជ្រាវនេះគឺត្រូវធ្វើដោយស្ម័គ្រចិត្តទាំងស្រុង។ វាជាជម្រើស របស់អ្នកក្នុងការចូលរួមឬអត់។ អ្នកអាចផ្លាស់ប្តូរចិត្តនៅពេលក្រោយនិងឈប់ចូលរួមទោះបីជាអ្នកបានយល់ព្រមចូលរួមពីដំបូង។

ការសិក្សានេះនឹងត្រូវបានធ្វើដោយអណាមិក។ ឈ្មោះរបស់អ្នកនឹងមិនត្រូវបានបង្ហាញក្នុងក្រដាសចម្លើយរបស់ពួកយើងនោះទេ។ យើងនឹងមិនចែករំលែកពត៌មានអំពីអ្នកទៅអ្នកណាម្នាក់ ក្រៅពីក្រុមអ្នកស្រាវជ្រាវ។ ពត៌មានដែលយើងប្រមូលបានពីគម្រោងស្រាវជ្រាវនេះនឹងត្រូវបាន រក្សាទុកជាឯកជន។ អ្នកអាចសួរខ្ញុំពីសំនួរអំពីផ្នែកណាក៏បាននៃការសិក្សាស្រាវជ្រាវនេះ។

ផ្នែកទី២: បញ្ជាក់ពីការយល់ព្រម

តើអ្នកយល់និងយល់ព្រមក្នុងការចូលរួមឬទេ?

ព្រម_____ មិនយល់ព្រម_____

បើអ្នកយល់ព្រម សូមចុះហត្ថលេខានៅខាងក្រោម:

ហត្ថលេខា:_____ កាលបរិច្ឆេទ:_____

បើមិនចេះអក្សរ:

ហត្ថលេខាសាក្សី:_____កាលបរិច្ឆេទ:_____

<u>ប្រធានអ្នកស្រាវជ្រាវ</u>

<u>តាកាហាស៊ី យូកុ</u>

មហាវិទ្យាល័យវិទ្យាសាស្ត្រសុខាភិបាលនៃសាកលវិទ្យាល័យជូឡាឡុងកន

<u>កាលបរិច្ឆេទ</u>៖ **<u>ម៉ោង</u>**៖

<u>លេខអត្តសញ្ញាណ</u>៖ **<u>ឈ្មោះភូមិ</u>**៖ **<u>ឈ្មោះឃុំ</u>**៖

<u>ផ្នែកទី ១៖ ព័ត៌មានសង្គមប្រជាសាស្ត្រ</u>

<u>ផ្នែកទី ១៖ ព័ត៌មានសង្គមប្រជាសាស្ត្រ</u>

ខ្ញុំសូមសួរអ្នកសំនួរខ្លះៗដែលទាក់ទងនឹងខ្លួនរបស់អ្នក និងការមានផ្ទៃពោះរបស់អ្នក:

ល.រ	សំណួរ	លេខកូដ		ទៅកាន់សំនួរ
1.1	បច្ចប្បន្នអ្នកអាយុប៉ុន្មាន? age	អាយុ		
1.2	ស្ថានភាពគ្រួសារបច្ចប្បន្ន	រៀបការ	1	
		នៅលីវ	2	
		មេម៉ាយ/ពោះម៉ាយ	3	
		លែងលះ	4	
		ចែកផ្លូវគ្នា	5	
1.3 ✓	តើអ្នកមានកូនប៉ុន្មាននាក់**?**	1 នាក់	1	
		2 នាក់	2	
		3 នាក់	3	
		លើសពី ៤ នាក់	4	
1.4 ✓	តើអ្នកមានផ្ទៃពោះប៉ុន្មានដងហើយ**?**	1 ដង	1	
		2 ដង	2	
		3 ដង	3	
		លើសពី ៤ ដង	4	
1.5	តើអ្នកធ្លាប់រលូតកូនដោយឯកឯងដែរឬទេ**?**	បាទ/ចាស	1	
		ទេ	2	
1.6	តើអ្នកធ្លាប់រំលូតកូនដែរឬទេ**?**	បាទ/ចាស	1	
		ទេ	2	
1.7	តើអ្នកធ្លាប់ចូលរៀននៅសាលាដែរឬទេ**?**	បាទ/ចាស	1	
		ទេ	2	ទៅកាន់ 1.9
1.8	តើអ្នកតើអ្នករៀនដល់ថ្នាក់ទីប៉ុន្មានដែរ?	គ្មាន	1	
		១-៣ ឆ្នាំ	2	
		៤-៦ ឆ្នាំ	3	
		លើស ០៧ ឆ្នាំ	4	

1.9	តើប្តី របស់អ្នកធ្លាប់ចូលរៀននៅសាលាដែរឬទេ?	បាទ/ចាស	1	
		ទេ	2	ទៅកាន់ 1.11
1.10	**តើប្តីរបស់អ្នករៀនដល់ថ្នាក់ទីប៉ុន្មានដែរ**?	**គ្មាន**	1	
		១-៣ ឆ្នាំ	2	
		៤-៦ ឆ្នាំ	3	
		ច្រើនជាង ០៧ ឆ្នាំ	4	
1.11	តើមេគ្រួសារមានមុខរបរអ្វី**?**	កសិករ	1	
		ឈ្មួញ	2	
		មន្ត្រីរដ្ឋាភិបាល	3	
		លក់កំលាំងពលកម្ម	4	
		ផ្សេងៗ	97	
1.12	**តើអ្នកប្រកបមុខរបរអ្វីដែរ**?	កសិករ	1	
		ឈ្មួញ	2	
		house wife	3	
		កម្មកររោងចក្រ	4	
		ផ្សេងៗ	97	
1.13	តើអ្នកកាន់សាសនាអ្វី**?**	ព្រះពុទ្ធ	1	
		មូស្លីម	2	
		គ្រិស្ត	3	
		ផ្សេងៗ	4	
1.14	តើអ្នកមានអ្វីខ្លះនៅក្នុងផ្ទះ**?**	ដំបូលបណ្តោះអាសន្ន	1	
		ដំបូលអចិន្ត្រៃយ៍	2	
		កង់	1	
		ម៉ូតូ	1	
		រទេះគោ	1	
		វិទ្យុ	1	
		ទូរទស្សន៍	1	
		គោ	1	

