

Factors Affecting the Use of Midwifery Services in Remote Nepal

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Ethics Statement



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Abstract

Tens of thousands of mothers and hundreds of thousands of newborns die each year or have birth injuries. Families living in remote mountainous areas of Nepal are geographically marginalized, and women often deliver without skilled assistance. Human resources are few and often not trained to the level that international professional organizations recommend. Although the government has established birthing centers in communities in eastern Nepal's remote, mountainous region of lower Solukhumbu, they are not fully utilized. This study of birthing in a remote area of Nepal examined factors associated with access to skilled birth attendants from both a health systems perspective and from the perspectives of mothers and community members.

A concurrent, embedded, mixed methods study investigated mothers', maternity staff and community members' experiences with birth through semi-structured interviews. The skills of attending nurses, and the enabling factors such as infrastructure, equipment, and supplies in three levels of maternity facilities were examined through two surveys. Participant observation and field notes were additional methods used.

Distance and cost were barriers for many women and lack of birth preparedness contributed to delays in reaching a facility if problems occurred. Although communities believed that health facilities save lives, some women preferred home births, citing institutional barriers arising from outdated and unnecessary obstetrical practices, and lack of choices for women. A shortage of skilled human resources and lack of adequate life-saving supplies and medications were found. Lack of infrastructure resulted in difficulty providing care and referrals. Skilled birth attendants were found to have gaps in life-saving skills.

Infrastructure and supplies were inadequate in birthing centers. Improvements in quality of care to maintain cultural safety within birthing institutions require respect for women's preferences, including birth companions and spiritual healers when requested. Frequent focussed midwifery skills refreshers are needed to improve ability to provide skilled and respectful care. Implementing a fully trained midwifery cohort in rural areas would be a longer term goal.

Keywords: respectful childbirth; remote midwifery services; access to midwifery services; skilled birth attendants; low-resource maternity care

Dedication

*I dedicate this writing to the mothers and Nepalese midwives and other caregivers in remote areas of Nepal. In Solu, I want to thank two health care providers who inspired me to carry out the research:
Pema Sherpa and Shreedhwoj Rai.*

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List of Acronyms

AMTSL	Active Management of the Third Stage of Labour
ANC	Antenatal Care
ANM	Auxiliary Nurse-Midwife
BEmONC	Basic Emergency Obstetric Newborn Care
BP	Blood Pressure
CEmONC	Comprehensive Emergency Obstetric Newborn Care
CHW	Community Health Worker
CMA	Certified Medical Assistant
CS	Caesarean Section
D and C	Dilatation and Curettage
DHO	District Health Office(r)
EDD	Expected Date of Delivery
FCHV	Female Community Health Volunteer
FIGO	International Federation of Gynecologists and Obstetricians
HA	Health Assistant
HHESS	Himalayan Health and Environmental Services Solukhumbu
HIV HIV/AIDS	Human Immunodeficiency Virus, Acquired Immunodeficiency Syndrome
ICD-10	International Classification of Diseases - 10 th edition
ICM	International Confederation of Midwives
INGO	International Non-Governmental Organization
IQR	Interquartile Range
IUCD	Intrauterine Contraceptive Device
LMP	Last Menstrual Period
LSCS	Lower Segment Caesarean Section
MBBS	Bachelor of Medicine and Bachelor of Surgery
MDG	Millennium Development Goals
MDGP	Family doctor, Medical Doctor General Practice
MIDSON	Midwifery Society of Nepal
MMR	Maternal Mortality Ratio
MVA	Manual Vacuum Aspiration
NGO	Non-Governmental Organization

NDHS	Nepal Demographic and Health Survey
NMR	Neonatal Mortality Rate
NND	Neonatal Death
NR	Nepal Rupee, Nepali currency
NSI	Nick Simon Institute, Nepal
PAHS	Patan Academy of Health Sciences
PHC	Primary Health Center
PPH	Postpartum Hemorrhage
RCT	Randomized Control Trials
RMC	Respectful Maternity Care
SARA	Service Availability and Readiness Assessment
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goals
SDIP	Safe Delivery Incentive Program
SVD	Spontaneous Vaginal Delivery
TBA	Traditional Birth Attendant
TD	Tetanus Diphtheria Vaccine
TTBA	Trained Traditional Birth Attendant
UI	Uncertainty Interval
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Glossary

Term	Definition
BEmONC	Signal functions of administration of parenteral antibiotics, parenteral uterotonics, parenteral anticonvulsants, performing manual removal of retained placenta, removal of retained products of conception, assisted vaginal delivery, and basic neonatal resuscitation with bag and mask. (Pattinson et al., 2015)
Brahmin	A high caste designation in the Caste/ethnicity hierarchy of Nepal (<i>World Bank, 2006</i>)
CEmONC	The signal functions listed above with the addition of performing caesarean section and provision of blood transfusion. (Pattinson et al., 2015)
Chhetri	A high caste designation in the Caste/ethnicity hierarchy of Nepal (<i>World Bank, 2006</i>)
Dhami	A Nepalese spiritual healer or shaman, also known as a Jankri
Jankri	A Nepalese spiritual healer or shaman, also known as a Dhami
Kangaroo Mother Care	A technique to promote extensive skin to skin contact and exclusive breastfeeding by attaching the baby to the mother or other adult for long periods each day. (World Health Organization, 2003)
NVIVO	Qualitative data analysis computer software package
Rai	One of the major ethnic groups living in eastern Nepal, composed of many subgroups. Also called Kirati people. Bennett, Dahal, & Govindasamy, (2008) (Bennett et al., 2008)
Sherpa	Ethnic group from Eastern mountainous areas (Bennett et al., 2008)
SPSS	Statistical computer software package for the social sciences
Sudeni	Nepalese traditional trained birth attendant
Tamang	One of the major ethnic groups living in Nepal (Bennett et al., 2008)

Chapter 1.

Introduction:

Despite improvements to maternity care there are still thousands of mothers and newborns each year who die or have birth injuries. The vast majority live in low-resource countries, are poor and marginalized, and deliver alone or without skilled assistance. Governments around the world are trying to reduce maternal and neonatal death by increasing access to quality antenatal care, facility-based birth and skilled birth attendance. Although access to both antenatal care and skilled care at birth has increased in the last two decades, this improvement has not included access for vulnerable mothers living in rural and remote areas of many low-income countries. Barriers to care include cost, distance, access to adequate numbers of well-trained providers, and culturally-acceptable options for safer birthing.

Nepal is one of the countries in South Asia that is taking measures to improve maternal and neonatal care. While the government of Nepal has set up rural birthing centers to provide skilled reproductive care, including childbirth services, many mothers do not use these services and choose to stay at home for delivery. The goal of this research is to understand what aspects of care in local birthing facilities meet women's needs, and what changes, if any, are needed to safeguard women's births while respecting their choices and preferences. Specifically, I wanted to assess attitudes and practices around birth and how they affect mothers' and families' willingness to use skilled birth attendants in health care facilities; to assess the readiness of Nepal's rural health system to provide services to parturient women; and to discover the links between mothers' perceptions around birth and their use of the health system.

The research reported on in this thesis was undertaken to better understand barriers and facilitators around access and availability of care in several remote mountainous communities of Solukhumbu, Nepal. Through careful analysis of the local situation, I offer suggestions for improving maternal and neonatal care in rural and

remote Nepal. I hope that my work can shed light on what is clearly a problem in rural and remote areas globally.

1.1. Positioning Myself and Theoretical Framework

I am a Canadian midwife and university midwifery instructor with several decades of global experience in low- and middle-income countries including Mexico, Nicaragua, Kosovo, Zambia, Uganda, South Sudan, Bangladesh and Nepal. I have been working in Nepal in partnership with the Midwifery Society of Nepal (MIDSON) and a local NGO, the Himalayan Health and Environmental Services Solukhumbu (HHESS). In 2010, the Midwifery Society of Nepal (MIDSON) became the professional organization representing the profession of midwifery in Nepal. (midson.org.np). The Society is a member of the Safe Motherhood Network Federation. The purpose of MIDSON is to strengthen midwifery services, and advocate and lobby for improved maternal and neonatal health, especially in rural and hard to reach areas. I discuss the HHESS organization and its contribution to Solu's maternity system in the Research setting section.

My first invitation to work on developing midwifery services in Nepal was through the Patan Academy of Health Sciences (PAHS) and its schools of medicine and public health. The PAHS mission is to train physicians, public health specialists and other practitioners to serve families in rural and remote areas. PAHS has already started nursing education and is planning a program leading to a bachelor's degree in midwifery. I was invited to Nepal to assist in the development of professional midwifery in the fall of 2006 by the vice-chancellor of PAHS. Since 2007 I have been working with MIDSON members in urban and particularly rural and remote areas providing refresher courses, coaching and mentoring to Nepalese nurses and auxiliary nurse-midwives and others working in childbirth. See the table below with a timeline of my experiences of participation in maternal and infant care throughout Nepal.

Table 1.1. Timelines of author's involvement in Nepal

Dates	Activity
Oct. to Dec. 2000	First visit to Nepal. One month trekking in Kanchenjunga area. Visited TTBA in Ghunsa and learned about midwifery practices and carried Safe Motherhood kits to her.
November 2006	Invited by Dr. Arjun Karki to assist with development of midwifery services in Nepal during his visit to Canada.
April, May 2007	Visited midwives at Patan Academy of Health Sciences (PAHS). Taught Emergency Skills and TBAs in Pharping with Dr. Rostoker. Visited Model Hospital and met TBA's and facility staff in Charikot, Dolakha.
April, May 2008	Visited Pharping Community Hospital, Patan Hospital. Visited various hospitals and health centers in Dolakha with Dr. Rostoker. Interviewed mothers and learned about birthing practices and problems to access care in Dolakha. (Nepal ethics review accepted). First meetings with Nepal Nursing Council in Kathmandu around midwifery implementation and regulation.
2009	No Nepal visit.
April, May 2010	Taught Emergency Skills and Midwifery Update in Patan and Pharping with Dr. Rostoker. First visit to Solukhumbu walked along trails visited remote villages; visited Bharatpur and gave short midwifery update. First year UBC midwifery students to Nepal.
April, May 2011	First visit to Phaplu Hospital and taught 30 auxiliary nurse-midwifery students and staff. Provided 2.5 days Emergency Skills and Midwifery Update update in Libang, Rolpa with Dr. Rostoker to rural and remote midwives. Visited Nepalgunj Government Referral Hospital.
April, May, 2012	First year licensed to attend births in facilities of Nepal. Worked on wards, side by side teaching for one month. Taught Emergency Skills and Midwifery Update (2 Days) to 21 nurse-midwives in Jumla, Karnali region with Dr. Rostoker. Taught 21 nurse-midwives (Human Rights Approach to Birth and Midwifery Update) in Thapathali Hospital (Kathmandu). Assisted MIDSON with a Midwifery Update in Dhangadhi, Kailali District.
April, May 2013	Worked with Himalayan Health and Environmental Services, Solukhumbu (HHESS). Taught 2.5 day workshop to 17 auxiliary nurse-midwives from Phaplu and district with Dr. Rostoker. Travelled through area by foot. Visited Ilam Hospital and maternity ward.
Sept. to Dec. 2014	Organized and went on Mustang reproductive health literacy trek (2 weeks) with Dr. Rostoker. Visited health centers. Travelled to Solu in preparation for research, travelled through district by foot. Met government and health facility staffs in Solu. Visited UNFPA in Patan.
April, May 2015	In Baglung with 3 students during earthquake. Travelled to Kathmandu and worked in relief camps for one month. Developed and taught a course with Midwifery Society of Nepal for UNICEF to work in earthquake affected areas providing reproductive care.

Dates	Activity
April, May 2016	Travelled to Mugu with Dr. Jill Allison, Dr. Rostoker and one student. Interviewed community and taught Midwifery Update and Emergency Skills. Assisted at Reproductive health camp in Patan with Midwifery Society of Nepal. Keynote speaker at National Midwifery Conference Kathmandu.
Sept. to Dec. 2016	Collected PhD data in research sites in Solu.
April, May 2017	With 2 students, worked on wards in Baglung (Dhaulagiri Zonal Hospital) and taught 2-day Midwifery Update to staff and SBA trainees with Dr. Rostoker. Travelled to Solu to remote PHCs providing nurse-midwifery mentoring.
April, May 2018	With 2 students, provided 2-day Midwifery Update to Baglung nurse-midwives and SBA trainees with Dr. Rostoker. Travelled to remote Solu PHC for mentoring nurse-midwives. Provided first Group Prenatal Care training workshop to nurse-midwives at Thapathali Hospital, and to Midwifery Society of Nepal members. Participated in Reproductive health camp in Patan.

* All teaching was done in collaboration with the Midwifery Society of Nepal

Recent legislation in Nepal may have an impact on some of the problems I bring forward in my research: namely lack of respectful care in health facilities. In October of 2018, the government of Nepal passed a Safe Motherhood and Reproductive Health Rights Act that enshrined respectful maternity care in legislation. This is meant to ensure legal protection throughout a woman's reproductive life. Respectful non-discriminatory care and privacy, confidentiality, information and informed consent are expected throughout the country in both private and government health facilities. Ideas in this act were developed following the Respectful Maternity Care Charter developed by the White Ribbon Alliance (WRA) and their partners. We began to use the White Ribbon Campaign materials in our midwifery updates several years ago.

I obtained permission to conduct the research through ethics approval at the national level, leading to district level cooperation. I had visited the research site several times before conducting the research. While some staff in the hospital and some birthing facilities knew me from when I had visited the district teaching refresher courses for midwives with local midwifery instructors, others did not know me. I carefully chose my team of translators and helpers from the local area. My translator was a married nurse from one of the main ethnic groups (Rai), and was accompanied by her breastfeeding baby and a babysitter (a family member). She was able to help me and our small group gain the confidence of the mothers who spoke with her in response to my questions. There was still the possibility that people would not be open in their responses to a

foreigner and outsider that had more wealth and perceived power. In order to encourage mothers to talk with us openly, we framed our discussions with, “there are no right or wrong answers”, and “we just want to understand your experiences in giving birth.” My guide and porter were from the research area, had many acquaintances and family members in the area, and belonged to the most common ethnic group. I also worked with a co-researcher who was local and had spent many years working in the area. Both the translator and the local co-researcher facilitated the planning and discussions with local communities, leaders and staff. With this team I was better able to gain entry to the community and understand their issues and concerns. My team also helped me gain the cooperation of the district health office, and the hospital and primary health care center directors who were the local authorities on provision of maternal care.

I considered the ethical challenges of being a researcher from a high-income country. Yassi, Breilh, Dharamsi, Lockhart, & Spiegel (2013) respond to ethical challenges by examining the concept of ‘interculturality’. They suggest that ethical approval in each country is inadequate to make sure that communities are not harmed. In addition to obtaining the required ethics approvals from ethics institutions in Canada and Nepal, I tried to follow the Yassi et al. recommendations. The researchers promote social justice issues by respect for local knowledge, assuring local capacity-building and asking the community to participate in searching for possible answers to problems. I entered the communities with an expressed need to learn from them. Although the World Health Organization (WHO) and other large non-governmental organizations have demonstrated that the use of skilled birth attendants improves maternal newborn survival, there are other important factors that promote acceptability of using a midwife, nurse or physician for a birth attendant. I recognize the cultural importance of maintaining traditional practices around birth, and assert that it is important for researchers and policy-makers to respect the views on birth preferences presented by the community while establishing culturally-safe birthing together. In addition to ethical approval obtained from Canada and Nepal, and consent from participants, I attempted to involve community members in advancing solutions to problems of access.

My research, focussing on facilitators and barriers to skilled care at birth in rural Nepal, may inform the district health office and not-for-profit organizations working in the

area of maternal infant care. It may also provide some guidance for policy makers and curriculum developers in the development and education of a culturally acceptable, contextually-appropriate midwifery cadre. The Ministry of Health, Nepal is preparing to establish postings for registered midwives in rural areas (Bogren, Van Teijlingen, & Berg, 2013) and has begun the education and regulation process. The research will assist in this process by demonstrating whether improvements are needed, and what type, in both staff skills and rural health facilities to provide safe and culturally appropriate delivery practices in a remote area of Nepal. The objectives for my research are as follows:

- To assess mothers' and families' attitudes and practices around birth and how these affect mothers' and families' willingness to use skilled attendants in healthcare facilities;
- To assess the readiness of one remote area of Nepal's health system to provide services to parturient women; and
- To discover the links between mothers' perceptions around birth and their use of the health system.

From these objectives, I developed the following research questions:

1. What are the factors (barriers, facilitators) that women report that affect their use of skilled birth attendants in rural and remote Nepal?
2. What are the barriers and facilitators to establishing skilled care at birth in rural and remote settings?
3. What are the gaps in skill sets and enabling factors in health care facilities to provide both culturally safe and skilled birth attendance?

I found two approaches useful in developing the research questions. The first is derived from Jordan's (1993) 'Childbirth and Authoritative Knowledge' theoretical concept. Jordan maintains that for any domain, there is more than one knowledge system, but one system becomes more powerful and acceptable by consensus. I relate this to the move from home to facility-based birth taking place within the health system and rural communities in rural Nepal. The second is the 'Three Delays' framework (Thaddeus & Maine, 1994), which categorizes causes of maternal mortality within three levels of delays: delays in decision-making at home when complications occur; delays in

getting to a facility; and delays in appropriate care once the facility is reached. I will elaborate more on these these approaches later in the thesis. In the course of this thesis, I demonstrate the usefulness and gaps within these theoretical frameworks to generate knowledge, and relate them to the use of skilled care for birth in remote Nepal.

1.2. Extent of Maternal and Neonatal Death Globally

My research focussed on access to midwifery services in remote Nepal both for normal birth and for treatment of maternity-related life-threatening conditions. I wanted to find out whether the maternity services provided to communities could reduce maternal and neonatal mortality in these remote areas. Factors associated with maternal and neonatal death in low-resource countries globally have resonance with the situation and conditions in Nepal.

Global inequities are reflected in both maternal and neonatal deaths. Most global maternal and neonatal deaths occur in the poorest regions of the world, and within these countries, many deaths occur in families who are socially and economically marginal, have the lowest income, and are living in remote areas, urban slums or conflict zones. Many families lack funds and transportation to health facilities to be able to receive life-saving interventions. A scarcity of skilled personnel to attend mothers and infants has been offered as a major influencing factor (Lassi, Das, Salam, & Bhutta, 2014), but adequate equipment, medication, health system referrals, access to blood, and access to surgical interventions such as caesarean section and hysterectomy play a large role in saving mothers and infants at the time of pregnancy and birth.

In low-resource countries such as Nepal, and particularly in remote areas, there is an increased risk of mortality and morbidity while pregnant and during or after childbirth. I will examine maternal-newborn mortality to be able to situate my research within the global context. The WHO classifies maternal mortality as: “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes” (World Health Organization [WHO], 2018a). The maternal mortality ratio, or MMR, is defined as

the number of maternal deaths per 100,000 live births. Recently, the 10th edition of the International Classification of Diseases (ICD-10) proposed a new standard of up to 12 months postpartum, as deaths related to childbirth causes can occur that late. Deaths after six weeks are classified as late maternal death (WHO, 2016c).

Maternal mortality has been declining in the last three decades, but at a variable and, in some countries, at a rate insufficient to meet country goals (Alkema et al., 2016). Most maternal mortality occurs in low-resource countries, with fewer skilled health personnel and poorly-functioning health systems (GBD 2015 Maternal Mortality Collaborators, 2015). A systematic analysis conducted by the UN Maternal Mortality Estimation Inter-Agency Group reported the global MMR fell from 385 deaths per 100,000 live births (80% UI 359-427) in 1990, to 216 (80% UI 207-249) in 2015 (Alkema et al., 2016). The number of maternal deaths was 303,000 in 2015 corresponding to a decline of 43.9% and a continuous annual rate of reduction of 2.3%. For calculations the proportion of maternal deaths among deaths of women 15 to 49 years was used, and the MMR was used only if the proportion of maternal deaths was unavailable for any country. Many low-resource countries have poor reporting systems, resulting in barriers to monitoring progress in reduction of MMR. Under-reporting is more common than over-reporting and early pregnancy related deaths or late maternal deaths are often not counted, leading to substantial uncertainty in reported numbers. Some researchers suggest that some vital registration systems fail to report 50% of maternal deaths (Alkema et al., 2016). Eight countries in sub-Saharan Africa are quite certain to have an MMR of 500 or above (Alkema et al., 2016). Another 12 countries, also in sub-Saharan Africa, are likely to have an MMR of 500. Among countries with a relatively high MMR (over 100), there were nine countries (Bhutan, Cape-Verde, Cambodia, Iran, Laos, Maldives, Mongolia, Rwanda, Timor Este) that had a high relative reduction of MMR (Alkema et al., 2016).

Nepal has achieved a relatively high reduction of maternal mortality in the past two and a half decades. The modelled estimate for Nepal's MMR showed a reduction from 901 to 258 deaths per 100,000 live births between 1990 and 2015. This estimate was still high compared to neighbouring countries of Bangladesh, which decreased from

569 to 176 between 1990 and 2015, and Sri Lanka, with an estimate decreasing from 75 to 30 maternal deaths per 100,000 live births (WHO and World Bank, 2015).

Reproductive health services within Nepal include strategies for improving outcomes for newborns as well as mothers. Neonatal mortality is often linked to the income level of a country, the health of the mother and the adequacy of the care that she receives at birth. The neonatal mortality rate (NMR) refers to the death of infants within the first 28 days of life per 1000 live births, while perinatal mortality refers to both stillbirths and infants who die in the first seven days of life. Most neonatal mortality occurs in the first 24 hours after birth. With declining infant and child mortality as a result of the effective and inexpensive interventions (oral rehydration therapy, immunizations, improvements to water and sanitation), neonatal mortality is emerging as a global priority. Today neonates comprise over 40% of the 7.6 million deaths of young children. The United Nations Children's Fund (UNICEF, 2018) estimated that 7000 neonates die daily. Achieving accurate estimates may be difficult, as under-reporting of births and neonatal deaths, particularly of early neonatal deaths, is very common. According to statistical information currently available, the burden of early neonatal deaths (death during the first week of life) has not decreased substantially. Instead, most low-income countries emphasized interventions for post-neonatal deaths (deaths after the first 28 days) such as immunization and treatment for malaria. Since the year 2000, newborn survival has become a much larger part of international agendas and funding priorities.

When I began my research, Nepal was less than a decade into recovery since the Maoist insurrection and conflict of the 1990's. Maternal and neonatal mortality and morbidity may have been affected as an indirect consequence of the conflict, which primarily affected rural areas including my research sites. Bhutta and Black's (2013) Dirty War Index presents a perspective on determinants affecting maternal and child survival. Over one-third of the maternal, child and stillbirth burden occurs in areas of conflict, although little is done to highlight this fact. The Index focuses on the ratio of undesirable or prohibited events (civilian death, child death, child injury, and torture), as a proportion of total deaths occurring in a combat area. Death of women and children comprise 15% of these cases, and targeting of women and children has become a weapon of war. But there is a paucity of literature about the effects of health system

upheavals during times of conflict, and their resultant effects on maternal and neonatal mortality.

1.2.1. Direct and indirect causes of maternal mortality

Through investigation of causes of maternal mortality, countries may use enhanced strategies to prevent and treat the main causes of death. Maternal mortality is usually divided into direct and indirect causes (WHO, 2012a). Direct causes include hemorrhage, infection, hypertensive disorders, and obstructed labour. Indirect causes of maternal mortality include diseases or disorders such as HIV, tuberculosis, malaria and anemia. These conditions, although treatable, compromise a mother's health in pregnancy, and can be associated with her death.

Focussing resources on the causes of maternal mortality in each country or region can provide information for governments and donors planning interventions to improve maternal infant health. The most prominent research about maternal mortality causes by region is by Say et al. (2014) who carried out a systematic review using datasets (research studies or vital registration records) representative of populations at different levels and the WHO mortality database for vital registration data. This work updates that provided by Khan et al. (2006). Authors aggregated country-level estimates to report cause of death by regions and worldwide. Estimates in countries without adequate mortality reporting were informed by typical experiences in the region. Three of the major causes of maternal mortality, namely hemorrhage, hypertensive disorders, and sepsis, were responsible for over half of maternal mortality globally, while one-quarter of deaths were due to indirect causes (Say et al., 2014). This review included a breakdown of major causes of death into smaller categories such as antepartum, intrapartum and postpartum hemorrhage. Authors found that postpartum hemorrhage was responsible for 75% of deaths attributed to hemorrhage, and antepartum bleeding encompassed 25%.

In all regions hemorrhage was the main cause of maternal mortality (27.1% of all deaths). Mortality rates attributed to hypertension showed wide variation between regions, with 22.1% of deaths in Latin America and the Caribbean, and 10.4% of deaths in East Asia (Say et al., 2014). Deaths from unsafe abortions were highest in Latin

America and the Caribbean. However, in an earlier study, Ronsman and Graham (2006) challenged the current data for deaths as a result of unsafe abortion and for deaths complicated by HIV. Mothers may become septic due to the abortion, and this may be categorized as infection or as hemorrhage, and Say et al. (2014) acknowledge this potential bias. Because living with HIV is still stigmatized in some countries, this indirect contributor to maternal death may be underreported or unconfirmed thereby skewing the data. In three-quarters of all maternal deaths in the available datasets HIV status is not recorded, suggesting that had it been known the contribution of HIV/AIDS to maternal death might be higher. The differentiation between indirect maternal death due to HIV and direct maternal deaths in HIV positive women is important since it has implications for clinical care and at the program level. This thesis examines factors affecting access to skilled care, which in turn are associated with maternal and newborn survival. Hemorrhage, being the largest contributor to maternal death in Nepal, should warrant special attention. In this thesis I will examine whether appropriate prevention and treatment of postpartum hemorrhage is provided within the context of the skilled care providers at birth.

It is important to look at other prominent causes of maternal mortality and where the problem is greatest. Say et al. (2014) found that sepsis was also a significant cause of maternal death in low-resource countries, and was the highest in South Asia (13.7% of all maternal deaths were attributed to sepsis). The large burden of hypertensive disorders including eclampsia, which almost equals hemorrhage in the Caribbean region and Latin America, signals that health systems need to improve the chain of medication supply of magnesium sulphate, the drug used to treat pre-eclampsia, to various levels of health facilities (Say et al., 2014).

Say et al. point out that they cannot directly compare maternal causes of death between the 2006 review by Khan and their more current one due to differing methods. However, they claim that the same basic patterns likely remain the same (Say et al., 2014). In Asia, the main contributor to maternal death is hemorrhage while in Latin America and the Caribbean, hypertensive disorders cause a high number of deaths. In sub-Saharan Africa, understanding and reducing indirect causes is important for maternal mortality reduction. Say et al. (2014) assert that it is important to improve

understandings of why heavy bleeding or eclampsia are still among the highest causes of mortality when effective and economical interventions exist. They urge countries to collect more detailed and accurate data, and for researchers to study why known interventions are not working to reduce mortality.

The WHO states that complications during adolescent pregnancy and childbirth are the leading cause of death for 15- to 19-year-old girls globally (WHO, 2016a). Young mothers, due to their undeveloped pelvises, and mothers who have grown up malnourished, are predisposed to obstructed labour, resulting in sepsis and injuries such as obstetric fistula. Although for some adolescents pregnancy and childbirth are wanted and planned, many pregnancies are unplanned or a result of pressure to marry and produce children at an early age (WHO, 2018c). Pradhan, Wynter, and Fisher (2015) found that in low- and middle-income countries limited education, low socio-economic position, insufficient access to family planning, and early marriage were risks for adolescent pregnancy. These findings imply that programs supporting the education of girls, delayed marriage, and parturition as well as family planning are needed (Banke-Thomas, Banke-Thomas, & Ameh, 2017; Chandra-Mouli, McCarraher, Phillips, Williamson, & Hainsworth, 2014).

A relatively new area of research addresses severe maternal morbidity and its effects on mother and newborn. For each woman who dies from maternal causes, there are many more who suffer from severe morbidities and disabilities (Geller et al. 2018; Hardee, Gay, & Blanc, 2012). Sometimes this is referred to as a 'maternal near miss' (Say, Souza, & Pattinson, 2009). Hemorrhage and hypertensive disorders lead to many cases of severe maternal morbidity such as strokes. Hemorrhage can lead to cases of severe anemia, and obstructed labour to obstetrical fistula. Factors relating to morbidity have been found to be similar to factors related to maternal death: failures in accessibility of services, delays in care-seeking, lack of prenatal care, lack of enabling factors such as adequate staff, equipment and medications (Geller et al., 2018). Solutions which require institutionalization for all childbirths might further marginalize young unmarried mothers where cultural norms prohibit unmarried women from childbearing.

1.2.2. Pregnancy avoidance

Information, medication and devices for pregnancy avoidance as well as safe abortion care can save mothers' lives by averting unwanted pregnancies and unsafe abortion. Potts (2011) argues that pregnancy avoidance is the best way to reduce maternal deaths, especially in low-income countries where interventions are expensive or inaccessible. Today, in many sub-Saharan countries with high mortality rates, total fertility rates are around five children per mother and in South Asia around 2.5 (World Bank, 2016). Each pregnancy carries with it a risk for mortality, and the greater the fertility the greater the lifetime risk. Prata, Sreenivas, Greig, Walsh, and Potts (2010) modelled the effects of different combinations of interventions in low-, medium- and higher-income countries and found that family planning and safe abortion service are the most economical and save the most lives in low-income settings. The burden of maternal deaths attributed to unsafe abortion is estimated to be 7.9% in developing regions (Say et al., 2014). Reducing the number of unintended pregnancies contributes to reducing maternal mortality. An increase in funding in family planning would reduce unintended pregnancies, and this could reduce unsafe abortion by almost three-quarters (Hardee et al., 2012). Homer, Friberg, and Dias (2018) claim that with family planning as a single intervention, 57% of maternal deaths could be prevented because of fewer pregnancies. For countries where abortion is illegal and many women deliver at home, the best way to reduce maternal mortality is to have antenatal care providers distribute misoprostol to mothers and to scale-up family planning programs (Prata et al., 2010). However, this assertion depends on quality of antenatal care offered in low-income countries as well as the supply chain. Quality issues are a concern, especially in low-income countries. Lawn et al. (2012), writing about neonatal mortality rates, agree that lowering fertility rates has been instrumental in lowering neonatal mortality in low- and middle-income countries.

1.2.3. Causes of neonatal mortality

More than half of all newborn deaths globally occur at home, unregistered and uncounted. I have mentioned that in remote areas of Nepal, including my research sites, many women deliver at home. The NMR has been decreasing in all regions globally, but

not as fast as the mortality rates of under-five's, making neonatal death an increased proportion of childhood deaths (UNICEF, 2018). The NMR has declined by 49 percent globally, while the under-five mortality has declined 62 percent (UNICEF, 2018). Lower under-five mortality is associated with a higher concentration of deaths occurring in the neonatal period. In South Asia, the proportion of neonatal deaths at 59 percent is among the highest of all regions, and is estimated to be 28 per 1000 live births (UNICEF, 2018). Early neonatal deaths (deaths during the first week of life) have not decreased much in the last two decades. The main causes of neonatal death globally are pre-term birth, intrapartum-related deaths (birth asphyxia), and infection, in that order. Although low birth-weight stemming from intra-uterine growth restriction is injurious, it is not one of the main causes of neonatal death (UNICEF, 2018).

There are great disparities between and within regions. Japan has the best neonatal mortality rate with only one child dying per 1000 live births (UNICEF, 2018). The Central African Republic has the highest NMR in Africa of 42.3, while Pakistan has an NMR of 45.6, the highest in Asia. Bhutan has an NMR of 18.1, and Rwanda has reduced its NMR from 41 in 1990 to 17 in 2016 (UNICEF, 2018). Countries achieving significant reductions in NMR have attained a rate of over 50% of all births attended by a skilled birth attendant, the same intervention that increases both maternal and neonatal survival. Some countries, including Pakistan, have increased skilled birth attendance but this has not decreased newborn mortality significantly due to what is cited as a generally poor quality of care (Every Child Alive, 2018). UNICEF (2018) emphasizes learning from successes in countries like Rwanda where increasing access to affordable health care and improving the quality of care has yielded significant reductions in neonatal mortality.

Although neonatal tetanus has been eliminated in some countries and greatly reduced in others in the last few decades, neonatal infection remains a significant problem. In countries with high NMR, about 50% of deaths are caused by infections, but in lower mortality settings around 15% are caused by infection as those births may take place in more sanitary conditions. Low birth weight babies as well as pre-term infants are at risk of death. Babies born to adolescent mothers are more likely to be of low birth weight, and have a higher chance of perinatal death (Every Child Alive, 2018). In order to reduce neonatal deaths, UNICEF asserts that system changes including ensuring

clean functional health facilities, competent midwifery and nursing staffs, having adequate medications and equipment, and empowering girls and women to demand and receive quality care are necessary changes.

No one strategy has actually been singled out as being effective to reduce neonatal mortality (Lawn et al., 2012). Use of the partograph to monitor labour and improve identification and actions around problems in labour, and implementing clean birth practices at the community level has been proposed by some authors (Lawn et al., 2012). Lawn however, presents a compelling argument that in countries where reduction of neonatal mortality has been most noticeable, it has occurred in tandem with an increase of women's education, countries' wealth, and subsequent health spending, supported by marked reductions in fertility. We will next look at some of the global health and human rights movements implemented to provide safer maternity care to all women.

1.3. Historical MMR Landmarks, Millennium Development Goals 4 and 5, and the SDGs

The Safe Motherhood Initiative was introduced at a conference in Nairobi, Kenya in 1987 by an alliance of organizations including WHO, United Nations Population Fund (UNFPA), and UNICEF among others motivated to halve maternal deaths by the year 2000. Safe Motherhood interagency groups raised awareness, gave advice, and promoted research about making pregnancy and childbirth safer. In 1994, at the International Conference on Population and Development in Cairo, the rights of women to undergo pregnancy and birth safely were first emphasized, followed by the Fourth World Conference on Women 1995 (Beijing), where it was re-stated that women needed information and services to go through pregnancy and birth safely. Several years later, a 10-year review of the Safe Motherhood Initiative revealed that little had changed in terms of maternal mortality reduction, and the problem was conceived as discrimination against women and a violation of their human rights since most maternal death was preventable. The review made several recommendations such as urging skilled attendance of birth, emergency obstetrical services, family planning, and reproductive health education services for families. In 2000, international organizations joined to develop 10 Millennium Development Goals (MDGs) to improve human wellbeing,

encompassing reducing extreme poverty, combatting diseases, increasing education and health services, and promoting partnerships. The Millennium Development Goals aimed to reduce under-five mortality by two-thirds and maternal mortality by three-quarters by the year 2015. The MDG statements were followed by the development of the Partnership for Maternal Newborn and Child Health, initiated in 2005 by WHO and other international organizations. Its aim was to enable research, educational, non-governmental and governmental agencies to share objectives and resources, and to mobilize actions for reduction of maternal infant and child mortality and their respective MDGs. The Millennium Development Goals ended in 2015, after efforts and strategies to decrease MMR by 75% in all countries between 1990 and 2015. 17 Sustainable Development Goals (SDGs) were introduced in 2016 with a broader focus on reducing poverty and inequities, care for the planet, and overall social and economic development (United Nations, 2018). Although there is a specific sub goal addressing maternal health in the SDGs (SDG 3), the problems of mothers and their newborns are a component of many of the SDGs.

An international organization, named Countdown to 2030, supports the monitoring and measurement of maternal and child mortality as well as stillbirths and stunting in the 81 countries where 95% of maternal mortality and 90% of child mortality occur (Countdown to 2030 Collaboration, 2018). To reach one of the SDG 3 objectives of reducing maternal mortality to 70 per 100,000 live births, with no country at a ratio of over 140, requires doubling the rate of reduction of maternal death that occurred during the MDG era. The target is a reduction of two-thirds from the baseline at a country level. Many of the 'Countdown Countries' do not have adequate coverage of essential interventions such as skilled care at birth. In addition, health systems are weak and large inequities still exist (Countdown to 2030 Collaboration, 2018). The slogan for SDGs in reducing inequities and improving quality of life for all by 'leaving no one behind' has very far to go. In the next chapter, I present a critical review of the literature outlining some policies and interventions that assist in improving access of care to rural and vulnerable populations.

Chapter 2.

A Critical Review of the Literature

I undertook a two-stage review of the literature. In the first stage, I reviewed the global literature on issues around maternal and newborn survival in low-resource countries and ways governments and others are trying to improve care to parturient mothers. In the second stage, I focused more narrowly on this question in the context of South Asia. In this second stage I applied the formal methods recommended for conducting scoping reviews, and I outline these methods later on in this section.

A literature review was conducted in order to fully understand factors relating to access to skilled maternal care, with a focus on identifying methods to establish a skilled human resource cadre in remote areas of low-resource countries. I investigated global efforts to improve access to skilled care and how the interventions related to maternal and infant mortality outcomes. I carried out this review to provide an 'evaluative report' of information related to the use of midwifery services in low-resource countries, and to contextualize the findings from my research.

I focused on identifying the barriers and facilitators to establishing skilled care at birth globally. In the first phase of the review I critically examined the interventions and issues around care for parturient women and their families, and programs used for reduction of maternal mortality through the MDG period and continuing into the SDG years. The findings of this first phase review provide a context for considering the results of a scoping review of access to skilled intrapartum care in three low-income countries of South Asia (Bangladesh, India and Nepal). These countries are geographically close, similar in terms of maternal mortality ratio and causes, and have some similar cultural and social aspects. The scoping review describes the problems and concerns around access to skilled birth attendants in rural Nepal, and its close neighbours.

2.1. The Literature Review Methods

The first phase of the review was a global literature review on maternal newborn issues. Through this review, I described and summarized the literature, discussed contrasting perspectives, and developed a theoretical base to both frame my research and to compare findings and insights about access to care (Jesson, Matheson. & Lacey, 2011). I used keyword search terms in conjunction with standardized subject headings to find relevant peer-reviewed literature related to my research questions. As studies informed me of other relevant issues, I expanded my search to include these related topics.

I examined issues affecting mothers, families and communities, followed by issues pertaining to human resources and their training and education to care for mothers. I introduced different perspectives on programs that have been debated in low-resource jurisdictions: antenatal care and its value, birth planning preparedness, and the move from traditional birth attendants to skilled birth attendants and facility-based birth. I organized the information influencing access to skilled care for mother and families into categories used in a review of reviews about access to care: physical, economic, socio cultural and perceived benefits to organize the data on access (Gabrysch & Campbell, 2009).

I then moved to the issues of training and education of caregivers for parturient women in low-resource countries, issues of task-shifting, and discourse regarding the need to improve quality of care at all levels. I combined information from these issues informing the care of mothers and communities with the findings from a scoping review focussed on culturally relevant interventions in South Asian countries.

2.2. Scoping Review Study Methods

2.2.1. Definition and overview of scoping review

I conducted a scoping review as part of my overall literature review to map out the literature about access to rural maternal intrapartum care as culturally relevant to

Nepal (Arksey and O'Malley, 2005). I wanted to see if culturally appropriate ways to increase access to care had been implemented and studied across South Asia. I searched for gaps in the research, specifically whether studies had been carried out in rural South Asia examining health sector variables and community experiences, and whether opinions of community had been considered in regards to culturally important aspects of birthing care. I first describe the process for my original scoping review and then will explain how I conducted an update of the review.

Typically, scoping studies look at depth and breadth of the research landscape on a topic, but are not concerned with the quality of the studies (Arksey & O'Malley, 2005). Following Arksey and O'Malley (2005) I organized the review into the following five stages: 1) identification of the research question, 2) identifying relevant articles, 3) study selection, 4) charting the data, 5) collating, summarizing, and reporting results followed by a thematic analysis (Arksey & O'Malley, 2005; Levac, Colquhoun & O'Brien, 2010). Levac, Colquhoun, and O'Brien (2010) broadened this methodology to include consultation with stakeholders as the last stage and addition of a knowledge translation component. This stage provides stakeholders with the chance to provide insights beyond those presented in the research. I will mention the consultation activities used in Nepal to fulfil this component of the scoping review later in this section.

2.2.2. Criteria for study inclusion

I formulated a search to identify the relevant studies. I searched for literature reviews, and peer-reviewed qualitative and quantitative articles. I searched three databases which I thought included articles most relevant to global maternal infant care. I used 'keyword' searches in *PubMed* (which are mapped to Medical Subject Headings), and subject headings, to ensure I was not missing articles that had not been assigned subject headings yet. In *Sociological Abstracts* I used 'access' and 'childbirth' and 'rural;' 'maternal mortality' and 'skilled birth'; 'health system' and 'maternal mortality'; 'health system' and 'childbirth' and 'rural'. In *PubMed* (1946 to present) I used the terms mentioned above and added 'Nepal'; 'increase access' and 'childbirth' and/or 'delivery care'; 'reduce' and 'maternal mortality' and/or 'attendants'; 'increase' and 'access' and

'childbirth delivery care'; 'access' and 'skilled birth' and 'rural'. In *CAB direct* I used the search terms 'access' and 'childbirth' and 'rural'.