ផ្នែកទី ២ៈ ចំណេះដឹង ខ្ញុំសូមសួរអ្នកសំនួរខ្លះៗអំពីការមានផ្ទៃពោះ និងសំរាលកូន។

ល.រ	សំណួរ	លេខកូដ			
2.1	តើមានបញ្ហាសុខភាពធ្ងន់ធ្ងរអ្វីខ្លះដែលអាចកើតមានឡើង**អំឡុង**	ធ្លាក់ឈាមខ្លាំង		Yes 1 **No** 2	

★	**ពេលមានផ្ទៃពោះ**ដែលអាចបង្កគ្រោះថ្នាក់ដល់អាយុជីវិតស្ត្រីមានផ្ទៃពោះ**?** សូមលើកឧទាហរណ៍។	ឈឺក្បាលខ្លាំង		Yes 1 **No** 2	
		ស្រវាំងភ្នែក		Yes 1 **No** 2	
		ហើមដៃ និងមុខ		Yes 1 **No** 2	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
2.2 ★	**ចុះនៅពេលសម្រាលកូន**?	ធ្លាក់ឈាមខ្លាំង		Yes 1 **No** 2	
		ឈឺពោះយូរ		Yes 1 **No** 2	
		សុកមិនធ្លាក់ ៣០ នាទីក្រោយពីទាកកើត		Yes 1 **No** 2	
		ប្រកាច់		Yes 1 **No** 2	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
2.3 ★	**ចុះអន់ឡួងពេលក្រោយការសម្រាលវិញ** (ពីរថ្ងៃដំបូងក្រោយការសម្រាលកូន)?	ធ្លាក់ឈាមធ្ងន់ធ្ងរ		Yes 1 **No** 2	
		ក្តៅខ្លួនខ្លាំង		Yes 1 **No** 2	
		ធ្លាក់អង្គជាតុរាវក្លិនមិនល្អតាមទ្វារមាស		Yes 1 **No** 2	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
2.4	បើតាមគំនិតរបស់អ្នក តើស្ត្រីអាចស្លាប់បាត់បង់ជីវិតដោយសារបញ្ហាណាមួយខាងលើនេះដែរឬទេ?		Yes	1	
			No	2	
2.5	តើមានសញ្ញាគ្រោះថ្នាក់អ្វីខ្លះដែលអ្នកដឹងថាវានឹងកើតឡើងជាទៀងទាត់/ចាំបាច់ចំពោះស្ត្រីពេលសំរាលកូន?	ធ្លាក់ឈាមខ្លាំង		1	
		ឈឺក្បាលខ្លាំង		2	
		ស្រវាំងភ្នែក		3	
		ហើមដៃ និងមុខ		4	
		ឈឺពោះយូរ		5	
		សុកមិនធ្លាក់ ៣០ នាទីក្រោយពីទាកកើត		6	
		ប្រកាច់		7	
		ក្តៅខ្លួនខ្លាំង		8	
		ធ្លាក់អង្គជាតុរាវក្លិនមិនល្អតាមទ្វារមាស		9	
		ឡើងឈាម		10	

2.6	តើអ្នកធ្លាប់ឮពី "ការត្រៀមលក្ខណៈសម្រាប់ការសម្រាលកូន" ដែរឬទេ?	Yes		1	
		No		2	
2.7 ★	បើតាមគំនិតរបស់អ្នក តើស្ត្រីអាចធ្វើអ្វីខ្លះដើម្បីត្រៀមលក្ខណៈសម្រាប់ការសម្រាលកូន?	កំណត់អ្នកផ្តល់សេវាដែលមាន ជំនាញ		Yes 1 No 2	
		រៀបចំមធ្យោបាយដឹកជញ្ជូន		Yes 1 No 2	
		ត្រៀមប្រាក់ទុក		Yes 1 No 2	
		កំណត់អ្នកផ្តល់ឈាម		Yes 1 No 2	
		កំណត់ពីទីកន្លែងសំរាល		Yes 1 No 2	
		ផ្សេងៗ (សូមបញ្ជាក់)			
2.8	តើសហគមន៍របស់អ្នកមានផ្តល់សេវានានាដើម្បីជួយស្ត្រីក្នុងការត្រៀមលក្ខណៈសម្រាប់ការសម្រាលកូនដែរឬទេ? ឧទាហរណ៍ តើមាន៖ សេវាដឹកជញ្ជូនសម្រាប់ស្ត្រីដែរឬទេ? វិធីស្វែងរកប្រាក់ដើម្បីជួយគ្រួសារបង់ថ្លៃសម្រាលកូនដែរឬទេ?	ការដឹកជញ្ជូន	Yes 1	No 2		
		ប្រាក់	Yes 1	No 2	
		ផ្សេងៗ (សូមបញ្ជាក់)			

ផ្នែកទី ៣៖ អាកប្បកិរិយា

ខ្ញុំចង់ដឹងថាតើអ្នកយល់ទាំងស្រុង (SA) យល់ស្រប (A) មិនបដិសេធក៏មិនយល់ស្រប (N) បដេសេធ (D) បដិសេធទាំងស្រុង (SD) ជាមួយប្រយោគទាំងនេះ។ មិនមានចំលើយ ខុស ឬត្រូវទេ។