The next stage determined study selection. There were many studies that did not include childbirth, or which described research in low- and middle-income countries that might have had contexts dissimilar to Nepal. I decided to retain literature reviews from low- and middle-income countries that pertained to access to childbirth in rural areas in any South Asian countries because I thought the results of reviews might help to answer the research questions about culturally acceptable ways to increase access to skilled care. I did not include studies using secondary analysis of data.

I obtained the titles with abstracts using the search terms I found (n=547). There were many close duplicates which I removed. I then assessed the remaining 322 records for suitability according to the inclusion/exclusion criteria and excluded 115 articles. Refer to Table 2.1 for final inclusion and exclusion criteria. Then I looked at the 207 abstracts. At this point I realized I had too many articles, many of which might not be culturally relevant in a South Asian context. I limited the inclusion criteria to any kind of literature review that include access to care in South Asian countries and research located in Nepal, Bangladesh and India. Like Nepal, these countries have relatively high maternal mortality ratios and share many common characteristics regarding access to care. As another criteria, if the review was about financial access, I included studies about 'demand side' access affecting the issues of client access to care rather than 'supply side', related to the health care provision of services. After adding these concepts to the exclusion criteria, 113 abstracts were removed. I read the remaining 15 articles to ascertain that they met the final inclusion criteria. Although I did not systematically review the 'grey literature', I added two additional resources early in my search and then three more studies during later phases of data collection, including two PhD dissertations on access to childbirth in rural Nepal, and an International Non-Governmental Organization (INGO) report on maternal healthcare in Nepal. I had 18 studies in my original scoping review. I entered the study selection process in a PRISMA diagram that can be found in Appendix A.

Table 2.1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • takes place in Nepal, Bangladesh and/or India • concerns or includes rural or remote areas • written in English • topic is access to maternal care, and must include childbirth care • dated 1993 or later • peer-reviewed • literature reviews from low-resource countries that include South Asian countries 	<ul style="list-style-type: none"> • high income countries • access refers to antenatal, postnatal care, or family planning but does not include childbirth care • study occurs in urban area only • books • no abstract available • commentaries on other articles • neonatal mortality and morbidity studies only, not including childbirth • supply-side interventions except for reviews about supply-side access

2.2.3. Data extraction, analysis, and results

I extracted and charted the data emerging from the full articles, creating a table recording information that included: author, year, name of publication and location. I included the research question and aims and methodology of the study. I used the analytical framework from Gabrysch and Campbell (2009) consisting of four categories: socio-cultural, perceived benefit/need of SBA, economic necessity, and physical accessibility. I slightly modified the categories from Gabrysch and Campbell analytical framework, combining economic necessity and physical accessibility into one and subdividing socio-cultural with a new category of autonomy decision-making. These categories were useful as the included articles described access to maternal care using one of these categories, which I also found relevant to the rural Nepal context and to my research questions. I summarized the data from the articles, noting the research questions, methods and main findings of the 18 studies. I then added sub-categories that arose inductively from my reading of the articles, and added them to the table with identifying information from each article and main themes and sub-themes.

In July of 2018, I updated the scoping review to include recently published relevant articles. I repeated the search using the same search strategy and study selection criteria of the earlier review, gathering 54 additional studies, but after reading

the abstracts and applying exclusions, 16 were included for data extraction and analysis. The summary template of the articles showing the Gabrysch & Campbell (2009) categories is in Table B.01 of the Appendix B.

The data gathered and presented in the table was a focus for the analysis. I collated and summarized the results from this data, then reported the results within the global critical literature review. This was a useful way for me to use the information gained from the literature globally, and from the research country and neighbours place my research in context with other findings. The last stage of a scoping review (stage six) reflects community consultation. I presented my scoping review to members of the Midwifery Society of Nepal, one of my local partners, whose membership holds local knowledge and influence within the Nepal health system. The results of the scoping review are amalgamated with the results of the critical literature review.

2.3. Antenatal Care

Antenatal care is an integral part of maternal care. The theme of antenatal care is important for this research since it is through antenatal care that mothers come in to contact with skilled childbirth attendants, where they receive care and information about recommended place of birth. The suggested content of antenatal care visits found in the literature and official organizations such as WHO contrast with the content of antenatal care existing in many areas, including in my research sites. It is somewhat surprising that the efficacy of antenatal care has not been studied much until recently, even though it occupies the greater portion of many low-income countries' reproductive health budgets and resources.

The aim of antenatal care is to prevent or manage health problems that may affect mother and baby in parturition as well as providing information and advice on pregnancy, birth, postpartum, the newborn and family planning. An antenatal visit with a skilled attendant is considered one of the most important components in reproductive health programs globally, and is often the first point of contact with the health system. The visits provide access to integrated care and influence health-seeking behaviours,

including skilled attendance at birth, and link mothers to referrals when complications occur.

There have been disagreements and changes over time over the number of antenatal visits recommended globally in order to carry out the recommended activities. WHO recommended that the number of visits that a pregnant mother needs with a skilled attendant be reduced to four essential visits (compared to more than eight done traditionally), that should be undertaken by a skilled attendant at regular intervals, ideally beginning in the first trimester (WHO, 2006). This scheme of antenatal visits had been the norm for many low-income countries including those in southern Asia. WHO's (2006) recommendations for the essential elements of antenatal care in low-income countries to consist of screening for hypertension and anemia, immunization for tetanus, screening and presumptive treatment for malaria and counselling, testing and treatment for sexually transmitted infections such as syphilis and HIV. Problems relating to mental health or any underlying or concurrent illnesses such as hypertension and anemia were to be identified and treated. Birth planning and emergency preparedness were essential components and had to be carried out in the four essential visits (WHO, 2006). These procedures are meant to improve pregnancy outcomes.

Disagreements on the focus of antenatal care, and how to increase utilization continue to the present time. One systematic review showed that in low- and middle-income countries fewer, more focussed antenatal visits (with specific procedural objectives at each visit) as compared to standard four visits resulted in a barely significant higher rate of perinatal mortality but all other measures reported no significance (Dowswell et al., 2015). A secondary analysis of this study revealed that higher mortality between 32 and 36 weeks reached significance only when results were pooled across studies, and that context of the visits (time between visits, number of visits, or quality of visits) could be causing the increase in perinatal mortality (Vogel et al., 2013). Vogel et al. (2013) advance the hypothesis that significant increases in perinatal mortality may have nothing to do with the number of antenatal visits, but might have to do with health status of mothers, or the quality of the antenatal care they receive.

Recent research demonstrates a lack of quality, and under-utilization of antenatal care. Globally, between 2007 and 2014 only 64% of women attended four antenatal visits, the recommended number during that period, showing the need to address access, utilization, and quality of antenatal care (WHO, 2016b). A recent change by WHO (2016b) aimed to improve the quality of antenatal care globally. WHO increased the number of antenatal visits from four back to eight, citing evidence for recommended activities, and eliminating past procedures that were not evidence-based. Interventions including nutritional, maternal and fetal assessment, preventative measures, interventions for common physiological problems and health system interventions to improve quality of care are described in detail. The new recommendations suggest obstetrical ultrasound in pregnancy. A study of the use of routine ultrasound as part of antenatal care in low- and middle-income countries looked at whether rates of antenatal care attendance and delivery rates from complicated deliveries increased (Goldenberg et al., 2018). Researchers found that using ultrasound did not produce detectable differences in the use of services, nor in maternal, fetal or neonatal mortality. Goldenberg et al. (2018) explain that improvement in quality of care at health facilities is needed to improve maternal mortality, stillbirths, and neonatal mortality, and ultrasound screening alone is not useful. The issue is not whether ultrasound is useful, but whether it is useful as an isolated procedure in the context of poor health facilities. I will examine this question in the context of my research.

Efficient referrals must take place in order to save mothers' lives when antenatal care determines that mothers are high risk. Antenatal screening for risk factors such as multiple pregnancies, anemia or history of excessive bleeding may be used to determine whether a mother requires a higher level of care. Both mothers and caregivers must be motivated to use the referral system for problems encountered, and families and communities must see evidence of reduced mortality and morbidity when mothers use the referral system. Families may refuse transfer to a higher level of obstetrical care when complications are noted during antenatal care if they know of others who were transferred and had bad outcomes. Carroli, Rooney, and Villar (2001) propose that those at highest risk are less likely to be able to access health services, particularly preventive services such as antenatal care. Barriers to accessing antenatal care such as age, lack of education, cost and availability are echoed by Simkhada, Teijlingen, Porter, and

Simkhada (2008) in their systematic review of utilization of antenatal care. Nepalese researchers investigating use and quality of antenatal care in Nepal recommended that more effort was needed to improve access to antenatal care for economically disadvantaged and rural women (Joshi, Torvaldsen, Hodgson, & Hayen, 2014).

One of the most important elements of antenatal care include the personal contact between maternity care provider and mother. If a mother and her family feel supported by caregivers and receive education about normal processes of pregnancy and birth and potential complications, they may be more likely to utilize skilled attendance at birth, or move to a hospital early when problems are first encountered.

Much of the literature pointed to a number of factors that affect the utilization by mothers of antenatal care. These include: the role of traditional birth attendants, economic and social factors, and the quality of care available. A 'traditional birth attendant' (TBA) has been defined as a person who assists during childbirth and who initially acquired her skills by delivering babies herself or through apprenticeship to another TBA. A trained TBA (TTBA) is one who has received biomedical training through the health sector to improve her skills (WHO, UNICEF, & UNFPA, 1992). Training traditional birth attendants (TBAs) has been found to increase access to antenatal care. Sibley, Sipe, and Koblinsky (2004) performed a meta-analysis review combined with a narrative review to look at the association of trained traditional birth attendants (TTBAs) with use of antenatal care. The authors found that training TBAs about the rationale for antenatal care and the recommended schedule of visits, appeared to improve uptake of antenatal care from 42% to 58%. Although the authors suggested the resulting 16% increase in antenatal care uptake was meaningful, whether it would make a difference in mortality and morbidity is questionable. Although more mothers may attend antenatal care, the mothers who are associated with TBAs may not access the life-saving measures associated with skilled care.

Secondly, economic and social determinants have been found to influence the uptake of antenatal care. Simkhada et al. (2008) reviewed factors associated with the utilization of antenatal care in low-resource countries. Maternal and husband's education, cost, household income, media exposure and having had previous obstetric

complications played a role. Say and Raine (2007) conducted a systematic review of inequalities across 30 studies of the use of maternal healthcare. They found that antenatal care in the first trimester was not associated with urban-rural differences in all good and medium quality studies, but was more influenced by lack of congruency between biomedical values and norms and the cultural norms of women and families. The authors reported an increase in uptake of early antenatal care with increased wealth in all but two studies, which corresponds with the results of the review by Simkanda et al. There were likely many confounders such as distance, education, or cultural beliefs. Mothers with fewer resources may not have access to information or may be isolated within their own communities, thus not attending early antenatal care. Moller, Petzold, Chou, and Say (2017) noted that some low-income countries collected data on mid-trimester and later antenatal visits, but did not collect data on first trimester antenatal visits. She claims early antenatal visits are critical to discover health issues that might negatively affect birth outcomes, instead monitoring the number of women who had one antenatal visit or four visits.

The recommendation for early antenatal care is contentious, demonstrating a difference between biomedical cultures and values and cultures of many women and communities. Say and Raine (2007) assert that some cultural groups do not see pregnancy as a medical condition. There are different criteria for when women are expected to share knowledge of their pregnancy publicly, and therefore would not consider using antenatal care until the pregnancy is publicly acknowledged. For example, in Jamaica women did not consider early antenatal care important, leading to a delay in obtaining care, while antenatal care was sought late in South Africa due to mothers' home activities that kept them busy, and they attended antenatal care only to get the card needed to register for delivery services (Say & Raine, 2007). Other groups stated that they thought it was better to wait several months to make sure they were in fact pregnant before public disclosure, making the first trimester visit recommended by the WHO (2006) unlikely. Among some groups, there were perceived dangers in disclosing the pregnancy in the first months, as malevolent spirits might 'bewitch' the mother causing problems in pregnancy or miscarriage. These mothers were less likely to attend antenatal care clinics until they were obviously pregnant. These findings emphasize the need to provide culturally appropriate antenatal care, tailored for specific

needs of mothers and families in distinct communities. It may not be appropriate to insist on early antenatal care within some cultures, or to offer early pregnancy care within the home.

The quality of antenatal care may attract or dissuade families from using antenatal care. Although Simkanda et al. (2008) found few studies that examined the effects of quality of care and utilization, other authors found that quality of care may influence attendance of repeat antenatal visits. In one of the most prominent critiques of why women do not use antenatal care in low-resource countries, Finlayson and Downe (2013) found that mothers' experiences related to quality of care in two areas: 1) considerations of the value of the time and money spent; and 2) poor interactions with health care staff. In this meta-synthesis of qualitative studies, authors found that mothers consider whether spending time and money attending antenatal care was worth the effort since the clinics were poorly resourced, with few medications, supplies or essential equipment. Mothers experienced poor communications and disrespectful interactions with some healthcare staff and felt criticized and belittled. Mistreatment of mothers can potentially negatively influence antenatal uptake in the community, as mothers share their own poor experiences with other community members. Finlayson and Downe (2013) found that some groups see obtaining the antenatal card as an important entry to health services for birth. Some mothers attended antenatal care only once to obtain the card. Davis-Floyd (2000), in her research about the medicalization of birth and why women choose traditional attendants, discussed obtaining the antenatal card for admittance to labour wards if needed. Both Davis-Floyd and Finlayson assert that quality of care affects access, and stress that when disrespect and abuse is directed towards pregnant women, it acts as a deterrent to care. The caring that women expect to receive is not there, so they decide to avoid further encounters with the medical system.

2.4. Skilled Care at Birth

In the following section, I briefly examine issues around the health system related to skilled care at birth. Informing the discussion around health workers' responses to challenges and successes of providing care at birth, and mothers' and community experiences, I discuss one of the main issues in global maternal infant care and in my

research: the 'skilled birth attendant' (SBA). I will discuss changing definitions of skilled birth attendants, and investigate access to skilled care in low-resource settings.

2.4.1. The role of the health system in enabling care

Most researchers and advocates view maternal mortality as a failure of the health system. The skilled birth attendant operates within a health system that may, or may not, contain elements that support and enable effective care. The Health Systems Framework used by the World Health Organization (WHO, 2014) can be used as a guide to conceptualize the enabling factors for effective midwifery services. The four goals of the health system considered by WHO (2014) include improved health (both level and equity); improved responsiveness of the system to respond to evolving and unmet health and service needs; and financial risk protection so that families do not face catastrophic financial problems as a result of paying for health services. The last goal is to improve the efficiency of the health system, generally meaning satisfaction with care and appropriate allocation of human resources.

The WHO framework uses six building blocks that work in coordination to effect the goals of the health system. The six building blocks are: leadership, health workforce, service delivery, medical products and technology, information and research, and financing. These building blocks influence access to care, and affect quality and safety to reach the health system outcomes or goals. The health workforce building block refers to sufficient numbers of health care providers, and the right mix of care providers in the right place to provide the required services (WHO, 2014). It is also concerned with education, training and continuing competence of workers as well as utilization and retention. Inadequate workforce is a barrier to provision of quality care, as is under-funding of primary care or referral services. Health service delivery includes all services relating to diagnosis, treatment or health promotion. It refers to money, staff, equipment and drugs that are combined to provide key services. In the context of maternal newborn health, the services are meant to provide safe effective birthing options, and appropriate care of the newborn, including emergency care at birth. The appropriate mix of medical products and technology increases effectiveness of diagnosis and treatment at each level of care.

2.4.2. Role of skilled birth attendant

One of the indicators for progress in reducing maternal mortality highlighted in United Nation's Sustainable Development Goals is the proportion of births attended by skilled birth attendants (United Nations, 2018). Although skilled care can be provided at home, in low-resource countries skilled attendants are few and usually available only in facilities. Initially developed in 2004, the WHO definition of a skilled birth attendant includes midwives, auxiliary midwives, nurses and physicians who have been trained to provide antenatal care, attend uncomplicated childbirth and postpartum period as well as neonatal care. Skilled birth attendants can identify, manage, and refer complications in mothers and newborns to the level of care that she needs (WHO, 2004). A newer definition developed by international bodies of obstetricians, midwives and nurses modified the former definition of skilled birth attendant to include personal qualities of caring and respectful behaviours providing "evidence-based, human-rights based, quality, socio-culturally sensitive and dignified care" as well as being a team member in an enabling environment (WHO, 2018d). The addition of "facilitation of physiological processes during labour and delivery" is new, and is in response to medicalization of childbirth in some areas (WHO, 2018b).

Skilled attendance at birth is a measure of a health system's ability to provide adequate health care for parturient women in pregnancy and during labour and delivery. The WHO (2011) states the process measure of skilled attendance at birth refers to the percentage of live births attended by skilled health personnel, with the denominator being all live births to women aged 15 to 49 in the years prior to the survey. The WHO, the International Federation of Gynecologists and Obstetricians (FIGO), the United Nations Population Fund, and other international bodies urge all countries to adopt measures to have a skilled birth attendant at every birth.

The rate of skilled birth attendance has increased in the last two decades. Therefore, skilled care at birth and facility-based birth usually occur together. In low- and middle-income countries, the proportion of mothers who used skilled attendance at birth increased from 57% to 74% between 1990 and 2013, ranging widely among regions of the world (Campbell et al., 2016). Although SBA use, together with facility-based birth, is

increasing, in many low- and middle-income countries, urban and richer women are the ones with access to these services (Campbell et al., 2016).

Midwives, considered mid-level providers, are one of the skilled attendant professions, and claimed to be the most useful in low-income countries (Campbell & Graham, 2006). Midwives' competencies include the provision of basic emergency obstetrical and newborn care, and are less expensive both to deploy and educate than physicians. The State of the World's Midwifery 2014 report asserts that, "midwives, when educated and regulated to international standards, have the competencies to deliver 87% of the estimated need in [lowest-resources] countries" (United Nations Population Fund, 2014, p. 12). Most evidence-based interventions to prevent newborn death are within the scope of midwifery practice. These interventions include immunization of mothers with tetanus toxoid, skilled care at birth, newborn resuscitation, clean umbilical cord care, management of infections, and promotion of breastfeeding (Lassi, Middleton, Crowther & Bhutta, 2015). Homer, Friberg, & Dias (2014, p. 1150) claim that 83% of maternal and neonatal deaths could be averted through provision of midwifery care, including family planning, and refers to the "potential of midwives for improving quality of care".

In contrast, the WHO (2018d) broadened the range of health care workers who can be considered skilled birth attendants, thus challenging the idea that trained midwives are the most effective providers of maternal-newborn care. The new definition of a skilled birth attendant notes that maternal newborn health professionals working as part of a team can participate in management of key interventions preventing mortality and morbidity in emergency maternal and newborn care. Health care providers do not have to perform these functions alone to be a skilled birth attendant (WHO, 2018d).

Skilled birth attendants cannot function without adequate and appropriate materials and supplies. Another aspect of providing skilled care at birth, according to the new definition by WHO (2018d), is the presence of an enabling environment. Enablers, defined as a well-functioning health system comprised of the WHO model of six building blocks described in the previous section (WHO, 2014), support skilled care at birth. Our study investigated both the skills of the nurse-midwives attending childbirth in remote

areas as well as enabling factors such as infrastructure, communication system, equipment, medications, and supplies.

Much of the literature does not differentiate between midwives and other birth attendants who have had training in managing childbirth. There are different definitions of who a midwife is and what she does in the literature, adding to the complexity of measuring the utility of midwifery services. According to the International Confederation of Midwives (ICM), midwifery involves being with women in a collaborative power sharing relationship. I do acknowledge that there is a 'disconnect' with the kind of midwifery described by the ICM, which resonates with the model and attributes of Canadian midwifery, and the quality of care and the midwives' treatment of women being described in the literature. In this section, I explore the problem of using the concept 'skilled birth attendant' as a proxy for 'midwife', as envisioned by the ICM (International Confederation of Midwives, 2017). A midwife is described by the ICM as a person who has been admitted to a midwifery education program that is recognized in her country and is based on ICM competencies and standards, who is qualified to be registered or licensed to practice midwifery, and is competent in managing care throughout the reproductive cycle. Her responsibilities are to assist the mother, while educating her about birthing and newborn processes, and providing informed decision-making options to her prior to birth (ICM, 2017). The WHO standards of maternity care have recently added the idea of promoting respectful care to all maternity care providers including midwives. This is aimed to empower and increase mothers' capacity for decision-making in her own health care and that of her infant (WHO, 2016a). If birthing processes become disrupted, the midwife is trained to manage complications and refer to a higher level of care when needed (WHO, 2016b).

In jurisdictions, including Nepal, where midwifery education has not been implemented, the proxy 'skilled birth attendant' may be used in place of the professional designation 'midwife'. There are several problems with promoting the use of skilled birth attendants and facility deliveries without high quality of care or a supportive relationship between mother and caregiver. Fauveau, Sherratt, and de Bernis (2008) cite the first problem as the general lack of appropriate up-to-date education and training given to the health care workforce in low-resource countries. Campbell et al. (2016, p. 2193) identify

the problem of high maternal mortality despite coverage of skilled birth attendants described as a 'quality gap'. This may exist where maternity attendants work in lower level, low-volume facilities with inadequate provider skills and lack of support, such as in rural and remote Nepal.

Globally, there is a power imbalance between maternity care providers including midwives, and mothers and their families. Fahy and Parratt (2006) claim that the unequal power dynamics between SBA and mother cause women to experience a lack of warmth and problems in both ease of delivery and access to care. They assert that the more medicalized the birthing area, the more uncomfortable the woman may feel. Mothers may experience distress with unkind staff behaviours and attitudes at birthing facilities. Brunson (2010) found that nurses scolded pregnant women who attended institutions for delivery if they were perceived to be too young to be a mother. Davis-Floyd (2000) related poor staff attitudes towards birthing mothers, representing a contributing factor to the under-utilization of healthcare services. Even when skilled attendance is available, some women in rural areas continue to use TBAs for cost, convenience and kindness. Davis-Floyd asserts that mothers make carefully calculated choices around using the formal health system or staying at home where they feel more at ease with traditional carers or family members.

In considering the use of a birth attendant, whether an SBA or another type of birth attendant, women focussed on how they wanted to be treated. As well as being respected, women wanted the health care worker to be close to them, to be nearby to avoid self-delivery if at an institution. Some were not familiar with monitoring of mother and fetus during labour. One mother was cited in the literature as saying, "When you are in labour you wait for delivery of the baby. I do not see what else could happen" (Kumbani, Bjune, Chirwa, Malata, & Odland, 2013, p. 4).

Recent literature has cited mothers' and communities' unease with SBAs who are harsh towards mothers, affecting the uptake of SBA services (Bohren et al., 2015; Nyakang'o & Booth, 2018). Communities may favour certain facilities over others depending on perceived quality and caring, however most women only attend those facilities if severe problems are experienced. This sentiment has been echoed in other

contexts, where women will not use a system that treats them poorly and undermines their confidence.

2.5. Access to Skilled Care

In this section I review factors affecting pregnant and birthing women's access to skilled birth attendance in low- and middle-income countries globally. I then discuss access to skilled childbirth care in Nepal and its neighbouring countries. Various demographic studies have analyzed factors affecting use of skilled attendants at birth (National Institute of Population Research and Training, 2014; Nepal Demographic and Health Survey, 2016). Some of these factors are not modifiable, such as age, and urban or rural residence. The main problem in determining the effects of interventions aimed at increasing access to skilled care was that sometimes only one intervention was studied when several interventions took place at the same time. This resulted in many references being eliminated from several systematic analyses, which I discuss in this section, and some interventions that appear to be useful may confound the effects of others. In general, much of the literature uses quantitative methods that do not generally demonstrate how and why some of the factors affect use of care, and how these factors might interact. Qualitative studies help us to understand some of the reasons for decisions made, and the facilitators and barriers according to the mothers and families themselves.

I draw upon Gabrysch and Campbell's (2009) systematic 'review of reviews' on access to skilled birth attendance to categorize the literature around factors thought to be associated with access to skilled care at birth. These categories are: economic accessibility, physical accessibility, perceived need/benefits and socio-cultural aspects. These are useful categories to discuss factors and interventions related to use of SBA for childbirth and are still relevant for more recent research findings. The category of perceived need/benefits includes research on quality of care influencing use of SBA and facility-based birth.

2.5.1. Economic accessibility

Economic considerations were cited as barriers to skilled attendance at birth in most studies. Islam and Yoshida (2009) assert that women do not access health facilities due to financial considerations. The ongoing preference for home birth may relate to myriad factors, combined with an economic efficiency to save travel and hospital costs if not needed. A review on inequalities on the use of maternal health care in developing countries found that within countries wealthy women used services of skilled birth attendants more often than poor women (Say & Raine, 2007).

Both formal and informal costs play a role in making access to skilled birth problematic. Even when governments reduce or eliminate charges for maternal care, informal charges for mothers can be daunting for many families. Costs may include travel to facilities, food and accommodation for accompanying family members, and costs of baby items.

Context was important in linking costs and use of SBA. In some countries women with more money used facilities for delivery but in Guatemala and Tajikistan, wealth did not affect access to skilled birth attendance (Say & Raine, 2007). In these cases, perceived quality of care and lack of social support for birth may have affected choice of caregiver.

In Nepal, most studies related to barriers towards use of SBA cite cost as a barrier to access (Byrne, Hodge, Jimenez-Soto, & Morgan, 2014; Dhakal, van Teijlingen, Raja, & Dhakal, 2011; Maru et al., 2016; Metcalfe & Adegoke, 2013; Simkhada, Teijlingen, Porter, & Simkhada, 2006). Karkee, Lee, and Binns (2013) disagreed and found that in their study area women preferred to travel and pay for services they considered to be of higher quality. I will discuss the implications of removing user fees and compensating for travel expenses to facilities in the 'Financing' section.

2.5.2. Physical accessibility

Geographical barriers and distance limited access to care for the mother-newborn dyad in most references. Two systematic reviews found that women living in

urban areas were more likely to access a health care facility than rural women (Say & Raine, 2007; Gabrysch & Campbell, 2009). Reviews focussed on Nepal and other countries found that distance to the nearest hospital, together with level of education and wealth, as well as length of time a midwife was working in the community were associated with use of skilled birth attendance (Baral, Lyons, Skinner, & van Teijlingen, 2010; Vieira et al., 2012).

Many authors have emphasized the importance of adequate and affordable referral systems (Bhutta, Darmstadt, Haws, Yakoob, & Lawn, 2009). Some have offered community-based interventions backed up by linkages with the local health care systems (Byrne et al., 2014; Lassi & Bhutta, 2010; Lewin et al., 2010; Prost et al., 2013). Improving access to care in remote mountainous areas, included upgrading facilities, training and supervision of workers, as well as involving the community in planning through community groups in interventions to mitigate the problem of distance to higher level facilities (Byrne et al., 2014).

Geographic barriers and distance were important barriers to care in most South Asia research. Authors discuss barriers created by distance in Nepal, where mothers said they could not reach a facility for birth due to distance or lack of transportation (Baral et al., 2010; Maru et al., 2016). Baral et al. (2010) proposed that when families live more than an hour away from skilled birth, they are unlikely to use these services. In Bangladesh, the odds of having a facility birth were one-fifth for women in the distant category as compared to women close-by (Gabrysch & Campbell, 2009).

Brunson (2010) on the other hand, found that although geographic access was not a barrier in her peri-urban study, mothers did not go to birthing facilities unless they had serious problems, and then they would go straight to a preferred referral hospital. Karkee et al. (2013) agreed with Brunson and found that in rural Nepal, women bypassed local health centers in favour of referral hospitals where they felt the services were of higher quality. However, for women living away from a road, finding people to carry them, or having night labours, were barriers to using an SBA for birth (Khatri, Dangi, Gautam, Shrestha, & Homer, 2017; Morrison et al., 2014). There have not been any large-scale studies on making affordable transportation available to families.

2.5.3. Socio-cultural factors

Socio-cultural factors in maternal healthcare broadly relate to the social conditions in which a mother lives, her community and the cultural aspects and beliefs that affect reproductive care. Social and cultural factors influence whether a mother seeks skilled care for childbirth or not. There have been many examples in the literature of women not seeking care, even when health centres are near by. In this section I will discuss the effects of age, education, social support, and traditional beliefs on utilization of skilled care. Both women's autonomy and family decision-making are included in this category.

Age is usually an important factor in predicting access to skilled birth, but there are inconsistencies in the literature. Gabrysch and Campbell (2009) found that age did not consistently influence use of a skilled attendant, but older mothers were more likely to use such services than younger mothers. Older mothers may have more knowledge of the benefits of preventive care, and of health services and medical procedures. They may also have more control over resources in the home and more decision-making power both at home and in health care facilities (Gabrysch & Campbell, 2009). In contrast, a study of access to SBA care in rural southern Nepal, found that older mothers were more traditional and less likely to seek SBA care (Shah, Rehfuss, Paudel, Maskey, & Delius, 2018).

The socio-cultural factors that consistently and strongly predicted use of skilled attendance at birth were maternal level of education and to a lesser extent the husband or partner's educational level. A husband's higher education also contributed to his wife using skilled attendance, possibly due to access and ability to process relevant health information and ability to communicate with health care workers. Wealth and place of residence may confound findings about educational levels and use of skilled birth attendant, however. The majority of studies found mothers from urban and wealthier families were more likely to give birth with the assistance of a skilled attendant, and these women were also more educated (Gabrysch & Campbell, 2009).

Gabrysch and Campbell (2009) assert that parturient women are not living in a vacuum; they live within families and communities and the influence of extended family

and community on decision of place of birth is considerable. These discussions are important for my research since use of birthing facilities may partly depend on decision making processes. In Nepal's remote communities, the role of community in influencing women's choice for facility-based birth may be larger than previously thought. Several authors propose that other women in the community, and especially older women, are the main supports, and influential forces in maintaining a community's birth culture and influencing access to skilled birth resources (Brunson, 2010; Kumbani et al., 2013; Mumtaz & Salway, 2009; Soubeiga et al., 2014a). Although in many cultures childbirth is the business of household and community women, some studies have assessed whether involving husbands in supportive aspects of childbirth improves pregnancy outcomes or increases access to skilled birth attendance. Story et al. (2012) found that husbands in Bangladesh whose wives gave birth with SBAs were found to provide social, informational and emotional support to their wives as compared to a group of husbands whose wives gave birth without skilled assistance.

Perceived conflicts with the culture of biomedical birth were found to be associated with low use of SBAs. Gabrysch and Campbell (2009) found requirements for handling the placenta, birth position, warmth, and beliefs that obstructed labours were signs of infidelity were all associated with preferring home birth. The cultural premium in biomedicine of considering birth as a medical condition tended to conflict with many community members' ideas of birth management. In a study in two rural districts in Ethiopia, most still elected home delivery even when transportation and other costs were covered (Shiferaw, Spigt, Godefrooij, Melkamu, & Tekie, 2013). In both surveys and focus groups, participants responded that skilled attendance was unnecessary, or that it was not customary, and that birth was not the kind of activity requiring medical interventions. Several studies have also described the idea that Nepalese mothers do not see birth as a medical process, and they do not feel the need to have this process monitored and supervised by a medical or paramedical attendant (Baral et al., 2010; Brunson, 2010; Kaphle, Hancock, & Newmann, 2013).

A belief in "God's will" influencing all outcomes or being too marginalized to take steps towards a safer birth influenced care seeking and the receipt of skilled care at birth. D'Ambruoso, Byass, Qomariyah, and Ouedrago (2010b), maintain that in Burkina

Faso and Indonesia, fatalism resulted from marginalized families being unable to alter their circumstances. Families attributed maternal death to God's will since they believed that everything within their power had been done. A midwife was considered unnecessary for normal childbirth. When a complicated situation arose, spiritual healers were first called to remedy the problem, because families were apprehensive of the costs that would incur for transport and for hospital care. In addition, inequalities and barriers to accessing services added to the complexity of accessing care. The stigma of being poor resulted in discriminatory care as indicated by the relative of a woman who died in childbirth in Indonesia:

“At the hospital, sometimes poor people are neglected, especially when there is no referral from the bidan [midwife], they just ignored us...”
(D’Ambruso, Byass, & Qomariyah, 2010a, p. 227)

Parturient women in peri-urban Nepal experienced birth in the process of change from a traditional model to a biomedical model, but mothers-in-law and male family members were responsible for decision-making around birth. Brunson (2010) found that birth had been considered a ‘natural process’ that was not medicalized, did not include planning or preparations, but was also part of a world view that you could do very little to control. This idea did not preclude efforts to change circumstances through offerings or prayers. Mothers and their female family members dealt with birthing activities, maintaining customary practices and preferring home birth unless something very urgently convinced them otherwise (Brunson, 2010).

With the young generation of mothers, customs and perceptions regarding place of birth are slowly changing in villages near the Kathmandu Valley, through antenatal care and more experience with hospital births (Brunson, 2010). Young married women in peri-urban Nepal have more knowledge about birthing processes, but an older female family member is usually still considered the appropriate person to attend the mother. Mothers are socialized to keep quiet about pain in labour, not to demand any services. The decision to move to hospital for prolonged labour is made jointly by senior male members of the family, which is difficult since men have little knowledge of birth. Some young, married women want the husband to become more involved in the birth

experience, signalling a change due to exposure to other ways of thinking through antenatal care, group experience with facility births, or media exposure.

In some cultures, gaining respect by birthing alone at home discouraged use of SBAs. In rural Western Uganda, women can gain respect and command status by birthing alone at home. In that culture, mother's importance lies in her ability to produce a number of children. Childbirth was referred to as 'walking down a thorn-strewn path' with only two endings: survival or death (Kyomuhendo, 2003). Injuries and risk were considered unavoidable. Women who had to go to the hospital because they were unable to birth normally at home were blamed and considered weak. Their experiences in hospital were harsh: they were not allowed to ask questions, and were humiliated and mistreated. The idea of preference for birthing alone is not isolated. Sargent's work in Benin discusses the idealization of solitary birthing where women show their courage by not asking for assistance until the infant has been born (Sargent, 1982). In Brunson's (2010) ethnographic study of birthing in Nepal, women were culturally socialized to keep quiet in labour. Similarly, Ugandan mothers were also expected not to vocalize pain. They were made into dependent patients, and prevented from asserting their strength in birthing. Through a paucity of acceptable choices for childbirth, women may be torn between staying at home unattended, or experiencing an unpleasant, discriminatory and cold environment in a health care facility.

It has been debated whether personal autonomy and gendered roles impact access to giving birth in health facilities. Some reviews found that women's autonomy increased use of SBAs to some extent (Baral et al., 2010). Other reviews emphasized that although women's autonomy played a role in use of an SBA, autonomy was contextually influenced by social structures, gendered roles and religion (Say & Raine, 2007). Both Story et al. (2012) and McPherson, Khadka, Moore, and Sharma (2006) argue that lack of women's autonomy negatively affects access to care, and the husband or father-in-law makes decisions regarding care, and the mother is left out of decision-making about care seeking, transportation or how money would be spent.

However, some authors assert that community and family norms have more to do with decisions about place of birth than whether or not the woman has power in her

home (Gabrysch & Campbell, 2009; Mumtaz & Salway, 2009). In some Muslim communities where women spend much of their time together in extended families, segregated by sex, they share thoughts and experiences around reproductive care. An older female relative may be the decision maker around reproductive health choices such as use of antenatal care and place of delivery. The relationship of the parturient woman to the elder female determines the type and extent of health care that she receives during her childbearing year. Mumtaz and Salway (2009) found that decisions to use family planning to maintain a small family size were decided by the community of young married men together with the older women (who had wanted to limit their family size but could not due to lack of technology) and the young married women agreed to these social norms. Using this as an example, the authors challenge the notion that women utilize reproductive health services when they have greater autonomy.

Certain cultural groups in Nepal consider birth to be polluting, and require cleansing procedures, not medical ones. Cultures that believe birth is polluting also assign low status to those attending them. TBAs, considered to be of lower status, may be sought to deal with birth. Both Kaphle (2013) and Thaddeus and Maine (1994) report that some women living in remote areas seclude themselves in a shed outside of the main house to avoid contact with others. Kaphle suggests that providing a birthing kit helps the mother cut the cord more safely; but she does not mention the benefits of community-based programs to slowly make changes to the traditional unsafe practice. In some contexts, facility-based births were also perceived as helping some women manage the demand that blood from childbirth be isolated. Sharma, Giri, Christensson, and Johansson (2013) reported that in Gujarat, India, mothers who chose facility-based birth said that the polluting aspects of birth could be handled in the facility thus relieving the concern about this problem in their homes.

In remote northwestern Nepal, health system barriers including lack of qualified personnel, fear of practices such as augmentation of labour and poor treatment of birthing mothers add to perceptions that birth is safer at home, despite stillbirth and neonatal death being a common occurrence (Paudel, Javanparast, Newman, & Dasvarma, 2018). Education for maternity care providers about respectful care could be offered, and community discussions could begin with bringing together families and local

respectful health care staff to consider healthy birthing practices. Slowly moving birth to a community-based health center, made comfortable with the use of local birthing positions and accompaniment by relatives, could resolve the problem of polluting blood in the home, and reduce morbidity caused by infection. Community-based interventions have been able to engage the community in different cultural areas of Nepal (Morrison et al., 2014; Prost et al., 2013).

2.5.4. Role of traditional birth attendants and community

Many research studies provide insight into why mothers wish to use community carers for assistance at birth. In areas without good access to skilled birth attendants, TBAs are an important source of support and care for parturient women (Vieira et al., 2012). Most TBAs are women over forty years of age, who are mothers and community members. They are known by their community as someone with experience to help other mothers in childbirth. Reasons that women prefer TBAs include cultural familiarity and availability within the community, reducing or eliminating the cost of travel during labour, and respecting cultural norms about avoiding exposure of genital areas in labour and delivery.

Female doctors may be unavailable in rural health facilities and mothers feel uncomfortable around male doctors (Sarker et al., 2016). Other research described women's shame and shyness in having their bodies exposed during labour and birth, even with female skilled birth attendants (Morrison et al., 2014; Shah et al., 2018). Other Nepalese studies have not applied concepts of shame as barriers to care, but Kvernflaten (2017) found shame to be an important reason for avoiding facility birth in Nicaragua especially amongst older mothers.

I rather die than spread my legs in front of those strangers! (Kvernflaten, 2017, p. 9)

EI-Nemer, Downe, and Small (2006) write about the caring of a traditional attendant in Egypt, providing reasons that women prefer to use TBAs, in this context called a 'daya'.

My first delivery was by the daya. She helped me to sit on the floor, walk and to do what I wanted to. She was warm. She delivered me sitting and she helped me move around, sleep, stand, and walk. She was very patient, kind, and had a warm voice and smile. (p. 88)

Training of TBAs was thought to be a solution for the lack of skilled personnel in many countries, including Nepal. Sibley, Sipe, and Barry (2012) examined whether training of TBAs improved health behaviours or pregnancy outcomes. Researchers found little evidence for referrals for obstetrical interventions, but a significantly lower perinatal death rate, 39% lower stillbirth rate and 29% lower neonatal rate in the trained versus the untrained TBAs. These results are consistent with Darmstadt's (2009) review where training traditional birth attendants was found to lower intrapartum-related neonatal mortality though there was little evidence that TBA training provided linkages of health system with communities (Darmstadt et al., 2009). Both reviews conclude that while TBA training is still controversial, strategies to create linkages and integrate them into the health system may save lives.

Byrne and Morgan (2011) offer suggestions concerning the integration of TBAs into the health system in a way that increases use of skilled care at birth. They assert that most useful strategies include training traditional birth attendants with annual refresher courses and close supervision and the inclusion of TBAs as staff in health facilities. They claim that providing a definition and job description beyond the task of referring women to skilled birth attendance increases use of skilled care at birth (Byrne & Morgan, 2011).

2.5.5. Perceived need/benefit of using skilled birth attendance

This category refers to factors influencing whether mothers and families perceive a need for skilled care. Factors include use of antenatal care, health and childbirth knowledge, previous facility birth, birth preparedness packages, and quality of care from mothers' and communities' perspectives. Many studies found an association between antenatal care and use of skilled birth attendants, although Gabrysch and Campbell (2009) acknowledge that this association may be confounded by service availability and other factors.

In Nepal, several studies showed no association between antenatal care and use of skilled attendance at birth. Karkee et al. (2013) and McPherson et al. (2006) did not find an association between antenatal care and skilled attendance at birth but they disagree on the reasons for the lack of association. Karkee et al. state that lack of autonomy and preference for home delivery were reasons why antenatal care was utilized but not skilled delivery, while discounting the lack of adequate transportation as a factor. McPherson et al. (2006), on the other hand, suggests that poor quality of institutional care, cultural factors, and high cost of transportation reduced SBA utilization.

One might think that possessing health knowledge and information about maternal services would influence mothers to use health facilities for childbirth, but Gabrysch and Campbell (2009) did not find this in their review. However, skilled attendance at birth was strongly associated with previous delivery in a health facility, or having had complications during a previous birth (Gabrysch & Campbell, 2009). The argument is that if a mother delivers in a health facility she will become used to it and use it again for the next birth. In Nepal, a previous maternal death among their acquaintances encouraged mothers to travel to the facility for childbirth (Maru et al., 2016).