ល.រ	សំណួរ	SA	A	N	D	SD
3.1	ស្ត្រីគួរត្រៀមទុកមុននូវទីកន្លែងណាដែលខ្លួននឹងធ្វើការសម្រាលកូនរបស់ខ្លួន។					
3.2	ស្ត្រីគួរត្រៀមទុកមុននូវមធ្យោបាយដើម្បីធ្វើដំណើរទៅកាន់ទីកន្លែងដែលខ្លួននឹងសម្រាលកូន។					
3.3	នៅពេលដែលស្ត្រីមិនទៅកាន់មូលដ្ឋានសុខាភិបាលដើម្បីសម្រាលកូន មូលហេតុចម្បងនោះគឺមកពីវាមានតម្លៃថ្លៃពេក។					
3.4	នៅពេលដែលស្ត្រីមិនទៅកាន់មូលដ្ឋានសុខាភិបាលដើម្បី សម្រាលកូន មូលហេតុចម្បងនោះគឺការលំបាកដើម្បីធ្វើដំណើរទៅកាន់ទីនោះ។					
3.5	នៅពេលដែលស្ត្រីមិនទៅកាន់មូលដ្ឋានសុខាភិបាលដើម្បី សម្រាលកូន មូលហេតុចម្បងនោះគឺ បុគ្គលិកនៅទីនោះមិនបានយកចិត្តទុកដាក់លើស្ត្រី។					
3.6	វាមិនចាំបាច់នោះទេ ការដែលប្តី/ដៃគូត្រូវកំដរប្រពន្ធរបស់ខ្លួននៅពេលដែលនាងសម្រាលកូន។					

3.7	ការសម្រាលកូនភាគច្រើនគឺជារឿងរបស់ស្ត្រី។ ប្តី/ដៃគូមិនអាចជួយអ្វីបានច្រើននោះទេ។					

ផ្នែកទី ៤៖ បទពិសោធន៍ផ្ទាល់ខ្លួនទាក់ទងនឹងការមានផ្ទៃពោះលើកចុងក្រោយ

ខ្ញុំនឹងសួរអ្នកអំពីបទពិសោធន៍ទាក់ទងនិងការមានផ្ទៃពោះលើកចុងក្រោយរបស់អ្នក។

ល.រ	សំណួរ	លេខកូដ		ទៅកាន់សំនួរ
4.1 ✓	នៅអំឡុងពេលមានផ្ទៃពោះលើកចុងក្រោយ តើអ្នកបានទៅពិនិត្យផ្ទៃពោះប៉ុន្មានដងដែរ? # of ANC	០	1	
		1 ដង	2	
		2 ដង	3	
		3 ដង	4	
		លើសពី 4 ដង	5	times
4.2 ✓	តើអ្នកមានផ្ទៃពោះប៉ុន្មានខែហើយនៅពេលដែលអ្នកបានទៅពិនិត្យផ្ទៃពោះលើកដំបូងសម្រាប់ការមានផ្ទៃពោះនេះ? first visit		M	
4.3	ចំពោះការពិនិត្យផ្ទៃពោះ លើកដំបូងតើអ្នកទៅពិនិត្យនៅឯណា?	មន្ទីរពេទ្យខេត្តស្វាយរៀង	1	
		មន្ទីរពេទ្យបង្អែកខេត្តស្វាយរៀង	2	
		មណ្ឌលសុខភាពខេត្តស្វាយរៀង	3	
		ឆ្ពបបូរាណ	4	
		ភ្នំពេញ	5	
		ផ្សេងៗ	97	
4.4	ហេតុអ្វីបានជាអ្នកជ្រើងរើសទៅពិនិត្យផ្ទៃពោះនៅទីនោះ?	នៅជិត		
		តម្លៃថោក		how much
		មានសុវត្ថិភាព		
		មានបុគ្គលិកនៅប្រចាំការជានិច្ច		
		មូលដ្ឋានសុខាភិបាលបើកទ្វារជាប្រចាំ		
		បុគ្គលិកមានជំនាញ		
		មានថ្នាំដែលចាំបាច់		
		មានសំភារៈគ្រប់គ្រាន់សំរាប់ករណីសង្គ្រោះបន្ទាន់		
		មិនត្រូវរង់ចង់យូរ		
		បុគ្គលិកមានការគោរពចំពោះស្ត្រី		
		បានទទួលការណែនាំពីគ្រួសារ/មិត្តភ័ក្រ		
		មានភាពខ្ជាស់អៀនក្នុងការទៅកន្លែងផ្តល់សេវាសុខភាព		
		ផ្សេងៗ		