Birth preparedness is the acquisition of knowledge and actions that promote timely life-saving emergency obstetrical care. Usual components of these programs include promotion of antenatal visits, knowledge of complications in labour, delivery and postpartum, preparations for delivery including preparing clothes for mother and baby, saving money and identifying transport, and having a companion with the mother throughout labour. Some plans urge delivery with an SBA and identification of blood donors, and if at home, plans for transfer to health care facility if needed (Khatri et al., 2017). A systematic review and meta-analysis of effects of birth planning preparedness and complication readiness found a statistically significant reduction of neonatal mortality (14 studies) (Soubeiga et al., 2014a). Subgroup analysis determined a reduction in maternal mortality only when 30% more of the women participated in interventions (Soubeiga et al., 2014a). Results showed that combining home visits and women's participatory groups would have a greater impact in reducing maternal mortality than either of these interventions alone. The limitation of this meta-analysis was the small

number of studies for review (Soubeiga et al., 2014a). A second systematic review identified thirty-three different programs that included facility, community or home-based birth planning preparedness interventions, of which only 13 resulted in an increase of use of an SBA at birth. The remaining programs identified increased knowledge among participants only (Solnes Miltenberg et al., 2015).

A community-delivered birth preparedness program in Cambodia was successful in increasing use of antenatal care by 22%, numbers of women attended by a midwife by 32%, and referral by 281%, demonstrating that community engagement was a useful way to increase use of maternal infant services (Skinner & Rathavy, 2009). Success in this project relates to engaging local maternal health staff with mothers and families and the health sector, without the help of NGOs. Knowing the midwives was important to promote utilization of the services. Families' familiarity with a birth attendant influenced use of skilled care at birth, and if a midwife worked in a community for two years or longer, users were more likely to seek her services (Vieira et al., 2012).

Birth preparedness programs will not work in all cultural contexts, especially those where obstetrical problems not seen as having a physiological cause. Birth preparedness in the biomedical realm is not related to supernatural processes that may affect pregnancy and labour. Kachiquel mothers in Guatemala do not privilege biomedical causes of complications over social factors. Safety is promoted in pregnancy, labour and delivery by having correct behaviours during pregnancy, including self-care, being honest, and respecting others. If problems occur in labour it may be due to behaviours of self or husband, or related to someone bewitching the mother (Berry, 2006). Each woman's situation is considered unique. Berry (2006) provides examples of how the basic thinking of Kachiquel birth attendants (expecting birth to be normal) and medical practitioners (expecting birth to be dangerous) differ. To prevent mortality among the Kachiquel mothers, the description of 'emergencies' (such as excessive blood loss) could be clarified for this group, as they will want to reach biomedical care in time, if they think it is warranted. Professional culturally respectful Guatemalan midwives might have a role to play in these communities in bridging home and health facilities.

Some birth preparedness programs in Nepal increased use of SBA while others did not. In Nepal, most of the literature focusses on community volunteers' provision of birth planning preparedness as part of their work (McPherson, Khadka, Moore & Sharma, 2006; McPherson et al., 2010; Joshi et al., 2014). Baral et al. (2010) analyzed several studies in Nepal and concluded that families were unaware of the benefits of an SBA, or of the danger signs for mother and infant. In one geographic area of Nepal, a birth preparedness intervention showed changes in newborn practices, but did not make any impact on use of skilled birth or emergency obstetrical care (McPherson et al., 2010). Conversely, Karkee et al. (2013) found a two- to three-fold increase in SBA use when a woman planned in advance of labour to identify a birth place, a blood donor, and saved money. The more arrangements that were made for the birth during the pregnancy, the more likely an SBA would be used.

There have been methodological issues with evaluation of birth preparedness programs, and to determine if complication readiness messages were responsible for decisions on place of birth or referral to hospital. Stanton (2004) states that to ask a postpartum woman what her intentions were prior to birth is prone to bias, especially if much time has passed between her birth and the interview on birth planning. Mothers' experiences of childbirth might also affect their perceived intentions. Asking about a woman's and family's birth planning within the first year postpartum is considered more accurate than within the three- to five-year period usually used in demographic and health surveys. The time frame for seeing a change in behavior must be considered as a minimum two to four years, and longer periods of time might be required to see a rise in the use of emergency obstetrical services. Soubeiga (2014a) agreed that time bias was a problem in birth preparedness studies, noting that their study had a relatively short recall time of six months on average.

The effect of quality of care, including respectful care, on choosing a facility birth has been described in many studies and some authors assert that quality is essential to increasing use of facilities (Gabrysch & Campbell, 2009). Women cannot be expected to report on the quality of care, but they do know if they feel they were treated well or not. It has been argued that the quality of the caregiver-mother relationship and the observance of cultural norms are more important to many mothers than technical

competence of the midwife or doctor (Kumbani et al., 2013; Shiferaw et al., 2013). Kumbani et al. (2013) reported fear of poor treatment by midwives. A mother witnessed a midwife shouting at a mother in antenatal clinic and recounted:

How is it going to be [when we are in labour]? It will be the same shouting at us? That day you will even beat us then? She [the midwife] said 'yes, if a person is troublesome we beat her up. We are very annoyed at some who exaggerate and cry when giving birth'. (Kumbani et al., 2013, p. 4)

Nyakang'o and Booth (2018) demonstrate both women's and community members' previous experiences with poor quality of care negatively influenced decisions to seek care in rural Kenya. Karkee et al. (2013) suggested that bypassing the local health center to a large referral hospital in Nepal was as a result of perceived better quality of care, more medications and supplies as well as surgical capacity in the hospital (for caesarean section and other related surgeries), even though a birthing center is near. In contrast, women in far-western Nepal having fewer choices in facilities, stated that safety and good care were reasons to use a facility and all women thought facility birth was safer (Maru et al., 2016). Not surprising, in the Karkee et al. study, mothers who were wealthier bypassed local birthing centers more often as they had the economic resources needed for payment of transport.

2.6. Human Resources for Birth

2.6.1. Human resource capacity building and shortages

There are a range of human resource cadres that can care for parturient women and their infants. Although most authors agree that emergency obstetrical care is a critical part of the health system that saves mothers' lives, many facilities are unable to provide this level of care (Gulmezoglu & Lawrie, 2015; Pattinson, Makin, Pillay, Van den Broek, & Moodley, 2015). The literature addresses both the the issues of training and capacity building of skilled birth attendants and the feasibility of using various types of providers, including community-level health workers. Midwives, considered mid-level health care workers, are one cadre whose role has been discussed broadly. The research suggests that community-based midwifery programs require support from a

well-developed health system that features good collaboration among health workers, appropriate supervision, and effective transport and referral systems to emergency obstetrical facilities (Campbell & Graham, 2006).

The United Nations Population Fund, together with the ICM and the WHO, in 2011 and 2014 produced two 'State of the World's Midwifery' reports. The 2011 report asserts that most of the world's low- and middle-income countries have too few midwives. It is suggested that health systems require six midwives for each 1000 births. To meet this target, the report finds that a large number of countries fall well short of this benchmark. The report argues for the development or expansion of midwifery training programs. (UNFPA, 2011)

The International Confederation of Midwives (ICM) propose that direct entry midwifery educational programs of at least three years length, or 18 months post-nursing training, should be developed and offered, with adequate clinical and theoretical modules so that participants can meet the competencies of truly skilled workers (ICM, 2014). The position of the ICM is that midwives should be permitted to work in any location including health center, hospital or home. Midwifery curricula, faculty training and clinical opportunities need to be strengthened in order to meet international midwifery competencies and standards. Most countries attempt to have their programs accredited but many do not have the resources to do so; at least a third of programs do not offer education on the full scope of midwifery. Once registered as midwives, they are not allowed by some governments to practice their full scope, deferring to physicians to perform some practices such as post-abortion care and vacuum assisted delivery.

Shorter programs requiring participants to have less formal training prior to joining a midwifery training initiative can save time and money in establishing skilled attendance at birth, but may sacrifice levels of adequate knowledge and clinical skills. Fullerton, Johnson and Thompson (2010) found, for example that short midwifery programs do not offer education that is up to the standards of the ICM. Many programs have rushed to educate large numbers of midwives, and have sacrificed quality of this cadre, so that they do not meet the international required competencies. Fullerton et al. (2011) found that barriers to implementation of quality education in sub-Saharan Africa

included a scarcity of appropriately educated tutors for clinical practice, adequate clinical practice experience, as well as inappropriate intake of candidates. They urged adaptation of internationally recognized core competencies that provide for balance between theoretical and clinical practice, and thereby better meet countries' needs for an appropriately skilled midwifery workforce. Similarly, Fauveau et al. (2008) explained that the rush to upgrade skilled birth attendants in Nepal used shortcuts to train more workers at low skill levels, and consequently the ICM competencies for labour, delivery, and newborn care were not met. The current education for midwives in Nepal is a bachelor's degree program (Bogren, Berg, Edgren, van Teijlingen, & Wigert, 2016).

The 2014 State of the World's Midwifery report focusses on the availability, accessibility, acceptability, and quality of midwifery services. In comparison to the 2011 survey, the 2014 report indicates improvements in workforce retention in remote areas, expanded deployment of midwives, and an increased number of regulatory measures implemented to increase the quality of midwifery services. By 2014 many countries had improved data on their workforce, information and accountability (UNFPA, 2014). They suggest that further improvement is needed to provide properly equipped facilities where midwives work, accessibility of midwifery care, quality of midwifery education, and an adequate midwifery workforce.

Few mothers in low-income countries can access SBAs in their homes since most countries train midwives for facility-based births. Several countries initiated short community-based midwifery education programs that were meant to produce skilled services for home deliveries in rural areas that currently rarely utilize SBAs. It is useful to examine studies of community-based midwives because the SBAs working in remote Nepal fit this description, but do not usually attend home deliveries. Bangladesh's community midwives were expected to offer home delivery services but almost all births they attended still took place in health facilities. Blum, Sharmin, and Ronsmans (2006) carried out focus groups with SBAs attending home deliveries and posit that the small number of home deliveries attended by SBAs was not a result of mothers' wishes, but was in reality due to problems such as lack of cleanliness at home and inability of caregivers to reach the homes, especially at night. As well, there were major differences in the way women wanted to deliver at home (vertical position fully clothed in dark corner

of the home) and the way SBAs wanted to attend them, in recumbent position where they could perform episiotomies. Blum et al. (2006) suggest that fear of episiotomy was a major barrier to seeking SBA even when skilled attendance at home was available. Barriers to home delivery from the SBA point of view included cultural differences in birthing practices, lack of proper environment, transportation, over-work from both facility and home birth responsibilities, lack of supportive supervision, fear to take responsibility for outcomes at home, and lack of specific training for home birth. The authors pointed out that SBA's disrespectful attitudes and behaviors towards women posed an additional barrier which needed addressing. After several years, the skilled home birth attendance initiative was discontinued (Blum, Sharmin, & Ronsmans, 2006).

Ahmed and Jakaria (2009) offer another viewpoint on the community-based midwife offering home deliveries in Bangladesh. These authors suggested benefits to home delivery by community SBAs in Bangladesh because the rate of facility-based birth was still very low. They outline requirements for training in facilities with adequate birth numbers, and training for a training of trainers program as well as for technical supervisors. They stress the need for evaluation of referral rates, and morbidity and mortality as a result of this cadre's work. Ahmed and Jakaria (2009) concur that training of community-based birth attendants may be an interim measure until professional midwives are regulated and educated to the level of ICM competencies. Excellence in training and adequate supervision are a requirement for SBAs who work in mothers' homes (Ahmed & Jakaria, 2009). Upon review of the description of training, the lack of depth and breadth of the training of this community level midwife, I concluded that the ability of the trainers to deliver this program might be questionable. As well, there are few rural facilities that are appropriate for community-based midwives to gain the hands-on experience they need, especially within a short period of training. Within the last few years, a three-year direct entry midwifery program has graduated thousands of Bangladeshi midwives who work in rural health centers and hospitals. Problems with lack of leadership, continuous professional education, professional midwifery jurisdiction and acceptance of this cadre by public and other professionals limit these midwives' abilities to provide quality care (Bogren et al., 2018).

Sarfraz and Hamid (2014) argue that a short community-based midwifery program with well-trained, motivated and supervised workers can reduce maternal and neonatal mortality. However, families in rural Pakistan questioned the role of a community-based skilled birth attendant who was not authorized to attend childbirth in a health center or hospital, but only in the homes. Pakistan's community midwives were found to be unable to function in the communities due to lack of ability to refer patients, lack of appropriate training, and insufficient equipment and supplies needed to function in the community setting. Study participants explained that community midwives were not utilized since the families perceived the work to be similar to that of the TBA, but without the services typically offered by TBAs, for example, washing clothes, cleaning, and forty days of providing massage. As a result, they concluded that the TBA was a better option. As well, many community midwives were unmarried, which was a serious cultural problem since only married mothers traditionally attended birth. Davis-Floyd (2000) has described similar problems with the acceptance and utilization of young newly trained midwives in communities where a known and experienced TBA worked.

2.6.2. Task-shifting

In rural and remote areas of low-resource countries including Nepal, there are skilled human resource shortages. Many of the reviewed studies addressed the potential benefits of task-shifting for building maternal and newborn care capacity in resource-limited settings, and support this strategy in order to improve coverage for health-related activities within the system. The shortage of skilled maternal care workers can be partially relieved by the re-allocation of workers and by task shifting. Other terms such as 'task sharing', 'substitute health worker', 'skills substitution' or 'optimizing health worker roles' may be used (Deller et al., 2015). Health planners sometimes shift tasks that were previously done by higher educated cadre to lower trained colleagues to be able to manage maternal, newborn and child conditions, HIV and malaria (Bhutta & Black, 2013). Deller et al. (2015) refer to creating a new cadre such as lay health worker to extend life-saving services to areas of few SBAs. Alternately, the scope of existing personnel may be expanded to accept additional tasks and functions (Deller et al., 2015). Task shifting is meant to increase access to health care interventions that have been proven to be effective, thus referred to as 'optimizing the delivery of key effective

interventions' (WHO, 2012b). Bhutta and Black (2013) claim that without adequate numbers of health care workers it is difficult to scale up needed interventions. A systematic review of 13 studies (n=15,197) assessing implementation of uterotonics (misoprostol tablets or oxytocin injections) by community workers, lay personnel and by mothers themselves found a reduced risk of post-partum haemorrhage (Raams, Browne, Festen-Schrier, Klipstein-Grobusch & Rijken, 2018). When community health workers and others receive the training they also require an adequate supply chain of materials and medications, as well as supervision and monitoring for quality of care. Deller et al. (2015) adds that in addition, for successful task shifting to occur, role definition, determination of requisite skills, appropriate education and training are essential components. There is some evidence that task shifting increases coverage of skilled care during the intrapartum period. Hofmeyr et al. (2009) claim that at least three-quarters of the burden of maternal and neonatal mortality occur outside of hospitals so that task shifting would have to involve community-based care.

However, challenges to task shifting are many. In the typically hierarchical medical system, maintaining respectful and collaborative relationships is difficult. To be successful, task shifting needs rigorous and standardized supportive supervision, which is often lacking in low-income countries. Low status cadres such as nurses or midwives may be denied continuing education opportunities. Hofmeyr et al. (2009) cite failures in Senegal, where training of lower cadres for surgery took place, but theaters and equipment were not ready and absent members of the team made surgery impossible. Incentives and clear career paths are needed for sustainability of task shifting as a solution to the shortage of appropriately skilled SBAs. In places where there are few health care providers and where needs are great, for example in conflict zones, the rapid deployment of SBAs is critical and also demands a time commitment that may be difficult for many to maintain.

Community health and lay health workers

Community-based intervention packages delivered by various levels of health care workers may improve maternal infant outcomes. Lewin et al. (2010) conducted a systematic review of interventions in 82 studies by lay health workers in both high- and low-income countries. Authors found wide diversity in health issues, aims and outcomes,

and therefore limited meta-analysis to several areas including breastfeeding rates, care seeking for infants and TB treatment. They found moderate evidence for improvements in breastfeeding initiation and exclusive breastfeeding, but weak evidence for reduction of neonatal morbidity.

Lassi et al. (2014) conducted a study of 43 systematic reviews showing various interventions at the community level: 17 studies on outreach services, six on task shifting, 18 on training and two on community mobilization. Researchers found home visitation, community mobilization and training of community health workers have the most impact to improve maternal newborn outcomes. Lassi et al. (2014) included studies on the training of TBAs as part of community-based intervention in their study and found positive effects on referrals, early breastfeeding, maternal morbidity, neonatal and perinatal mortality. This constituted more significant findings than previous reviews and reduced neonatal deaths through training of TBAs (Darmstadt et al., 2009; Sibley et al., 2004; Sibley, Sipe, & Barry, 2012). Other studies in the review included research within high-income countries such as midwifery-led continuity of care which did not have an effect on maternal mortality, but only on some quality markers. Midwifery-led care resulted in higher rates of initiation of breastfeeding but lower rates of vacuum assisted deliveries and episiotomies (Hatem, Sandall, Devane, Soltani, & Gates, 2008). This is essentially a high-income country issue as many low-income countries struggle to get any SBA care at birth. Some portions of the review group articles together that measure results of interventions using cadres with dissimilar levels of expertise. I question the definition of 'semi-skilled health workers' as TBAs and CHWs, as some may be recruited to the project intervention already with training (CHWs) and some illiterate and untrained. The grouping of nursing auxiliaries with nurses, midwives and other higher skilled assistants as 'mid-level health worker' for analysis is also problematic as it includes higher functioning professionals with auxiliaries who may have very low-level training. Meta-analysis was only performed in six of the reviews, due to differences in program categories of health-workers and high- and low-income country differences. Some of the SBAs in my research sites work autonomously in remote settings, but most are auxiliary nurse-midwives with 18 months to 2 years training after secondary school. This cadre may not be 'mid-level health worker', as compared to a midwife with ICM competencies.

Kidney et al. (2009) in her systematic review of over 118,000 pregnancies and births in 13 eligible studies studied interventions that reduced maternal mortality. Authors studied interventions accessed locally at home or clinic by health providers in primary health care centers, or by lay workers in the community. The researchers found a paucity of high-quality studies examining the role of community-based interventions to reduce maternal mortality. Meta-analysis of interventions drawn from two studies; n=19,557 pregnant women (Jokhio, Winter, & Cheng, 2005) and n=28,131 women and 6,714 pregnant women (Manandhar et al. 2004) aimed to improve perinatal practices already known to be effective in reducing perinatal mortality (including educating lay birth attendants on maternal and neonatal care, reducing unsafe delivery practices, and increasing referrals) also reduced maternal mortality. Prost et al. (2013), in their systematic review of seven cluster randomized controlled trials (RCTs) (n=119,428 births), cite reductions in maternal and neonatal mortality through participatory learning and action in community-based mothers' groups in low-income settings. When at least 30% of pregnant women participated, a 49% reduction of maternal mortality and a 33% reduction in neonatal mortality was achieved. In these groups, women discussed danger signs, organized and saved money for emergency transport, and taught the community about maternal safety. The limitation of this study was the paucity of trials included. Both Prost et al. (2013) and Lassi et al. (2014) agreed that community-based participatory actions were effective to engage mothers in the maternity system and therefore improve outcomes.

2.6.3. Initiatives to move from traditional carers to skilled birth attendants

As discussed, the majority of maternal deaths occur in low-resource countries where there is a shortage of skilled human resources (Alkema et al., 2016). Most of the literature supports the policy proposition that having a skilled attendant at birth reduces maternal mortality. I argue that knowledge of ways to encourage mothers and families to use a skilled birth attendant while respecting traditional practices is therefore a key challenge. An additional challenge is making the health facility welcoming and attractive, insofar as skilled birth attendance and facility-based birth usually occur together. The literature in this area is important to my research because communities had indicated

that the optimum birthing location was to stay with community carers in the community, but at the same time, they acknowledged that medical attention was sometimes required.

In one of the more important systematic reviews of the SBA versus TBA issue, Vieira et al. (2012) examined interventions across 12 studies that assessed what was being done to change community use of TBAs to SBAs and the effectiveness of the intervention. In this systematic review, Indonesian midwives were either village or health center based, and those in the health center were responsible for maternity care in surrounding villages (Vieira et al., 2012). Midwives in these studies helped with childbirth and worked with traditional carers, promoted community participation in health, and referred complex cases to higher level referral centers. Risk of maternal death was found to be lower during the intervention likely due to more SBA births and increased referral for emergency care (Vieira et al., 2012). However, Kidney et al. (2009) disagree with this conclusion insofar as adjacent areas not included in the intervention were also found to have lower maternal mortality, due to increased care-seeking for emergencies whether or not a midwife was deployed in the area. This finding seems to suggest that it is not the presence of skilled birth attendant alone that reduces risk, but rather decreasing delays in accessing emergency care when needed.

Other than encouraging families to move away from traditional birth attendants to use skilled attendants in health facilities, other interventions have been tested. I have already discussed providing training to TBAs and birth preparedness programs to family and community. The third intervention is to bring SBAs, TBAs and the community together to develop a new model based on mutual respect for local cultural norms. When mothers do not discuss distance or cost as a factor, the type or quality of services might be the reason for staying home for birth. Workshops on birthing methods and practices attended by both facility staff and local traditional birth attendants can share cultural understandings and promote collaboration in care. Dietsch (2010) asserts that the need for TBAs and SBAs to work together other than when TBAs refer mothers to hospital is critical to build bridges of understanding. In Canada, when midwifery was being established as a separate legal profession, collaboration grew among midwives, doctors

and nurses only when the different providers experienced working together outside of the emergency referral context.

In a remote area of Peru, with high mortality ratios and few facility births or rapport between traditional and facility caregivers, a culturally acceptable solution was found. The community was the driving force in bringing TBAs, doctors and midwives together to change the way professionals reacted to traditional cultural birthing and to increase awareness of medical practices to save lives. Both groups attended workshops to learn about each other's ways of working, and facility births were changed to become more responsive to what families wanted. They instituted vertical birthing¹, use of traditional medicines, birth attendant and family presence, local language, and culturally appropriate handling of the placenta (Gabrysch et al., 2009). Women were allowed to wear their own clothes and use their language for birthing. A normal bed was also provided instead of a gynecological bed. The cord was cut with sterile scissors by a health professional. Abdominal binders were permitted after birth, as well as oxytocics. Most women began to use the health facilities, with good maternal and neonatal outcomes, and traditional attendants began to refer mothers to the facility, which had never happened previously. Gabrysch et al. (2009) claim that this model is feasible and sustainable and women will use the facilities if their needs are met. However, sustainability of such programs may be affected by changes to hospital or regional administration, or by senior staff who are not supportive of integrating medical and traditional birthing practices. Not all medical directors are culturally respectful or creative in their approach. Byrne and Morgan (2011) agree that collaborative respectful approaches combined with community input increase integration between community carers and the formal health system. I elaborate on respectful care later on in the thesis.

¹ Vertical Birthing is a culturally sensitive adaptation to birthing facilities to copy physiological birthing positions used by some cultures. This initiative intended to increase access to SBA in Ayacucho, Peru (Gabrysch et al., 2009).

2.6.4. Basic and comprehensive emergency obstetrical care

Both skills and resources are needed to perform life-saving actions when a mother develops complications in pregnancy, labour or in the postpartum period. There is consensus among experts that basic emergency obstetrical and neonatal care (BEmONC) should be offered in primary health care facilities where childbirth occurs, as well as higher level facilities, and comprehensive emergency obstetrical and neonatal care (CEmONC) should be available in hospitals meant for more advanced childbirth care (Islam & Yoshida, 2009; Girma, Yaya, Gebrehanna, Berhane, & Lindtjorn, 2011). BEmONC includes medications and resources to treat postpartum hemorrhage, abortion or post-abortion care, hypertensive disorders and infection, as well as assisted vacuum delivery and ability to resuscitate the baby. Facilities that have these resources and the ability to perform caesarean section and provide blood transfusions are considered to offer CEMONC.

Gulmezoglu and Lawrie (2015) warn that although training in basic and comprehensive emergency obstetrical and neonatal care should be rigorous, emergency skills in isolation are unlikely to save lives without a broad approach to improve quality of care. This broad approach in remote Nepal requires an improvement in infrastructure of facilities and referral system. An improvement in respectful care practices by staff is also needed.

Lack of training and poorly skilled human resources were the most important problems related to obstetric care. Knight, Self, and Kennedy (2013) in their systematic review, identified facility-level barriers to emergency obstetrical care in low-resource countries in Africa, Asia, and Latin America. Beyond the coverage and capacity issues described in an earlier section, human resource problems, cited in 41 out of 43 papers, included staff shortages, staff motivation and 24-hour availability. Problems with shortages or lack of drugs, blood transfusion capability, and equipment were cited in 38 articles. Poor infrastructure such as a lack of continuous power or water delayed life-saving caesarean sections. In addition, eight papers referred to unofficial costs as a barrier to treatment. This review reveals important information about the inability of many health care services to provide basic or comprehensive emergency obstetrical care, and indicates where systematic monitoring, increasing numbers of staff, and supportive

supervision could improve care. The problem has been described in other studies where skills, equipment and medication were lacking (Mahato, Teijlingen, Simkhada, & Angell, 2017). Girma, Yaya, Gebrehanna, Berhane, and Lindtjorn (2013) found that 92% of birthing facilities in one region of Ethiopia did not have all functions to perform life-saving actions. Only 35% of deliveries were conducted using parenteral oxytocin to prevent hemorrhage, even though many mothers had complicated pregnancies (Girma et al., 2013). In some cases, the problem may be so severe that facility birth did not provide any health benefit (Girma et al., 2013). Ith, Dawson, Homer, and Klinken Whelan (2010) assert that several health care centers and referral hospitals in Cambodia showed poor quality of care, lack of supplies and medications to the extent that life-saving interventions were not done and unnecessary practices (episiotomy and vacuum) were used so that providers could charge extra money in order to supplement inadequate salaries.

2.6.5. Continuum of care

A model focussing on the continuum of care from antenatal care through delivery to the postpartum period has been suggested for improving both maternal and newborn health. Birth spacing through family planning and antenatal care can be implemented at the beginning of the continuum followed by emphasis on improving access to and quality of care during childbirth.

In remote areas like my research sites, alternative ways of providing care to parturient mothers that do not require high levels of human resources can be considered. Campbell and Graham (2006) suggest that an intrapartum strategy that involves health centers with midwives as providers, but surrounded by other health care workers who function as a team, might be an effective strategy. They assert that midwives as primary care providers are preferred over doctors in low-resource countries due to cost effectiveness and their suitability for managing normal birth. They claim that there is little to be gained by using physicians over midwives where there are no surgical facilities to make the most use of this highly trained provider. Care for mothers and their babies in these centers involve best practices such as clean environment for childbirth, care and support during labour, use of the partograph to prevent prolonged or obstructed

labour, oxytocics for prevention of postpartum hemorrhage, early breastfeeding, and avoidance of procedures that are harmful. Midwives and others working in primary care facilities need to be able to initially manage complications and refer complex cases to a larger centre. This requires a properly functioning referral system, an effective transportation infrastructure, and availability of high quality medical and surgical team members and facilities present in referral centres on a 24-hour basis.

Kidney et al. (2009) caution against the idea of a facility-based intrapartum strategy, arguing that in many countries wide facility coverage is 'simply not achievable' with current constraints on numbers of skilled attendants, supervision, equipment and infrastructure. Although well-resourced, culturally-acceptable facilities for maternal care would not be questioned as an option, they suggest an alternate strategy of non-facility-based, community-level care in low-resource settings. In their review they found that community-level practices, such as clean delivery kits, hand washing, and referral meant to improve perinatal care also appeared to reduce maternal mortality.

Bahl, Qazi, Darmstadt, and Martines (2010) propose two approaches for establishing a continuum of care between home and various health facilities where reproductive care is provided. The first approach is to increase access to health facilities where skilled attendants provide care. The second strategy consists of community health workers carrying out their work as close as possible to, or in the home. This latter strategy is particularly important for immediate postpartum and newborn care.

Care for mothers and their newborns in the postpartum period is an important part of reproductive health care (WHO, 2016a). Although the attention of many countries has been on increasing antenatal care and the presence of a skilled attendant for birth, little attention has been given to the weeks following childbirth. The postpartum period is a time when physical, emotional and mental problems can occur, but most low-resource countries have inadequate systems in place for providing postpartum care by skilled professionals. The risk of death for mothers is highest in the first 24 to 48 hours after birth, making early postpartum visits important for the health of mothers and newborns.

Research supports that community health workers can effectively carry out postpartum care and may be essential to enhancing continuity of care in the period after

the birth (Lassi et al., 2014). The WHO recommends care during the first 24 hours, again on day three, between day 7 and day 14 and again at six weeks for routine care (WHO, 2015). Bahl et al. (2010) reviewed studies of community health worker and community participation on care-seeking and maternal-infant health behaviours. The strategy with the greatest effect on neonatal mortality was combined visits by community health workers and enabling better care of infants through participatory women's groups meetings. Crowe, Utley, Costello, and Pagel (2012) echo this alternative vision to facility-based care, citing the importance of early postpartum visits by community health workers. Health services provided by community-based health workers include providing safe delivery kits, education about hand washing, and information about how and when to refer to higher levels of care. In addition, community health workers provided vital information on family planning modalities, decreasing unmet need for contraception during postpartum care visits.

2.6.6. Improving quality of care

Good quality of care is critical for preventing maternal and neonatal mortality and morbidity. Rowe, de Savigny, Lanata, and Victoria (2005) conducted an overview of issues concerning job performance showing that inadequate health worker performance including maternal care is common in low-resource countries. Determinants of performance include motivation, incentives that increase job satisfaction, such as working conditions and prestige, and monetary incentives. When interventions are undertaken to improve skills of health workers, some actions produce more benefits than others. Posting guidelines is usually ineffective. A common perception is that better trained health personnel can be achieved through carefully implemented in-service programs, but it did not produce the best results (Rowe, de Savigny, Lanata, & Victoria, 2005). Rowe et al. found that supervision, audit and feedback consistently had the best outcomes in improving performance, though community case management showed moderate improvement. In Tanzania, with locally available managerial strengthening and management, revisions to resource allocation practices, and more effective supervision, the quality of health care workers improved. A large multi-country initiative to reduce maternal and neonatal mortality in Uganda and Zambia claimed a 44% and 41% reduction of maternal mortality respectively through a health systems strengthening

initiative (Saving Mothers, Giving Life, 2019). However, the interim report on this initiative stated that only 10 to 13% of the gains could be attributed to education efforts directed at maternity staff. The reductions of maternal and neonatal mortality reported appear to have had more to do with the facility renovation, increased supplies, community participation, and increase in the numbers of maternity staff.

More recent WHO documents (WHO, 2016a; WHO, 2017) emphasize quality of care through ensuring eight standards of care. These include evidenced based interventions for routine care and management of complications, use of data gathering and monitoring, enabling infrastructure, and implementing appropriate referrals, respectful communication and care, and the birth attendant's involvement in strengthening the capacity of the birthing mother are now expected standards.

Quality of care includes respectful care and kind treatment towards mothers in home and facilities. It has been emphasized as a main element of intrapartum care in WHO standards of care (WHO, 2016a). We have already discussed quality of care from the mothers' and communities' perspectives in the category of 'perceived need/benefit of using SBA'. Bohren et al. (2015) conducted a systematic review to synthesize evidence on the mistreatment of women in facilities during childbirth. Broadly, mistreatment occurred within mother-caregiver interactions and also as a result of system failures to provide adequate care. Women felt that they would survive at facilities but did not receive emotional support for birthing. Categories of abuse included lack of decision-making powers, lack of consent for procedures, and denial of birth companions. Discrimination, physical and verbal abuse, and lack of adequate communication added to problems of poor resources in facilities. Some of the reasons for the abuse, as described by workers, focussed on problems of over-work and low staffing where maternity workers felt they had to use coercion to achieve compliance and safe birthing. Consequences of the poor treatment of women were found to result in erosion of trust in SBAs and use of facilities as a last resort only (Bohren et al., 2015).

Downe, Finlayson, Oladapo, Bonet, and Gülmezoglu (2018), through a qualitative review, assisted WHO to develop a new set of guidelines for ensuring quality of intrapartum care and to address some of the problems of mistreatment and abuse

(WHO, 2018b). Their review of five studies (n=8000) found that women desired a positive experience that fulfilled their expectations, and consisted of giving birth in a safe environment with support from a birth companion and competent and kind staff (Downe, Finlayson, Oladapo, Bonet, & Gülmezoglu, 2018). Women also wanted to take part in decision-making around their birth. Elements of a 'Respectful Maternity Care' (RMC) policy having the most effects are not yet determined, although multi-component policies reduced physical abuse and other types of abuse may have been reduced by developing policies in the facility. However, implementation of these policies did not appear to change women's satisfaction rates or episiotomy rates.

In Nepal, authors have identified inadequate quality of care in birth arising from mistreatment of women, lack of cultural respect, poorly trained health workers (Karkee et al., 2013; Khatri et al., 2017; Kaphle et al., 2013). They also identified lack of medications, supplies and materials as barriers to maternal care access. The Nepal SBA Assessment Evaluation Survey (National Health Training Centre, Government of Nepal, & Nick Simons Institute, 2013) found that SBA-trained nurses throughout Nepal, especially those trained several years prior, scored poorly on several emergency obstetrical care scenarios. This survey indicated that continuing professional development or higher trained cadres are needed. Cultural safety education and interventions meant to build understanding and respect for birthing traditions, as well as increasing capacity of facilities and skilled attendants are needed.

2.6.7. Medicalization of birth

Most of the literature is concerned with ways to increase rates of facility-based birth and some authors are concerned with what many refer to as the "over-medicalization" of birth. I will use the following definition of medicalization:

...the biomedical tendency to pathologize otherwise normal bodily processes and states. Such pathologization leads to incumbent medical management. (Inhorn, 2006, p. 354)

The idea of medicalization has been debated by many, and often linked to power and control of populations. Zola (1976) asserts that medicine is an institution of social control, and the area where control was most evident was around childbirth, where

medicine's claim to the processes of prenatal, birth and postpartum became entrenched. Zola stated that medicalization occurred through convincing people that virtually any activity may lead to problems and required medical supervision and monitoring. Parturient women therefore became patients. Some authors describe how women actively resist medicalization of childbirth, through resisting medical testing, standard procedures, and by choosing midwives instead of doctors (Parry, 2008). This discourse may be useful to my research where some families, having access to midwifery services in health facilities, do not utilize them.

Jordan (1993) adds to the discourse on medicalization in childbirth globally by cautioning that the expected lowering of maternal mortality and morbidity has unforeseen and sometimes negative effects. Practices in some facilities that are meant to safeguard women's health may actually be damaging (supine position for birth, episiotomy). Jordan discusses replacing low technology practices (for example abdominal palpation) with high technology (ultrasound) and the loss of control and decision-making power that women may feel (Jordan, 1993). She warns that the exportation of the medicalized practices and facility birth may cause iatrogenic problems as a result of poorly-trained staff, lack of infrastructure, materials, and supplies. As births move to health care facilities it is important to monitor whether 'medicalization' of normal birth is occurring, and encourage evidence-based childbirth practices to safeguard normal physiological birth.

Sharma et al. (2013) describes the transition of childbirth practices in Gujarat, India and explains how childbirth became medicalized as mothers began to use facility-based births. The rate of facility birth increased from 39% in 2003 to 73% in 2009. Families considered facility birth a compromise that they had to make for safety in childbirth over the comfort of a home delivery. The factors influencing the change from home to hospital birth in Gujarat included paying the TBA for taking women to hospital, and constant exposure to messages about facility birthing benefits. The move from home delivery with traditional attendants to hospital birth managed by doctors was thought to be a symbol of upward mobility reflective of wealthy women's birthing customs. They also proposed that modern women needed medical facilities since they are not as physically strong as rural women in the past. In this context, birth was

becoming an activity that had to be monitored and attended by doctors. Although the mothers thought hospital birth was needed to save mother and baby, mothers did not approve of routine episiotomies or caesareans when they felt that they could deliver their babies without being cut (Sharma, Giri, Christensson, & Johansson, 2013). Routinely hastening the birth with oxytocin drips, delivery in a recumbent position, routine episiotomies and quick decisions for caesarean sections and other medical procedures became the norm for all hospital deliveries.

Flandermeyer, Stanton, and Armbruster's review (2010, p. 273) of the use of uterotonics at home demonstrate women's opinions on use of oxytocin. They sometimes requested the medication to increase pain in labour saying that it added a spiritual component to the pain. Some women in this study adjusted to the medicalized way of giving birth by using the technologies to produce more power for themselves. Others rationalized what was being done to them by blaming themselves for being weak and needing the drug (Flandermeyer, Stanton, & Armbruster, 2010). Oxytocin for augmentation is also used at home births in some jurisdictions. Fronczak, Arifeen, Moran, Caulfield, and Baqui (2007), investigated practices of TBAs in Dhaka slums, and reported use of uterotonics for augmentation of labour in 19% of home births. Most of these births were attended by experienced TBAs who did not monitor the effects on fetus or mother.

Bohren's qualitative review of 65 studies on determinants of facility births analyzed and discussed moving to facilities for birth when complications arose. While realizing the need, women feared loss of control through medicalization. They disliked being made to deliver in certain positions, and having vaginal examinations (Bohren et al., 2014).

2.6.8. Financing

Health systems financing ensures that services are affordable and that families do not incur financial catastrophe as a result of having to pay for them. Financing also deals with how funding is allocated, thus determining what services are available, and

where. In most low-income countries, health system financing is inadequate and countries have to make difficult decisions about financing services.

There is literature that focuses on supply and demand side financing and elimination of user fees to reduce the barrier of cost. Supply-side financing refers to improving quality and responsiveness of the services provided by giving incentives to care-providers for performing the service. Demand-side financing refers to encouraging the use of services by providing cash or vouchers to pay for services, usually as a method to incentivize use of health facilities. A systematic review of effect of cash transfers and vouchers on use and quality of maternal care found, when tied to services, cash payments or vouchers can increase use of antenatal care and birth with an SBA (Hunter, Harrison, Portela, & Bick, 2017). When vouchers were used, postnatal care usage also increased. Most evaluations were carried out in the initial period of intervention, and little evidence was found for improvements in quality or maternal-newborn health outcomes. The authors urge studies on longer term effects of use of services and health outcomes.

Nguyen et al. (2012) assert that both conditional cash transfers and vouchers have increased access to antenatal and postpartum care, skilled birth attendants and facility births. The coupons provided to women as part of a demand-side financing scheme covered transportation to services and a cash incentive for low-income mothers in first or second pregnancies who spaced their pregnancies and delivered with a qualified birth attendant. In another geographical area of the project, all mothers meeting these qualifications, regardless of their income level, were eligible. Evaluation of the program showed acceptance by family members of the program, increased numbers of births in the care of a skilled attendant, and an increase in facility births. Mothers from lower economic groups benefitted more than those of higher economic status. Challenges included difficulty of assessing the level of poverty, parity, and determining whether the women used family planning between deliveries, which was a requirement for receipt of the voucher. In the facilities, problems included keeping up to demand when the supply of medications was depleted, and crowding. In addition, poor provider attitudes were noted. Concerns about this program include future problems with

decreased facility birth if the funding is discontinued, insofar as both provider and user now expect incentives.

In Africa, user fees were found to be a financial barrier to uptake of skilled birth services (Ridde & Morestin, 2011). In contrast, D'Ambruoso et al. (2010b) argue that using health insurance for the poor caused more difficulties in access to emergency care when women needed transfer from home to institutions. The stigma of being poor and using insurance resulted in lower quality of care and delays in treatment because of the lack of incentives for medical professionals (supply-side financing). During verbal autopsies with family members of mothers who died, discrimination for those using insurance for the poor is a common theme (D'Ambruoso et al., 2010b).

Community-based insurance helps to prevent catastrophic financial expenditures that can occur when resource-poor mothers experience pregnancy complications. It also provides a way for mothers and families to connect with the health care system through use of other services, so that they become comfortable using the facilities and are more likely to use maternal care later. A household survey addressed whether membership in a community-based health insurance scheme in Senegal, Mali and Ghana increased access to maternal care (Smith & Sulzbach, 2008). In Mali and Senegal, mothers were significantly more likely to use facilities for childbirth, but not in Ghana since payment was only for hospitalizations such as caesarean section. Smith and Sulzbach (2008) question whether this type of incentive increases caesarean section rates. Although Nguyen et al. (2012) found that caesarean sections were not increased through a voucher program to increase facility births with incentive payments to facilities for performing caesarean sections as needed, monitoring and evaluation are needed to determine how decisions for caesarean section were made when surgeries are incentivized for the physician.

The elimination of user fees has had both positive and unforeseen negative effects. Dzakpasu, Powell-Jackson, and Campbell (2014) included 20 studies in a systematic review of the effects of user fees on maternal services and showed that most studies were of poor quality and no firm conclusions could be reached as to effect. They found removal of user fees appeared to increase the number of hospital births and

management of complicated cases, but may also have a negative effect on quality of care. Bahl et al. (2010) echoed the concern about decreasing quality of care with elimination of user fees as patient intake and staff's workload increased substantially. Studies of equitable access to care need to be jointly evaluated with respect to indicators for quality of care and appropriate attendance of both normal birth and emergency obstetrical care.

The Aama Program in Nepal, established in 2009, developed from the 2006 Safe Delivery Incentive Program (SDIP) providing childbirth service at no cost, is one strategy to reduce barriers of cost and increase uptake of skilled attendants at birth. The Aama Program is comprised of financial incentives for both mother and caregiver to encourage use of skilled care at birth. The amount of financial incentive for transportation, irrespective of mothers' economic status, is provided is based on geographic location, whether Terai, hilly area or mountains, and is 500NR, 1000NR and 1500NR respectively. In addition, all mothers who complete four antenatal visits are paid 400NR when they also have a facility-based birth and have one postnatal visit. If women come to hospital for delivery or for complications of a delivery that begin at home, they are given the incentive. The facility providing the care is paid 1000 to 1500 NR for normal birth, 3000 NR for a complicated birth and 7000 NR for caesarean section. Maternity care providers are paid 300 NR per birth and if a birth attendant goes to the woman's home it is 100 NR (this is meant to discourage home deliveries). The program is in effect in all government-run facilities providing childbirth care and many not-for-profit institutions. Ensor, Bhatt, & Tiwari (2017) argue that the Aama Program was only useful in the mountainous areas as a result of the supply-side interventions, and that in remote areas, inferior services reduce impact of the incentives.

In most cases, the cost of using an SBA, poverty issues or cost combined with distance and travel were important barriers to facility based birth. Planning to receive care from a skilled attendant was to some degree based on socio-economic status. Some women who were poor indicated a need to be efficient with existing family economic resources by travelling to an SBA only if needed (McPherson et al., 2006). In general, families who received financial incentives for maternal childbirth services were more likely to seek skilled health care (Vieira et al., 2012).

2.7. Discussion

From the combined findings of the literature review and the scoping review, I present the general findings relevant to programming in rural low-resource countries, and relevant to my research sites. In order to make use of already existing rural birthing centers, it was most important to gain the confidence of not only parturient women but also their families and communities. Baral et al. (2010) discussed the need to raise awareness among mothers, families and communities about the benefits of using SBAs for childbirth, but this idea is tempered by acknowledging the poor training and attitudes of some SBAs and poor quality of some systems of care.

Distance is an access barrier that could be modified by establishing community-based services. Facilities must be available, within a reasonable distance since childbirth can take place within any timeframe. Dependable transportation needed to be available for a mother to reach the facility, or for the midwife to reach the woman. The occurrence of bypassing local birthing centers in favour of large referral hospitals has suggested that some mothers want better quality of care than what is available locally, even with appropriate medications, supplies and equipment (Karkee et al., 2013). This idea was challenged in the literature, since bypassing was explained as an option for communities with better access to roads and where populations were relatively better off.

Studies found mothers considered childbirth to be a physiological, not a medical event (Baral et al., 2010; Brunson, 2010; Kaphle et al., 2013). Many articles described the preferences of mothers to deliver alone with family members or TBAs, rather than using medical facilities, because they consider it a 'normal event' (Gabrysch & Campbell, 2009). Differences in use of maternal care were found to be related to gender roles and autonomy of women (Say & Raine, 2007), but other authors argued that the role of community in influencing place of birth was more important than the power a woman had in her home to choose it (Gabrysch & Campbell, 2009). In any culture, decisions about childbirth may be dependent on community norms more than we currently believe. There were some studies that addressed community-based participatory learning and awareness raising (Kidney et al. 2009; Prost et al., 2013) but more research needs to be

done on this topic relative to remote areas such as mountainous Nepal where women cannot meet easily.

Findings of quantitative research show that different social demographic, economic, socio-cultural and religious factors are responsible for the utilization of maternal health services but very few studies discussed “how and why these factors are responsible for the utilization of skilled birth attendants” (Baral et al., 2010, p. 325). Gaps in knowledge about how to best meet the needs of families were related to geographical regions and cultural groups. There were few descriptions of ways to tailor programs to specific needs (Baral et al., 2010). Studies that use population data are not designed to characterize diverse groups within those populations. Most research with rural and remote populations did not indicate sustainable ways to incorporate cultural needs within facility birthing systems.

However, recent articles discussed the preference for facility birth and women’s beliefs that facility births saved lives. As well, authors continued to address the ongoing problem of poor quality of care, poorly functioning services and unwelcoming care-providers. Although interventions to increase access to SBA were addressed, there were no studies of sustainability of the interventions.

In conclusion, it may not be enough to have a facility, SBAs and equipment at hand if we do not know which factors (that are changeable in the near future) should be modified. It takes a long time to increase the education level of women and their family members, known to be a factor influencing uptake of SBA in communities. Considering the culture and context, improving quality of care, the use of ANC and birth preparedness programs increased the use of SBAs skilled birth attendants either for delivery or when complications are encountered, thus making childbirth safer for mothers and their newborns. Development of a cadre of community-based workers was an interim measure where skilled birth attendants were few and access was poor.

Programs of inadequate length and depth of training of midwives and others to international basic competency levels, and lack of enabling factors of equipment and supplies were barriers to be able to assist parturient women when they faced complications. Much of the literature described programs that were not long enough to

make much of a difference in attracting mothers to accept skilled care. The available literature did not provide information on how improving the quality of care in facilities, both enabling infrastructure and equipment, and improvement of emergency care and respectful care skills, increased the acceptability of SBAs in their communities. These aspects of childbirth care, embedded in my research questions, are explored using the two theoretical concepts I discuss in the following section.

Chapter 3.

Theoretical Perspectives

In the course of this thesis, I demonstrate the usefulness of two frameworks that support and illuminate analysis of factors affecting childbirth that are relevant to my research. The first perspective is Jordan's (1993) 'Childbirth and Authoritative Knowledge Framework'. Jordan maintains that for any domain there is more than one knowledge system, but one system comes to dominate the others by virtue of its links to powerful institutions and actors. This perspective helps us understand drivers of and consequences for mothers of a change from home birth using traditional methods of managing labour and delivery, to government-mandated facility-based birth.

The second framework that is relevant to this research is the 'Three Delays' model applied to identify and explicate the causes of maternal mortality, particularly in low-resource settings. The three delays include: 1) factors or processes occurring at the community or family level that delay a decision to seek care; 2) once the decision is made to seek care, delays may occur in getting to an appropriate facility; and 3) factors that delay provision of adequate care once a woman arrives at a facility (Thaddeus & Maine, 1994). I will first discuss the Authoritative Childbirth theory.

3.1. Authoritative Knowledge

Jordan (1997) notes that in virtually every country and culture there may be competing ideas about how and where childbirth should occur, yet one mode of childbirth comes to dominate others. Her theory of authoritative knowledge describes the processes through which this occurs, and the consequences these have for women, their infants, and their families. She asserts that "birth is everywhere socially marked and shaped" and cultures "have integrated systems of knowledge and practice" (1993:1, 2). The view on childbirth that is commonly accepted comes to be dominant because either it explains the world better for the community involved, or it is associated with a stronger power base, or both. Competing types of knowledge are suppressed or dismissed. The

authoritative knowledge of childbirth in any community thus builds on and reflects power relationships and comes to be perceived as natural and legitimate and thus most beneficial for all. Jordan explains that “the power of authoritative knowledge is not that it is correct but that it counts” (Jordan, 1997, p. 57). In his history of health care and healing in America, Paul Starr (1982) describes several kinds of practitioners, such as midwives, barber surgeons, and folk healers, who in the 18th and 19th centuries all provided medical care and were seen as possessing authoritative knowledge within various segments of society. It was not until after the publication of the Flexner report in 1910, which led to the development of biomedical institutions, that physicians began to dominate the field of medicine. Allopathic medicine became the authority in medicine, “in charge of the facts” about childbirth (Jordan, 1997). Today, the biomedical model of childbirth is either already the prevailing model in both high- and low-resource countries or is becoming so through technological globalization (Sharma et al., 2013) and the control of populations through medicalization (Zola, 1976).

Jordan’s (1997) detailed ethnography of how power is wielded in the biomedical delivery room setting demonstrated that all persons present including mother, nurse, and partner acquiesce to the fact that birthing procedures are under physician control. The pronouncement of the time that the mother can push and give birth to the neonate cannot happen without the physician’s control and guidance. Authoritative Childbirth theory emphasizes that, in such biomedical settings, involved persons acknowledge and accept physician control as legitimate, thereby perpetuating this model of childbirth, and in the process having detrimental effects on the experience of mothers, their infants, and their families. Jordan asserts that the exportation of a Western system of birth to low-resource countries has had a serious detrimental effect on indigenous systems (Jordan, 1997 p.3).

3.1.1. Exportation of the biomedical model

When exporting the biomedical model of childbirth to low-resource countries, policy makers fail to consider whether the practices are evidence-based or have medical benefit. Childbirth practices such as requiring women to assume a lithotomy (prone) position, augmentation of labour with drugs, and use of episiotomies, are considered to

be most medically appropriate and justified by health workers trained within the medical system, and are then packaged and taught to health personnel in low-resource countries. These practices are then widely replicated in medical, midwifery, and nursing curricula. In this research I find that some of these practices, and the additional practice of routine induction of labour for post-dates are adopted without considering evidence, benefit, education of practitioners, consent of birthing mothers, and lack of ability to adequately monitor labour.

Ironically, many of the practices exported from the 'global North' to the 'global South' settings have been found through research and evaluation to be inappropriate or harmful, yet reforms to practices in high-resource countries take time to diffuse to lower resource settings. When reproductive care activities have been adopted by medical authorities, it is difficult to change them because of the power attached to the medical profession. For example, exported biomedical models may fail to consider current science that has demonstrated the safety of home birth attended by midwives, which may be applicable to some low-resource countries (Janssen et al., 2009), or the benefits of accompaniment in labour by non-medical persons (doulas) which, although not studied widely in low-resource countries, are likely easy to implement (Bohren, Hofmeyr, Sakala, Fukuzawa, & Cuthbert, 2017). Problems with highly-medicalized birth are being contested in high-resource countries by birth advocates, and by the International Federation of Obstetricians and Gynecologists (FIGO) in various countries. Advocates to 'reclaim normal birth' are beginning to raise their voice in low-resource countries, although in Mexico 'humanization of birth' benefits were concentrated among the privileged (Vega, 2017).

Jordan's theory of how authoritative knowledge shapes childbirth in non-Western settings was further developed and adapted by Stacy Pigg (in Davis-Floyd & Sargent, 1997). Pigg examines the pitfalls of authoritative knowledge within the training of birth attendants in eastern Nepal hill areas. These birth attendants became representatives of the medical system and advocates of government policies to reduce maternal mortality during the 1980's and 1990's. Pigg describes how programs sometimes selected and trained women who had never attended childbirth. Subsequent to a two-week training program where women learned reproductive physiology and birthing techniques, they were designated as 'trained birth attendants' or *sudeni*. In this

manner the authority for childbirth moved to a state-sponsored designate, who, although allowed to keep some traditional ways, was trained in the biomedical model, achieving legitimacy in the eyes of medical practitioners and reaping the benefits of small training allowances. They replaced previous practices, where childbirth attendants were family and community members who shared the knowledge of childbirth with each other (Pigg, 1997). Trust is an important element for choosing childbirth attendants at the community level. Most communities choose older women who are known for their birthing knowledge and expertise. Short training courses cannot replace years of experience and knowledge that 'community approved' birth attendants gained from working with women in their communities.

A Canadian example of accommodating community practices within a biomedical model is seen in the experience of the arctic community of Povungnituk. For decades, European and southern Canada trained nurse-midwives provided antenatal and postnatal care but facilitated the evacuation to southern communities of mothers who would soon give birth. In 1985, the health system and community began the process to choose local women for training in midwifery so that local low-risk women could birth in their communities. Daviss (1997) discusses how local traditions were shared between local women and their midwife-trainers from the South, and how local women acquired medical knowledge and licenses to attend mothers in their community. Inuit elders regard birth as a 'community, social, and spiritual act' while Inuit birthing women consider birth 'their own personal act' and neither group sees birth as a medical event (Daviss, 1997; p. 441). Daviss (1997) maintains that the ability to exert control over birth culture is valuable and possible when sharing power in birth with practitioners and community members.

Davis-Floyd (2001) discusses the theory of 'authoritative childbirth' and then describes 'mutual accommodation' as a way of sharing the authoritative knowledge around childbirth. She describes three different paradigms: the technocratic model, the humanistic model, and the holistic model. She explains that the technocratic model reflects mind-body separation where the body is considered a machine, the authority is the physician, and technology is highly valued. The humanistic model describes the attempt by health care providers to make the medical system more 'relational, partnership-oriented, individually responsive, and compassionate' (Davis-Floyd, 2001, p. 6). Finally, the holistic model of medicine encompasses many approaches, most

acknowledging that an individual's health is affected by her feelings, relationships and life events, and sees the birthing woman as a 'whole person'.

An example of the technocratic model, and preference for technology among health providers, is my observation that the antenatal ultrasound, referred to as 'video-X-ray' in remote Nepal, has become the most important part of the antenatal visit. The holistic approach is purported to be used by midwives studied by Davis-Floyd in the US and resonates with the Nepalese spiritual healing paradigm that I describe in a following section of the thesis. It is congruent with Davis-Floyd's description that 'the body as an energy system linked with other energy systems' and 'healing the whole person in whole life context' (Davis-Floyd, 2001, p. 13).

As discussed in my review of literature, the ascendancy of the biomedical model can be seen in the training of 'traditional birth attendants (TBAs)' in low-resource countries. An interesting example of the contest between traditional and biomedical models can be seen in Berry's (2006) study of childbirth in the highlands of Guatemala. She shows that the biomedical and traditional birthing models are not commensurate due to conflicting world views. Mothers do not perceive birth as a medical event, and therefore planning and taking a biomedical approach to changing the practices of the existing traditional midwives does not work. The trainers brought to introduce the medical model to traditional midwives in short courses did not comprehend traditional views, nor did they investigate why and how traditional views were valuable to the mother and community, or how they might have been considered in the provision of life-saving care (Davis-Floyd, 2003; Pigg, 1997; Berry, 2006). Davis-Floyd (2000) argues that in the case of implementing a training package among the Karamoja in Uganda, instead of automatically implementing facets of the biomedical model in training traditional midwives, the midwife investigated and included useful and culturally relevant aspects of care in her training package, mutually accommodating both the traditional midwifery norms and the new childbirth attendance knowledge that the state wished to impart. While looking at ways to best use traditional knowledge, Jordan urges us not to romanticize traditional ways of birthing, nor to assume they will not change. Change is inevitable and birthing culture is already changing, but the question becomes which direction the change should take (Jordan, 1997).

3.1.2. Resistance and marginalization

The literature review pointed to a disconnect between birthing women and health care providers and was relevant to how and where women and families decided to give birth. Families and communities strive to maintain customs that make sense to them, and provide comfort in birthing. Some groups of women experience marginalization due to maintaining their practices of traditional home birthing and resistance of dominant model of childbirth presented by health authorities. For example, the Huichol, an ethnic Mexican group, utilize 'traditional ethnomedical practices as an expression of resistance to the political and cultural domination' of their group (Gamlin, 2013, p. 76). The practices include ceremonies based on a ritual-agricultural cycle, presided over by shamans. When they use Western medicine to treat some diseases, they also need the shaman to treat the cause of the illness, which is nearly always identified as a 'supernatural cause.' Gamlin asserts that social groups, stigmatized by poverty, marginalization and racism, develop their own culturally-mediated strategies to cope with the dangers of childbearing. In the context of the Huichol, who are mostly migrant workers on tobacco farms, the injustices that they suffer in forms of racism and discrimination further reinforce a cycle of structural violence and denigration of traditional authoritative knowledge. The women experience great shame when being exposed during labour or birth and have developed a series of practices, including preferred modest birthing positions, designed to assist easier and more comfortable birth at home.

Resisting authoritative knowledge sometimes involves entire communities. Yemeni women describe losing personal authority at facility birth and therefore do not elect to give birth in a hospital (Kempe, Theorell, Noor-Aldin Alwazer, Christensson, & Johansson, 2013). Women achieved authority primarily through leading their own birthing experience at home, and 'opportunity to show authority over their husbands' (Kempe et al., 2013, p. 1184). Kempe refers to the theory of authoritative knowledge by Jordan (1993) but asserts that it may need adaptation from its original conceptualizations regarding the commonly accepted value of biomedical knowledge. While the state mandated model of childbirth in Yemen promotes facility-based birth in keeping with MDG 5 (and now SDG 3), women in Yemen typically resisted this authority by asserting their own authoritative knowledge where they would have 'the full right to

conduct childbirth in their own preferred manner, and the strength, knowledge and support needed would be provided through their faith' (Kempe et al., 2013, p. 1184). When they were unable to exert influence concerning their births in a facility setting, they felt helpless. Childbirth was the only time in their life that they could exert personal authority, and thus resisted the biomedical model. In these studies, women's resistance to biomedical birthing for spiritual and cultural reasons demonstrate the lack of congruency of the biomedical model with existing systems, and provide a model for which to examine other examples of resistance.

3.2. The 'Three Delays' Framework

Maternal mortality has many different causes and related circumstances. One of the most well-known frameworks for categorizing the factors leading to maternal death is the 'Three Delays' model, first developed by Thaddeus and Maine (1994). Their original literature review entitled, 'Too Far To Walk: Maternal Mortality in Context' (1994) emerged from a large program of research on maternal health initiated by Columbia University's Center for Population and Family Health. Its mandate was to strengthen capacities of African Institutions to carry out maternal health programs and disseminate information to several government and policy makers concerned with preventing maternal mortality. Research informing the 'Three Delays' framework arose from that initiative. In this model, identification of one or more delays prevent the birthing woman from receiving timely emergency obstetrical care when needed. This section will describe the model and its suitability to my research.

The first delay occurs in the home, where the mother or the family do not recognize that labour is not going well. Sometimes decision-making to leave the home is delayed because the labouring mother does not have authority within the family to make the decision to be transferred to a health center. Culture, traditions at the community level, and financial constraints, have a significant effect on this first delay (Banu, Akter, Begum, Choudhury, & Nasreen, 2014).

The second delay describes the difficulty of obtaining transportation leading to long delays in reaching medical assistance. Many authors have emphasized the

importance of adequate and affordable transportation to reduce the second delay (Gabrysch & Campbell, 2009; Pacagnella, Cecatti, Osis, & Souza, 2012; Thaddeus & Maine, 1994). The third delay occurs within the institution once a woman reaches it, and refers to a delay in accessing appropriate services, such as required medications and procedures. Often maternal mortality results as a consequence of more than one category of delay, and the delays are interrelated.

Although most studies using the framework of the 'Three Delays' analyze the problem from the perspective of the mother and her family, Knight et al. (2013) argue that there is considerable evidence to show that many mothers die in facilities during the third delay even though they arrive in time, due mainly to: poor patient management, lack of well-trained personnel, and adequate drugs and supplies. Knight et al. argue that attendants' skill may be inadequate in health care facilities, primarily due to poor per-service education and training, and lack of continuing education with up-to-date educational resources. Mgawadere, Unkels, Kazembe, and van den Broek, (2017) echo these sentiments, finding lack of timely admissions, medications and skilled human resources at facilities in Malawi attributing to the third delay in a majority of cases. The 'Three Delays' patient-focussed theory minimizes the common problem of poor care available at the level of the facility, even though it may be the most critical issue affecting poor outcomes. Monitoring and evaluating care at the facility, and optimal standards of emergency care are important interventions to saving mothers' and infants' lives (Pacagnella et al., 2012).

While maternal mortality has many different causes and circumstances, this framework originally focussed on the time between the occurrence of maternal complications and its outcome (Thaddeus & Maine, 1994). The authors posit that when the obstetrical problem is recognized and acted on early, the risk for an adverse outcome will be reduced. It is the delays preventing adequate and timely treatment that are responsible for maternal deaths. Thaddeus and Maine (1994) discuss many components of each delay and assert that many times it is multiple delays that affect the provision of care. Women's status affected their ability to travel, decision-making authority, and financial ability to seek care. Barriers to utilization of existing maternal care services are explained by the interaction and layering of delay-causing factors.

Distance and cost, often used to explain why mothers die at birth, were complicated by issues of gender relations, socio-economic status, perceived severity of the condition at both the community level and in the facility, and the experience of care once arriving at the facility. Although local hospital records found that most service users lived within five kilometers of the facility, adequacy and quality of care was found to be a barrier both to access to care, as well as to saving lives at the facility level. Under-staffed and poorly equipped facilities were often not utilized. Sargent (1982) writes that in rural Benin, community practices of detecting witches who might be adversely affecting women's lives, and esteem for solitary birthing, conflicted with facility norms. Thaddeus and Maine acknowledge that traditions change, and that cultural practices are less of a barrier than inaccessible or inadequate services. It would be a mistake to blame the mortality on cultural practices, as this is a "blame the victim" bias and underemphasizes the critical importance of accessible and high quality care.

A more recent consideration of the 'Three Delays' framework by Gabrysch and Campbell (2009) expanded the model to include the role of preventative facility-based birth for uncomplicated childbirth. The authors found that socio-cultural and economic factors were emphasized in the research while perceived benefit/need and physical accessibility were neglected in most studies. Gabrysch and Campbell developed the model further with more emphasis on the effect of quality of facility care (third delay) and noted the lack of access for indigenous women at the facility, relating to barriers of language, and reliance on traditional birth attendants. The authors mentioned that there have not been adequate ways of measuring quality of care at the facility level through existing surveys. Finally, they drew attention to the probability of a 'courtesy bias' when interviewing and collecting data on institutional quality of care from residents in their homes in large household surveys, thus leaving some doubt as to whether community experience of quality of care was a larger deterrent to facility use than previously thought.

Although the 'Three Delays' model is found to be useful to categorize findings, results of Gabrysch and Campbell review (2009) cannot be synthesized into general conclusions about determinants of facility use across contexts. Reasons offered by the authors for this limitation include inclusion of different study types, selection of exposure

variables (i.e. distance), different analysis techniques, and context specificity related to the interactions between factors and different norms around delivery care. The last difficulty related to the poorly understood effect of community-level health care seeking where the probability of using care when urban and rural residence and biases toward facility birth masked other variables determining facility use. The authors found that few studies dealt with the complexities of community-level influences (Gabrysch & Campbell, 2009).

I applied the 'Three Delays' model to identify factors leading to maternal death in Uganda (Ellis, Schummers, & Rostoker, 2011) and found that the third delay was the critical one for life-saving. However, most times more than one delay was involved. Maternal mortality is a rare event in any community with sparse population and care facilities in place.

Pacagnella et al. (2012) expanded the 'Three Delays' conceptual framework to include the 'near-misses' approach to increase recognition around events leading to maternal death. The authors asserted that the relatively low numbers of maternal deaths in any specific geographical area results in methodological difficulties in analyzing data. Pacagnella et al. (2012) posited that the main differences in maternal mortality in high-income compared to low-income countries resulted from time management of obstetric complications. Identifying 'near-misses' provided an expanded story of the chain of events that might have, but did not, result in death. 'Near-misses' can be defined as women in childbirth who have survived severe complications of childbirth either by chance or by receiving timely adequate hospital care (Pacagnella et al., 2012, p. 158). The WHO (2009) explained that researching information on 'near-misses' can be seen as a proxy model for researching the causes of maternal death, providing a larger number of cases for analysis that are more acceptable to individuals and institutions than analysis of causes of maternal death. Women who have survived can tell their stories in detail of what they encountered in reaching life-saving care, that would otherwise have to be reconstructed from records and family accounts. From these stories, delays and gaps in services may be identified.

Two applications of the 'Three Delays' model in Malawi found that delays once women reached the facility were most significant (Mgawadere et al., 2017; Thorsen, Sundby, & Malata, 2012). In the first paper, Mgawadore et al. (2017) found that 96.8% of maternal deaths investigated through a Reproductive Age Mortality Survey (RAMOS), were categorized as arising from the third delay. Among the maternal mortality cases studied, 52% experienced all three delays.

The second application of the model in Malawi incorporated three data collection methods: the 'Medical Record Extraction Form', facility-based interviews, and community-based interviews. Researchers conducted personal interviews with the 'Facility Staff Interview Questionnaire' and the 'Verbal Autopsy and Contributing Factors Questionnaire' (Thorsen et al., 2012). The authors contribute a narrative analysis of examining maternal death through more traditional methods (facility chart reviews) combined with personal interviews with staff, family members, neighbours and TBAs. Thorsen et al. (2012) add a new category to the third delay, ('3b' delay), which they attribute to patient-located causes of lack of timeliness or provision of services. They explain that mothers in this category withheld information or treatment due to religion, stigma or beliefs (Thorsen et al., 2012). Although one mother of Jehovah Witness faith could not receive a blood transfusion as life-saving treatment, this case was not representative of most maternal deaths. I argue that it is more likely that women received poor treatment due to stigma around HIV, and chose not to reveal their HIV status. Others could not reveal that they had attempted to abort a fetus where abortion is illegal, and thus sepsis related to their attempt was not treated in a timely way. The additional categorization of delay at the facility level appeared to blame women for their death instead of looking at the system of disrespect and lack of human rights of women in some facilities. In addition, Thorsen et al. (2012) blame TBAs for maternal death without considering the problem of the health system failing to facilitate adequate referrals to hospital, and poor treatment once there.

The 'Three Delays' model has been expanded to include the analysis of perinatal death at both community and facility levels. In a perinatal audit of 250 cases from 5 Rwandan hospitals, Musafili et al. (2017), suggested that the model has good resonance in investigating delays in care seeking, transportation and care once reaching a facility.

They attributed more than three-quarters of the perinatal deaths in research studies to the effects of either one or several delays. Although the authors noted that participating in the perinatal audit may already have increased needed collaboration among hospital obstetricians and paediatricians thus improving care, the study recommended strengthening supervision and the motivation of staff with a performance-based financial approach to improve the outcomes of newborns arriving at the facility. Very little attention in the examples of applications of the 'Three Delays' model was placed on community-level factors.

My research takes place in a remote mountainous area of Nepal where all of the delays may be present. I wanted to explore whether mothers and community discussed any or all of the three delays in their discussion of use of health care facilities. I also wondered whether government or community had implemented any activities to decrease delays and increase access to use of SBA.

3.2.1. Community-based supports in expediting care

Delays are common in decision-making to travel for emergencies in childbirth in remote Nepal, and the support of community is paramount. Birth preparedness programs in rural Bangladesh encompassed part of an intervention to identify and reduce the first delay (Banu et al., 2014). The intervention provided emergency preparedness programs for the community, and increased competency of community-based health workers and home services to address the delay. There was a decrease in time needed to reach services but no decrease in the time to receive intervention in the facility; in fact, there was an increase in time to receiving treatment for postpartum hemorrhage. This research demonstrated one application of the 'Three Delays' theory at the community level and the need to work on interventions reducing more than one delay. A further adaptation of the model in Haiti (MacDonald et al., 2018) identified a fourth delay with respect to community responsibilities and actions to reduce maternal mortality reflecting lack of responsibility in the community to help a woman reach obstetrical care. Community-based action helped to reduce the delay in the community transport of women to safe care by providing people to carry them when there were no roads.

A recent qualitative study in southern rural Nepal applied the 'Three Delays' model to ten cases of maternal newborn illness or death (Lama, Khatri, Katz, LeClerq, & Mullany, 2017) . The findings suggest that while complications were discovered early, their severity was under-estimated, and decisions to seek medical assistance were made too late. Families sought assistance from spiritual healers, TBAs and village doctors prior to seeking medical care for maternal complications. Care was perceived to be poor in government facilities which also contributed to delay in access. The important contribution of this study was its finding of the compounding effect of delays with the community reliance on informal providers who were not linked to the medical system. This was occurring in an environment where all mothers were urged to give birth in a facility. The authors argued for programs to focus on improving care seeking for mothers and newborns. Another view, which I espouse, suggests that efforts to improve emergency care in the facility must precede other work to reduce delays in order for the community to gain trust in facility-based care (D'Ambruso et al., 2010a; Ellis et al., 2011; Knight, Self, & Kennedy, 2013; Mgawadere et al., 2017).

3.2.2. Critique and adaptation of 'Three Delays' original theory

Critiques of the 'Three Delays' model have focussed on its original narrow perspective on delays after experiencing complications at home birth, transfer to hospital, and care while in facility. The model is inadequate to account for all reasons why birthing mothers die in remote Nepal, or why they have difficulties when deciding to travel to medical assistance. It does not resonate with the beliefs that birth in a facility is unnecessary when they have healthy pregnancies. The model resonates well with the aspects of delay during travel in areas without roads, and facility delays upon arrival. Subsequent researchers (Mgawadere et al., 2017; Thorsen et al., 2012) have adapted and added to the model to include a more detailed examination of the determinants of facility-based care and factors affecting perinatal death. Data collection methods for examining cases affected by delays used additional methods such as personal interviews of staff and families to determine factors around death in addition to large surveys. Near misses were added to the collection to obtain the perspective of the mothers who survived in order to address policy and cultural issues (Pacagnella et al.,

2012). A 'fourth delay' has been proposed in two different contexts: one, encompassing morbidities after a 'near-miss' explains difficulties in accessing care if further complications arise (Say, Souza, & Pattinson, 2009), and two, relating to the role of community in enabling safer maternal care including economic and physical ease in reaching facilities (MacDonald et al., 2018).

3.2.3. Use of the theoretical frameworks in this thesis

In this thesis, I use both of the above frameworks to discuss use of midwifery services. The 'Three Delays' framework resonates well with problems of access to care in remote areas with few facilities. It does not have enough depth to examine effects of lack of respectful childbirth care, or the dominance of medicalized birth and the resistance to it. Delays arise from fear of medicalized and culturally insensitive practices. I adapt the Authoritative Knowledge theory to examine culturally and physically unsafe medical practices that arise when biomedical care becomes the dominant childbirth mode (Jordan, 1993). I examine the tension between the comfort of home and 'safety' of medical care, and the pressure to endure the discomfort of facilities in order to receive the benefits of facility care. Medical technology used by semi-skilled practitioners has caused unexpected problems for women, such as reduced confidence in their ability to give birth and fear caused by going past their estimated due date. Some communities and individual families resist the loss of control that home birth provides, and refuse to be 'made naked' or 'have hands inserted' during childbirth procedures. Breaches of cultural norms are strongly opposed by some. I argue that use of skilled birth attendants in remote Nepal is affected by delays in decision-making and care seeking at the community level partly related to resistance of medicalized childbirth, transport time and cost, and poor quality of care at the health care facility, including lack of respect for traditions and women's preferences.

In the chapters following, I critically evaluate and contest the idea presented by Pacagnella et al. (2012) that the main problem in low-resource country facilities is the length of time available to attend emergencies. The 'Three Delays' framework suggests that if the mother and family are able to reach the facility in time and get medical assistance at the facility by a physician or another person designated to attend

emergencies in childbirth, the mother will survive. This framework may be lacking in consideration of two areas: skills and enabling factors supporting safety at facility birth and respect for and consideration of cultural norms for birthing. Women and families do not always fail to attend facilities in time because of delays; they may resist the health facility's disrespectful practices and protocols, and elect instead for the social support and relative autonomy experienced in home birthing. The Authoritative Childbirth theory helps us understand this resistance when facility birth protocols are instituted without community input. I suggest that the lack of respectful caring and poor knowledge base of skilled birth attendants poses a barrier to care. The Authoritative Childbirth model imposed on mothers and caregivers constitutes a barrier to care among women in this remote area of Nepal.

In the discussion of my research findings, I will relate examples of Huichol and Yemeni women to the experiences of women in remote Nepal. In these different contexts, women resist the humiliation of being exposed to others during the birthing process, long to continue traditional birthing practices. They challenge the authoritative knowledge which stipulates place of birth. I present an alternative 'mutual accommodation' model following Davis-Floyd (2000) to modify childbirth in small and large facilities. The model facilitates choices and preferences for women who choose or are referred to facilities for birth.

The following section describes the research methods I used to investigate whether delays were affecting access to care, and to see how mothers and families responded to the government mandated programs for facility-based birth. I also investigated whether the human resources, lack of nurse-midwives' expertise or lack of facilities' enabling factors contributed to delays in care.

Chapter 4.

Methods

In this chapter I present the research design and methods used to answer my main research questions. I describe my research setting briefly so that the reader will understand the context of the research and I discuss the concurrent and specific methods used to answer the research questions. In the sub-section on study sites, I describe in more detail the areas and facilities, including how and why I chose them. In the sections that follow, I explain my data collection and analysis.

4.1. Research Design

As listed in Chapter 1, my main research questions are as follows:

1. What are the factors (barriers, facilitators) women report that affect their use of skilled birth attendants in rural and remote Nepal?
2. What are the barriers and facilitators to establishing skilled care at birth in rural and remote settings?
3. What are the gaps in skill sets and enabling factors in health care facilities to providing both culturally safe and skilled birth attendance?

To answer these questions, I chose a mixed methods research design. This strategy promised a broader understanding of the use of midwifery services in remote areas of Nepal than one method alone would have provided (Creswell 2009, p. 18; Sandelowski 2000). In order to improve access to maternal and infant care for mothers living in remote areas, it was necessary to investigate the birthing customs and needs among the women and families in the research sites. To do so required implementation of a qualitative design that allowed me to delve into these questions in a way that would not have been possible through the use of surveys alone. To supplement this approach I employed two quantitative surveys that focused mainly on the characteristics of providers and the facilities they work in. See Table 4.1. for details on the various methods used.

Although mixed methods are often employed sequentially (e.g., quantitative followed by qualitative or vice versa), insofar as my research design involved looking at different components of the health system – from mothers to providers – with each involving a different question and thus requiring a particular methodological approach, I found that a concurrent approach was most appropriate. This corresponds with the approach advocated by Sandelowski (2000), who asserts that qualitative and quantitative techniques can be used together and approaches may be used sequentially, concurrently or iteratively, or in a sandwich pattern, and one method may have relationship priority and be done concurrently or one sequentially. Sandelowski explained that when a qualitative approach is the priority, the use of more than one qualitative approach supports measured description, validation and formal generalization. Bazeley (2010, p. 196) in Bazeley and Jackson (2013) offered that elements and strategies are combined to become interdependent in reaching a common research goal, producing findings that are greater than the sum of the parts. In this study, the practical aspects of collecting all data concurrently were most important since travelling to remote research sites took days to reach. I used a ‘concurrent embedded strategy’ where both qualitative and quantitative data were collected simultaneously, with the primary method being qualitative.

Such an approach permitted some “triangulation” of data results. As described by Creswell (2009), triangulating data sources helped to ‘neutralize’ bias inherent in any single method. Mixing data from the different methodological approaches allowed me to integrate the information, gain a broader perspective, and provide an overall composite assessment of the problem (Creswell, 2009, p. 214). Sandelowski (2000, p. 248) describes combinations of data collection allowing “innovative uses of a range of techniques” for purposes of triangulation, to clarify or fully elaborate the results, and to guide the use of sampling and analysis.

4.1.1. Research setting

The location of my research was in the Eastern mountainous district of Nepal called Solukhumbu. This district met my research needs for several reasons: 1) it was a rural area with many remote communities whose mothers had both home and facility-

based births; 2) it was little studied, so new findings would address gaps in knowledge; and 3) I had strong connections there. The northern part called 'Khumbu', is famous for Mount Everest and Sagarmatha National Park, and its Sherpa people have a reputation as expert climbers and are valued as porters for high altitude expeditions. The Lower Solukhumbu, called 'Solu', is the southern part of Solukhumbu district. The southern part is less well known, has more inhabitants than Khumbu and is populated by diverse ethnic communities, although total population from a 2011 census was around 100,000 (Code for Nepal, n.d.) My research took place in the lower mountains of Solu. The administrative centre of Solu district, the town of Salleri (population 6590 in 2011) (Code for Nepal, n.d.) is contiguous with the town of Paphlu, where the hospital and airport are located. The area is primarily agricultural and tourism plays a very small part of its economy compared to the Khumbu district, where high altitude treks and expedition tourism predominate as sources of income for local people.



Figure 4.1 Map of Nepal with Solukhumbu District in Red

Map: (Google, n.d.), modified by Camilo Rostoker.

People in Solu have strong ties to their cultural groups and their ethnic group or caste can be identified by their surname (as in the rest of Nepal). Groups of Hill Chhetri, and other Hindu castes, and non-Hindu Rai, Tamang and Sherpa peoples live together in towns and villages in Solu. (Code for Nepal, n.d.). The names Rai and Sherpa refer to

two commonly represented ethnic groups in Nepal, while the Chhetri and Brahmin refer to higher caste groups of people who are Hindus (refer to the glossary).

Caste distinctions among Hindu people play a role in the social fabric of society, including selection of mates for marriage. While the villages and towns were not distributed according to caste groups, we observed that the lower caste groups typically had unfavourable land for crops, and were located farther from village centers of commerce. Most women and men worked in agriculture although some have small businesses, or work for wages. Health workers in this district came from the various ethnic and caste groups. Some were local to the district and some were not. The focus of my research did not require attention to the caste or ethnic distinctions, and I do not go into detail about them.

Some interviewees alluded to women in some 'ethnic' groups (Rai, Sherpa, Tamang), as having more power in the family than those in Hindu castes. We did not find this to be always accurate according to the participants we interviewed. The health care workers came from various ethnic groups as well as Hindu castes, but there was some discussion on the benefits of being 'local', meaning having been born in Solu, and being from one of the most common ethnic groups (e.g. Sherpa). We did not find health care worker mistreatment of women during birth of any caste or group specifically; it seemed to occur in any group, but not to every woman or by all caregivers. Most physicians came from upper Hindu castes but one was Sherpa. One physician, commenting on ethnic groups, stated that some were difficult to converse with, diagnose and treat because they used alcohol. I was unsure if he referred to men only or also included women. This comment from a physician from a higher caste demonstrated racism and stereo-typing of people from non-Hindu groups.

Health care in this district was provided by a government district hospital, primary health centers, and health posts. Birthing centers were situated in health posts, although many health posts did not have birthing centers. Only the district hospital and primary health center were staffed by doctors. The health posts and birthing centers were staffed by auxiliary nurse-midwives and community health workers. A group of volunteers called Female Community Health Volunteers (FCHV) were respected by local women and were

important players in maternal and child health. Female health community volunteers, having been selected by government, were trained to perform health education functions and administration of some vaccines and medicines. They were to identify and visit parturient women during pregnancy and postpartum, encouraging use of antenatal care and facility birth.

The setting for my research is unique. Although the area is remote, both local and foreign organizations provide support to birthing programs. The Himalayan Health and Environmental Services Solukhumbu (HHESS) is the main local NGO working in Solukhumbu. Its main objective is to improve the life of remote Himalayan poor and marginalized people providing basic education, health facility and social and environmental awareness (www.hhess.org). One of its programs is the Phaplu maternity center along with strengthening services in other remote facilities in the district. HHESS, together with the Himalayan Trust (www.himalayantrust.org) established by Sir Edmond Hillary in New Zealand and other partners, have provided training and support to Solu residents. They train and maintain a physician at Phaplu district hospital, train nurse-midwives at the vocational school and provide ultrasound and other courses to nurses working in the facilities where the programs are located. In addition, they assist in the delivery of antenatal care, postnatal care and the growth monitoring program with its 'super cereal' free supplement for mothers in certain villages. Some communities in Solu benefitted more than others insofar as not all communities were beneficiaries of the NGO programs and funds. Many smaller remote communities in Solu still do not have health care providers with knowledge of parturient care.

Given the programs of the two NGOs, Solu has some well-supported facilities where skilled birth attendants can be accessed. The NGO works in facilities where there is relatively strong leadership and supervision. The district hospital receives gloves and other materials from the Himalayan Trust, making the shortages less severe than other areas of Nepal. One of the primary health care centers has also received equipment and the salary for a trained auxiliary nurse-midwife from HHESS.

In Nepal's mountainous zones, 43.3% of women were attended by skilled attendants and 41.7% gave birth in facilities (NDHS, 2016). This is significantly lower

than all Nepal where 58% of women give birth with the help of an SBA. Solu's low rate of skilled attendance at birth (30%) is comparable to the mountainous areas of Jumla and Mugu in the less developed western mountains where 35.3% of women have skilled attendance at birth (NDHS, 2016). My research investigates factors leading to this low use of skilled birth attendance.

Residents in Solu often experience food insecurity due to the inability to grow enough food to last the entire year. Family members, especially young males, will thus emigrate for work to the Middle East, Korea or Malaysia. We also learned that some husbands worked in Kathmandu and most women interviewed lived with their in-laws. Although conditions have improved for the poorest in the past three decades, the area is still served by the World Food Bank. The local NGO distributes a supplement of high-calorie cereal, named 'super cereal', which is offered to improve nutrition to all pregnant mothers from the 4th month of pregnancy up to two years after the birth of her baby. The mother is encouraged to attend 'growth monitoring' at the local health post or hospital with her newborn and feed herself and her infant the 'super-cereal' from 6 months of age until 2 years.

The 2015 earthquakes on April 25 and May 12 affected the Solu area by damaging many homes and causing large landslides that affected transportation and water supplies, even 17 months later during the data collection period. Travel was difficult during my data collection period because the rainy season stretched on to autumn, causing landslides. See Appendix C for an excerpt from field notes that gives the feel for the rigours of travel in the district that this fieldwork sometimes entailed.

4.1.2. Research methods

My 'concurrent mixed methods' research design involved semi-structured interviews with mothers, female community health volunteers (FCHVs), key informants, maternity care staff and spiritual healers. I used participant observation and documented my observations daily in field notes. In addition, I used two surveys. I address these methods in turn in relation to the research questions. An expanded discussion on each

method occurs later in this chapter and a summary table is provided at the end of this section (Table 4.2.).