4.5	តើអ្នកបានជួបនរណាមុនគេបង្អស់ដើម្បីពិនិត្យផ្ទៃពោះនេះ?	វេជ្ជបណ្ឌិត		1	
		ឆ្មប		2	
		គិលានុបដ្ឋាក		3	
		ឆ្មបបុរាណ		4	
4.6 ✓	តើអ្នកមានផ្ទៃពោះប៉ុន្មានខែហើយនៅពេលដែលអ្នកបានទៅពិនិត្យផ្ទៃពោះលើកចុងក្រោយសម្រាប់ការមានផ្ទៃពោះនេះ? last ANC visit			M	
4.7	នៅអំឡុងពេលមានផ្ទៃពោះលើកចុងក្រោយ តើបុគ្គលិកសុខាភិបាលមានបានផ្តល់ដំបូន្មានដល់អ្នកអំពីចំណុចខាងក្រោមណាមួយយ៉ាងហោចណាស់ឲ្យបានមួយដងដែរឬទេ?	សញ្ញាគ្រោះថ្នាក់សុខភាពធ្ងន់ធ្ងរ			
		ទីកន្លែងដែលត្រូវទៅ បើអ្នកមានសញ្ញាគ្រោះថ្នាក់នៃបញ្ហាសុខភាពធ្ងន់ធ្ងរ?			
		ទីកន្លែងដែលអ្នកគួរសម្រាលកូន			
		ការរៀបចំការដឹកជញ្ជូន?			
		ការរៀបចំប្រាក់កាស/ហិរញ្ញវត្ថុ?			
		ការរៀបចំអ្នកបរិច្ចាគឈាម?			
		ការរៀបចំបុគ្គលិកជំនាញផ្នែកសុខភាព ដើម្បីសម្រាលកូនរបស់អ្នក?			
4.8 ★	តើអ្នកបានទទួល ពត៌មានទាំងអស់នេះមកពីប្រភពណាដែរ?	សមាជិកក្នុងគ្រួសារ		Yes 1 No 2	
		ទូរទស្សន៍/ប្រពន្ធ័ផ្សព្វផ្សាយផ្សេងៗ		Yes 1 No 2	
		ការផ្សព្វផ្សាយរបស់អង្គការក្រៅរដ្ឋាភិបាល		Yes 1 No 2	
		ពីកន្លែងធ្វើការងារ		Yes 1 No 2	
		ផ្សេងៗ		97	
4.9	នៅអំឡុងពេលមានផ្ទៃពើលើកចុងក្រោយ តើអ្នកមានបានជួបប្រទះបញ្ហាសុខភាពណាមួយធ្ងន់ធ្ងរពាក់ព័ន្ធនឹងការមានផ្ទៃពោះនោះដែរឬទេ?			Yes 1	
				No 2	**Section5**
4.10 ◎	តើបញ្ហាសម្គាល់អ្វីដែលអ្នកបានជួបនៅអំឡុងពេលមានផ្ទៃពោះលើកចុងក្រោយ?	ធ្លាក់ឈាមតាមទ្វាមាសអំឡុងពេលមានផ្ទៃពោះ	Yes 1→ No 2	severe	
		ឈឺក្បាលខ្លាំង	Yes 1→ No 2	severe	
		ស្រវាំងភ្នែក	Yes 1→ No 2	severe	
		ហើមដៃ និងមុខ	Yes 1→ No 2	severe	
		ក្តៅខ្លួនខ្លាំង	Yes 1→ No 2	severe	
		សន្លប់	Yes 1→ No 2	severe	
		ពិបាកដកដង្ហើម	Yes 1→ No 2	severe	

		ឈឺពោះខ្លាំង	Yes 1→ No 2	severe	
		ចលនាទារកក្នុងផ្ទៃថយចុះ	Yes 1→ No 2	severe	
		ខ្សោយ	Yes 1→ No 2	severe	
		Hypertension	Yes 1→ No 2	severe	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
4.11	តើអ្នកមានបានស្វែងរកជំនួយដែរឬទេសម្រាប់បញ្ហានេះ?	បាទ/ចាស		1	4.13
		ទេ		2	
4.12 ◎	តើហេតុអ្វីបានជាអ្នកមិនបានស្វែងរកជំនួយសម្រាប់បញ្ហានេះ? ជជីកសួរនាំពីមូលហេតុផ្សេងទៀត និងកត់ត្រាមូលហេតុទាំងអស់ដែលបានលើកឡើង។	អ្នកត្រូវបានសម្ភាសន៍គិតថាមិនចាំបាច់		1	
		ប្តី/គ្រួសារគិតថាមិនចាំបាច់		2	
		សេវាសុខភាពនៅឆ្ងាយពេក		3	
		គ្មានមធ្យោបាយដឹកជញ្ជូន		4	
		គ្មានតំហែទាំកុមារ		5	
		ថ្លៃពេក		6	
		គុណភាពអន់		7	
		ប្រើថ្នាំបុរាណ		8	
		មិនដឹងថាត្រូវទៅទីណា		9	
		គ្មានពេលទៅ		10	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
4.13	តើនរណាជាអ្នកសម្រេចចិត្តថាតើត្រូវឬមិនត្រូវស្វែងរកជំនួយសម្រាប់បញ្ហានេះ?	គ្មាននរណាទេ		1	
		អ្នកត្រូវបានសម្ភាសន៍		2	
		អ្នកត្រូវបានសម្ភាសន៍ និងប្តី		3	
		ប្តី		4	
		ម្តាយរបស់អ្នកត្រូវបានសម្ភាសន៍		5	
		ឪពុករបស់អ្នកត្រូវបានសម្ភាសន៍		6	
		ម្តាយក្មេក		7	
		ឪពុកក្មេក		8	
		ប្អូនស្រី/ប្អូនស្រីថ្លៃ		9	
		មិត្តភក្តិ/អ្នកជិតខាង		10	
		ឆ្មបជំនាញ		11	
		ឆ្មបបុរាណ		12	
		ផ្សេងៗ (សូមបញ្ជាក់)		13	

ផ្នែកទី ៥៖ ការអនុវត្ត (បទពិសោធន៍ទាក់ទងនឹងការមានផ្ទៃពោះលើកចុងក្រោយ
ខ្ញុំនឹងសួរអ្នកអំពីបទពិសោធន៍នៃការសំរាលកូនរបស់អ្នក។

ល.រ	សំនួរ	លេខកូដ			ទៅកាន់សំនួរ
5.1	**តើអ្នកបានសម្រាលកូន**ចុងក្រោយ**នៅឯណា?** **delivery place** _____ (ឈ្មោះទីកន្លែង)	មន្ទីរពេទ្យខេត្តស្វាយរៀង		1	
		មន្ទីរពេទ្យស្រុកក្នុងខេត្តស្វាយរៀង (រដ្ឋ)		2	
		មណ្ឌលសុខភាពក្នុងខេត្តស្វាយរៀង (រដ្ឋ)		3	
		គ្លីនិកឯកជនក្នុងខេត្តស្វាយរៀង		4	
		នៅផ្ទះ		5	
		សេវាសុខភាពនៅភ្នំពេញ pp		6	
		សេវាសុខភាពវៀតណាម		7	
5.2	តើអ្នកបានគ្រោងជាមុនថាត្រូវសម្រាលកូននៅទីកន្លែងនេះមែនទេ?	បាទ/ចាស		1	
		ទេ		2	
5.3	មុនពេលសម្រាលនេះ តើអ្នក ឬគ្រួសារអ្នកមានធ្វើការរៀបចំត្រៀមលក្ខណៈទុកជាមុនសម្រាប់ការសម្រាលនេះដែរឬទេ?		Yes	1	
			No	2	ទៅកាន់ ៥.5.11
5.4 ★	តើការរៀបចំមុនមួយណាដែលអ្នកឬគ្រួសារបានធ្វើត្រៀមសម្រាប់ការសម្រាលកូននេះ? ↓ arrangement	កំណត់មធ្យោបាយដឹកជញ្ជូន		1	
		សន្សំប្រាក់		2	
		កំណត់អ្នកផ្តល់ឈាម		3	
		កំណត់ ឆ្មបជំនាញ		4	
		ខោអាវទារក		5	
		សារុង		6	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
5.5	កំណត់មធ្យោបាយដឹកជញ្ជូន?	ទេ		2	ទៅកាន់ 5.7
		បាទ/ចាស↓		1	
5.6	តើអ្នកបានឃើញមធ្យោបាយដឹកជញ្ជូនដែលអ្នកបានកំណត់ដែរឬទេ?	បាទ/ចាស		1	
		ទេ		2	
5.7	សន្សំប្រាក់?	ទេ		2	ទៅកាន់ 5.8
		បាទ/ចាស↓		1	
5.8	តើអ្នកបានប្រើប្រាស់ប្រាក់ដែលអ្នកបានសន្សំទុកដែរឬទេ?	បាទ/ចាស		1	
		ទេ		2	
5.9	កំណត់អ្នកផ្តល់ឈាម?	ទេ		2	ទៅកាន់ 5.11

		បាទ/ចាស↓	1	
5.10	តើអ្នកបានប្រើប្រាស់អ្នកផ្តល់ឈាមដែលអ្នកបានកំណត់ដែរឬទេ?	បាទ/ចាស	1	
		ទេ	2	
5.11	តើនរណាគឺជាអ្នកសម្រេចចិត្តចុងក្រោយទាក់ទងនឹងទីកន្លែងដែលអ្នកនឹងត្រូវសម្រាលកូន?	គ្មាននរណាទេ	1	
		អ្នកត្រូវបានសម្ភាសន៍	2	
		អ្នកត្រូវបានសម្ភាសន៍ និងប្តី	3	
		ប្តី	4	
		ម្តាយរបស់អ្នកត្រូវបានសម្ភាសន៍	5	
		ឪពុករបស់អ្នកត្រូវបានសម្ភាសន៍	6	
		ម្តាយក្មេក	7	
		ឪពុកក្មេក	8	
		ពេទ្យឆ្លប វេជ្ជបណ្ឌិត គិលានុប្បដ្ឋាក	9	
		ពេទ្យឯកជន	10	
		TBA	11	
		ផ្សេងៗ (សូមបញ្ជាក់)	97	
5.12	សម្រាលកូននៅឯសេវាសុខភាព	ទេ	2	ទៅកាន់ 5.24
		បាទ/ចាស↓	1	
5.13	តើអ្នកអាចប្រាប់ខ្ញុំបានទេមូលហេតុអ្វីបានជាអ្នកជ្រើសសម្រាលកូននៅឯសេវាសុខភាព ជាជាងសម្រាលនៅកន្លែងផ្សេងទៀត?	សុវត្ថិភាព	Yes 1 No 2	
		បុគ្គលិកមានជំនាញ	Yes 1 No 2	
		មានថ្នាំដែលចាំបាច់	Yes 1 No 2	
		មានសំភារៈចាំបាច់ក្នុងករណីត្រូវការសង្គ្រោះបន្ទាន់(បើត្រូវការរៈកាត់)	Yes 1 No 2	
		មានបុគ្គលិកនៅទីនោះជានិច្ច	Yes 1 No 2	
		បុគ្គលិកមានការគោរពចំពោះស្ត្រី	Yes 1 No 2	
		ជានទទួលការណែនាំពីសមាជិកក្នុងគ្រួសារ/មិត្តភក្រ	Yes 1 No 2	
		ធ្វើតាមការសម្រាលពីមុន	Yes 1 No 2	
		ការសម្រាលដែលសុំញ៉ាំ ការមានផ្ទៃពោះដែលមានគ្រោះថ្នាក់	Yes 1 No 2	

		នៅជិត	Yes 1 No 2	
		តម្លៃថោក	Yes 1 No 2	
		12. រាជរដ្ឋាភិបាលមិនអនុញ្ញាត	Yes 1 No 2	
		គ្មានសេវាសុខភាពកុមារ	Yes 1 No 2	
		Others		
5.14	តើអ្នកទៅកាន់មូលដ្ឋានសុខភាពដោយមធ្យោបាយអ្វី? ជជីកសួរ៖ តើអ្នកប្រើប្រាស់មធ្យោបាយដឹកជញ្ជូនប្រភេទណាជាចម្បងដើម្បីទៅកាន់សេវាសុខភាព?	រថយន្តសង្គ្រោះ	1	
		រថយន្តឯកជន	2	
		តាក់ស៊ី	3	
		រទេះ	4	
		ម៉ូតូ	5	
		កង់	6	
		ថ្មើរជើង	7	
		ម៉ូតូកង់បី (តុក)	8	
		ផ្សេងៗ (សូមបញ្ជាក់)	97	
5.15 ◎	នរណាបានកំដរអ្នកទៅកាន់ទីកន្លែងដែលអ្នកសម្រាលកូន? កត់ត្រាបុគ្គលទាំងអស់	គ្មាននរណាទេ	1	
		ប្តី	2	
		ម្តាយរបស់អ្នកត្រូវបានសម្គាសន៍	3	
		ឪពុករបស់អ្នកត្រូវបានសម្គាសន៍ father	4	
		ម្តាយក្មេក	5	
		ឪពុកក្មេក	6	
		ប្អូនស្រី/ប្អូនស្រីថ្លៃ	7	
		មិត្តភក្តិ/អ្នកជិតខាង	8	
		ពេទ្យឆ្លប វេជ្ជបណ្ឌិត គិលានុប្បដ្ឋាក	9	
		ពេទ្យឯកជន	10	
		ឆ្លបបុរាណ	11	
		សាច់ញាតិស្និទស្នាល	12	
		ផ្សេងៗ (សូមបញ្ជាក់)	97	
5.16	ដើម្បីទៅដល់មូលដ្ឋានសុខាភិបាល តើអ្នកបានចំណាយពេលប៉ុន្មាន ? បើតិចជាងពីរម៉ោង សូមកត់ត្រាចំនួននាទី។ ឬកត់ត្រាជាម៉ោង		Hours Minutes	
5.17	តើមណ្ឌលសុខភាពដែលនៅក្បែរបំផុតមានចម្ងាយ	<2km	1	km
		2-5 km	2	