This table outlines the research questions, the research methods and methods of analysis used to answer each question.

Table 4.1. Methods

Questions	Methods to answer questions						Analysis		
	Interviews					Observation & Notes	Survey		
Research Questions	Mothers	FCHV ¹	Mat. Care Providers	Key Informants	Spiritual Healers		WHO SARA ²	SBA ³	NVIVO ⁴
1.What are the factors (barriers, facilitators) women report that affect their use of skilled birth attendants in rural and remote Nepal?	✓	✓		✓				✓	
2.What are the barriers and facilitators to establishing skilled care at birth in rural and remote settings?	✓	✓	✓	✓	✓	✓		✓	
3.What are the gaps in skill sets and enabling factors in health care facilities to providing both culturally safe and skilled birth attendance?	✓		✓	✓		✓	✓	✓	✓

¹FCHV: Female Community Health Volunteer

²WHO SARA: WHO Services Availability and Readiness Assessment

³SBA: Skilled Birth Attendant

⁴NVIVO: Qualitative data analysis computer software package

⁵SPSS24: Statistical Program for the Social Sciences, version 24

In order to answer the first research question, I used semi-structured interviews. This was the best way to explore mothers', community members' and maternity care providers' experiences around birthing in the region. Through interviews addressing mothers' perspectives, I was able to find out about their birthing experience and reasons

for making choices around caregiver and place of birth. I interviewed the community members who played a significant role in parturient health care in remote communities, including: female community health workers (FCHW), key informants (women with experiences of birthing in remote areas some years prior), and spiritual healers (Dhamis and Jankris). The key informants in Solu were women, two of whom who had been FCHVs and had given birth in one of the research sites many years prior, and the other a farmer who had given birth locally more than two decades before. I wanted to understand if their experiences of giving birth were similar to women in our study (who had given birth in the last two years). Two key informants, interviewed in Kathmandu, were female political leaders who had given birth in remote mountainous areas and who had considered women's access to maternal health care. The Dhamis (spiritual healers) lived in central and eastern communities, and were community members and relatives of the health care workers. Inclusion of interviews from FCHVs, key informants and spiritual healers helped to answer the third question about gaps in culturally-safe skilled attendance, since community members, through their responses, provided information about whether their cultural practices and preferences were treated with respect.

To answer the second research question, I used semi-structured interviews and surveys. I conducted semi-structured interviews with doctors who provided antenatal services, and one who provided emergency obstetrical care, including caesarean section, and nurses and nurse-midwives who conducted antenatal, birthing and postpartum care. These interviews provided viewpoints about barriers to care and how maternity care could be improved. Participant observation and field note recordings assisted in more fully understanding the context around care provision in the remote area. I observed and documented the communication and care procedures in health facilities and understood the barriers of distance more fully by spending significant time in the remote health facilities, villages and travelling by foot between sites. The following two surveys, 'WHO Service Availability and Readiness Assessment (SARA)' (2013) and 'Assessment of Skilled Birth Attendants' (Nick Simon Institute, Nepal, 2013), assisted in answering the second research question from a systems perspective where aspects of service provision, both enabling factors such as materials and supplies, and ability to perform life-saving procedures were examined.

To answer the third question, I again used the two surveys mentioned above. I carried out the surveys with senior community health workers or head nurses at each facility. The first survey assessed the readiness of birthing facilities to provide reproductive health and newborn care, using a WHO survey instrument. The WHO instrument identified gaps in adequacy of infrastructure, equipment, supplies and medications in six facilities. I added to this survey questions from the respectful childbirth initiative ‘White Ribbon Campaign’ (White Ribbon Campaign, 2011). These questions indicated respectful care and included whether women could make choices for labour and birth on position, presence of a companion, and whether to eat or drink. The second survey aimed to determine if nurses’ skills were adequate for providing safe normal delivery care and basic obstetrical emergency care.

Table 4.2. Data collection methods (n=number of participants)

Data collection methods	Participant or survey details	Contents of interview or survey questions
Semi-structured interviews: Mothers	Mothers having given birth in last 2 years. n=35	Demographics. Decision-making for birth. What is good/bad/easy about facility and home birthing? Description of birth(s). What does community need?
Semi-structured interviews: FCHV	Female community health volunteers (FCHV). n=14	Decision-making for birth. What is good/bad/easy about facility and home birthing? What does community need?
Semi-structured interviews: Maternity Care Providers (Nurses and ANMs)	Nurses and ANMs currently working in maternity and attending births. n=17	What services do you provide? Decision-making for place of birth, and factors influencing birthing services. What is good/bad/easy about facility and home birthing? What are the barriers to facility birth?
Semi-structured interviews: Doctors	Physicians working in research area conducting antenatal care or deliveries. n=3	Describe factors affecting use of birthing services. What is good/difficult about working here? What are the barriers to provision of care?
Semi-structured interviews: Dhamis/Jankris (referred to here as “spiritual healers”)	“Spiritual” healers identified as working in research area. n=6	Description of profession and becoming a Dhami. What does Dhami do to help spiritual problems? What is good/bad about facility or home birthing?
Semi-structured interviews: Key informants	Older women with experiences on birthing mothers in remote areas. n=5	Decision-making for birth. What is needed for safer birthing?

Data collection methods	Participant or survey details	Contents of interview or survey questions
Participant Observation & Field Notes	Observed antenatal, postpartum visits, births. Notes taken in notebook and transcribed or on computer.	Observed people and interactions, travelled to remote areas, observed visits and births, wrote in field notes: descriptions of remote life, interactions in facilities, conversations with people
WHO 'SARA' (birthing facility) survey	Maternity part of WHO Survey on 'Service Availability and Readiness Assessment' n=6	Section on availability of human resource Section on availability of infrastructure Sections on supplies, materials, laboratory, and medications. Section on respectful practices.
SBA Nurse Assessment Survey	Survey developed and tested by Nick Simon Institute and Ministry of Health, Nepal. n=12	Demographics 25 knowledge questions Skill testing simulations on preparation for birth, normal birth and emergency management

4.2. Study Sites

I travelled from the far east side to the west side of Solu and worked in several research sites with variable levels and kinds of services in order to study factors affecting use of midwifery services throughout the district. I investigated several levels of facilities to allow insight into mothers' and community's birthing preferences, the functionality of the various levels of health centers, and the quality of care provision at the facilities to answer my questions about access to care. I sought facilities ranging from local level (birthing centers), to primary care level (Primary health centers or PHCs) and hospital level (district hospital) where women have the opportunity to attend a facility for birth. I also chose one site to conduct interviews where there was a health center with health care workers but without provision for births, requiring travel to the nearest facility by road. I also looked for communities having a variety of 'ethnic' groups and Hindu castes to determine whether inequities posed problems for access. A combination of these research sites was available in Solu.

Mothers in mountainous areas of Nepal have poor access to government health services. The 2016 Nepal Demographic and Health Survey (NDHS, 2016) outlines the differences in access to care among urban and rural women, in parameters of ANC visits, facility-based birth and delivery with a skilled birth attendant. Among all survey

respondents, 84% of mothers received ANC from a skilled birth attendant while in mountainous areas such as Solu, only 78.9% of mothers received ANC from a skilled person. 58.9% of Solu mothers received all the required ANC visits (NDHS, 2016). In mountainous areas, 41.7% had facility-based births (with a skilled attendant) while in Solu, only 30% accessed facilities for birth compared to 58% of all Nepalese women. In mountainous areas 32.6% of mothers had a family member as birth attendant (NDHS, 2016).

I selected health facilities spread across the district where I could talk with mothers, community and health care workers about their experiences in maternity care. With the assistance of the public health nurse at the district health office, we used a map and reports of birth center utilization reports to select six facilities that had been functioning for at least a year, and attended at least several births per month. The first site for research was the town where the hospital was located and its surrounding catchment area. Some respondents in this group had travelled to the hospital for antenatal care with ultrasound examinations, childbirth or medical consultations for them or their children. The second and third sites were Primary Health Care Centers (PHCs), and their surrounding areas; one located two days walk from the small airstrip and road, and the other several hours on a barely passable road by jeep. The fourth and fifth sites were small health posts with birthing centers, between one and two days walk from the hospital, one having a poorly-maintained dirt road. The sixth site was a village with no birthing center where women were expected to travel about one hour by road to reach a facility. I interviewed mothers and staff in and around villages with birthing facilities and in two villages that did not have a birthing facility to see the range of responses between them. Selection of these facilities provided a range of both types of facilities geographically located across the district, some closer to a road, some farther from a road to see if distance posed a barrier to care.

To protect the anonymity of the sites, facilities, and providers, I use the following pseudonyms to refer to the different facilities:

Table 4.3. Facility code names

Code names for facilities	Short name
Hospital	Hospital
Primary health center	Central PHC
Remote primary health center	Remote PHC
Village birthing center	Village BC
Hilly birthing center	Hilly BC
Mountain birthing center	Mountain BC

Few deliveries take place in health facilities compared to the total number of births in the district. According to the District Health Office report of 2015, approximately 30% of mothers had a facility-based birth in the previous year. Therefore, I chose the district hospital, the two primary health centers, and birthing centers that had above-average uptake of facility-based birth attendance, rather than ones where few women attended. I obtained statistical data on number, types of births, and referrals per month in the district hospital from the District Health Office Annual Reproductive Health Report (refer to Table F1 in Appendix F).

I assessed readiness for birthing care and maternity care provider skills in the district public hospital, the two primary health centers, and two birthing centers through two surveys that I will discuss shortly. These facilities provided a range of different levels of facilities to compare availability of equipment and supplies, readiness to provide care as well as skills of auxiliary nurse-midwives and nurses. They represented the three levels of care and were distributed throughout the district.

Local nurses in each site contacted the female community health volunteers who in turn asked mothers if they wanted to participate in the research. My Nepalese partners, members from the Midwifery Society of Nepal (MIDSON), the Himalayan Health and Environmental Services Solukhumbu (HHESS, a Nepalese NGO), and the Patan Academy of Health Sciences (PAHS) provided suggestions and support for visiting the research sites. The District Health Office of Solukhumbu in Phaplu approved the sites.

To obtain consent to carry out the research, all participants were given the opportunity to learn about the research, ask questions and receive answers. I handed out the consent form with the research questions in Nepali language at the beginning of the interview or the SBA assessment survey. Some mothers read the research information and consent form a day or two prior, and together we planned a convenient time and place where they felt at ease for the interview. All provided written or oral consent (with thumbprint) prior to participation.

4.3. Surveys

Investigating barriers and facilitators to establishing skilled care at birth in rural and remote settings and identifying the gaps in skill sets and enabling factors in health care facilities to providing both culturally safe and skilled birth attendance (research questions 2 and 3), required me to undertake structured surveys of maternity care providers and facilities. The enabling environment for midwifery services was assessed, and skills of Skilled Birth Attendants (SBAs) for intrapartum care.

Elements of an enabling environment include adequate skilled human resources, regulation and policies for health care providers and practices, equipment, medications and supplies for both normal deliveries and for basic obstetrical emergency care, as well as a functioning referral system (WHO, 2016a). I used the 2013 WHO Service Availability and Readiness Assessment (SARA) survey tool to assess six maternity care facilities in Solu. I selected this tool because I wanted to determine if the SBAs had an enabling environment in which to work, and whether the community had a functioning maternity system at a basic level. The WHO (2013) framework asserts that health care facilities should be prepared to attend childbirth by having appropriate infrastructure, medications and equipment, local expertise appropriate to the level of facility, as well as a functioning referral system. A new WHO document on standards of maternity care asserts that in addition to the above requirements, birthing attendants must be motivated, and provide respectful care to parturient women that increases their capacities (WHO, 2016a). I added one page to the SARA study asking questions that pertain to respectful care: whether mothers could have companions for labour and birth; whether they could eat and drink in labour; and whether they could position themselves

as they chose for labour and delivery. I thus adapted a useful WHO tool to see whether women's choices were considered and respectful care was provided.

I was also able to use a separate survey instrument, the Skilled Birth Assessment Survey (2016), that was developed by the Nick Simon Institute (NSI, 2013). This added an additional dimension that helped to determine whether the nurses who had been trained as skilled birth attendants had maintained their knowledge and skills about normal birth, obstetrical emergency, and newborn care. The skills assessment was carried out in Nepal in various urban and rural facilities but this portion of the research constitutes the first time it was carried out in the Eastern mountainous district. In the following sections, I describe data collection and analysis for each survey.

4.3.1. WHO Service Availability and Readiness Assessment (SARA)

The SARA survey offers guidelines on how to survey health centers to see if the services are available and ready to be used. The main domains assessed are service availability (facility density, health worker density, service utilization) and service readiness for antenatal, family planning and obstetrical care including newborn care (basic amenities, equipment and supplies, diagnostics and medicines). The reference manual contains a survey section about maternal and newborn care, which I selected and adapted for use in our study. I left out all sections about antenatal care and family planning as not applicable to our study, leaving in everything else pertaining to intrapartum care and general facility infrastructure. I added several questions about respectful care in childbirth including whether or not an accompanying person was permitted in labour and delivery, and whether mothers could choose their positions for labour and childbirth. I entered all variables in SPSS 24. With the help of a Nepalese nurse co-researcher, we collected the survey data in English in each facility studied. I took field notes to further explain and describe the survey answers at each site.

Sites included the district hospital, two primary health care centers, and three health posts (n=6). I selected a sample of three existing health posts designated as birthing centers representing different geographical areas of Solukhumbu. We gathered survey data at all but one of these facilities, together with a nurse co-researcher, and a

local facility in-charge or head nurse, during a one- or two-day visit. We requested the in-charge of each facility to lead us through the childbirth area with the paper survey in hand and to physically see and check the availability of all equipment and supplies. In the district hospital, the nurse in-charge was delegated to assist us with the survey. I was not able to reach the third remote birthing center during the time of favourable weather conditions. One of the nurse co-researchers surveyed the third birthing center herself with the in-charge, after we completed the rest of the research. sending her scanned report directly to me by email.

We collected descriptive data, and percentages were obtained and displayed in a table for the six sites for the categorical variables. (E.g. Is equipment for manual vacuum evacuation available at hospital A? Yes/No. Does at least one staff member know how to use it? Yes/No.) More complex analyses were not undertaken since it is not indicated by the research questions and the sample size is small (n=6).

4.3.2. Skilled Birth Attendant (SBA) skills survey

Nursing and auxiliary nurse-midwifery staffs in facilities attending childbirth in Solu are expected to attend normal births and deal with emergencies according to their level of health care facility and training. We administered the SBA skills assessment to all auxiliary nurse-midwifery and nursing staff who were currently attending childbirth, and had taken the SBA training in Nepal, and who were working in birthing centers in the research area (n=12). We conducted the SBA skills survey in three different locations. Four auxiliary nurse-midwives came from birthing centers that we were not able to reach to administer the survey or to interview mothers. One of the birthing centers was surveyed by a nurse co-researcher, as previously mentioned. The main survey location was the district hospital where eight of the participants came to participate and receive the follow-up gap training. The second and third sites were remote sites and required several days of walking to reach each of them in the far eastern and far western sides of the district.

Examples of necessary skills in rural Nepal included maintaining a clean environment with proper disinfection and sterilization of equipment, safe attendance at

normal birth including prevention and treatment of postpartum hemorrhage, recognizing and treating pre-eclampsia, attending mother and baby in the immediate postpartum period, and resuscitation of the newborn. With permission from the authors (Nick Simon Institute), we used a tool developed, tested, administered and updated November 2016 by the Nepal National Health Training Center and Nick Simon Institute (NSI). We used the 25-question knowledge test but made one change allowing two correct answers for one of the questions where both of the nurse-assessors and me disagreed with their answer. We assessed through simulation with mannequins, partographs and resuscitation dolls, the skills of preparation for birth, infection prevention, procedures for attending normal birth and immediate newborn care, and emergency management. We also assessed the use of vacuum for assisted delivery and use of Kangaroo Mother Care for preterm infant thermo-regulation. As per the instructions for the tool, we offered the written knowledge test in Nepali language either at the beginning of the entire assessment, or the day prior depending on the schedules of the nurses present. A senior SBA nurse-assessor worked through the skills assessment with each individual separately taking four to five hours to complete each individualized assessment. As outlined in the SBA Assessment guide, the gap training was carried out following the assessment. This took four to eight hours and was done in a group setting except at one remote center where only one SBA worked.

All variables for each skill were entered into the statistical analysis software package, SPSS version 24. To determine whether SBA participants were scored as 'very competent' as had been done with NSI nurses assessed in other parts of Nepal, we entered all items for the management of each emergency as variables. These ranged between 20 and 33 items. The following example is for the identification and management of pre-eclampsia. There were 30 pre-eclampsia items. Response options were 0 (not competent) and 1 (competent). We summed the number of competent items. The higher the score, the more competent they were in that area. To get the percentage, we divided that score by the total number of pre-eclampsia items and multiplied by 100. We separated those who scored 85% and higher from those who scored 84% or lower, to know how many were very competent in managing pre-eclampsia. I chose to stratify the competency sums and by two variables: type of facility (hospital and lower levels of

birth facilities), and years since their SBA training (less than one year through 3 years, and four or more years).

4.4. Interviews

The research involved semi-structured interviews with mothers, family members, female community health volunteers, key informants, and local maternity health workers regarding factors affecting place of delivery and birth attendant. The other community member included in the interviews, involved with advising and treating mothers in pregnancy and childbirth, was the Dhami/Jankri (shaman). These spiritual healers have a prominent role providing traditional spiritual healing in the more remote communities where there are fewer maternity care providers, and I added them to the group of interviewees by adapting the questionnaire and consent form.

I interviewed the English-speaking participants (physicians) and my translator (a Nepali speaking nurse and member of the Midwifery Society of Nepal) translated for me during interviews of the Nepalese speaking participants. The techniques for the in-depth interviews are informed by ethnography, 'the work of describing a culture' to understand another's way of life from the insider (emic) point of view (Spradley, 1979). To understand the culture, I needed to go to where the people live and do my *'field work'* thus learning from the people. I learned about complex meaning systems through observation, dialogue and interviews to understand birthing culture from an insider's perspective (Spradley, 1979).

4.4.1. Samples and sampling

Mothers and families

Interviewing mothers about their birth experiences and ideas about access to childbirth services was most important to answer my research questions. I interviewed mothers in six sites, and continued interviewing until I did not find new information about birthing practices within the categories in the stratified sampling frame described below. I sought to gain information from mothers who had given birth within the past two years,

who offered in-depth information about their experience with childbirth. I encouraged mothers to bring family members if they chose, but the majority of mothers came alone or with small children. I interviewed several older women individually - who had given birth in the research areas when I wanted to clarify the ways that birth was carried out a generation prior, compared to the present time. I refer to these five women as key informants.

I recruited participants from a broad range of experiences and cultural traditions (Denzin & Lincoln, 1998). I advertised among mothers' groups comprised of Rai, Sherpa, Tamang and Hindu caste groups for inclusivity by approaching the female community health volunteers who know the communities. I did not ask the respondents their caste, but asked about residence and place where they gave birth. I identified sub-groups within the participants who agreed to be interviewed (home delivery or hospital delivery). I looked for 'information rich' cases, and included some mothers who had both hospital and home deliveries. In addition, to gain information from mothers who have been transferred to hospital for problems in labour, I used 'stratified purposive sampling' technique to focus on the inclusion of certain cases based on preselected parameters such as place of birth, being transferred in to hospital, or having both home and hospital births (Sandelowski, 2000, p. 250). Two mothers gave birth while travelling; one in a plane who was being referred out for lack of progress, and another stopped in her mother's village on the trail (her mother had been trained in birth attendance), on her way home walking back from a workshop. This 'extreme or deviant sampling' presented information that maximized at least one of the factors of interest: receiving emergency care from skilled birth attendants, or delivering on the way to a facility (Denzin and Lincoln, 1998; Sandelowski, 2000).

Care providers

I presented my research plans to staff members at the six sites through in-person meetings. I asked to interview staff members who had been working in childbirth for at least one year in Solu. In the district hospital, which has many staff changes, there are usually four or five doctors with one qualified to provide caesarean sections. I interviewed the three doctors who had taken part in antenatal care in this site, including the caesarean section provider, although none of these physicians had taken the 'Skilled

Birth Attendance' course for doctors in Nepal. In all the facilities, the staff nurses or auxiliary nurse-midwives were the primary attendants for all vaginal births. Where present, the doctors' role was to assist the midwife in difficult cases when they were able, or provide support or assistance with referrals. In both primary health care centers, I interviewed senior community health workers who either assisted or had assisted many mothers in childbirth. Physicians were on leave in one of the primary health care centers, and were uninvolved with childbirth in the second primary health care site, so were not interviewed. I interviewed all auxiliary nurse-midwives in each site who currently attended childbirth. One research site had only one childbirth attendant on site when I conducted my research, the SBA trained auxiliary nurse-midwife.

Female community health volunteers

I interviewed female community health volunteers (FCHVs) as a separate group as they play an important educational and supportive role in Nepalese rural maternity care. On average, there is one female community health volunteer for a population of about 80 families. The District Health Office selected women to be the volunteers linking women, their families and the district health office. Their work encompasses health education, promotion of antenatal care, facility-based birth, family planning and post-natal care, and sometimes community-based care curative activities such as initial antibiotic treatment for children exhibiting signs of pneumonia, when antibiotics were available. Since the FCHVs are close to the mothers, they had important insights on attitudes to childbirth, traditions, and barriers to reproductive care. The FCHVs attended the homes of parturient mothers in antenatal and postpartum education visits but, during the past decade, rarely served as birth attendants. I interviewed as many FCHVs as I could in each of the six sites, according to their availability. The health care workers in each facility or in the district health office called FCHVs and asked if they wanted to participate. Some who lived far from the road or birthing center may not have been invited by the health workers.

4.4.2. The sample

A table of all the data collecting methods carried out in the research sites is presented above (Table 4.1). The following table shows the types and numbers of

participants interviewed through semi-structured interviews and the distribution of interviews obtained. I aimed for a larger number of mothers having home births because of the greater number of births at home in the district, and achieved this when the mothers having transfers from home to hospital were included. I did not interview mothers in western communities in the district who had both home and hospital births (a less common occurrence in the research), nor did I encounter Dhams to interview in western communities, possibly due to it being less remote (closer to a main road).

Table 4.4. Interview sample size

Categories	Central Solu communities	Eastern Solu communities	Western Solu communities	Total
Mothers having home births	4	6	2	12
Mothers having hospital births	6	2	3	11
Mothers having both home and hospital births	3	1	0	4
Mothers having transferred to facility	3	3	2	8
Maternity staff and doctors	13	3	1	17
Female community birth volunteers	7	3	4	14
Key informants	0	0	3	5*
Dhami/Jankris	2	4	0	6

Note: Central Solu includes interviews in four communities. Eastern Solu includes interviews in three communities. Western Solu includes interviews in one community in my research.

* Two key informants were interviewed in Kathmandu

4.4.3. Interview guide development

Basic questions for the interviews were developed from the Nepal Demographic and Health Survey (2011), and from themes in prior research to find out what factors influenced mothers and families in accessing maternity care, especially intrapartum care, including facilitators and barriers to care. We asked them to describe one or more of their births. Hearing about their births was a source of rich information about whether they had a choice of caregiver, and how they perceived quality of care, barriers to care and what the community needed. Female community health workers were asked similar

questions, and Dhamis/Jankris were asked similar questions about access to care and their role in the care of parturient women.

We asked caregivers about barriers to mothers using facility-based birth and their experiences about being a maternity care worker in a remote area. Interview questions are found in Appendix D.

4.5. Participant Observation and Field Notes

During the same period of time as I was conducting interviews, I used participant observation to learn about practices and interactions between nurses, auxiliary nurse-midwives and families. Field notes, written on a daily basis, another data collection tool, supplemented the participant observations (Bernard & Gravlee, 2015). Observing and documenting helped me to understand the power dynamics between staff and mothers, the flow of antenatal and postpartum clinics, the activities and materials used to provide care in antenatal clinic, and during labour, birth and the early post-partum period. Participant observation helped me to answer the questions about gaps in skills sets and enabling factors to provide culturally safe and skilled care.

Bernard (2002) discusses participant observation as a technique with long-standing roots in both anthropology and sociology. Fieldwork that includes participant observation can involve three different roles: *complete participant*, *participant observer* and *complete observer*. The most common is the participant observer, and that was my level of participation (Bernard, 2002; Erlandson, 1993). Given that I am an experienced midwife, I helped a bit with the initial steps of resuscitation and stabilization of one newborn. If there had been an obstetrical emergency where my expertise was needed I had planned to assist and did so in one case of a retained placenta, together with my co-researcher, a licensed Nepalese midwife instructor. I did not interfere where the staff was managing the care and did not request or appear to need extra help.

Through participant observation, I was able to put in context some of the information received from the interviews. Bernard (2011) claims that participant observation is a 'strategic method', a method comprising several methods at once. Both

Spradley (1979), and Bernard (2011, 257) discuss the acquisition of tacit knowledge, which becomes embedded in the actions and behaviours of the researcher. Bernard proposes advantages to the researcher through engagement of participant observation in enhancing the quality of data obtained during fieldwork; through interpretation of data and formulation of new research questions or reassessing existing ones (Bernard, 2015, p. 245). I was able to move through various remote research settings whether village homes or health facilities, and talk to mothers and maternity care providers about birthing customs and access challenges. We stayed in homes, or slept just outside the homes in tents while eating with families on a daily basis. I felt the discomfort and itching of flea infestation for several months as we collectively scratched during interviews with mothers in their single room homes. I was saddened by visiting the home of a family whose mother had just died in childbirth, to try to help the bereaved father and the eight-year-old sister, now female head of the other four children, to safely bottle feed the two-week-old newborn. By participant observation, I could feel for myself the difficulty of the 45-minute steep climb up a rocky path to the health post meant to serve birthing mothers, and wondered what it would be like navigating that trail in labour, in the rain or at night, by flashlight.

We found that including Dhamis and Jankris (local spiritual healers) in the research was important through interactions with Dhamis while interviewing and while living with the village families. Mothers in the more remote areas generally consulted with Dhamis for discomforts in pregnancy, and for advice as to the signs of the beginning of labour. We observed the Dhama perform a healing ceremony for the wife of the most educated man in the village, while I was in the kitchen drinking buffalo milk with the family for breakfast. A Dhama was part of the extended family in another two households where we stayed. We watched one of them cut up and cook local chicken that we had located and purchased to thank the family for hosting us.

Much of the knowledge obtained by observing staff and mothers in the setting of interest (health centers in this case) is tacit knowledge, learned from inferences, by listening, observing and studying what people do. I made maternity caregiver - mother relationship inferences from how maternity caregivers act towards birthing mothers, and the equipment and materials they use, testing these inferences multiple times until I was

reasonably sure that I understood the cultural meaning (Spradley, 1979). For a non-member of the culture as I am, Bernard (2002) suggested three months is the minimum time, for field work and knowledge of the language is needed. I have slowly learned some of the language and had already been involved in the birthing culture of Nepal. I participated in teaching continuing education workshops and have been licensed to practice in maternity wards in several remote sites, including the research site, for eight years prior to doing the research. I had made three visits to one of the remote villages, and was told that I was the first foreigner to visit there several years prior to the research. Spending longer periods in the field reduced the problem of reactivity and people begin to take me for granted. I spent four months in my research sites during my data collection year, so was able to spend 'prolonged engagement' observing and learning about practices (Erlandson, 1993; Creswell, 2009).

4.6. Data Collection and Management

4.6.1. Training translators, piloting the tools, and collecting data

I trained the translator/research assistant who assisted with the interviews, as well as two senior rural midwives who assisted with the surveys. I emphasized techniques for interviewing and ways to allow the participant to explain their responses further. I explained that the interviews should be transcribed verbatim from the recordings, leaving out only 'umm's' and pauses, and then translated by the same interviewer. A second translator reviewed the translation of several randomly selected interviews to assure correct translation and completeness.

I pre-tested the interview questions for mothers (and family members), health care workers and female community health volunteers. I developed the questions in English and the translator and expert translation team (made up of members of the Midwifery Society of Nepal) translated them into the Nepali language. The team conducted pre-tests, which were carried out in Kathmandu and environs. In this way, I received feedback about the ease of comprehension and response to the questions. I corrected a few English words or phrases that were not well understood in Nepalese.

The Forwards Backwards Translation method that I used is further described in Appendix E.

During the harvest month of November, 2014, I travelled to the research sites where I was introduced by a member of the local NGO partner and met with health district staff and health facility directors and staff. When I returned for the data collection, I first went to meet the District Health Officer (DHO) and public health nurse who were, from the government side, in charge of childbirth attendants and the birthing centers. The public health nurse at the DHO gave us contact information for the Female Community Health Volunteers (FCHVs) in the area to explain the purpose of the research. The translator and I conducted the interviews after informed consent was given for each interview. I conducted interviews with physicians in English, and the translator and I conducted the other interviews in Nepalese.

We used written notes on the questionnaire paper to record the main points in the recording and to signal to me when a new probe should be used to delve further into the information being shared. Those notes were shredded after the interviews were transcribed and translated and backed up on hard drives. All interviews were digitally recorded. Only the translator and I saw the raw data.

4.7. Interview Analysis

I used thematic analysis of data using the following steps: (1) discover themes and sub-themes; (2) decide which main themes are important to answer my research questions; (3) build hierarchies of themes or code books; and (4) link themes into a theoretical model (Ryan & Bernard, 2003).

I used a combination of a priori approach and an inductive approach. I began with prior research-driven code development (Ryan & Bernard, 2003; Boyatzis, 1998). The a priori approach begins with a priori themes from already agreed on professional definitions found in literature reviews (Ryan and Bernard, 2003). I built on research already done for the development of themes for a similar population in the same country. In reviewing literature about access to maternity care in S.E. Asian countries, including

Nepal, I have found themes arising about use of maternal care services from both Nepal Demographic and Health Surveys (2011) and qualitative and quantitative studies about use of maternity services in Nepal. Discussion abounds on factors of distance and finances (Maru et al., 2016), use of antenatal care as a facilitator of institutional birth (Sharma, Poudyal, Devkota, & Singh, 2014), personal agency (Baral et al., 2010) and lack of appropriate or perceived quality services in rural areas (Karkee, Lee, & Pokharel, 2014). The most frequent example of that was 'distance as a barrier to seeking facility-based birth' (Gabrysch & Campbell, 2009; Onta et al., 2014; Wong, Benova, & Campbell, 2017).

Building a codebook is a widely used step in the analysis of data. The codebook may develop and change while analyzing the data. I built a codebook with my a priori selected codes prior to the interviews as described above, and added to the codebook when I found and clarified new codes within the raw data guided by steps outlined in Tesch (1990, pp. 142-45). I assigned codes to phrases, sentences or paragraphs which were connected to a specific context. Adding to my prior-research driven codes, I developed 'data-driven' codes that were associated with the research questions (Ryan & Bernard, 2003). Data-driven codes required repeated examination of the raw data (DeCuir-Gunby, Marshall & McCulloch, 2011). The process was iterative and I revised definitions for the codes as I gained a clearer insight into the interview data. I structured the codes using three components: code name/label, full definition and an example (DeCuir-Gunby, Marshall & McCulloch, 2011). I wrote a definition of the issue concerning the code, a description of how to know if the code occurs, and any exclusions to identification of the theme and examples of the theme.

After each encounter (i.e. one or more interviews in one morning), I wrote field notes, noting distinct new themes or repetition of existing themes. I reviewed initial thematic content of the interviews with the translator during and after interviews. She attempted to transcribe and translate interviews as much as possible during and immediately after the data collection period so that information could be revisited when meanings were unclear. Most of the translations from the audio-file to written English were carried out while I was in Nepal.

Once back in Canada, and I was confident that the materials were translated as closely as possible to its intended meaning I entered the interviews in NVIVO, and proceeded with the coding process. As I engaged with the interviews, I applied the codes to the raw data, added new codes, and clarified the codes. Each category of respondents (mothers, maternity care providers, spiritual healers, etc.) had its own codebook, because the codes emerging from mother, spiritual healer, and caregiver interviews were different. Clustering codes into categories allowed me to assemble a small number of themes used in the 'discussion' and 'findings' category of the research (Creswell, 2009). I applied steps by Boyatzis (1998) and DeCuir-Gundy (2011) in reducing the raw information into categories or themes, coding by 'level of meaning' rather than by sentence or paragraph, then looked for the themes across interviews and across categories of respondents. Theme identification techniques included repetition or 'topics that occur and reoccur' (Ryan & Bernard, 2003). I re-read the interviews several times during the coding process. If I had questions about any aspect of the translated files, I wrote to the translator seeking her clarification from the original audio-file.

I used several methods to check qualitative validity of the coding and the meaning of the text (Creswell, 2009). I shared my biases and my background in maternal infant work in low-resource countries including Nepal in the introduction of the thesis. To ascertain accuracy of the meaning of the findings from the standpoint of Nepalese researchers and the people being interviewed, I used member-checking, by discussing initial findings with local nurses who had worked in the area for a long time. I also shared themes and descriptions from the mothers' interviews with community members and other researchers who were familiar with Nepalese childbirth in remote areas, used peer debriefing, and checked to see if they agreed with the findings. One of the most important methods to see if I had understood the data was checking with researchers who worked in remote areas establishing placements for a progressive medical school. I tried to use 'thick' description in providing detail on the settings and quotes from participants about the themes, and I facilitated this by spending 'prolonged time in the field' to develop a more profound understanding of the issues (Creswell, 2009).

I determined reliability of the approach through several means. I reviewed the interview transcripts and compared them to my field notes, making sure that there were no obvious transcription errors. I documented the steps of my research and analysis procedures in detail and through inter-rater reliability, the next step in prior-research-driven coding, looked for reliability in coding the text (Boyatzis, 1997; Gibbs, 2007). In order to determine reliability within the codes, I shared the codebook with descriptions of the codes with an experienced qualitative researcher familiar with the remote Nepal context and asked her to code certain sections of several interviews independently and compare her codes with mine. This technique is also referred to as intercoder agreement or cross-checking (Creswell, 2009). An empirical study of inter-rater reliability of code development demonstrated that researchers developed the same basic themes, but did not label them the same (Armstrong, 1997). Although she worded some codes differently, there were no situations where our coding was dissimilar. As in Armstrong et al., (1997), I expected the level of convergence of themes to be high for the basic codes or themes and to find some divergence in the interpretation of the 'story' of the data.

Although post-modernist researchers are not in agreement that their research needs to be 'checked' or the interpretation of the themes is consistent with what other researchers have said, some qualitative researchers argue that there is a place for consistency in descriptions of codes given by interviewers (Gibbs, 2007). They insist that demonstrating that the research codes could be reproduced by another researcher would give the reader reassurance that the data was interpreted consistently (May & Pope, 1995). In our study, I expect that Nepalese policy makers and researchers would think that reliability in coding was a necessary step, especially in light of the fact that there were few Nepalese qualitative studies on why mothers do not choose facilities for births.

Some of the data collected ran counter to findings from other researchers' previous research, and were included and explained, which made the inquiry more valid (Chilisa, 2012; Creswell, 2009). One example was the issue of 'bypassing rural birthing centers' to go to urban centers where both number and quality of birth attendants were increased (Karkee et al., 2013). In my research, I found by-passing the rural centers for a larger center only once.

I used the program NVIVO as my main tool for thematic analysis. Ryan and Bernard (2003) mention that when different discovery techniques are used with the same set of data, different sets of themes may be found, resulting in useful information. I did not use more than one discovery technique when analyzing my data.

I presented results of the emerging themes to colleagues at the two Nepalese partner-organizations. They provided some insights on interpretation of the emerging themes. This was part of integrated knowledge translation used in this research where the partners were involved in reviewing and commenting on the research questions, data collection and tools development (piloting the instruments, administering interviews, surveys and translation), interpreting the findings, and helping disseminate the research results.

Chapter 5.

Findings from Surveys and Interviews

This chapter describes findings from the two surveys, interviews and field notes. I first describe survey findings from the 'Skilled Birth Assessment' survey. I found that the skills of the midwifery workforce are largely incomplete, especially for those who trained more than four years prior. Next, I describe the findings from the WHO 'Service Availability and Readiness Assessment (SARA)'. Although the survey showed a reasonable amount of supplies and materials at the facility level, life-saving supplies and medications needed to manage emergencies were not present in most birthing facilities.

Finally, I describe the findings from the interviews with all levels of respondents. I group findings from all participant groups into categories and sub-categories according to the main themes of distance, cost, antenatal care, health system, and socio-cultural themes. Most of the mothers and female volunteers believed that facilities and birth attendants saved lives, by using appropriate procedures and medicines to stop bleeding, but shortages of human resources and materials were noted as concerns. Mothers disliked medicalized procedures in the hospital.

5.1. Skilled Birth Assessment Survey

Increasing the number of Skilled Birth Attendants (SBAs) is one intervention in the Nepal Ministry of Health's plans to achieve safer childbirth in both rural and urban areas. The government of Nepal had decided to upgrade the skills of all health personnel in permanent posts who attended childbirth in public facilities. Training periods were of different length, depending on whether they were obstetricians, family physicians, graduate doctors, nurses or auxiliary nurse-midwives (ANMs). The ANMs and nurses in the study attended two months of training, consisting of four weeks theory in the classroom, and four weeks practical where they used their newly acquired skills to attend deliveries. Physician and nurse trainers teach the course while experienced ANMs and staff nurses work alongside the trainees as they attend births.

In order to evaluate the success of this program in Solu, I surveyed nurses using the validated Skilled Birth Assessment (SBA) tool (2016). The SBAs surveyed were auxiliary nurse-midwives (ANMs) and staff nurses (n=12) working in government facilities in Solu. See the table below for ages of participants, work sites and years in current workplace.

Distance to referral facility is an important factor in considering skills of birthing attendants, since those farther from the referral hospital would not have the ability to consult with a physician or access surgical care. In remote areas, they might have to manage unexpected emergencies such as postpartum hemorrhage or newborn resuscitation alone or with one other nurse assisting. Those working in the hospital, compared to the PHCs or birthing centers, had a much higher volume of childbirth cases, both normal and abnormal, so might have more opportunities to practice skills that they learned during SBA training. Shown in Table 5.1. below, four nurses who worked in facilities with no road, had to assist women experiencing obstetric emergencies. They had to be carried between eight hours and several days or be evacuated by helicopter for hospital care. Two respondents worked two to three hours away by jeep from the referral hospital and two had some access to a road but referral took over five hours in a combination of carrying and jeep.

Table 5.1. SBA survey

Age	Number
Under 25 yrs.	2
25 to 30 yrs.	6
31 to 35 yrs.	1
36 to 40 yrs.	3
Position	Number
ANM	11
Staff nurse	1
Type of facility	Number
Hospital	4
PHC	3
Birthing center	5

Years in current workplace	Number
< 2yr	3
2 to 5 yrs.	5
6 to 10 yrs.	1
>10 yrs.	2
Years since SBA training	Number
<1 yr. to 3 yrs.	7
4 or more yrs.	5
Distance to referral hospital	Number
Works in referral hospital	4
2 to 3 hrs. by jeep	2
> 5 hours jeep and carrying	2
No road	4

We carried out skills and knowledge testing of all participants according to the updated Skilled Birth Attendant Assessment Survey (2016). With reference to the SBA Nurse Assessment written in 2016 by Nick Simon Institute (NSI) and Nepal Ministry of Health, we applied a grade of 85% correct in essential competencies as a reference point for 'very competent' because that is how the Nepal assessors applied the assessment grades. The main responsibility of skilled birth attendants at the ANM and staff nurse level is to attend normal deliveries, and be able to recognize when pregnancy, labour and delivery is no longer normal, and to manage complications until safe referral to a higher level of care is achieved. Refer to Table 5.2. for proportion of nurses scoring over 85% on critical skills. Although all skills tested were important, skills such as sterilizing equipment might be shared with others. Essential competencies included both appropriate management of normal deliveries and management of emergencies, until they were able to refer to a higher-level facility. We considered the essential competencies to be use of the partograph, normal delivery, vacuum, shock due to postpartum hemorrhage, resuscitation of the newborn and management of eclampsia, as well as the knowledge-testing questionnaire. Six participants were 'very competent' in use of partograph, and five achieved over 85% in the knowledge-testing questionnaire. In the area of normal delivery, the principal domain of our participants, two out of four hospital nurses scored as 'very competent' (over 85%); one out of three PHC participants and only one out of five birthing center participants scored over 85%. We

found only three were 'very competent' in assisted delivery using vacuum device, and only two were 'very competent' in management of shock due to postpartum hemorrhage, and newborn resuscitation.

In relation to being highly competent and the level of health care facility where they worked, we stratified the scores for essential competence by level of health care facility. We found that half of the participants from each level of facility were 'very competent' in use of the partograph. In knowledge testing, three out of five birthing center participants scored over 85% whereas only one out of four hospital nurses and one out of three PHC participants scored as 'very competent'.

Many participants explained that they did not utilize vacuum for assisted delivery often and some had never used it, although it was one of the skills taught in the SBA training and is a skill for management of basic obstetric emergency care. Half of hospital participants were very competent in vacuum delivery. Only one-third of PHC participants and none from birthing centers were very competent, although most facilities had functioning vacuum apparatus. The hospital's vacuum for assisted delivery was repaired while we were visiting. Overall only one-quarter of nurses had very good competency in vacuum.