	ប៉ុន្មាន?	5km<	3	
5.18	តើមន្ទីរពេទ្យស្រុកដែលនៅក្បែរបំផុតមានចម្ងាយប៉ុន្មាន?	<2km	1	km
		2-5 km	2	
		5km<	3	
5.19	បន្ទាប់ពីទៅដល់មូលដ្ឋានសុខាភិបាលរួច តើអ្នកត្រូវចំណាយពេលរងចាំប៉ុន្មានដើម្បីទទួលបានសេវាពីបុគ្គលិកសុខាភិបាល?	Waiting time Hours Minutes		
5.20	តើអ្នក និងគ្រួសារមានប្រាក់គ្រប់គ្រាន់សម្រាប់បង់៖	ថ្លៃសេវា	Yes 1 No 2	***how much***
		មធ្យោបាយធ្វើដំណើរ	Yes 1 No 2	
		ថ្នាំ	Yes 1 No 2	
		កំរៃក្រៅផ្លូវការ	Yes 1 No 2	
		ថ្លៃចំណាយផ្សេងៗ	Yes 1 No 2	
5.21	តើអ្នកបានប្រើប្រាស់ជំនួយសមធម៌សម្រាប់សុខភាពសម្រាលកូនដែរឬទេ	Yes	1	
		No	2	
5.22	បើតាមគំនិតរបស់អ្នក តើសេវាកម្មនៅមូលដ្ឋានសុខាភិបាលនេះយ៉ាងដូចម្តេច?	ល្អណាស់	1	
		ល្អ	2	
		មធ្យម	3	
		អន់	4	
		អន់ខ្លាំង	5	
5.23	តើអ្នកអាចប្រាប់ខ្ញុំបានទេពីមូលហេតុដែលអ្នកអោយចំណាត់ថ្នាក់សេវាកម្មដូចសំណួរមុន? កត់ត្រាចម្លើយទាំងអស់។	មានបុគ្គលិកនៅទីនោះជានិច្ច	Yes 1 No 2	
		មូលដ្ឋានសុខាភិបាលតែងតែបើកទ្វារ	Yes 1 No 2	
		បុគ្គលិកមានជំនាញ	Yes 1 No 2	
		មានថ្នាំដែលចាំបាច់	Yes 1 No 2	
		មិនត្រូវរង់ចង់យូរ	Yes 1 No 2	
		បុគ្គលិកមានការគោរពចំពោះស្ត្រី	Yes 1 No 2	
		ជាញឹកញាប់មិនមាន បុគ្គលិកនៅទីនោះ	Yes 1 No 2	
		ជាញឹកញាប់មូលដ្ឋានសុខាភិបាលិបិទទ្វារ	Yes 1 No 2	
		បុគ្គលិកជំនាញមិនគ្រប់គ្រាន់	Yes 1 No 2	