The emergency skill with the lowest score was the management of eclampsia. Only one of the participants (a hospital participant) was very competent in management of eclampsia. Maternity care providers who live and work in PHCs or villages with birthing centers are supposed to refer mothers who are experiencing complications including high blood pressure, which might result in pre-eclampsia or eclampsia, to the district hospital. It is possible that in the hospital setting the most experienced nurses are called to assist when there is a complicated delivery or an emergency, therefore newer nurses do not have a chance to put their training into effect and use their emergency obstetrical skills. We observed this when a multiparous woman (who had three prior normal deliveries) arrived with a breech presentation when there was no physician present. The most experienced nurse attended her delivery, while teaching ANM students.

Most nurses scored low in essential skills of management of shock due to hemorrhage and newborn resuscitation, with only two nurses scoring over 85%. None of the hospital nurses were very competent in newborn resuscitation.

Table 5.2. Proportion of nurses scoring over 85% on essential competencies

Skill	Partograph n (%)	Knowledge test n (%)	Normal delivery n (%)	Vacuum n (%)	Shock n (%)	Newborn resuscitation n (%)	Eclampsia n (%)
Hospital nurses (n=4)	2 (66.7)*	1 (25.0)	2 (50.0)	2 (50.0)	1 (25.0)	0 (0)	1 (25.0)
PHC nurses (n=3)	2 (66.7)	1 (33.3)	1 (33.3)	1 (33.3)	1 (33.3)	1 (33.3)	0 (0)
Birth center nurses (n=5)	2 (40.0)	3 (60.0)	1 (20.0)	0 (0)	0 (0)	1 (20.0)	0 (0)
Total nurses (n=12)	6 (50.0)	5 (41.6)	4 (33.3)	3 (25.0)	2 (16.6)	2 (16.6)	1 (8.3)

Note: * One hospital nurse's partograph assessment was lost.

In the SBA Assessment performed by Ministry of Health and Nick Simon Institute (NSI), skills were assessed and stratified by time since training and level of facility. I stratified skill assessment findings in the same way. Refer to Table 5.3. for skill scores categorized by time since training. The group of participants who had taken SBA training within the last three years were more likely to be 'very competent' (over 85%) than those who had taken training more than four years prior. In general, recall of specific skills might have been lost for some of the respondents who took the training four or more years ago. On the other hand, nurses trained longer ago, and with a lot of experience might still rank higher than newly trained nurses. More participants recently trained were ranked as 'very competent' in partograph, knowledge test, and autoclaving. Participants who were recently trained and those trained four or more years ago had similar numbers of those scoring over 85% in decontamination, cleaning instruments, management of shock, kangaroo mother care, chlorine preparation and donning gloves. One nurse who

was trained four or more years ago scored as ‘very competent’ in management of eclampsia, a condition not seen often in the mountainous area of Nepal.

Table 5.3. Participants who were very competent (achieving 85% or more), stratified into years since sba training. (n=12)

Competencies	n	<1 to 3 yrs. n=7 n (%)	4 yrs. or over n=5 n (%)
Partograph	11*	5 (71.4)	1 (20.0)
Knowledge test	12	5 (71.4)	0 (0)
Normal delivery	12	3 (42.9)	1 (20.0)
Vacuum	12	2 (28.6)	1 (20.0)
Newborn resuscitation	12	1 (14.3)	1 (20.0)
Decontamination	12	6 (85.7)	4 (80.0)
Cleaning instruments	12	6 (85.7)	5 (100)
Eclampsia	12	0 (0)	1 (20.0)
Shock	12	1 (14.3)	1 (20.0)
Kangaroo mother	12	1 (25.0)	2 (40.0)
Chlorine preparation	12	5 (71.4)	4 (80.0)
Putting on gloves	12	6 (85.7)	4 (80.0)
Autoclaving	12	7 (100)	1 (20.0)
Total (n)	12	7	5

Note: *1 participant’s information missing on partograph

Each of the skills examined were scored and a mark out of 100 was given. The obstetrical management and emergency skills listed in the table below was stratified into those recently trained and those trained over four years ago with median and range of scores out of 100. Median is a measure that is less affected by small numbers as opposed to mode. I did not perform tests of significance because of the small numbers.

In a group of 1000 participants assessed in the Nepal SBA Nurses’ Skills Assessment, greater skill retention was found in groups trained recently and among younger participants. Among participants in our study, seven participants were trained within the last three years and five were trained four or more years ago. Refer to Table 5.4. for median, range and maximum scores since training. The written knowledge test median score was higher in the recently trained group as compared to the group trained

four or more years ago (88 out of 100 as compared to 76 out of 100), and in the vacuum skill test with a median of 68 out of 100 in the recently trained group as compared to 40 out of 100 in the group trained four or more years ago. Newborn resuscitation and management of eclampsia median scores were higher among participants trained four or more years ago (77.8 out of 100 and 73.3 out of 100, respectively) as compared to those trained recently (55.6 out of 100 and 60.0 out of 100, respectively). Median score for shock due to postpartum hemorrhage was higher for those having recent training (77.4 out of 100) as compared to 67.7 out of 100 for those trained four or more years ago.

Median scores were relatively closer in use of partograph with 80.4 out of 100 and 87.0 out of 100 for those trained four or more years ago, and those trained less than three years ago respectively. The minimum scores for both groups are quite low in some areas such as partograph, vacuum, management of eclampsia, shock and newborn resuscitation, showing a need for further refresher training and mentoring. Median low scores for vacuum, shock, resuscitation and eclampsia management also indicate that further updates and mentoring are required.

Table 5.4. Median and range of participants' scores (out of 100) and time since SBA training

Time since SBA training		Partograph	Know-ledge	Vacuum	Shock	Newborn resus-citation	Eclampsia
>4 yrs. n=5	median	80.4	76.0	40.0	67.7	77.8	73.3
	min	35.0	76.0	24.0	65.0	67.0	37.0
	max	91.0	84.0	92.0	94.0	89.0	97.0
<4 yrs. n=7	median	87.0	88.0	68.0	77.4	55.6	60.0
	min	61.0	84.0	32.0	45.0	39.0	23.0
	max	91.0	92.0	96.0	97.0	89.0	83.0

Nurses who work in busier facilities who have more birthing experiences to consolidate their skills after SBA training might be expected to score higher than those who work on less busy birthing centers. I stratified the median and range of scores for essential skills (except for normal birth which I discuss later) into level of facility. Refer to Table 5.5. below.

Table 5.5. Median and range of participants' scores (out of 100) by level of facility

Type of facility		Partograph	Knowledge	Vacuum	Shock	Newborn resuscitation	Eclampsia
Hospital	(n)	3*	4	4	4	4	4
	median	87.0	76.0	82.0	80.7	75.0	75.0
	minimum	83.0	76.0	24.0	68.0	67.0	70.0
	maximum	91.0	92.0	96.0	94.0	78.0	97.0
PHC	(n)	3	3	3	3	3	3
	median	86.9	84.0	64.0	80.7	66.7	36.7
	minimum	35.0	84.0	28.0	65.0	44.0	23.0
	maximum	91.0	92.0	92.0	97.0	89.0	83.0
Birthing center	(n)	5	5	5	5	5	5
	median	78.3	88.0	52.0	67.7	55.6	60.0
	minimum	61.0	76.0	32.0	45.0	39.0	50.0
	maximum	87.0	92.0	80.0	77.0	89.0	77.0

Note: * one hospital participant's partograph score is missing

I present the results of skills for attending normal delivery separately from the other skills (see Table 5.6.). It is the most common activity (after antenatal care) of skilled birth attendants at the level of ANM and staff nurse. The median score for all 12 SBAs was 79.0 out of 100 with a wide range of 60.0 to 90.0. The median, maximum and minimum scores presented below are stratified according to length of time since SBA training. Those who were trained recently had a median score of 82.3 out of 100 as compared to a median score of 75.8 for those with SBA training four or more years ago. For both recently trained and those trained four or more years ago, the minimum scores are quite low for attending a normal birth (60.0 out of 100 and 66.0 out of 100). One possible reason might be that although the assessment tool had been updated (November 2016) some participants had not been taught the expectations of the new tool such as positioning the newborn on the mother's chest, and delayed cord clamping.

Table 5.6. Median and range of normal birth competencies scores (out of 100) and time since SBA training

Time since training		
4 or more years n=5	median	75.8
	minimum	60.0
	maximum	90.0
<1 year to 3 years n=7	median	82.3
	minimum	66.0
	maximum	90.0

There might be some differences in competencies for attending normal birth if there are not many births in rural and remote PHCs and birthing centers. Therefore, I stratified median, minimum and maximum scores according to level of health care facility. Refer to Table 5.7. The median scores of hospital and PHC participants were the same (82.3 out of 100) while the median birthing center participant score was 77.4 out of 100. Minimum scores were under 70.0 out of 100 in all facilities for the commonly required skill of attending normal birth, while maximum scores were almost the same with 90.0 in hospital and PHCs and 87.0 in birthing centers.

Table 5.7. Median and range of normal birth competencies scores (out of 100) by type of facility

Type of facility		
Hospital n=4	median	82.3
	minimum	60.0
	maximum	90.0
PHC n=3	median	82.3
	minimum	68.0
	maximum	90.0
Birthing center n=5	median	77.4
	minimum	66.0
	maximum	87.0

Recently trained nurses and among those who performed skills more often (those in hospital and PHC) scored higher on skills. Minimum scores for attending normal childbirth, which they do most frequently, were quite low for nurses in all areas.

Most concerning are the low minimum and median scores attained for shock due to hemorrhage in PHC and birthing centers. There are no higher-level trained cadre at these facility levels, and the distance and time to transport a bleeding women is great. Hemorrhage is the greatest cause of maternal mortality in Nepal.

5.2. Service Availability and Readiness Assessment Survey

The Service Availability and Readiness Assessment (SARA) provided information on availability of human resources, infrastructure such as electricity, water, transportation for referrals, basic equipment, supplies and laboratory facilities. It also assesses the readiness to provide 24-hour newborn care, and basic and comprehensive emergency obstetrical care. The survey assessment I conducted provided information on the hospital, two primary health centers, and three birthing centers in Solu on a particular day when I visited.

Table 5.8. Human resources in Solu research sites

	Family doctor	Doctor	Staff nurse	ANM ¹	Nurses with SBA	Certified medical assistants	Assistant health workers
Hospital	1	5	2	4	5	N/A	N/A
Central PHC	0	2	0	3	2	1	2
Remote PHC	0	2	0	3	2	1	2
Village BC	0	0	0	1	1	1	1
Hilly BC	0	0	0	2	2	N/A	N/A
Mountain BC	0	0	0	2	1	2	2
Total	1	9	2	15	13	5	8

¹ANM: Auxiliary nurse-midwife

The human resources of maternity care facilities in Solu reflect a very low number of staff with Skilled Birth Attendant (SBA) training. There were no SBA trained physicians working in the hospital or in the district. The family doctor had undergone training to perform caesarean section, and through experience could handle some complex births. There were no SBA trained physicians in primary health care settings. At

the time we conducted the research, there were no physicians in Solu trained to perform comprehensive abortion care.

According to the District Health Office, each birthing center is meant to have at least one SBA trained auxiliary nurse-midwife on staff. Refer to Table 5.9. All birthing centers and primary health centers in the research sites had a least one SBA trained nurse and some had two, facilitating skilled attendance at birth if one nurse was away on leave or at a training session. Sometimes certified medical assistants attended childbirth when the SBA trained nurse was not at the facility. There was a nurse on-call to attend births and other maternity care cases during each shift in the hospital. At the other facilities, nurses attended births in addition to their other workload. In one of the primary health centers, two or three nurses attended births at night and on weekends as their accommodation was nearby. Another primary health center had just begun on-call shifts for night and weekends.

Table 5.9. Availability of care in Solu birthing sites

	Basic childbirth care 24 hours*	SBA trained person 24 hours	BEmONC available 24 hours	CEmONC available 24 hours
Hospital	Yes	Yes	Yes	Most of the time
Central PHC	Yes	No	No	No
Remote PHC	Yes	Yes	No	No
Village BC	Yes	Most of the time	No	No
Hilly BC	Yes	Most of the time	No	No
Mountain BC	No	No	No	No
Total 24-hour availability	5	2	1	0

*Basic childbirth care includes basic newborn care available 24 hours

Most facilities offered childbirth services 24 hours per day, but one facility was occasionally without 24-hour services. Basic services for newborn care were available at the same frequency as childbirth services, as the same person attended to both the mother and the newborn. No facilities had specialized newborn care services. We did

not find that there was an SBA trained person attending births all of the time except in the hospital and one primary health center, but two other sites had SBA trained persons attending most of the time.

Only the hospital provided Basic Emergency Obstetrical and Newborn Care (BEmONC) all of the time. The same hospital provided comprehensive emergency obstetrical and newborn care part of the time, with the additional capacity of caesarean section and blood transfusion. The neighbouring district had a mission hospital where women report having caesarean sections but we did not study that facility to ascertain whether BEmONC or CEmONC was available.

In order to be ready to provide safe maternity services, basic dependable infrastructure is needed. The 2015 earthquakes affected some of the research site facilities. The hospital, although functioning, was not able to provide the same facilities for birth as prior to the earthquake. A lack of 24-hour electricity and water was observed in most of the facilities. Functioning generator back up for electricity was not commonly available. One of the birthing centers did not have any running water at all. Water had to be brought by bucket from a nearby house. The water pipe had broken and was not repaired. At the same center, electricity was lacking most of the time as a small solar panel only provided light for three small bulbs in evening and night hours. Another birthing center had solar back-up supplied by an NGO. Refer to Table 5.10.

Comfort and privacy for mothers is a part of health system provision. Winters in Solu are quite cold, and only one facility had heaters for labouring and birthing mothers. There is a lack of privacy for labouring and giving birth at most facilities. The birthing centers and PHC's were constructed for a small number of deliveries. There were only two sites that had private toilets or taps/showers for mothers only. Even though the numbers of deliveries in the research sites were not high, there were times when two mothers would be labouring together or even giving birth to their babies at the same time.

Table 5.10. Basic amenities in Solu research sites

	Electricity 24 hrs.	Back-up generator	Water 24 hours	Heat	Privacy labour	Privacy birth	Toilet mothers only	Tap or shower
Hospital	Sometimes	Sometimes	No	Sometimes	Sometimes	Sometimes	No	Sometimes
Central PHC	Sometimes	Yes	No	No	Yes	Yes	No	No
Remote PHC	Sometimes	No	Yes	No	Sometimes	Sometimes	No	No
Village BC	Sometimes	No	No	No	Sometimes	Sometimes	Yes	No
Hilly BC	Yes	No	Yes	No	Sometimes	Sometimes	No	Yes
Mountain BC	Yes	Yes	Sometimes	No	Yes	Yes	Yes	Sometimes
Total 24	2	2	2	1	2	2	2	1

All facilities in Solu need to be able to refer mothers to higher levels of care. Birthing centers and primary health centers refer to the district hospital and the district hospital refers women with more difficult problems to a larger center, usually in Kathmandu. For greater ease of transfer, phone, apart from personal mobile phones, internet, and ambulances or jeeps with availability of fuel are needed. This part of Nepal was in the process of road building. I did not hear of anyone using motorbikes, or even cars, to transport women in labour. Where there are no roads, stretchers to carry the mother are an integral part of the transportation and referral network. Few facilities had the necessary infrastructure to initiate and carry out a transfer of care to a higher facility. One of the remote facilities had a prominently displayed poster with the phone numbers of helicopter operators to transport mothers requiring urgent care to Kathmandu. The other mode of transport was two days of being carried by stretcher, followed by a jeep ride.

Transport by jeep was only available sometimes in two of the three facilities connected to roads, and fuel was only provided for a fee. The other facility connected to a road did not have readily available transportation and fuel. Refer to Table 5.11.

When families carried or accompanied mothers to a birthing facility or hospital, they need a place to rest and prepare food. Many people are needed to carry a mother when the distance is more than an hour. There were no facilities for family members to rest and prepare food. In most research sites, small hotels and lodges were close by.

Table 5.11. Communication and transportation for referrals in Solu research sites

	Phone 24 hr.	Computer, internet	Stretcher	Emergency transport	Fuel availability	Space for family
Hospital	Sometimes	Sometimes	Yes	Sometimes	Yes, at cost	No
Central PHC	No	No	Yes	No	No	No
Remote PHC	Sometimes	No	Yes	Part way	No	No
Village BC	No	No	Yes	No	No	No
Hilly BC	No	No	Yes	No	No	No
Mountain BC	No	No	No	Sometimes	Yes, at cost	No
Total	0	0	5	0	2	0

A small amount of equipment and supplies are needed for antenatal care, and to attend labour and normal childbirth. For the most part, this equipment was present in all the facilities, and in good condition. Refer to Table 5.12. At one site (Mountain BC), basic equipment was shared with the adjoining health post.

Table 5.12. Basic equipment and supplies for ANC and monitoring labour

	BP and stetho scope	Adult scale	Thermometer	Light source (includes flashlight)	Fetoscope
Hospital	Yes	Yes	Yes	Yes	Yes
Central PHC	Yes	Yes	Yes	Yes	Yes
Remote PHC	Yes	Yes	Yes	Yes	Yes
Village BC	Yes	Yes	No	NA	Yes
Hilly BC	Yes	Yes	NA	Yes	Yes
Mountain BC	Sometimes	Sometimes	Sometimes	Sometimes	Yes
Total	5	5	3	4	6

5.2.1. Basic equipment and supplies availability

Almost all the sites had the basic equipment and supplies for attending normal birth. Refer to Table 5.13. All facilities had a functioning infant scale (not included in the survey, but noted in field notes). Some facilities did not have extra delivery sets and needed to sterilize them frequently. Sometimes unwashed delivery sets were seen on the wards. In one facility, nurses shared basic equipment with the health post, possibly making equipment such as BP equipment, thermometers not readily accessible. One facility did not have suture material within date at the time of the survey.

The important exception of materials for both normal and complex birth was the availability of partograph. The partograph is a necessary tool in low-resource countries for monitoring labour and assuring well-being of mother and baby. The modified WHO partograph as provided by the Ministry of Health in Nepal, has an alert line and an action line for progress of labour indicating when transfer of care to a higher level of facility should be carried out.

The provision of oxytocin is the most important medication and is used for all normal and abnormal births in facility-based birth in Nepal to prevent postpartum hemorrhage. All facilities had and used oxytocin routinely except for one birthing center that had out-of-date ampules. Supplies and medications that were usually available, but unavailable or expired at the time of the survey, may have been present on a different day.

Table 5.13. Basic supplies and equipment for normal birth attendance

	Delivery set	Vicryl or catgut	Suture set	Partograph	Bag and mask	Suction	Sterile gloves	Cleansing solution	Oxytocin
Hospital	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Central PHC	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Remote PHC	Yes	Yes	Yes	Yes	Yes	Sometimes	Yes	Yes	Yes
Village BC	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Hilly BC	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Mountain BC	Yes	Yes	Yes	No	Yes	Yes	Sometimes	Yes	No
Total	6	5	6	3	6	4	5	6	5

5.2.2. Basic emergency obstetric and neonatal care (BEmONC) supplies and medications

Appropriate supplies and medications to save lives are critical in both urban and rural birth facilities. Oxytocin is used for both prevention and treatment of postpartum hemorrhage, and therefore can be considered a medication for normal childbirth and emergency care. As previously mentioned, oxytocin was available and before expiry date in all but one facility. In one birthing center, dozens of ampules were found that had passed the expiry date by four months. Along with oxytocin, IV fluids (normal saline or Ringers Lactate) are needed along with size 18 or size 16 cannulas and IV lines. We found lack of adequate IV cannulas to treat a hemorrhage in three facilities and lack of adequate IV fluids in one facility. In one birthing center, only two small IV cannulas were present. The small size is inadequate to save the life of a mother who is bleeding, and facilities need more than two. No facilities had secondary medications for treatment of postpartum hemorrhage. Although the drug misoprostol does not require special storage for extreme temperature, and is often used for primary and secondary treatment of postpartum bleeding, it was not present in the research sites. Where childbirth is attended, oxygen may be needed for postpartum hemorrhage and shock, and some newborn resuscitation cases. Oxygen was available in one PHC only and sometimes available in the hospital. Nasal prongs for administering oxygen to newborns were in low

supply. Refer to Table 5.14. for availability of emergency supplies and equipment at sites.

Other medications and materials to treat causes of maternal mortality and morbidity were often lacking. We found magnesium sulphate to treat mothers with pre-eclampsia or eclampsia was missing in all facilities except the hospital. No facilities were supplied with calcium gluconate, the antidote for overdose from magnesium sulphate. Parenteral antibiotics are needed to treat infection before, during or after labour. Oral antibiotics are inadequate in severe cases. One birthing center sends the patient's family to a pharmacy in the village run by a health assistant. For pregnancy loss, when post-abortion care is needed with manual vacuum aspiration (MVA) or dilation and curettage (D&C), equipment was sometimes available in the hospital but in no other site. Vacuum for assisted vaginal delivery may be required for dystocia of the second stage of labour or for when the fetal heart is abnormal in second stage of labour. Vacuum was available in all sites except for two birthing centers.

Every facility had a bag and mask for resuscitation of the newborn. All facilities had slightly larger resuscitation masks than are recommended, using a size '2' instead of a size '1'. However, resuscitation of the newborn could be carried out with existing equipment. We did not see size '0' required for resuscitation of a preterm infant. All facilities had shortages of equipment such as suction tubes or extra bulb syringes for newborns. Suctioning newborns may be needed for cases where meconium is present in the airways of a newborn, prior to resuscitation with bag and mask. These supplies and materials were not used often, but when needed, they are important for optimum resuscitation of the newborn.

Table 5.14. Availability of basic emergency obstetrical and neonatal supplies, equipment and medications

	Bag and mask	Oxytocic	Oxygen	IV cannulas and fluids	Magnesium sulphate	Calcium gluconate	Parenteral antibiotics	MVA or D and C equipment	Urinary catheter	Vacuum for assisted delivery
Hospital	Yes	Yes	Some times	Yes	Yes	No	Yes	Some times	Yes	Yes
Central PHC	Yes	Yes	Yes	Shortage	Yes	No	Yes	No	NA	Yes
Remote PHC	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes
Village BC	Yes	Yes	No	No	Yes	No	NA	No	Yes	Yes
Hilly BC	Yes	Yes	No	Yes	Yes	No	Yes	No	NA	No
Mountain BC	Yes	No	No	No	Yes	No	Some times	No	NA	No
Total	6	5	1	4	6	4	4	0	3	4

'Standard precautions' are usual methods to protect both patients and staff from infections due to contaminants. Refer to Table 5.15. Some facilities had more provisions for safe storage and final disposal of both medical waste and sharps. All had boxes to store sharps to avoid needle prick hazards. All facilities had soap and water or alcohol hand rub to clean hands. All had gloves. None had guidelines on standard precautions. None had prophylactic HIV medications available in case of blood and body fluid exposures, and only the hospital had availability of HIV testing.

Table 5.15. Standard precautions and safe disposal of waste

	Safe sharps disposal	Safe waste disposal	Storage of sharps	Storage infectious wastes	Chlorine	Soap-water or alcohol gel	Instrument sterilization
Hospital	Yes	Yes	Yes	No	Yes	Yes	Yes
Central PHC	Yes	No	Yes	No	Yes	Yes	Yes
Remote PHC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village BC	No	No	Yes	No	Yes	Yes	Yes
Hilly BC	Yes	Yes	Yes	Yes	No	Yes	Yes
Mountain BC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Total	5	4	6	4	6	6	6

Medications for emergency obstetrical use (oxytocin, IV fluids, parenteral antibiotics) have been discussed above. Basic medications for maternity services (other than emergencies) include medications such as iron tablets to prevent/treat anemia and tetanus toxoid vaccine given during the antenatal period for prevention of neonatal tetanus, as well as medications for the newborn. Refer to Table 5.16. All sites had iron combined with folic acid, and most had tetanus toxoid vaccine. Tetanus vaccine was combined with diphtheria vaccine (TD), as this was the only presentation available. No level of facility had vitamin K or antibiotic eye prophylaxis for newborns nor was it a protocol for this district.

Table 5.16. Basic medications

	Iron and folic acid	Tetanus toxoid vaccine	Vitamin K eye ointment
Hospital	Yes	Yes	No
Central PHC	Yes	Sometimes	No
Remote PHC	Yes	Yes	No
Village BC	Yes	Yes	No
Hilly BC	Yes	Yes	No
Mountain BC	Yes	Yes	No
Total	6	5	0

Laboratory testing is an integral part of health system maternity care. Basic laboratory tests to be carried out in pregnancy include pregnancy tests, hemoglobin, urine dipstick or urinalysis, syphilis, blood glucose and blood group and screen. Birthing centers do not have any laboratory testing capacity. The primary health centers are meant to have basic tests but sometimes reagents are missing or machines for analysis were damaged. Refer to Table 5.17. to see availability of laboratory tests. No center had regular access to urinalysis at the time of the study. Other than urinalysis, basic laboratory tests were available in the hospital, sometimes available in one of the primary health centers and available in the other primary health center. Case-based testing may include liver function tests, which were available at hospital only.

Table 5.17. Basic laboratory tests

	Hemoglobin	Blood glucose	Urine dipstick	HIV testing	Syphilis test	Urinalysis	Blood group and screen	Pregnancy test
Hospital	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Central PHC	Some times	Some times	Some times	No	Some times	Some times	Some times	Yes
Remote PHC	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Village BC	No	No	No	No	No	No	No	No
Hilly BC	No	No	No	No	No	No	No	No
Mountain BC	No	No	No	No	No	No	No	No
Total	2	2	2	1	2	0	2	3

Human rights and respectful birthing practices have become very important globally in the past few years. These practices emphasize choices for women, the right to know about their health, the right to be accompanied and not left alone during birth, the right to privacy, the right to be treated kindly in labour and the right to refuse medical procedures. Both verbal and physical abuse are included in abuse of rights during childbirth. 'Respectful Care at Birth' has gained momentum and importance through the White Ribbon Campaign's web-based materials to promote respect for childbearing women (White Ribbon Campaign, 2011). I added questions regarding parturient

women's choices to my WHO facility survey because I wanted to know if the facilities were ready to provide quality of care with choices for women. Refer to Table 5.18. More recently, the World Health Organization introduced new evidence-based recommendations for intrapartum care with the first recommendation being respectful maternity care including dignified care, privacy and confidentiality, a companion of their choice and ability to choose comfortable positions for labour and delivery (WHO, 2018, p. 3). Results of our survey showed that only one-third of facilities always permitted a companion during delivery; although during labour women were allowed one or more family members to accompany them. Some women spoke about their shame in being viewed during vaginal examinations by male health care workers with no provision for their privacy. Some facilities did not permit freedom of movement in labour, and none acknowledged choice of birthing position for mothers, even when an adequate bed was available. If there was more than one mother in the labour and birthing area, it was difficult to maintain privacy, as separate rooms were unavailable and privacy screens were not utilized.

Table 5.18. Caring and respectful childbirth

	Companion in labour	Companion at birth	Choice labour position	Choice delivery position	Privacy maintained
Hospital	Yes	No	No	No	Sometimes
Central PHC	Yes	No	Yes	No	Sometimes
Remote PHC	Yes	Yes	Yes	No	Sometimes
Village BC	Yes	Sometimes	Yes	No	Sometimes
Hilly BC	Yes	NA	Yes	No	Sometimes
Mountain BC	Yes	Yes	No	No	Sometimes
Total	6	2	4	0	0

Being ready to save lives at birth involves having the capacity to perform life-saving actions and the equipment, supplies and medication to support the actions. Refer to Table 5.19. to see ability and readiness of the facilities to perform emergency care. The procedure of giving an oxytocic medication, usually injectable oxytocin, is recommended by all global agencies to prevent postpartum hemorrhage. This procedure is the Active Management of the Third Stage of Labour (AMTSL). Most or all health care workers who attend births in Nepal are trained in this procedure. One birthing center

provided this service only ‘sometimes’ as the supply of oxytocin was expired. All other facilities used AMTSL with every birth. The life-saving procedures of manual removal of the placenta and removal of placental fragments were less commonly performed. Removal of placenta is taught in ‘Skilled Birth Attendant’ courses to all levels of nurses and physicians, but practice and mentoring is needed. When an experienced SBA was present, the procedure could be done. Sometimes mothers bleed excessively due to placental fragments or ‘products of conception’ left inside the uterus after abortion or childbirth. Removing products of conception was less commonly performed as it is a more difficult skill. Products of conception were removed only sometimes in one PHC and the hospital (presumably when the SBA trained doctor was present). Using vacuum extraction for assisted delivery was carried out in only the hospital and sometimes in one PHC. Caesarean section was performed sometimes in the hospital, when the doctor trained for caesarean section was present. Blood transfusion was also performed sometimes at the hospital and at one remote PHC, even though it is usually a function of comprehensive emergency obstetric and newborn care (CEmONC) facility.

Table 5.19. Provision of life saving actions and procedures

	AMTSL*	Manual removal of placenta	Manual removal of retained products	Assisted delivery vacuum	Caesarean section	Blood transfusion
Hospital	Yes	Yes	Sometimes	Yes	Sometimes	Sometimes
Central PHC	Yes	Sometimes	Sometimes	No	No	No
Remote PHC	Yes	Yes	No	Sometimes	No	Sometimes
Village BC	Yes	Sometimes	No	No	No	No
Hilly BC	Yes	Yes	No	No	No	No
Mountain BC	Sometimes	Sometimes	No	No	No	No
Total	5	3	0	1	0	0

*AMTSL: Active Management of the Third Stage of Labour (with uterotonic to prevent postpartum hemorrhage)

In summary, the surveys showed deficits in both human resource skills and enabling factors. The survey assessing competencies of skilled birth attendants was

administered to 12 nurses working in three levels of facilities. Assessments were carried out through a written knowledge test and through simulated skill testing with a mannequin. In general, those trained recently scored higher compared to those trained four or more years ago. Nurses scored higher in knowledge than midwifery skills, except for those working in the hospital where they had more births. Most nurses did not score as 'very competent' in essential midwifery emergency skills required to care for birthing mothers and newborns. Emergency skills including management of eclampsia and obstetrical shock scored low. The WHO SARA survey demonstrated missing infrastructure for safe care. This included a lack of 24 hour availability of water and electricity, referral capabilities and private spaces for labouring women. While supplies and equipment were generally available, adequate life-saving materials for postpartum hemorrhage, and capabilities to perform life-saving procedures were absent in some facilities.

5.3. Interviews

This section focuses on the findings from the interviews with all categories of respondents. I included information from extensive field notes and observations, enabling me to learn more about the environment, the women whom I interviewed and the community homes where I stayed. I learned firsthand about distance, the food insecurity, and the health workers and shamans who are an integral part of communities.

The interviews with mothers and female community health volunteers (FCHV) as well as some maternity care workers illuminated problems occurring in the misalignment between the government's initiative to move to institutional delivery in all cases despite challenging terrain and women's cultural safety concerns.

5.3.1. Distance

Distance was the most commonly discussed theme by all groups of respondents. Distance affected the ability to provide health education and to communicate with mothers, the ability to travel to a health facility for childbirth, or to access medical assistance when problems occur. Many mothers described 'labour at night' as a reason

that they were unable to come to the health facility. The difficulties of uneven and steep trails made treacherous at night, or finding people to carry at night or not wanting to bother people at night all played a role. Mobile and landline phones were often out of order.

I had pain. But the way to hospital was not easy, it was dark already and did not want to inconvenience others... I need to be carried with 4 person on stretcher. It's a small trail. [If no stretcher available] then carried on a doko [basket supported by trump-line from forehead of carrier]. If it is strong men then 4-5 people is needed. Carrying to PHC takes less than an hour (Mother Interview #22).

Although this mother's trip to the facility would have been less than an hour by being carried, sometimes mothers needed to travel first to the district hospital and then to the neighbouring district which was up to three and a half days of carrying. Even when there were stretchers, there was a lack of people to carry. This resulted from their husbands, family members and neighbours having left the country to work for wages. In this study area most of those who were engaged in international labour were men who travelled to the Middle East, Korea, and Malaysia. We were in several homes where there were no men who would be able to carry the labouring women. In one instance the mother told me that her parents-in-law said that they did not have money to pay people to carry her but that female relatives and neighbours had offered to carry her if her life was in danger after attempting to deliver at home.

One respondent mentioned that about 10 to 15 mothers per year have to be carried from rural birthing centers to the hospital by stretcher. This estimate did not include the number of mothers who were carried from their village homes to local birthing centers. Transferring a mother to Kathmandu by plane was impossible many days both during rainy seasons and dusty spring seasons due to poor visibility.

The delays in reaching emergency care sometimes resulted in maternal death. During my research period several mothers died. One mother was brought in to hospital who could not be managed due to lack of operating theatre personnel. She needed referral to a higher center and subsequently died on the second day of being treated in the hospital. Three other mothers died of postpartum hemorrhage due to lack of skilled care at birth in their remote communities where they delivered. Two mothers died at their

homes. A third Mother died en route while being carried by stretcher, an entire day's journey to hospital.

Community volunteers called Female Community Health Volunteers (FCHV), trained by the local Ministry of Health to be a community liaison for maternal and child care, were meant to visit each pregnant woman. A FCHV in a remote area, told us that she was unable to go to mothers' homes and see if they were pregnant to advise the mothers about maternity care initiatives.

Sometimes I meet mothers. It is not possible to visit every home. Our ward is spread wide, and there are about 100 homes (FCHV Interview #27).

The hospital and the maternal waiting home were damaged by the earthquake. The difficulty of not having a maternal waiting home and long distance to care increased the possibility of delivering alone en route or without an SBA, according to one nurse. In health posts without a birthing center, there were no SBAs, no delivery sets or basic life-saving medication or supplies.

While visiting a remote facility, we observed a first-time mother in the very early stage of labour, waiting for active labour to commence. From one area, nurses told us that some mothers came to stay nearby and waited in either guesthouses or with family members until labour came, but most mothers did not report travelling ahead of time. One maternity care worker described attending a birth in a vehicle on a village road when the woman was sent back from the facility without obvious signs of labour.

We have found that mothers who have gone to {...} hospital with the intention of delivering have been sent back without proper care, who unfortunately have gone into labour or delivered on the way back. When this happens, it is difficult to manage them because we have no preparation since home delivery is not allowed anymore and we don't have a birthing center. (Maternity Care Worker Interview #1)

5.3.2. Cost of receiving skilled care at birth

Related to distance, cost was a large barrier to having a facility birth for most families who did not live near the health facility. In an environment with few roads and vehicles, even living an hour away by foot was a challenge to reach the facility while in

labour. As discussed in the previous section, in most of the accounts, women were carried to the facility, or had to pay for a vehicle if they lived adjacent to a road. When they travelled to reach a facility, they had to pay for food and accommodation of those who carried or accompanied them. Most people were worried about incurring large costs but a few said that they had saved money for childbirth costs. Although some families grew sufficient crops to sustain their family, they did not have money available.

Community action was strong in some communities in Nepal. Mothers joined together to save money for family needs or to ameliorate conditions in their community. Some mothers' groups in our study assisted financially to help mothers with travel expenses for a facility birth. They charged a high rate of interest to all except the very poor who had one month interest free.

It is not free [to borrow money from the mothers' group]. If the family is very poor we lend them money for a month without taking interest. If the family is a bit capable, then we take 10% interest for 8000 to 10,000 NR." (FCHV Interview #63)

All birthing facilities in the study area were under the government's Aama Program enacted in 2009 to reduce costs to birthing families. The Program provides free childbirth services and paying transportation allowances, thus increasing access to care. The exception was a report from one mother that she paid 50 NR (50 cents US) per day for a bed fee at the mission hospital.

For the mountain district of Solu, women were given 1500 NR to help with travel costs and 400 NR for four antenatal visits if they had a facility-based birth. Lower amounts (1000 NR and 500 NR respectively) were provided to mothers who lived in hilly and plains areas of Nepal. This program was developed based on a previous program, the Safe Delivery Incentive Program (SDIP). The facility was also given 1000 NR for attending the birth. Money provided by the Aama Program to the facility could be used as an incentive for staff for attending the birth especially at night, or to purchase supplies such as intravenous cannulas to replace the ones used at the preceding births. We discovered that birth was categorized as a facility-based birth if the mother arrived at any stage of labour. For example, if the woman arrived for a retained placenta, she was also listed as having had a facility birth, and received transportation money. One facility

posted the names of mothers and amount received on the wall to show transparency in distribution of funds.

Among our respondents, a few mothers and FCHVs maintained that cost was not a barrier to achieving a facility-based birth. Some mentioned that the 1900 NR provided for facility birth was a welcome incentive and was one of the 'good things' about facility-based birth. However, most mothers who stayed at home for birth, or who had not planned to travel far and were referred to a higher level of facility, commented on costs of travel. Of those who had home births, many discussed lack of funds as a problem. Some mothers did not have the cash to pay for travel upfront, as the Aama Program reimbursed the money to mothers after the birth or at later dates. Many said that the total incentive of 1900 NR was inadequate to reach a facility for birth from most remote communities. Although we learned that many male members of the communities were out of country working, this did not appear to translate into having more cash on hand for transportation to a birthing facility. This might have been related to the preference for homebirth, and the idea that birth was not an event that required medical intervention, so money was not saved for hospital transport.

The cost of paying a nurse or doctor to come to the home was less than the cost to travel to a facility, but skilled birth attendants who were able or willing to travel were few, and sometimes the problem might have been beyond their ability. Three mothers said that a health worker had attended them at home. One of these had a husband who was a certified medical assistant in a private clinic. The other two paid a small fee for a nurse to come to the home to help them and they also paid the nurse for medications. Although previously, being attended by an SBA at home or in facility had been part of the Aama Program, the use of SBAs at home births was later discouraged. The government paid the 1500 NR in mountainous areas only for facility-based births.

There were cases of birth-related costs that were extremely high. We spoke to a teacher and his wife in a simple guesthouse in a remote area where we ate the traditional evening meal of 'dal bhat' together on long wooden tables. Both he and his wife worked (his wife was a tailor), and had been saving money to pay for a facility birth. They had planned to travel to the PHC a half day away. He told us about their family

experience of being referred to a higher level of care. The teacher, who was from the lowest Hindu caste, explained that his daughter's birth cost 75000 NR (approximately 750 USD). This is more than he would have made in several months work as a teacher. He told us that the local facility provided an extra 1000 NR to him and his family to assist them in their journey.

The following morning, we interviewed the mother about her birthing experience, and discovered how she tried her best to minimize costs by trying to deliver locally, and by walking home four days after childbirth, rather than being carried. Her family spent the largest amount of all respondents who travelled by land to reach the local hospital, but appreciated being able to go there as a life-saving measure.

I had bleeding a month before the due date. So, we called a local certified medical assistant who advised us to go to [...] PHC. We did not have transport facility. So, we waited [the] whole night and they carried me by stretcher to [...] PHC. From there they referred us to the hospital. Then I was carried on stretcher and [arriving at the road] we reserved a jeep to hospital. It took 3 hours to reach PHC and three days to reach hospital... 16-17 people carried me to the hospital. I stayed only one day in hospital post-delivery. Then we stayed in a hotel for a couple of days... Though it was difficult to reach the health facility we went there to save our life so it was ok." (Mother Interview #44)

Mothers and most other family members have very busy farm work schedules where all of the work is done by hand, so a journey to a distant health facility is very time consuming. Many times, mothers said that they could not have gone alone, nor could they have been away from farm and household work, as money would have been lost indirectly.

Helicopters were sometimes used to transport mothers living remotely, with life-threatening problems to government health facilities with surgical capacity. The cost to families was up to 1800 USD for transfer to Kathmandu from very remote areas of Solu. In a recent change of policy in spring of 2016 the government commenced payment for helicopter costs when a physician approved an urgent transfer to a government hospital. This came after two mothers died when they were not able to be transferred out from the PHC due to financial reasons. In these cases, the health care staff had recognized the need for surgical intervention and a higher level of care. When a family had to use a

helicopter for transport for lifesaving surgery, the community, including the District Health Officer and local NGOs, sometimes contributed. We became aware of two mothers who were recently transported to hospitals for urgent assistance. In one case, they had not followed government protocol for transferring a patient to a government facility (they went to a private facility) and therefore no part of the helicopter fee was returned to them.

One mother in a remote health center explained that mothers were sent to a referral facility several days away in the case of post-dates (41 weeks and over according to these facilities). Some mothers had been advised about their estimated due date but estimates were often incorrect. Many women had mid-trimester instead of early ultrasounds which would have provided more trustworthy estimations. Some mothers were unable to attend the ultrasound facilities available in the PHC and district hospital. We were told that local staff did not attend the mothers with post-dated pregnancies if they refused to go. If they decided to travel, there was a risk of birthing on the way, and the risk of travel might have been higher than the risk of having a post-term newborn (over 42 weeks). We did not confirm this policy with health care workers, but we spoke with one maternity care worker who attended a mother at home when she was unable to travel to a higher level of care. A nurse described her intention to help when the family could not afford to travel to get the care they need.

... There is an obligation to go when I am called because they are not in a position to take the mother to other health facility. Richer people can charter a helicopter but not poor people. So, when I go, whole villagers will have gathered around the mother with the problem. (Maternity Care Worker Interview #21)

Although the idea of planning for potential problems at birth was uncommon, many mothers said that they had thought about going to the health facility. They waited to see how things went before they sought help to be carried to the facility. Many had not saved money and were not in a position to borrow money either.

[My in-laws] advised me to go to health facility. However, they also told me that they could not afford to carry me to the health facility because they did not have money. I already had loans and my husband was not sending money at that particular time. But I delivered at home while we were planning to go to the facility if I had problems. (Mother Interview #48).

5.3.3. Antenatal care and creating awareness for facility childbirth

We observed a number of antenatal visits, during different days and months and in two separate facilities. Women often met nurse-midwives for the first time during these visits and might have decided about place of birth based on treatment received and perceived benefits of the facility. In Nepal, most rural women do not attend the recommended number of visits, and may not receive the care recommended by both country protocols and WHO (WHO, 2016a). Although antenatal care numbers are increasing, quality of care may not be improving. A significant portion of the antenatal visit is based on the ultrasound scan for which they must wait in line. We did not observe nurses providing health education on birth preparedness planning or other education. In order to attend to the large numbers of women who come to ANC on any given day, they are attended in a structured way. Both the number of nurses and the time available for ANC visits was quite limited.

During the first visit, women received an ANC card and then went to obtain laboratory testing (at the hospital site). They waited in line to be registered, weight and blood pressure were taken, and an abdominal palpation was done as required by weeks of gestation. If the routine schedule required deworming, they were given that medication and most women were given iron tablets. If an ultrasound was scheduled for that visit, they waited in line for the specialized nurse to perform the scan. They received some health information especially regarding the recommendation to deliver in a facility. They then received instructions on when to return or when to expect their baby from the expected due date obtained from their ultrasound. In this district, SBAs were very concerned that women should deliver within one week of the expected due date. Sometimes a family member or the husband was present for the visits.

Both physicians and nurse-midwives commented on the 'lack of awareness' of mothers regarding pregnancy and birth recommendations. One physician said that when mothers delivered successfully at home for their first birth they were not aware that complications were possible for their subsequent deliveries. We also found that once women delivered in a health facility, they did not always do so in subsequent births.

People are not aware especially when they have already given birth for the second babies or the third babies ... when the first baby is delivered at home they're confident maybe that they can deliver the second baby at home. Sometimes they have difficulties in that case. (Doctor Interview #1)

Nurse-midwives' attitudes differed from the physicians. Most nurses did not think it was the mother's conscious decision to miss the recommended ANC visits and facility birth. Nurses discussed the lack of time for health education on the part of both health care workers and on mothers who had heavy workloads at home. Nurses explained that some mothers could not afford to leave their duties to travel even for a day for antenatal check-up. One nurse used Solu's monthly growth monitoring and nutritional program to contact mothers and families and to provide health education about birth. She mentioned that through encounters with mothers around 'super cereal' they increased awareness of other services for parturient women and their infants.

Through conversations with women describing their first birth, many spoke of a lack of knowledge about the childbirth process. Neither mothers-in-law, nor maternity care nurses, nor FCHVs taught young parturient women about labour and birth processes. Sometimes women were unaware of signs of labour until it was too late to go to the health facility, even if that was planned.

It was raining, cold and I was washing clothes. Therefore, I thought it was probably because of cold I was not feeling well. I felt I had fever, thus I slept. My mother-in-law (Aunt-in-law) cooked dinner and called me. I was feeling better, so I got up and ate dinner. Whole night I had pain, I still did not suspect labour pain. I told my husband too, he helped massage my abdomen. In the morning 5:30 am, I felt like pooping. Then I suspected I was in labour because I had heard from mothers that you will want to poop if in labour. By that time, I was sure I was in labour. My husband called the women in the neighborhood. He was arranging people to carry me to the health facility. However, I gave birth in the bed at home attended by the women from the neighborhood. (Mother Interview #53)

As explained earlier, 'birth planning preparedness' is a term to describe a series of preparations prior to childbirth in order to plan for a normal birth and prepare for a transfer to a higher level of care, if needed. Nurses are meant to provide this teaching during antenatal visits. In Solu, nurses usually told the mother her due date according to her last menstrual period and an ultrasound done during an antenatal visit so that she could be prepared to move nearer the facility if she lived far away. We did not see

evidence of thorough birth planning discussion during several days of observing antenatal visits, nor did women tell us that they had much instruction on preparation for birth. Some nurses assured us that they counseled the mothers about boiling the blade for cutting the cord in case of home delivery, but mothers did not tell us that nurses prepared them for home birth.

All Nepalese women in rural areas were encouraged to speak to FCHVs regarding their pregnancies. Mothers were encouraged to give birth in a health facility in order to have a skilled birth attendant present. There were only two occasions where a mother commented that a FCHV did not urge all mothers to birth in facilities. The FCHV recommended facility birth only for the women who had large fetuses. The other case was when we visited one FCHV in her home and stayed overnight. She told us that she had not given birth in a health facility, an hour and a half distance by foot. She explained that it was usual practice for women in her community to deliver at home. This surprised us since her own mother had died while giving birth to her. She also told us that she was unable to visit and counsel the women in her area, since houses were scattered over many kilometers of steep hills. She was the only worker in her home who was not elderly, and her husband was working out of country. When speaking to government health officials, they maintain that the FCHVs visit all pregnant women in their community.

We found that making some preparations for unexpected events at birth had increased in the last few years compared to a decade or so prior. Mothers who had given birth several years earlier in remote areas where there were no birth facilities had not planned for problems at all. Actions to save their lives in case of serious problems would have included being carried for three or four days to the district hospital. Some mothers appeared not to have made plans prior to the due date. One mother mentioned that because the baby had come earlier than expected, they had not made any plans.

Nothing was planned. I gave birth to my son around 21 days prior to EDD. My daughter also was born before EDD (Mother Interview #53).

There were two respondents (key informants, women's health leaders) who maintained that families who were of local ethnic groups (Rai, Sherpa, Tamang) were run by women so they could decide what to do and save the money themselves,

whereas in Hindu caste groups, men controlled the money so women could not be involved in decision-making and birth planning preparedness. Although we did not ask women about their ethnicity group, some women mentioned it, or we knew their group from their names. Within our small sample, we did not readily find any association regarding evidence of saving money for birth and ethnic group.

There were no apparent preparations for antenatal foods or any special food during labour. Some prepared clothing for themselves and fewer prepared soft cloths for the newborn. Mothers in the study sites did not wish to purchase new clothes for the newborn before the birth. This appeared to be a longstanding cultural practice in this area. The health system had gifted mothers and their newborn babies who delivered in facilities a set of warm clothes called 'nan jola'. Most mothers appreciated this incentive for facility delivery.

Some mothers who had made no plans for the first childbirth and had difficulties in delivering, prepared for delivering in a facility for the subsequent childbirth. The woman speaking below had to be carried to the hospital due to a retained placenta in her first birth.

I had prepared clothes... food such as ghee, honey, eggs. Also arranged a companion to go hospital with me... I was already staying around hospital area. I had intended to arrive in the hospital area a week before the EDD. (Mother Interview #20)

Some women did not discuss with any family member the process or plans for childbirth until they were in labour for a substantial time and having difficulties. For the Nepalese women in our research sites having a 'hard time' or becoming 'serious' meant a prolonged labour, or very strong contractions without giving birth. As well as the length of time and the strong contractions, they worried that the fetus was not lying in a good position. Some of the mothers who were planning to deliver at home as long as the labour progressed well (that usually meant delivery in less than a day) had prepared something to cut the cord and some thread.

I had bought shaving blades and thread to cut and tie the cord. I bought them at local shops. We have the tradition of cutting the cord while keeping it on a coin. I had prepared it too. (Mother Interview #6)

Without systematic birth planning for travel to birthing facilities prior to labour, many mothers found themselves in labour at home during nighttime or after many hours of difficult labour. Their families then had to make arrangements for transporting them to facilities, sometimes days away, by carrying.

5.3.4. Health facilities saving lives

Mothers and FCHV appreciated the hospital for its lifesaving capacity but there were also concerns of lack of care, lack of medications, and lack of personal warmth by nurses and treatments. In Solu, the government facilities may be better than in some other areas due to the assistance from two NGOs. One is international, and one is a national NGO, but both work to improve the availability of medications and supplies, and ultrasound examinations by trained nurses. Together they work to assure that one specialized family doctor, capable of providing caesarean section, works at the district hospital. In my years of working in rural Nepal, I found facilities in this area to be better equipped than other areas with similar types of health facilities. However, as I discussed in the survey findings, some facilities lacked adequate infrastructure and materials to support maternity services. The 2015 earthquakes affected the hospital infrastructure. I was surprised that not many families or maternity care workers discussed disturbance of services as a result of the earthquake.

Safety in hospital for complications was commonly discussed. All maternity staff and most mothers, family members, and female community health volunteers appreciated the health facility care for their ability to reduce and deal with complications, and therefore save lives. The most common benefit cited through facility birth and the use of skilled birth attendants was the prevention of excess bleeding and retained placenta.

One mother was referred from one facility to another for a caesarean delivery due to a breech presentation in labour. Although fearful of hospital procedures, she believed that her life was saved in hospital.

If I was home I might have to give birth to a baby in difficult position. But I could deliver safely at hospital... I was also afraid in the hospital because they had to put IV saline in both of my arms, and place a urine catheter.

However, if I was home I might have died in childbirth. (Mother Interview #8)

Neither mothers nor community members made complaints or comments about lack of proficiency in life-saving skills. Several mothers and community members specifically mentioned doctors as the ones who could save mothers' lives, even though all but one of the trained maternity care providers in the research area were nurses. When doctors were untrained in the area of childbirth complications, mothers said that they felt more confident with the doctor present. Only one doctor, however, did not think that care at the remote birthing centers was adequate.

At the local level ...they are not being able to manage any emergency services like postpartum bleeding and other emergencies and they have to refer to District Hospital or to Kathmandu and in the middle of that maternal deaths occurs (Doctor Interview #2).

Nurses counselled and referred high-risk mothers to a hospital with surgical capacity. When referred to a higher level of care, most mothers and families chose the location where they had family members, or the closest location. There were only two cases of bypassing the local clinics for larger urban hospitals among women who were not referred for complications. We heard that some mothers who felt they were safely attended in health facilities would choose that health facility again.

They told me that I was small and might have complication of too much bleeding. So, for safer delivery I went to Mission Hospital. They had a mothers' center for high risk there and good monitoring. Where I will be living determines the hospital I would go to. But if I was here in [village], I would go to [Mission Hospital] instead of PHC (Mother Interview #28)

One mother had a partial uterine prolapse, and measured very small for dates. The nurse recommended that she travel to a surgical facility for birth. Attending an antenatal visit at a facility in Kathmandu, the doctor told her she must agree to be admitted to hospital immediately, or not return for delivery. Not being able to afford this, and not aware of the public facilities, it understandably discouraged the mother and family from seeking a hospital birth.

I was not feeling well doing daily activities. I thought I will not be able to [give birth] with that condition in the village. I thought I might die there... the nurses told me that the uterus had fallen down and they could not manage that in that birthing center. They counselled me well about that... [But now

after the ANC visit at the private hospital] I will never go there again, even if I die. That is how I felt (Mother Interview #66)

When mothers were referred to Kathmandu because they were high risk but could not afford the trip they often stayed at home and did not receive care from an SBA in any birthing center. Risk factors for referral stated by FCHVs included being older age at first pregnancy (over 30 years), any pregnancy over 40 years, and being 'weak'. If the mother successfully delivered at home without any complications, it undermined other community members' trust in the decision-making of the nurses or doctors referring her. Our interviews suggested that when mothers shared stories about perceived unnecessary referrals, the community members began to believe that the birthing center was incapable of attending births and lost confidence in the facility.

Mothers agreed that birth was safer in hospital for prevention of complications such as malpresentation and excessive bleeding. One mother lamented that she would have preferred to attend the facility and receive medical care but she could not get there due to night labour. She bled for many days at home.

It was night time. Nobody was there at home. Maybe in hospital I would have services like medications for too long bleeding. (Mother Interview #43)

Even when a mother had her first baby at home, she would not necessarily decide to stay home for the next birth, but only if she did not feel strong or had a difficult labour. When one went to hospital, it was usually in the passive role as almost all the woman were 'being carried', except for a very few who lived at a roadside.

I had a hard time, and felt weaker. I felt that I will survive if I go to the hospital, I would be safer. So, I was carried to the hospital. (Mother Interview #22)

One mother explained that if she had come to hospital for delivery, she would have not suffered a breast abscess. I observed that by the time she arrived in hospital, she was very ill and needed to stay in hospital for several weeks. She received treatment that included painful lancing of the abscess and intravenous antibiotic treatment.

Nurses express the excess breastmilk in the health facility. They teach us proper breastfeeding techniques, caring for the baby. If I had come for a

health facility birth, I would not have needed a breast incision. I would have learned many good things. (Mother Interview #35)

Several mothers commented on why they used facilities for birth when their due date was determined by ultrasound during antenatal visits. Some were confused about the significance of the date of delivery given to them, thinking that it was a fixed date, not an estimate. They stated that they would attend the facility for delivery if they passed the proposed date, because in that case it would be risky for them at home.

Some family members, however, were critical and abusive when nurses or doctors were unable to prevent bad outcomes. Criticizing medical staff was a common occurrence in Nepal where communities having access to previously inaccessible medical services believed that responsible medical staff should never have a poor outcome.

There are people who have appreciated our services and even compared us to God. There are also times when we have not been able to provide effective care; those times are the difficult. We have been called names, as bad as murderer. (Maternity Care Worker Interview #9)

Attitudes and practices in facilities

The provision of safe services is incomplete without respectful maternity care. There were several mothers and FCHVs who commented on the poor treatment of mothers by nurses and doctors in health facilities. Some mothers bitterly recounted verbal abuse, lack of consented care and lack of privacy. One mother recalled several male doctors watching a pelvic exam being performed by another doctor. She had not given permission. When women did not do as told during labour and delivery, sometimes nurses berated them.

In the labour room, I was laid down on the high bed with legs up and apart. It was a very difficult position for me. I preferred to sit on crouching position but the nursing staff did not allow me. They would scold me and use verbal insults if I did not do as they say. I did not like that at all... They did not allow me to walk around and asked me to only lie in bed. I would take opportunity to walk around when the nurses left their station. (Mother Interview #18)

Another mother did not know if she had sustained a tear or if she had an episiotomy performed. She felt powerless in her request to avoid getting sutured.

I thought I may have to come to the hospital for another childbirth and I might have difficulty so I asked them not to suture. However, they threatened to call the doctor and called him. The doctor came in and told me that I needed the suture. What could I do? They sutured me.... [it hurt] for about a month. I could not sit properly. (Mother Interview #44)

Almost all mothers who experienced a facility-based birth for their first baby indicated that they had an episiotomy, and it hurt them for weeks afterwards. Mothers perceived the episiotomy to be unnecessary and it was the most commonly voiced complaint mentioned to us about procedures in the facility. Sometimes the wounds became infected and the mothers had to go back to the facility for medication. One FCHV blamed the infection on the mother's hygienic practices and home conditions.

Recently, two mothers wounds got infected and they had to go to hospital for medication... I have heard that in summer those wounds get infected. Doctors had probably told them to clean it and take care of it. However, some mothers had a difficult time with that. (FCHV Interview #25)

Most primiparous mothers explained that they suffered from having episiotomies performed, citing between 12 days and two months of pain postpartum in the perineal area. Nurses performed routine episiotomies for mothers during their first childbirth. One woman was not informed of the episiotomy and did not get a local anaesthetic until she said she was feeling extreme pain while being sutured. Nurses said they understood that mothers do not want episiotomies, yet they insisted that it was necessary. One said that the mother or family tried to block them from doing it. A mother living in a remote area explained that three or four mothers had told her about the episiotomy and for that reason she did not attend a facility for childbirth.

Although female community health volunteers know that mothers were reluctant to attend facilities because of having an episiotomy, one normalized the procedure, aligning herself with the maternity health care providers in acceptance of this medicalized procedure, and took her unwilling daughter-in-law to the facility.

They are afraid about the pain they get from small operation during childbirth. Even my daughter-in-law was afraid of that and did not want to

go to the health facility for birth. They cut you in birth canal to make the passage bigger and easier for birth of the baby. (FCHV Interview #16)

Mothers in the community discussed among themselves the practices for repairing tears after birth, or leaving them to heal on their own. One respondent expressed that her sister-in-law had a tear at her home birth and was not sutured. The woman believed that because of that, her husband had had an affair with other girls because he did not get pleasure from a physical relationship with her. The woman believed that if she had gone to the hospital and received sutures maybe he would not have done that.

Birthing positions, exposure and frequent vaginal exams

A female community health worker spoke as a mother and for the women of her community, about how the practices in the birthing center and hospitals deter women from coming for facility birth. Most mothers talked about preferred delivery positions as semi-sitting with support from another person behind them, kneeling or squatting. They hear from other mothers in the community the restrictions placed on their labour and birth positions, and the shame they feel when having vaginal exams.

One of the mothers told me nurses inserted fingers inside her private organ. So, I thought regardless of outcome, I would not come to the hospital for delivery. (Mother Interview #24)

Only some come for a health facility birth. When others in the village ask them what happens in the facility birth and the mothers tell them that their clothes are taken off, and hands are inserted inside. Women do not like hands inserted, they find it difficult to handle. So, they are afraid of that as well as the pain that is caused after inserting hands... Nurses do expose the private part and examine by inserting hands. One other thing is that mothers are laid flat on the bed. We mothers cannot push down well in that position. We go into labour, we like to move around. However, nurses do not allow us to move around. (FCHV Interview #39)

Most mothers complained about birthing in a lithotomy position or having their movements restricted in any stage of labour. Almost all mothers said that they had to lie down with their legs in uncomfortable positions at delivery, some were also restricted to lying on their left side during labour, or felt exposed during procedures. Mothers also

disliked the high beds for labour and the postpartum period, which were difficult for them to get into.

I found giving birth lying down very difficult. I would have preferred to give birth in a crouching position. I did not like them making me naked in front of them. (Mother Interview #9)

5.3.5. Human resources, equipment and supplies

As noted previously, in rural areas of Nepal, there is a shortage of skilled human resources (Dhakal et al., 2011; Khatri et al., 2017). At the district hospital level, there is a lack of MDGPs (family doctors) who are trained as SBAs and can manage referrals, including caesarean section. Although there were five doctors, only one was trained in performing caesarean sections and had some training as a family doctor in obstetrical care. No doctors were certified in the SBA course for doctors.

There is a large turnover of doctors, resulting in a shortage at times. Two doctors emphasized the lack of financial incentives for working in the rural and remote areas since they cannot earn extra money in the private sector. In one primary health facility, over a three-week period, all MBBS doctors were away on holiday and the Health Assistants (HA) and Certified Medical Assistant (CMA) provided medical consults and support to the ANMs if they had difficult births.

When there is no doctor capable of providing caesarean sections, mothers who are in early labour or perceived to be higher risk are referred to other facilities, resulting in additional costs to the family. The family doctor trained in provision of caesarean section commented:

When I was away last week, two or three deliveries were referred... they have the belief, when referred or [they] go to [district hospital] the doctor is always available; that is very important. I am usually here. So sometimes they go to Kathmandu instead of coming here... Having at least two MDGPs is very important. (Doctor Interview #1)

Doctors (MBBS) were expected to support nurses if they had problems with a mother in labour but they did not have SBA training. Nurses who worked in a facility without surgical back-up still consulted doctors for psychological support, even though

the doctors had not been trained as an SBA, and had only received basic maternity training in medical school.

There are advanced SBA courses available for the doctors but our doctors are not trained in that. However, whenever there are complications or emergencies nursing staff call the doctors (Maternity Care Worker Interview #14)

SBA nurses became more worried about outcomes in the district hospital when the doctor was not there to perform a caesarean section if needed. One nurse commented that they are afraid to perform functions that they used to do and now refer people to the mission hospital if their doctor is not in town. Nurses mentioned that they no longer attend vaginal breech deliveries since the doctor has decided to perform caesarean section on all breech presentations. Some mothers were referred to other hospitals when the risks did not appear to be substantial. They could not use the skills that they had learned through their SBA training.

A striking theme in mothers' reports was the doctors' and nurses' lack of willingness to take responsibility for care provided. Those nurses working in remote centers had to manage as best they could but tried to refer cases to higher levels of care. They cited fear of family, and wanted to refer early to avoid complications requiring helicopter referral, which was expensive for the families. If the nurse made an error in judgment, the families were unhappy with her, thinking that she should have been able to judge whether there was a problem ahead of time. Nurses deferred to the doctors as being the 'most responsible person' in the facility, whether or not the doctors had received training. Some nurses used out-dated, medical procedures routinely for normal birth, citing fear to take responsibility if they did not perform procedures such as episiotomy.

In birthing center even when we have skills and authority to provide certain care, there are times we are very reluctant to provide it due to lack of an emergency management care facility. For example, even though I can conduct vacuum delivery I have a hard time making the decision to do it because I will have to refer the patient to other facilities in case it fails. That will only add more problems to the mothers. So, we can only use our skills depending on whether CEONC or BEONC facilities are available. (Maternity Care Worker Interview #10).

One female woman leader, serving as key informant, commented on the general problem of lack of responsibility.

First there needs to be a health facility with medicines and all the necessary supplies including technical components... adequate supplies for health services. Secondly, service providers need to mentally develop the feeling of responsibility of giving health care. Only then the care will be good (Key Informant Interview #67)

Most of the health care workers expressed satisfaction in being able to serve mothers and families in this remote area. A number of the nurses had received extra training to serve in the remote area. They maintained that they were providing a life-saving service, which made them proud. One looked in her mobile phone, looking at calculation of childbirths that she had assisted and reported that she had attended 180 to 190 births in the last two years and that made her happy.

I have almost devoted my life to this service. Though I was only ANM, I received training on anaesthesia assistant, USG service, and SBA. I give family planning services. So, I am happy to have been able to provide these services to the mothers. (Maternity Care Worker Interview #9)

Being local was considered important in providing culturally appropriate care to people and to not need to be away for long periods to visit one's own family. Two doctors emphasized the importance of being local and therefore being able to understand and serve the people better.

Cooperation among staff and management in the health district

There was concern about poor staff cooperation and coordination in the hospital and within the district. In order for the district hospital to function well, adequate staff and the right numbers of various levels of staff were needed. Most maternity care workers stated that inadequate staff compromised care and caused mothers to wait for services. Nurses commented that even though there were doctors in the hospital, the coordination for emergencies was poor, and sometimes nurses were unable to call them due to phones not functioning. Some nurses said that poor teamwork between old and new staff, and among nurses has hampered the quality of care.

We have a pharmacy close by, we have store keeper close by but we cannot get supplies even after many times of requesting. Also, the

information about the supplies are not communicated among different departments as well as staff. So, there is mismanagement and lack of coordination. (Maternity Care Worker Interview #12)

Equipment and supplies

All levels of the maternity care team providers commented on the scarcity of certain equipment, medication and supplies to save lives. Equipment such as back-up light systems were lacking in some of the health facilities, and affected care for many mothers birthing during night hours.

Sometimes it is night and we do not have lights. We need to suture the episiotomy but under the candle light. (Maternity Care Worker Interview #10)

For the district hospital to function as a CEmONC center, both caesarean section and blood transfusions had to be available. Lack of a blood bank, lack of reagents, and only part-time lab personnel affected the ability of staff to care for complications in childbirth. The capacity to get blood they needed was compromised due to unwillingness of the captain at the Army Camp to send his soldiers to donate blood, which they had previously done. In addition, maternity wards needed functioning equipment, supplies, and medicines. Staff at the district hospital mentioned the help that they receive from INGOs in providing additional supplies to the hospital. Some of the remote health care facilities had formed community pharmacies to provide free medication to birthing mothers and 'at cost' to other patients to fill the gap in medications not provided by government. One of the challenges of being in a remote district was that medications and supplies need to be carried from the district office, or carried from the nearest road. One maternity care worker explained that in her workplace, lab tests had not been available for nearly a year resulting in lack of testing for pregnant mothers.

Being far away from the district office, instruments and medications are not supplied on time. There are times we cannot manage with limited supplies and need to refer patient away. When we counsel the client that they need to go to other place then they say they will stay in birthing center whether they live or die. (Maternity Care Worker Interview #58)

Quality of care

Nepal Health Policies (SBA Policy 2006) referred to SBAs as necessary to provide safe care and to reduce maternal and newborn mortality. Most of the health facilities attending childbirth had at least one SBA and some had several. Previous to the SBA training, Health Assistants (HAs) and Certified Medical Assistants (CMAs) had attended births outside of the district hospital, and sometimes did not follow guidelines for normal birth. Now the HA's and CMA's were not supposed to have a role in delivery, although some do when there is no nurse available. The role of the HA and CMA is to assist the nurses and to make referrals after discussions with the skilled attendants.

One key informant female leader commented that the birthing centers were hastily set up with poorly trained health workers. She referred to the two-month period of SBA training given to ANMs and nurses before they are hired as SBAs in birthing centers.

...Government has invested in health care and made more birthing centers. I have seen new birthing centers in the villages now. However, those who have minimum education are taking couple of months training and giving services through those health care facilities. So, how can one feel safe to deliver there? (Key Informant Interview #67)

Because of few complex cases to manage or lack of supervision and support to perform the skills, there was perceived de-skilling mentioned by the professionals themselves. Doctors stated that they needed training and refresher courses in Kathmandu or other busy places in order not to lose skills in other related gynecological procedures.

Some nurses said that they received few refresher courses, at most two annual skills days offered by doctors hired through the District Health Office. They requested training in areas of manual vacuum aspiration (MVA) and insertion of IUCD. They also reported that few nurses had been trained in using ultrasound in pregnancy and when the one capable person was away, there was no one to perform the procedure, which had become a standard part of care in many facilities. Most nurses stated that supplies were either missing or in short supply. Other nurses who had worked in other areas said that the district hospital was better-supplied and equipped than other rural hospitals.

I had provided a two-day continuing midwifery education session for nurses in 2013, but some participants were no longer in the area. Some nurses' skills were out of date. However, nurses thought that their SBA training had increased their ability to attend birth, and increased the level of faith the community had in their services.

In my experience, having trained SBA has increased trust and faith of villagers in health service providers....so far, I have seen a positive impact. Previously we used to be afraid to start oxytocin for PPH, but now we confidently manage it. May be it was because we did not have an SBA. Now we have 2 SBAs. Since I worked together with them, I am also confident in managing PPH now. (Maternity Care Worker Interview #23)

Satisfaction with care is a part of quality of care. It is difficult for mothers or family members to know if they are receiving quality services. In this study, there were more positive interview results about skills than there were comments about lack of skills. Many mothers and FCHVs said that they had confidence in the nurses, and thought they were skilled, well-educated and saved lives. Some mothers praised the nurses, saying they provided support, checked their health, managed the placenta delivery, and cleaned and weighed the baby. In areas closer to a hospital, mothers said they preferred a hospital over a birthing center since there were more services available such as medications, ultrasound, and medical care from doctors. Some mothers mentioned that they thought care was better at the mission hospital because there were always doctors and surgical care available. Mothers also mentioned the continuous monitoring of the health status of mother and baby in the mission hospital during 24 hours postpartum, while at the birthing center the mother was sent home after two hours. An important indicator of quality of care in facilities is the procedure of providing intramuscular oxytocin after the baby is born prior to the placenta. Several mothers said they did not receive injections of oxytocin after the baby was born.

When I observed several births in two different remote areas, I saw adequate care, medication to prevent bleeding provided, and appropriate use of local anaesthetic and suturing to repair a tear. In only one case the nurse did not appear to be adequately trained in some areas of emergency care. In one location the unheated facility was very cold, and nurses wore down jackets, fleece pants and warm hats to attend the birth, their sleeves rolled up during hand washing and donning of sterile gloves. Women who gave birth that night wore several layers of warm shirts, shawls, and skirts. Despite a

financially constrained environment, nurses were organized, attentive and attended the birth competently using soft voices and actions along the lines of ICM and WHO for normal childbirth.

Mothers and FCHVs readily commented on procedures they disliked such as routine episiotomies which hurt them for weeks. They also complained about harsh words from nurses but did not say that doctors or FCHVs treated them poorly. One FCHV stated that a barrier to using the SBA was the poor treatment towards mothers.

...nurses also get angry with the mothers. They scold them saying 'do you not have enough kids yet, your desire is not fulfilled yet, why are you getting pregnant at this age?' So, because of this fear as well as shyness mothers do not come to the health facility. (FCHV Interview #39)

Some nurses also agreed that speaking harshly to mothers affected access to care, and some mothers will not return for birth services when treated poorly in antenatal visits. Other nurses denied that mothers were treated or spoken to disrespectfully.

An example is when provider speaks in annoyed tone to mothers who has come to seek services... and says "you were supposed to do this, either hurry up or go away". So, the behavior and communication of health care providers also affects the use of antenatal care and birthing services. (Maternity Care Worker Interview #9)

Mothers who had received poor treatment related what had happened to them while giving birth in a facility. These comments were not common from mothers who gave birth in every facility, but came from more than one. Mothers who had negative experiences explained that not all nurses treated mothers badly, but they wondered why these female staff had not understood birthing mothers' difficulties.

When I cried with labour pain [nurses] would yell at me and slap me on my cheeks. They called us names, humiliated us. They said things like "Why are you shy now? You were having fun while making babies". Many mothers do not want to deliver at the hospital because of bad attitudes or behaviours of the nursing staff. They were not comforting or supportive. Many mothers who had a delivery in the hospital have sworn to never go back there again due to the abuse they got from the nursing staff. (Mother Interview #3)

Mothers appreciated the skills of the SBA-trained nurse in the remote birthing center study site. Our findings showed that mothers in this area had no complaint about this nurse and they appreciated being able to give birth in the community.

Since I am the only one here with SBA training, they ask for my services. Maybe they also like the care I provide or maybe if there were more staff they might have asked for their services. However, they do demand that they be taken care by the provider with training (Maternity Care Worker Interview #58)

5.3.6. Socio-cultural aspects of birthing

Factors related to gender, culture and community norms were important for communities. We found that in these remote communities, many decisions were made by family members and community. I will describe findings pertaining to decisions on place of birth, whether the formal health system or traditional healers were used, whether male or female children were preferred, cultural norms on body exposure in public facilities, and use of spiritual healers.

Personal agency and decision-making

In this section I discuss decision-making in regards to place of birth. Mothers were not autonomous decision-makers regarding their place of birth. We found that within families the mother-in-law or husband (when financial expenditures were considered) made decisions regarding place of birth. We also found that some women who wanted home delivery were able to make that decision, possibly because it was also less expensive than travelling to the facility and was customary. When the mother shared in the decision for the place of birth, she usually stated that she felt confident to deliver at home. Many respondents said that the mother-in-law wanted to follow traditional ways with birth at home for her daughter-in-law. Most planned home births occurred at home.

Often families' options were limited for place of birth. The decision to deliver at home was influenced by distance, lack of people to carry, fast or night labour, financial considerations or people to accompany the mother to the facility. The following table shows decision makers and influencing factors according to the mothers' point of view,

who felt that they were decision makers for place of birth to a greater extent than either FCHV or maternity care providers had stated.

Table 5.20. Mothers who had any home births

Participant #	Decision maker	Planned place of birth	Influencing factors
5	Mother-in-law/self	Facility	Fast labour
6	Self	Home	Self-efficacy
7	Mother-in-law	No plan	Night labour
17	Self	Home	Self-efficacy/fear of hospital
18	No one	Home	Distance/no road
20	In-laws	Home	Customary way/HC closed
22	Self	Home	Night labour/remote
29	Self	Home	Lack of carriers/finance
34	Self	Home	Self-efficacy/finance
35	Family members	Home	Finance/no road/lack of carriers
43	Husband	Facility	Finance/night labour/disrespectful care
46	Husband	Facility	Fast labour/distance/no road
48	Self	Home	Finance/lack of accompaniers
53	Self	Home	Shyness to be exposed at birth
59	Husband	Facility	Night labour/mother had been TBA
62	Husband/self	Home	Husband medical practitioner
66	Husband/self	Home	Distance

Female community health volunteers, whose job it was to encourage antenatal care visits and facility births, stated that it was difficult to advise the in-laws about place of birth. Two respondents mentioned that in the Hindu caste system, mothers-in-law and fathers-in-law make more decisions for the birthing mother as compared to the non-Hindu ethnic groups.

In home villages mother and father-in-law are supposed to care about [planning for safe birth]. But that is not the case. Mother and her husband care about it themselves. If we tell 'sasur sasura' [mother-in-law, father-in-law] about taking mother to health facility they get really angry with us. In Chhettri and Brahmin that is the culture to do what 'sasur sasura' says (FCHV Interview #37)

Although in-laws were blamed for keeping their daughters-in-law at home for birthing, there were cases where family members took the mother to a near-by facility without her consent. When spending money was concerned, the husband, and sometimes the father-in-law, had more decision-making authority. Although decision-making might be shared or in fathers-in-law hands, the mother-in-law was the one held responsible for the welfare of her parturient daughter-in-law.

Mother-in-law gets criticized that her daughter-in-law died because of the carelessness of the mother-in-law. Therefore, she cares about it a lot. Father in law are not criticized at all. (FCHV Interview #63)

Some mothers-in-law worried that their daughter-in-law would have problems delivering and made arrangements for the labouring woman to be carried to hospital once labour was apparent. This seemed to depend on whether the mother-in-law perceived childbirth as potentially dangerous or not.

My mother-in-law delivered her child while cutting grass for the cattle. But they were also afraid for me and told me to go to the hospital for safer delivery. My labour pain started and I was carried to the hospital and I gave birth in the hospital. (Mother Interview #24)

Some people stated that ideas and practices were changing towards mothers having an increased voice in decision-making. There was more family discussion about use of local facilities when the family lived in close proximity to the facility, possibly because of familiarity with the facility or birth attendants. Mothers who lived apart from in-laws and those whose husbands were away appeared to make more decisions on their own.

There is no more culture of in-laws ruling daughter-in-law like in the past. Wherever mother wish to deliver, 'sasur' agrees with them. (FCHV Interview #41)

A woman's status in the home affected her access to care. A woman who was one of two wives (not common in this area) laboured at home in a difficult to reach area, when she had a complication during birthing. Neighbours called the nurse and she went to the home to attend. The nurse explained that in her view, the mother almost died because of her low status in the family.

Sometimes there is cases like husband has second wife so he does not even take first one to the health facility. Some other people informed me of the problem and I went. I found that she had urinary retention with retained placenta and anemia. I was able to save her life. (Maternity Care Worker Interview #21)

Almost all births at home took place without trained personnel. It is not common for nurses or other health workers to attend mothers at home, and it is discouraged by government policy.

Traditional birthing at home

Nepal has rich traditions in many aspects of life such as in religious festivals, weddings, baby naming and rice feeding ceremonies as well as in birthing. I was able to experience many of these, through being a friend of the family in Rai, Sherpa, Newari and Hindu families, many rituals and festivals over many years. I found that mothers value traditional ways while giving birth. What some groups maintained as 'traditional ways' varied among and within the same cultural group in the same community. Traditional birthing at home was an event that was usually unplanned, not usually feared, and considered to be a culturally mediated event for women. The move to hospitals breaks long-standing cultures around birth.

Preference for home birth was often based on convenience, not having to bother people to be carried, and the fact that it was considered customary to birth at home. Some of the mothers from ethnic groups had special birthing places prepared for them where a fire was built. One such room was a storeroom, and another was an outdoor kitchen. Many women described their birth experience following customs and teachings of their mother-in-law or cultural group.

I kept doing household work, field work. When my labour pain started, I was given hot boiled water to drink, alcohol poured in fried fenugreek seed to drink, in order to help with labour pain. I had labour pain for 24 hours. Then I gave birth to my first baby outside the house in the balcony just so inside of the house would not be dirty. My mother-in-law gave hot massages with mustard oil. I stayed in a crouching position for delivery because it felt right. (Mother Interview #18)

A pregnancy or birth thought to be complicated would warrant travel to the facility. A labour that was 'going well', consisted of two elements: the mother usually

delivered within a half day (12 hours) and the labour that did not involve much perceived pain. We did not hear women referring to complications such as having high blood pressure or bleeding in labour. Some mentioned reasons for long labour being fetal malpresentations, where they might be referring to breech or transverse lie. Family members and mothers reinforced the idea that home birth was customary. Their relatives before them had given birth at home and were fine. Among home-birthing mothers, many felt confidence in their own strength and ability to give birth at home similar to the way that their mothers and grandmothers had previously done.

I asked them to take me to the health facility if I had a problem. I felt that I could handle small pain... it is better if we can deliver at home. Our mothers delivered at home. They say new mothers nowadays are weak and need to be taken to the hospital. Therefore, I wanted to stay for home birth and thought it won't be very bad. (Mother Interview #46)

In some parts of Nepal and in other countries, the traditional midwife or birth attendant (TBA), also called 'sudeni', attends births at home as an alternative to facility birthing or when the mother cannot or does not want to use the facility (Thatte et al., 2010). In our study we found that many mothers delivered alone with no birth attendant present. We only heard of one TBA, but she lived far from a road and it was not possible to meet her due to landslides and slippery walking conditions. Only one respondent referred to a TBA being called, and the reason was to help deliver a retained placenta. The training and support for TBAs in the form of short courses and distribution of birth kits had been discontinued more than a decade prior. Most villages no longer had a TBA. This resulted in some communities having been left without a birth attendant who had even a small amount of training.

When an assistant was present, it was usually the mother-in-law, either alone or with other village mothers or with the female community health volunteer. Husbands were only present for a few of the births within non-Hindu ethnic cultural groups such as Rai, Sherpa, and Tamang, but having the husband present was not the custom with Hindu caste groups. However, we found that at least one husband from a Hindu caste group was present when a mother was referred, and gave birth in the mission hospital. There were two occasions where birthing mothers were attended by their own mother. In the research sites this was not common, but took place when the husband was away

and in-laws were not present. In another case, the heavily pregnant mother delivered while travelling, and stopped at the home of her mother who was a 'sudeni'.

During contractions when I cried, they told me not to cry and save my energy... we cut the cord after the placenta came out. We used a new blade to cut the cord. She used to do the job of 'Sudeni' in the village before the Female Community Health Volunteer. (Mother Interview #59)

Several FCHVs mentioned that they had become a FCHV first and secondly been trained as a Trained Traditional Birth Attendant (TTBA). Attending low-risk mothers in their community at home had been part of their responsibility. The training courses of five to twelve days duration took place between 10 and 20 years ago. Some of their training had focussed on bringing birth indoors, and to provide a cleaner area for delivery. One FCHV mentioned that she was still fulfilling the function of a 'sudeni' but in a different way by counselling and bringing mothers to facilities, now that the recommended place of birth and caregiver had changed. She described her work as a trained TBA.

The [mothers] want to deliver outside the house on the [ground], which might be dirty. Take support on the rope. After our training, we used to deliver on top of the plastic and if that is not available then we spread a straw mattress. (FCHV Interview #16)

Many mothers described labouring at home as a comfortable experience. They appreciated the warmth of the fire and easy availability of hot drinks and fresh hot foods, as well as hot oil massages. Women and FCHVs described aspects of familiar and comforting home atmosphere and the practicalities of not having to spend money and effort in travel as the best thing about home. These were cautiously reported by some as they wove the benefits of comfort at home with the perceived dangers of being at home alone with no knowledgeable birth attendant to help in case of a problem. One woman said that she felt more comfortable at home because she could share her feelings with her husband, and was afraid to confide in the nurses in the health facility.

In the hospital mothers had to carry hot water from a nearby hotel, purchase hot foods, which might not be fresh, and labour and deliver in cold rooms. One of the FCHV described the care that can be given to labouring and delivering mothers at home.

[It is easy to do] hot massages there. We do that even during labour pain to ease it. We can also provide them drinks, food like tea, hot water, soup, etc. In the hospital fire for warm oil massages is not available. (FCHV Interview #16)

Mothers and FCHVs also commented about the cold temperature of the facility. Before the earthquake, the hospital had been made more comfortable with a heater in the delivery room, but since the earthquake, there were no heaters in any facility.

At home mothers spoke about being able to assume positions of ease for labour and birth and being in their own environment as benefits of home birth. A FCHV explained that mothers at home are mobile and active which increases comfort during labour, while a mother mentioned that the opposite was true in hospital.

In delivery room, I was laid down flat on delivery bed with legs spread. I found that to be very difficult and inconvenient position. I wished I could stand or sit with support on the back. It also hurt to lie on that bed. (Mother Interview #33)

There were only two women who thought delivering in hospital was more comfortable than at home. One mother said that the delivery positions insisted on by nurses were preferable to what was done at home where family members were not knowledgeable about birth. She commented that at home births family members had no idea how to 'position a mother'. Another mother, once reaching the hospital after a very prolonged labour, expressed relief and appreciation for the delivery bed.

I had my head lifted a little bit. There was place to rest the legs. I felt more comfortable after reaching the hospital. (Mother Interview #55)

Many women described their labours with the mother-in-law in attendance. Some described their relationship with the mother-in-law as a loving one, and they felt secure in her presence.