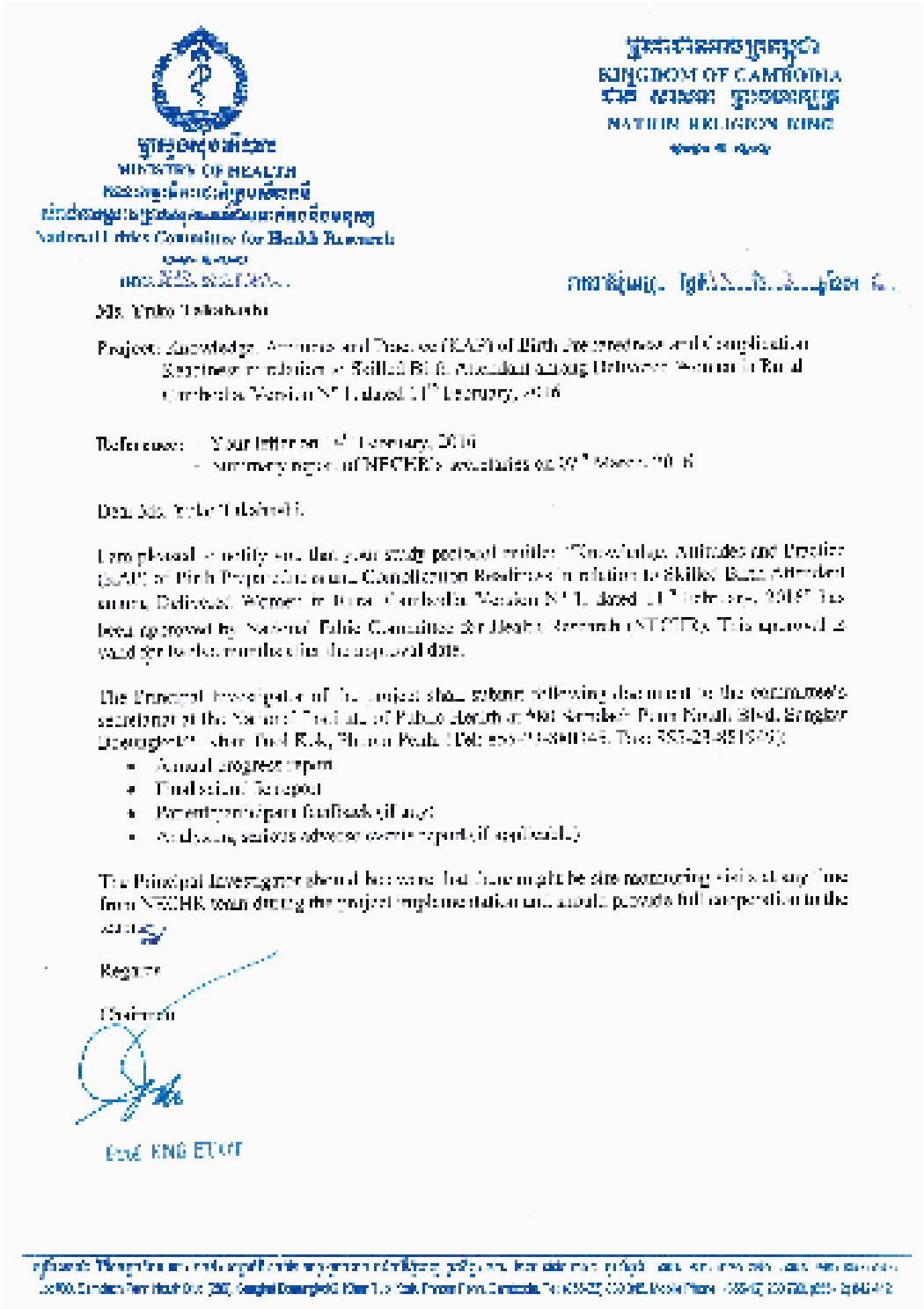
		ខ្វះថ្នាំដែលសំខាន់ៗ	Yes 1 No 2	
		ត្រូវរង់ចាំយូរ	Yes 1 No 2	
		បុគ្គលិកគ្មានការគោរពចំពោះស្ត្រី	Yes 1 No 2	
		ផ្សេងៗ (សូមបញ្ជាក់)		
5.24	**សម្រាលកូននៅឯសេវាសុខភាព**	បាទ/ចាស	1	go to 5.26
		ទេ↓	2	
5.25	តើអ្នកអាចប្រាប់ខ្ញុំបានទេមូលហេតុអ្វីបានជាអ្នកមិនដែលបានសម្រាលកូននៅឯមូលដ្ឋានសុខាភិបាល?	អ្នកត្រូវបានសម្ភាសន៍គិតថាមិនចាំបាច់ not necessary	Yes 1 No 2	
		ប្តី/គ្រួសារគិតថាមិនចាំបាច់	Yes 1 No 2	
		សេវាសុខភាពនៅឆ្ងាយពេក	Yes 1 No 2	
		គ្មានមធ្យោបាយដឹកជញ្ជូន	Yes 1 No 2	
		គ្មានសេវាសុខភាពកុមារ	Yes 1 No 2	
		ថ្លៃពេក	Yes 1 No 2	
		គុណភាពខ្សោយ	Yes 1 No 2	
		ប្រើថ្នាំខ្មែរ	Yes 1 No 2	
		មិនដឹងថាត្រូវទៅទីណា	Yes 1 No 2	
		គ្មានពេលទៅ	Yes 1 No 2	
		ផ្សេងៗ (សូមបញ្ជាក់)		
5.26	**តើនរណាជួយដល់ការសម្រាលកូនរបស់អ្នក**?	វេជ្ជបណ្ឌិត	1	
		ពេទ្យឆ្លប/គិលានុប្បដ្ឋាក	2	
		អ្នកអនុវត្ត/ពេទ្យឯកជន	3	
		ឆ្លបបុរាណ	4	
		ផ្សេងៗ (សូមបញ្ជាក់)	97	
5.27	តើអ្នកសម្រាលកូនតាមវិធីណាដែរ?	សម្រាលតាមទ្វាមាស	1	
		សម្រាលដោយវះកាត់	2	
		តំបៀត (ប្រើក្បៀតដើម្បីទាញទារកក្នុងការឆ្លងទន្លេពិបាក)	3	
		សម្រាលតាមការបូមទាញ	4	

5.28	នៅអំឡុងពេលឈឺពោះ និងសម្រាល តើអ្នកមានបានជួបប្រទះបញ្ហាសុខភាពធ្ងន់ធ្ងរណាមួយទាក់ទងនឹងការសម្រាលដែរឬទេ?			Yes 1	
				No 2	5.34
5.29	តើបញ្ហាផ្នែកសម្ភពមួយណាដែលអ្នកបានជួបប្រទះនៅអំឡុងពេលសម្រាល?	ធ្លាក់ឈាមខ្លាំង	Yes1→ No 2	severe	
		ឈឺក្បាលខ្លាំង	Yes1→ No 2	severe	
		ឈឺពោះយូរ	Yes1→ No 2	severe	
		សុកមិនធ្លាក់ ៣០ នាទី បន្ទាប់ពីទារកកើត	Yes1→ No 2	severe	
		ប្រកាច់	Yes1→ No 2	severe	
		សន្លប់	Yes1→ No 2	severe	
		ក្តៅខ្លួនខ្លាំង	Yes1→ No 2	severe	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
5.30	តើអ្នកចាប់មានបញ្ហានេះនៅទីណាដែរ?	មន្ទីរពេទ្យខេត្តស្វាយរៀង		1	
		មន្ទីរពេទ្យស្រុក (រដ្ឋ)		2	
		មណ្ឌលសុខភាព(រដ្ឋ)		3	
		គ្លីនិកឯកជន		4	
		នៅផ្ទះ		5	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	
5.31	តើអ្នកមានបានស្វែករកជំនួយសម្រាប់បញ្ហានេះដែរឬទេ?	Yes		1	ទៅកាន់ 5.33
		No		2	
5.32	តើហេតុអ្វីបានជាអ្នកមិនបានស្វែងរកជំនួយសម្រាប់បញ្ហានេះ? ជជីកសួរនាំពីមូលហេតុផ្សេងទៀត និងកត់ត្រាមូលហេតុទាំងអស់ដែលបានលើកឡើង។	អ្នកត្រូវបានសម្ភាសន៍គិតថាមិនចាំបាច់		1	
		ប្តី/គ្រួសារគិតថាមិនចាំបាច់		2	
		សេវាសុខភាពនៅឆ្ងាយពេក		3	
		គ្មានមធ្យោបាយដឹកជញ្ជូន		4	
		គ្មានតំហែទាំកុមារ		5	
		ថ្លៃពេក		6	
		គុណភាពខ្សោយ		7	
		ប្រើថ្នាំបុរាណ		8	
		មិនដឹងថាត្រូវទៅទីណា		9	
		គ្មានពេលទៅ		10	
		ផ្សេងៗ (សូមបញ្ជាក់)		97	

5.33	តើនរណាគឺជាអ្នកសម្រេចចិត្ត ចុងក្រោយទាក់ទងនឹងទីកន្លែងដែលអ្នកត្រូវទទួលជំនួយ ?	គ្មាននរណាទេ	1	
		អ្នកត្រូវបានសម្ភាសន៍	2	
		អ្នកត្រូវបានសម្ភាសន៍ និងប្តី	3	
		ប្តី	4	
		ម្តាយរបស់អ្នកត្រូវបានសម្ភាសន៍	5	
		ឪពុករបស់អ្នកត្រូវបានសម្ភាសន៍	6	
		ម្តាយក្មេក	7	
		ឪពុកក្មេក	8	
		ពេទ្យឆ្មប វេជ្ជបណ្ឌិត គិលានុបដ្ឋាក	9	
		ពេទ្យឯកជន	10	
		ឆ្មបបុរាណ	11	
		ផ្សេងៗ (សូមបញ្ជាក់)	97	

5.34 អាំងភ្លើង

APPENDIX 3 Ethical approval



ព្រះរាជាណាចក្រកម្ពុជា
KINGDOM OF CAMBODIA
ជាតិ សាសនា ព្រះមហាក្សត្រ
NATION RELIGION KING

ក្រសួងសុខាភិបាល
MINISTRY OF HEALTH
គណៈកម្មាធិការជាតិសាធារណៈសុខភាពស្រាវជ្រាវសុខភាព
National Ethics Committee for Health Research

Ms. Yuko Takahashi

Project: Knowledge, Attitudes and Practices (KAP) of Birth Preparedness and Complication Readiness in relation to Skilled Birth Attendant among Unbooked Women in Rural Cambodia Version N° 1, dated 13th January, 2016

Reference: - Your letter on 15th January, 2016
- Summary report of NECHR's resolutions on 20th March, 2016

Dear Ms. Yuko Takahashi,

I am pleased to notify you that your study protocol entitled "Knowledge, Attitudes and Practices (KAP) of Birth Preparedness and Complication Readiness in relation to Skilled Birth Attendant among Unbooked Women in Rural Cambodia Version N° 1, dated 13th January, 2016" has been approved by National Ethics Committee for Health Research (NECHR). This approval is valid for one year from the approval date.

The Principal Investigator shall submit following documents to the committee's secretariat at the National Institute of Public Health at #40 Samdech Penn Nouth Blvd, Sangkat Lvea Aem 3, Khan Doun Penh, Phnom Penh, Cambodia, Tel: 855-23-881344, Fax: 855-23-881569):

- Annual progress report
- Final technical report
- Participant/participant feedback (if any)
- Serious adverse event report (if applicable)

The Principal Investigator should be aware that there might be site monitoring visits at any time from NECHR team during the project implementation and should provide full cooperation in the visits.

Regards,

Chairman

Prof. ENG ETTE

ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

[illegible]

[illegible]

[illegible]

[illegible] Yuko Takahashi [illegible] Candidate of Master of Public Health, College of Public Health Sciences, Chulalongkorn University [illegible]

[illegible] Yuko Takahashi [illegible] Yuko Takahashi [illegible] Candidate of Master of Public Health, College of Public Health Sciences, Chulalongkorn University [illegible] Knowledge, Attitudes and Practice (KAP) of Birth Preparedness and Complication Readiness in relation to Skilled Birth Attendant among Delivered Women in Rural Cambodia [illegible]

[illegible]

[illegible]

[illegible]

APPENDIX 4

- **Administration and Time schedule**

	2015				2016						
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Literature Review											
Proposal writing											
Theses proposal examination											
Ethical Review											
Data collection											
Data analysis and report writing											
Theses examination											
Submission											

- **Budget**

Estimated total budget of this study is 70,700 Thai baht. The breakdown is following.

	item	quantity	Unit price (USD)	Sub total (USD)	Total (THB)
1	Translation questionnaire	10	10	100	
2	Air ticket (Thailand – Cambodia)	1	200	200	
3	Transportation (PP-SVR)	4 round trips	10	40	
4	Accommodation	1person*25days	10	250	
5	Training	4person	10	40	
6	Assistant (admin)	1	50	50	
7	Research assistant	260 samples	3	780	
8	For respondent	260	1	260	
9	Copy	400	0.5	200	
10	Miscellaneous	1	100	100	
	Exchange rate 1USD=35THB			2020	**70,700**

VITA

Name: Yuko Takahashi

Sex: female

Nationality: Japanese

Date of birth: 19 June 1981

Educational background:

2004 Tsukuba University,Bachelor of International Relations

2012 Tsukuba University, Bachelor of Nursing Science

Work experiences:

2005 JICA Cambodia office NGO desk coordinator

2007 Tsukuba Gakuin University Coordinator

2012 Tsuchiura general hospital Nurse- midwife

2013 JICA project JICA Project for Improving Maternal and Newborn Care through Midwifery Capacity Development, Cambodia