She [my mother-in-law] is very caring and kept giving suggestions about what to do or what not to do so I would not have to face problems like she did. She took good care of me. Told me not to eat cold foods or sit in cold places, to cover myself with warm clothes and keep the baby warm and to tie my hair at the back. (Mother interview #17)

When families were far from a facility and therefore did not have skilled attendance at birth, they had to balance the disadvantage of carrying the labouring mother in cold winter weather, possibly over snow laden trails, with the alternative of waiting to see how the birth process evolved. Some mothers explained that their mothers-in-law had wanted them to go the facility for birth, but they were home because of a quick or night labour, or because of the cost of being carried. Some women did not want to wake relatives during night hours. But in the early morning their mother-in-law would build a fire in an outbuilding or outdoor kitchen in the yard. She or the sister-in-law would then provide hot massages to the woman's abdomen with mustard oil and prepare hot foods and the blade and thread for cutting the cord. They sometimes prepared alcohol with warmed masala to sip to speed labour. Sometimes the mother-in-law was the only one in attendance if the labour was progressing rapidly, but often she called other experienced neighbourhood women to come and help.

Most mothers describing their home births cited choosing comfortable positions for labour. When the contractions became strong, the mother assumed a position of her choice, sometimes kneeling or crouching, sometimes semi-sitting, sometimes lying on her bed with her legs stretched out, or sitting on a little wooden stool.

I sat at my ease. I found sitting on my knees holding something was more convenient... I delivered on the front porch on spread-out plastic and a straw mattress. (Mother Interview #35)

Some described tying a thick band of cloth around their abdomen, above the fundus, to keep the baby moving down. In some cases, other women supported her from behind, pressing on her back and encircling her abdomen with their arms. When she pushed the baby out of her body, it emerged onto the bed or the floor, on cloths, plastic or mats but was not 'caught' or 'delivered' by anyone. Sometimes no one touched the newborn until it was cleaned except the mother. Some mothers did not touch the baby until the placenta emerged, when the cord was cut.

Women gave different reasons for giving birth outside the home. The reasons for delivering outside appeared to be related to ritual pollution, according to the older women interviewed from several cultural groups. One of the spiritual healers (called a

'Dhami') who delivered decades prior provided her description of the meaning of ritual pollution.

Sub: *They [the family] could not touch... both of us for 4-5 days. They put us separately, provided food separately.*

Int: *Were you kept in a cowshed, or inside the mulghar [main family home]?*

Sub: *inside the mulghar in one corner.*

Int: *Did you deliver inside or outside the house?*

Sub: *I delivered outside the house.... there will be blood and mess, so house God can be angry. Family members will get ill when they are angry. (Dhami Interview #40)*

In contrast, many younger women said that they delivered outside because they wished to do so. Most mothers who delivered at home in remote areas had delivered outside but mentioned that there were no prohibitions on delivering inside. Mothers who were not in Hindu caste groups thought that women from Chhetri and Brahmin castes delivered outside while we found the opposite occurred. Those in our study who delivered outside were from other ethnic groups. Most if not all of the Brahmin and Chhetri mothers delivered indoors. We realized this when we interviewed mothers in a location where there were only Hindu-caste mothers interviewed. Neither they, nor the older women in the community, had delivered outside.

Once the placenta emerged, mothers and FCHVs described dealing with the placenta in different ways. Some buried the placenta within two large plate-like leaves so that the dirt would not touch the placenta. Others said that it could be buried in a plastic bag but had to have the cord facing upwards. If the cord faced downwards, they thought the baby would become ill. Many mothers explained that they found a section of a large hollow bamboo and inserted the placenta inside and put it up high on a limb of a tree that leaked sap. This was thought to increase mothers' milk. One mother explained that it was important not to leave the placenta on the ground in case an animal ate it because the baby would become ill. Only one woman stated that they put the placenta in a box on the ground far from the house. We saw the placenta pit in several birthing centers where institutional birthed placentas were tossed. No one mentioned the treatment of placentas in institutions as a barrier to care-seeking or facility-based birth.

Postpartum care in Nepal is closely linked to seclusion as well as prescribed rest for the mother and infant for varying periods of time. The postpartum mother is called 'sutkeri,' is considered ritually 'unclean' and has restrictions placed on her activities involving others. Some of these restrictions are useful to her as she can rest more. Others, as I have already discussed, may involve a period of being outside to deliver the baby, where she and her newborn lack hygienic conditions and can become cold. There are links between the time the cord falls off, mothers being able to bathe, naming the baby (given a ritual name by a priest) and the mother resuming day to day household chores. Interviewees typically reported that a mother could rest between five and 22 days. The longest time mentioned that a mother would remain in postpartum rest (sutkeri) was a month.

The significance of the naming time was that it corresponded with the time the mother could bathe and would 'become clean' from 'ritual pollution' of blood and body fluids. This was independent of their ethnicity. All respondents, when asked about birthing practices, had an opinion about the date they became clean and what activities within the family they could do before and after that date. Sutkeri mothers are generally kept out of the area where food is prepared and do not carry water, cook food for others or touch plants or crops for a certain period of time. A mother living in the vicinity of the hospital (not in a remote area) explains that she feels these traditions are folktales but still are followed according to tradition. Once the priest comes for the baby naming, he performs rituals by sprinkling water that cleanse the pollution and allow them to resume water carrying and cooking.

For 22 days 'sutkeri' are not allowed to touch water. Others cannot eat the food we touch... according to folktales they say we are dirty, since we are bleeding. After 22 days, they call puret [priest], who sprinkles water, only then. (Mother Interview #24)

Both mothers and FCHV maintain that an advantage of facility-based birthing is that health care personnel clean the blood and body fluids, and the family members will not have to do it. Although many mothers reported that their mother-in-laws helped them clean up after the birth, whether inside or outside of the house, some were unhappy to do that.

In hospitals mothers don't need to clean the blood spills during the childbirth. Her family member washes her dirty clothes but hospital staff take care of the rest. However, at home family members may have to clean everything and they actually get angry to have to do that, and complain to the mothers about it. (FCHV Interview #2)

I found that some families can bend the traditional rules about pollution after childbirth when a mother's help in the household or on the farm was needed. One mother in a remote community, when asked if something would happen if she touched water before 22 days, said no one did that because it would mean less postpartum rest for them.

I do not think [touching water after 11th day] will be any problem. However, if we touch water then we will have to do all the house work like cooking, cleaning, and the mother will not be able to rest. Therefore, we do not touch water until 22 days. (Mother Interview #62)

Most mothers reported preparing and collecting healthy and nutritious foods for the postpartum period. Although there are certain prohibited foods (such as pumpkin and chili), most mothers said that they could eat what they pleased in pregnancy and focused on nutritious and hot foods to help them recuperate and increase milk supply in the postpartum period. Fresh hot foods including chicken, ghee, rice, egg soup with fenugreek seed, heated alcohol with masala were among the preferred foods.

Disadvantages of traditional birthing

Although there were many comforting aspects of traditional birthing mentioned, there were also disadvantages. FCHVs listed problems that mothers have which cannot be managed in the home setting: urinary retention, abnormal bleeding, lacerations becoming infected. The family and community members simply did not know how to resolve these problems. More than one FCHV said that when families used traditional birthing practices at home, many mothers and their newborns died. Dangerous traditional practices cited were related to an unclean environment, delivering alone, lack of a birth attendant to stop bleeding, or improper treatment of newborn, placenta and umbilical cord.

Some of the FCHV assumed that traditional practices are no longer used, such as tying the umbilical cord to the handle of a hoe, but we found that it was still being

used in remote areas where transfer to hospital was difficult. There were no mothers who advised pulling on the cord for delays in placental delivery, but they tied the cord to the hoe handle to apply firm traction to the placenta.

Sub: *Then according to the tradition cord was tied to a hoe. The placenta came out two hours after childbirth.*

Int: *Did you pull on the cord while waiting for the placenta to come out?*

Sub: *No, we did not pull because we believe that pulling will cause heart complications and kill you. (Mother Interview #6)*

In interviews with mothers who birthed at home, all used a new or boiled blade for cutting the cord. Some years ago, families traditionally cut the cord with a small unsterilized knife or blade, and set the cord over a coin or piece of wood to stabilize it while cutting. Some infants became infected and died. Sometimes other substances such as chicken or egg soup were put on the cord to encourage it to fall off. One of the practices (rarely cited) was cutting the umbilical stump which according to their tradition ends the postpartum rest period (sutkeri period), and this will cause the newborn to bleed.

Other problems occurred around unclean environments and unsafe delivery practices. When we were in one of the communities, a woman explained that she delivered in a traditional way, and had to decide whether she would kneel on a clean mat or an old one. She used the older dirtier one as it was going to get dirty anyways. One FCHV spoke of a woman who was delivering in the traditional kneeling position supported by a rope but was kneeling over a pile of wood where the infant could have fallen and been bruised.

There were many opportunities for the newborns to become dangerously cold after birth. Since mothers in many areas delivered outside, babies were prone to hypothermia in winter. Both FCHVs and mothers discussed the reasons for this.

Babies may be kept out for too long due to the belief that babies should not be taken away before the placenta comes out as well, and babies become hypothermic. Instead of warmly wrapping the baby soon, they give some herbs (FCHV Interview #4)

One mother from a remote area who delivered outside, followed her mother-in-law's traditional birthing instructions on how and when to touch the baby and cut the cord, leaving the baby unwrapped until the placenta emerged.

[The] baby fell on the floor. My husband only helped putting pressure on the back.

We did not touch the baby first because we waited for the placenta to come out. My mother-in-law had told me not to cut the cord before placenta came out due to risk of the cord entering back into the womb. Later I cut the cord myself with the blade.

... it was our first time and others had told us to do it that way. (Mother Interview #43)

Some young mothers lamented that they were caught in-between the old traditional ways and new ways of handling birth and the newborn. Their mothers-in-law did not want to be told to change the traditional way at all, including incorporation of hygienic methods. If the FCHV was considered a part of the modern health system, whose job it was to recommend changes and influence people to new attitudes about childbirth, they were disappointed when that was not the case.

Our mothers [and mothers-in-law] do not know about washing hands to deliver the baby. When we inform them then they think we are being condescending. They get upset saying 'we gave birth on cow dung, in field while working. Make your baby cleaner, we don't know anything'. When we try to inform them, then they feel that we are being superior. We wish they would wash their hands, be cleaner. We wish our mothers knew more about taking care of mothers and babies during childbirth. (Mother Interview #24)

Son preference

Son preference is discussed in many countries in the world, but this topic seldom emerged in our interviews spontaneously and we did not ask about it. There were some women, who said that purposefully giving birth alone reflects on the cultural preference for sons. One woman had given to birth to only girls and was afraid to have the neighbouring women pronounce her labours as 'abnormal', since she delivered only girls. Having one girl is usually considered acceptable, but it is frowned on to have two girls when the average number of children born is between two and three. Some women lamented the poor treatment of postpartum mothers who gave birth to girls. One woman

described the treatment she received when someone suspected that she gave birth to a baby girl.

While delivering my youngest daughter I held Jato (grinding mill) and crouched... Once the baby fell on the floor and started crying, my father in law asked if a son or daughter was born... [another guy staying in the house said] that it may be a baby girl considering the sound of the cry, and my father-in-law went back to his room and slept. There was such discrimination between baby boy and baby girl. (FCHV Interview #65)

One nurse reported extreme pressure on a woman to produce more than one son. The father-in-law had threatened not to provide any money or land if she did not have two sons. Not giving birth to boys may result in many pregnancies, producing embarrassment and failure to seek antenatal care or assistance during childbirth.

Shame and shyness

Mothers and FCHV identified shyness and shame as a reason for preferential birthing at home. Shame was related to both exposing their perineum to others, and shame in having too many children. The FCHVs blamed the avoidance of facility-based birth on lack of education and awareness, not on shame. When the FCHVs reflected on mothers feeling shy and shame in exposing private parts, some felt that it was experienced more in past years, and more by mothers who were unaware that they should accept the hospital-based birthing experience. Facility birthing practices causing shame included caregivers seeing their perineum, examining them per vagina, and suturing them after birth. One FCHV said that only a small percentage of women experienced shame or shyness as a barrier to care but we found that it was a commonly cited as one of the 'bad' things about facility-based birth. Almost all FCHVs counselled mothers that they should not stay home because of shyness and they should go to the hospital to ensure safety for herself and her baby. There were several mothers who reported that they did not call neighbours to help out at home delivery because of the possibility of exposure of private parts.

Nurses, and also doctors when present, examine women during labour. All doctors in the research sites were male and were usually called when labour was not straightforward. In all but one case, mothers experienced extreme embarrassment having a male doctor examine them. One mother said that she could not share her

feelings with male staff, and the nurse was away during her labour and birth. She was so embarrassed after being examined by a male doctor that she could not meet his eyes the next day. Another mother said that she wished there were female staff only examining her but when she became weak after a long labour, she was less worried about feeling embarrassed. She had been told he was a great doctor so felt confident that she would be helped. Several mothers and FCHVs proposed that if all birth attendants were female, the mothers would not be as shy.

Mothers and FCHVs mentioned that having nurses watch them take off clothing in labour was a problem resulting in increased shyness. Female community health volunteers explained that being comfortable and relaxed was considered optimal for the birthing process, while being worried and tense about exposure affected mothers' wellbeing. Most FCHVs assert that they have all done the health education counselling required for mothers to have a facility-based birth but sometimes shyness prevents them from going to hospital. Some older FCHVs who were providing service near a remote birthing center discussed tales by new mothers and how that reinforced norms on shame around exposure during the birthing process.

Maybe most would have come to health center for delivery but people spread rumors about becoming naked, inserting hands due to which most mothers get discouraged to come... Then they think it is better to have home birth because they need not be naked, have hands in private parts or be sutured. People who accompany mothers to a health facility to deliver, they spread news in the village that it is shameful to deliver in the facility being a woman, it is an undignified way...women are made naked, it is insulting to women, and it is better to die at home than be insulted that way. (FCHV Interview #39).

Mothers experienced shame when they already had several children and became pregnant again, or became pregnant at an older age in both near and remote areas. With a strong focus on family planning in the public health sector, the current public message to communities is to use family planning resulting in a small family and therefore a healthy family. Having many children, or having children at an older age (over 35 years of age) is considered wrong and preventable among these communities. When we asked if mothers reported to the FCHVs that nurses actually criticize them for having many children, they mentioned that mothers do not go to health centers for fear of being criticized and avoid both antenatal care and facility birth.

She was shy to go to the hospital to deliver because in our community if you get pregnant after having more than two children, or after a long gap of ten years then mothers feel shame in front of others. They are so ashamed that they even are reluctant to take their babies for immunizations.... people ridicule mothers saying they gave birth at that age... In the community it is expected that two babies is happy family, so when a mother gives birth to more than three children, people start talking about her, which causes shame in mothers. (FCHV Interview #2)

Abortion has been legal in Nepal since 2002. In at least some jurisdictions selected doctors and nurses have been trained to perform abortions (for doctors, up to 12 weeks gestation and for nurses, up to 8 weeks). Doctors spoke of the difficulty they had obtaining the training to perform abortions. No one in our study spoke of getting an abortion, although one woman spoke of not wanting her current pregnancy. The only place where abortions could be obtained was in the district hospital. This woman had never been to town, nor had she heard about abortion services. It is likely that remote living women with little education are unaware of these services.

Some Female Community Health Volunteers blamed lack of education as the reason that some mothers feel so much shame that they cannot go to the health facility. The feeling of shame is so prominent that being aware of the government's policy and reasons for facility-based birth was not enough to change attitudes. One FCHV admitted that although she counsels mothers to go to the hospital, she herself purposefully stayed at home for birth because of shame.

Use of spiritual healers

Dhamis and Jankris (Nepalese spiritual healers or shamans) are an integral part of Nepalese culture especially in rural areas. They live in remote communities and serve families' spiritual needs. They were described as health care workers who worked with spirits that affect wellbeing of communities. In pregnancy, they treated the problems caused by spirits and ghosts that affected mothers' labour and birth.

They are recorded among many ethnic groups and lower Hindu castes throughout Nepal. Dhamis and Jankris are part-time spiritual healers who are summoned by spirits to take up the profession. Dhamis usually perform ceremonies while shaking in an altered state of consciousness to meet and affect spirits in the spirit

world and Jankris beat the drum as their instrument of mediation with spirits. In Nepal they are usually male, and sometimes they use the names Dhami and Jankri interchangeably. The respondents in our study did not differentiate between the two. However, Sidky (2007, p. 31) maintains that they are not the same and they carry out different work. They do not interact with the same kind of spirit, and the nature of interactions are different between each of them and the spirits. Jankri can become spirit-possessed at will, and 'Dhami is possessed by a God who possesses him' (Sidky, 2007, p. 32). Both are called upon to be spiritual healers, sometimes a replacement for a family member who was a healer. This person describes how he became a Dhami.

It has been 13 years since I became a Dhami... It cannot be learnt. It comes from the ancestors. It makes you shake on its own, after shaking your becoming a Dhami starts. You become mad, restless. So, with obligation you become Dhami... you lose awareness of the surroundings. (Dhami Interview #32)

Another spiritual healer who has three decades of experience being a Dhami told us how he experienced the spirits and received instructions from the teacher (guru) Dhami and became a Dhami.

I suddenly started to shake/shiver, 'guru' started talking through me to me and said that he was 'guru'. It wanted 'dhangrya', (plates), musical instruments, 'rudrakshya mala'. Then I became Dhami.

Jankri talks through my lips. The Dhami before me asks me questions, gathers the things demanded, and I became Dhami. (Dhami Interview #36)

There are no organized groups of shamans in Nepal, but whatever ethnic group they are from, they share much in terms of worldview, beliefs and customs (Sidky, 2007, p. 24). When they are called, they pass through an initiation ceremony of sorts, often a crisis, and transform into a Dhami/Jankri. I found that although the shamans were a part of the community, and lived with their families in the community, some appeared to have a larger role and be more well accepted than others. Some mothers admitted having summoned several Dhamis in turn to heal them when troubled, thus possibly receiving different kinds of treatments. Others spoke of Dhamis being the only healers available before small health and birthing centers were established in recent years, making them more frequently used for any health problem in the past. One shaman talked about ancestral powers being passed down to him.

I did not learn it. It has been descending through our ancestors. First my great grandfather, then grandfather, then father, then it came to me on its own.

In my dream, I was shaken. Then I almost became mad. Whenever I heard drums beating I started shaking, running towards the drum's beat. So, once it came to me, Gods demanded materials used by my father and grandfathers. We collected them and offered them to the Gods by lighting candle and became Dhami. (Dhami Interview #45)

They then become one of the ritual intermediaries between their community members and the spirits in the spirit world (Sidky, 2008). They also have a role in healing certain kinds of diseases. In pregnancy and childbirth, they have the role of removing the spirit who is causing distress to the parturient or her newborn, thus facilitating normalcy in birth for their clients. The souls of people who committed suicide, or those who died in childbirth are the spirits that bother parturient women, who can become weak, lethargic or suffer from other conditions (Sidky, 2008). It is considered a parallel system by some, who acknowledge that the problems caused by supernatural problems cannot be cured by bio-medicine. The Dhamis and Jankris fight spirits that cause the disease but they do not cure the disease themselves (Sidky, 2008, p. 124).

The spiritual healers with whom I became acquainted were predominantly from the Rai ethnic group, and resided and worked among Rai, Sherpa and Hindu castes. Only one was female and she mentioned that she became healthy when she was transformed into a Dhami. She carried out healing ceremonies for her family members only, as she did not know how to treat other people.

I was very sick [with chest pain for 3 to 4 months]. I had a cousin who was a Dhami who looked into my situation. He said I was turning into Dhami. He taught me how to be Dhami... put clothes on me, wrapped [my] head with long cloth, put on feathers, and I danced around... It was good for me. My pain went away. Before being Dhami four sons and two daughters had died. I only had a one-and-a-half-year-old daughter [alive]. After being Dhami I was cured and now I have four sons and two daughters (Dhami Interview #40).

Dhamis and Jankris are well known in rural Nepal. When on a new model bus with comfortable seats and a video screen while making the 12-hour return trip from the western side of the research area, I saw a movie on the bus, which depicted a story about the influence of the 'Forest Jankri' and how he saved the life of a child. While most

health workers did not say that they would ever use a spiritual healer, some acknowledged the benefits of them in specific cases. They agreed to patients and women in childbearing using both the spiritual healing system and the allopathic health system. Some allopathic practitioners and Dhamis felt that there were some types of problems better dealt with by shamans.

...in cases where the person is shaking, talking meaningless things, is mad. People say he/she is turning into Dhami as well. In such cases Dhami can help. They do not take them to the health centre. Who knows what is inside their mind, whether it is depression or psychosis (Maternal Care Worker Interview #21)

Some health practitioners complain that because their patients see Dhamis and Jankris, they are not adhering to values and treatments of western medicine. However, in my interviews, I did not find that Dhamis interfered with biomedical treatment. They sometimes replaced nurses or midwives in diagnosing labour by observing the woman in pain when no health practitioner was present in the village. They 'diagnosed labour', then recommended travel to the health center for birth. There was only one Dhami who said that if they resolved the problem of ghosts bothering the pregnant woman, she did not have to attend the health facility for birth. Others said that mothers were safer delivering at hospital where nurses and doctors provided safety in childbirth. Dhamis commented on the place of birth:

For example, my own wife, I was afraid delivering at home because of the unknown. In the hospital doctors can treat her. So, I took her to the health facility. We feel more confident delivering in hospital (Dhami Interview #42).

Changing birthing practices in remote Nepal

In the past, many mothers lived more than three days walk from the hospital where trained nurses or doctors could attend birth. There are now new opportunities to choose facility birth since local birthing centers have been built, making it easier to reach a facility for birth. Sometimes in-laws thought that their daughter-in-law should deliver at home as they did, while husbands wanted their wives to use the health facilities. This woman was taken to a birthing center according to her husband's wishes.

Mother-in-law wanted home birth. She did not say it to me personally but I heard from the villagers that she told them that I being a girl/woman must deliver at home. But my husband did not agree. (Mother Interview #28)

As well as place of birth, there were other changes according to the older women (key informants) to the mothers who had delivered in the last few years. Among mothers from many years ago, the cord was cut with an unboiled knife blade. In the birthing accounts from the past few years, all the umbilical cords were cut with a new shaving blade or a boiled blade at home births. In the past, few went to hospital without severe complications in pregnancy or labour. Families were now ready to transfer a mother as quickly as possible when the birth seemed prolonged.

I thought I will endure as long as I can and not inform others since everyone had just gone to bed. Then after 4 am labour pain started to increase in intensity, then I told my mom. Mother lit the fire, gave me an oil massage. It was too painful so I just kept lying on bed. Mother gave me egg soup, hot water, hot foods. Mother called other women who had experience in attending births. They arrived at around 7:30 am. Some supported me in a half-sitting position, some provided massages. They did not let me lie on my abdomen. I had labour pain up until 3 pm in the evening so decided to go to the hospital. (Mother Interview #56)

There have been several changes in families' thinking and actions in regards to moving the place of birth from home to facility. First is the change in attitudes towards birth as an activity that needs monitoring and medical assistance. Second is the perceived difficulty to register a home-birthing baby, and third is the change in materials, supplies and lack of trained attendants for home delivery. Since there is widespread knowledge that birthing centers exist in most jurisdictions, both nurses and FCHV advocate facility-based birthing for monitoring and treatment of mothers and infants. Some FCHVs mentioned that it was now difficult to register home births in the Village Development Committee, but we did not confirm that. Home birth kits were no longer found for sale in dispensaries even though they had been previously distributed freely. Neither trained TBAs nor nurses were usually available for home birth. In one FCHV's geographical area, among the mothers that she knew had delivered recently, seven had facility-based births and three stayed home. We found that FCHVs were part of a system that pressured women to deliver in facilities, although some women strongly objected to procedures and disrespectful treatment in facilities. The community was also beginning to make the change to facilities through normalizing facility-based birth.

Some mothers felt pressure to use the facility for birth or they would be criticized in the community, in spite of the fact that they had a normal

pregnancy and delivered the first baby safely at home. (Mother Interview #46).

Some FCHVs had lost confidence in the family and their ability to care for the newborn at home. Most families and community members had changed their traditions from bathing the newborn quickly after birth to wrapping and drying it. Some expressed praise for newborn care in facilities and questioned the families' ability to keep the newborn safe. They also mentioned that the main person responsible for the life of the birthing mother was the mother-in-law, who would be criticized if she did not make arrangements for a safe delivery for her daughter-in-law. Now that birthing centers are available, there is a shift and a pressure for families to use the facilities set up for them.

Village women started getting anxious and were saying that nowadays everyone went to the health post to deliver and they delivered fast as well (Mother Interview #46)

In summary, I interviewed mothers, community members, and maternity care providers to learn about their experiences with birthing in Solu, and to examine barriers and facilitators to skilled birth attendance. Some barriers were discussed by almost all of the participants. Distance and cost were commonly mentioned as barriers to reaching skilled birth attendance. Although there was a shortage of human resources, the nurses and others in the maternity facilities were considered skilled, and the institutions were thought to save lives. The district hospital's only caesarean section provider was not always available, leading to difficulties for families regarding referrals. His absence also led to nurses' fear of taking responsibility for attending mothers in labour. Maternity care providers discussed lack of infrastructure (lack of 24 hour electricity and water), as well as supply shortages. Mothers and community volunteers spoke of facility birthing practices that were not compatible with their cultural norms. Some of the traditional ways described as being used at home were beneficial, and some were harmful. The Dhami appeared to play a role in spiritual support and did not appear to be a barrier to accessing skilled care. I found a lack of respectful care in facility birthing where mothers were unable to make choices around birthing practices, and their preferences were not considered.

Chapter 6.

Discussion

In this study of birthing in remote Nepal, I examined both community and health system factors to obtain an understanding of ways to establish culturally acceptable skilled birth attendance. I listened to mothers' reports of their recent births to understand the issues affecting their use of skilled birth attendants. I sought to understand barriers and facilitators in establishing skilled care at birth, and looked for gaps in facilities and skill sets of birth attendants.

The Nepalese government is trying to follow the global maternity health movement around use of SBA and place of delivery for low-risk women by establishing health facilities close to expectant families (Mahato et al., 2016). They have attempted to establish birthing centers in rural and remote areas and have also trained over four thousand health care providers in skilled birth attendance. District governments have tried to post at least one SBA trained nurse in each facility providing birth. The term SBA has been used to suggest skill in life-saving procedures. Yet there have been few studies to determine whether nurses and midwives who are skilled birth attendants have the required skills to attend normal childbirth and attend mothers who experience emergencies until they can reach higher level facilities.

In Nepal, the growth of facility-based birth has occurred in conjunction with a reduction of mortality (NDHS, 2016). Although MMR has decreased, it is not clear whether this is a result of an increase in use of skilled birth attendants and facility-based birth, or whether it is due to non-medical determinants of health. The presence of roads, fewer people who are desperately poor, and an increase in educational levels in both mothers and husbands may be contributing factors (NDHS, 2016). The findings of this study suggest that the new birthing facilities are under-utilized, with many mothers birthing at home.

Health centers have been poorly utilized in some of the areas where they have been established. Sharma, Poudyal, Devkota, and Singh (2014) maintain that factors

predicting the uptake of maternal services in a rural area included mothers' utilization of antenatal services, distance of less than 60 minutes from a facility, and perception of birth attendants' attitudes. I found a number of complicating factors in the provision and utilization of the services of skilled birth attendants. Our study found that while most women would like to use the health facilities and skilled attendants available to them, there are a number of obstacles in the way. Some are modifiable and some are not. These are summarized below.

6.1 Distance and Cost

Living in mountainous areas of Nepal results in lower use of maternal care offered in health facilities. The 2016 Nepal Demographic and Health Survey (NDHS) outlines the differences in access to care among urban and rural women, in parameters of ANC visits, facility-based birth and delivery with a skilled birth attendant (NDHS, 2016). In our research area, very few women attended facilities for birth (30%) compared to the country average of 42% in mountainous areas. In the mountainous areas, 32.6% of mothers had a family member as her birth attendant (NDHS, 2016). This is congruent with our findings that mothers-in-law and other family members often served as birth attendants. Birthing centers were established for mothers in our area but many women did not use them.

I found distance and cost were barriers to access and that not living close to a road resulted in home deliveries. While this link would seem obvious, several researchers debate whether distance is a predictor of institutional birthing in Nepal. Authors Say and Raine (2007) found in their systematic review no distance-based differences in using a medical setting for delivery, but studies in Nepal included in their review were carried out in the semi-urban Kathmandu Valley. Dhakal et al. (2011) found distance to be the biggest challenge to access for 30.4% of women delivering in institutions and 42.3% of those delivering at home. This suggests a common barrier among Nepalese women living near the Kathmandu Valley. In contrast, Karkee et al. (2013) did not find that distance posed a problem of access to birth facilities, possibly because in his research area birthing facilities were located in health posts serviced by roads. Maru et al. (2016) did not find that distance predicted facility birth, but stated that

60% of study participants claimed distance as a reason for delivering at home. Baral et al. (2010) and Sharma et al. (2014) suggest that being more than an hour away from skilled birth services in Nepal was a barrier to use of birthing facilities. In interviews with mothers, I found that distance was a barrier to SBA attendance, but living within an hour of a facility did not appear to be associated with facility birth. Some families travelled more than a half day to reach the facility, while others living close to facilities preferred to birth at home. Our study area was more remote than the literature cited here with several exceptions. The cultural safety research in Mugu carried out by the Nepalese midwife researcher Kaphle (2013) took place in a remote villages, as did Khatri's study (2017) in mid-western Nepal. Onta et al. (2016), and Paudel et al. (2018) recently studied perinatal care in western Nepal. In these remote areas with few or no roads, and our research area, skilled care may be far more than one hour of travel time, and was a reason for delivering at home.

In remote settings mothers cannot reach medical assistance in time when they have problems. In mountainous areas including Nepal, Byrne et al. (2014) argued that outcomes were poorer. Strategies to increase skilled care at birth included removal of user fees, and bringing services closer to the people by supporting community health workers to work alongside formally trained maternity care workers. Byrne asserted that increasing demand for care by engaging community and decreasing socio-economic disadvantages were appropriate interventions for mountainous communities.

Living remotely is a barrier for mother and child community-based programs. The female community health volunteer (FCHV), selected in each community by district health, is intended to play an important role in coordinating and providing health education. Their role includes linking the health system to local families through home visits, mothers' groups and counselling. Nepalese government policies state that all pregnant women are seen by their local FCHV to receive maternal and infant health information and education (Khatri et al., 2017). Our study did not find that was always the case due to homes being dispersed over mountainous terrain. In this instance, distance was a barrier to even receiving primary maternity care education and information about services.

One way of increasing skilled care at birth is to post skilled birth attendants in rural and remote areas. Vieira et al. (2012) found that, in Indonesia, deploying midwives in rural areas increased the use of skilled care at birth, as more women were able to avail themselves of the service. Other authors claimed that larger centers with referral systems were more effective in providing safe care. Miller et al. (2003) argued that a reduction in maternal mortality in several countries could be attributed to availability and use of a district hospital rather than village-based birthing centers and referral systems. Similarly, Maru et al. (2016) found that the majority of women in rural areas of Nepal thought it was safer to deliver in a district hospital. Those who attended the district institution felt that they received safe care. Birthing centers with SBAs were established in some but not all remote communities. In my research area, I found that although birthing centers had been set up for mothers in some remote communities, most of them preferred to deliver at home with family members. This was irrespective of whether they lived relatively close to the facilities.

However, three mothers who died in childbirth during my research period lived in remote communities without birthing centers or skilled birth attendants. Some women still had a day's walk to arrive at the basic level of care, and over three days to reach a hospital with capacity to attend labour or delivery complications. When they began to bleed and did not deliver the placenta easily, their families began to seek transport. The 'Three Delays' framework may be applied to the reason for these deaths, as either the first delay (delay at home) or the second delay (delay in reaching care) were evident. In addition, I found that some villages did not have easily accessible stretchers for carrying women, and where roads had been built, there were no ambulances.

Our findings suggest that being in labour at night was a common reason for not delivering in a facility. I found that the reasons to avoid travel at night included geography, weather, and culture. Mothers explained that when labour began at night, they could not disturb family members who needed to sleep in order to work. In some homes men were not available to carry them. Most mothers spoke about preparing for normal birth and postpartum. They did not prepare for a complicated labour and birth where they would need to leave their homes for medical interventions. This corresponded with other Nepalese studies of birth planning preparedness (McPherson et

al., 2006). However, in the context of mountainous living far from a road, gathering carriers would still take time even if one planned ahead. In this context the concept of birth planning preparedness providing safety for mothers is less useful. Changes of employment patterns with so many men out of country have made women in isolated areas more vulnerable when pregnant.

Cost was a barrier to care in our remote setting. The Say and Raine systematic review (2007) found mixed results in wealth as a factor for using SBA services. Studies carried out in rural Nepal showed that women from higher economic status used facility-based birth and skilled attendants more than economically disadvantaged women (Baral et al., 2010; Sharma et al., 2014; Dhakal et al., 2011; Onta et al., 2014).

Providing financial incentives through the Aama Program was an incentive to facility birth (Maru et al., 2016) and in our study. Byrne et al. (2014) noted that women in mountainous areas reap fewer benefits from the travel incentive than others, with the incentive covering only 30 to 50% of the travel costs on average. I found that travel sometimes cost ten-fold the amount provided. Other studies, with the exception of Khatri et al. (2017), have not described the problem of distance as 'having to be carried' which I found in our study. Karkee (2013) in his study of bypassing birthing centers for urban hospitals described costly jeep hire, accommodation and food for those accompanying the woman.

Mothers in our study preferred to give birth locally, at home or in local facilities. Other researchers did not find preferences to give birth locally. Brunson (2010) found that even when mothers in a semi-urban village were only a half-hour away from hospital by public transport, they often did not attend facilities for birth, and rarely used the local health post for childbirth. When they did use birthing facilities, they went to urban hospitals perceived as having good quality care. In our study, only two bypassed both birthing centers and the district hospital, and one woman travelled to Kathmandu for a medical reason. The total number of mothers who bypassed services was very low, likely due to distance, financial issues, and male family members making decisions about finances. They may have had positive opinions on childbirth care available in their own district.

There are very few studies that asked mothers what they thought should be done to increase their access to care. Maru et al. (2016) asked participants about changes needed for them to give birth safely, and found that ambulances for transport were most frequently mentioned. In our study area there were few roads, and the available roads were so poor that no one mentioned ambulances. The mothers in our study recommended improving care at their local rural birthing centers so that they would not have to travel to the district hospital to receive a higher level of care at birth, particularly if any complication was expected. The particular context of living in a remote mountainous area affected their behaviours and choices. What participants in this study described appeared to be dependent on geography, ease of movement and judgments regarding quality of care. It is difficult to generalize about other rural and remote areas, as each is contextually different.

Cost to access care in low-resource countries is commonly cited in the literature as a barrier to facility-based birth (Baral et al., 2010; Kesterton et al., 2010; Say & Raine, 2007; Pulok et al., 2016). Communities in my research sites were generally of low socio-economic status and arguably had more access to care when a transportation stipend was provided. But incentive programs that are poorly funded or require upfront spending are not as useful to disadvantaged groups or those living remotely. In our study, women discussed expenses for facility birth often. The high cost of transportation as well as indirect costs such as paying carriers' expenses, and being away from agricultural or other work constituted a high financial burden. Women in our study described the Aama Program as a motivating factor for institutional birth, but many said that it was inadequate. Dhakal's study (2011) showed interquartile range (IQR) costs of 1574 to 4000 NR for facility-based birth. He did not discuss the types of costs involved such as needing to be carried or the high cost of private transportation. At that time, the Government of Nepal Maternal Incentive Program (Aama Program) had not begun, so no government incentive was mentioned. Onta's more recent study found a cost of 4000 NR and a lag time of three months to be paid the maximum 1900 NR incentive (1500 NR for facility delivery and 400 NR for four antenatal visits) resulted in barriers for economically disadvantaged women. Similarly, Mahato (2016) found that the Aama Program was least beneficial to women in the mountainous areas. Cost estimates for a facility birth in our study were much higher than mentioned in the literature. One FCHV

said that she has seen families have to pay 20,000 NR to 30,000 NR in order to travel to a facility, provide food and hotel to the accompaniers, and to return home. A mother in our study, who required three-and-a-half days of carrying and many meals and hotel rooms for the carriers, told us that the birth of their baby girl cost 75,000 NR. She believed that the expenditure saved her life and that of her infant. To economize, she slowly walked back to her home after giving birth at the district hospital, taking four days. One local maternity care provider explained to us that some families, not economically poor, were unable to pay for transport to facilities upfront because their wealth was in land. Maru et al. (2016) agreed with this finding, explaining that some farmers with more land do not have paid jobs, while those without land are wage earners. Our study found that although the Maternal Incentive Program has helped many mothers reduce costs, the majority living remotely said that it was not enough. I discovered that in the late fall of 2018, an increased stipend for transport to a birthing facility (3000 NR) and 800 NR for attendance at four antenatal visits had been agreed on by the government of Nepal. This somewhat eases the financial burden for those living remotely. I was not able to ascertain whether the increase had been implemented in the research sites.

Helicopters are commonly used in Nepal to move people and goods in mountainous areas. While in the field, I discovered that the Government of Nepal had instituted a plan for helicopter transport to transfer women with obstetrical emergencies to a government facility for comprehensive obstetrical care. This is a welcome step towards increasing access to emergency medical care but it was only to be enacted when a physician in a government facility recognizes that a mother's life is in danger. Most remote facilities did not have doctors that could affirm the need for government paid transport. In addition, families have to pay upfront. The first delay may be experienced by having to collect money before travelling, whether for being carried, travelling by jeep or by helicopter.

6.2 Socio-cultural Aspects

The organization of and practices in birthing centers do not align well with culturally-based attitudes, values and practices at the lay, community level. I have already mentioned that although mothers who lived far from facilities described distance

as a barrier, many women who lived close by did not use the facilities for birth. What I found was that many cultural factors affected the use of skilled birth attendants. These included concepts of birth planning preparedness, autonomy in decision-making, comfortable home birthing traditions, modesty and shame, and the role of 'traditional' healers in the place of birth. I found that many mothers described being supported physically by family members, maintaining privacy, adopting specific birthing positions and having hot and fresh foods prepared for them in the home environment as the reason for preferring home births..

Birth planning preparedness, usually part of antenatal care, is claimed to play a role in increasing facility-based birth. I found that most of our participants who gave birth at home had planned for a normal childbirth by preparing clean blade and ties, and food for the postpartum period. They did not prepare for complications in childbirth, and many mothers spoke about feeling strong and capable to give birth unassisted. Most mothers who gave birth at home explained that they had thought it would not be very difficult; giving birth without skilled attendance was customary. Their perception of birth did not match a medical perspective, and going to a facility for normal childbirth was a misalignment with their cultural values. This echoes the perception of mothers in the NDHS (2016), and of Baral et al. (2010), Brunson (2010) and Kaphle (2013) where many women who birthed at home said it was customary, or not necessary to go to a facility. Some mothers in our study said that they would try for a day or so to see how labour progressed before seeking hospital care. Unlike other research citing preference for birthing with a TBA, I did not find that women used TBAs for home birth assistance (Davis-Floyd, 2000; El-Nemer, Downe & Small, 2006; Vieira et al., 2012). Instead, women referred to their mother-in-law assisting them, sometimes accompanied by other village women. In several cases, women delivered with the help of their husbands, or alone.

Although women in the study expressed that they felt personal strength by birthing at home, birthing without a back-up plan was sometimes risky. Brunson (2014) also found that women did not use birth planning preparedness in her peri-urban study. In Solu, women who delivered at home said that they planned to go to the facility only if they had difficulty in labour. This inevitably resulted in delays in access to care,

corresponding to the 'Three Delays' theory. Planning for travel with no roads was difficult since people who could carry were in the fields or out of village gathering fodder or wood during daylight, and travel on dark steep trails was difficult at night. Nawal & Goli (2013) found that birth planning preparedness was far more common among the women with more money, education and greater autonomy and in urban areas. The urban women might have had a cultural belief that birthing was inherently risky as in the biomedical model.

Much of the literature found that decision-making about maternity care and place of birth was not within the prescribed gender roles for women (Gabrysch & Campbell, 2009; Brunson, 2010; Powell-Jackson & Hanson, 2012). In contrast, Dhakal et al. (2011) found that 52% of women in a rural Nepalese community claimed they themselves had made the decision to deliver at home. I found differing responses by mothers and communities. Some mothers in our study made their own decisions to have a home delivery, and were able to influence others in the family to accept that choice. No mothers told us that they had wanted facility birth but family members did not allow it. However, I found that in most cases, the mother-in-law and husband made decisions on place of birth, while in a few cases the women had a role in decision-making. Mothers also appeared reluctant to draw attention to their labours, similar to findings of Brunson in her peri-urban study (2010). This might refer to the woman's status in the home, or the wish to remain unnoticed due to feeling shy about bodily functions. With the decision-making out of the hands of most parturient women, antenatal advice given to pregnant women will not influence family decision makers. When women had some control in their homes, they were more likely to be able to make choices in access to care (Adhikari & Sawangee, 2011; Furuta & Salway, 2006). These findings resonate with the 'Three Delays' theory where a delay in decision-making at the community level delays care-seeking and increases time until travel arrangements are made.

Our study found a trend of community pressure towards choosing a facility-based birth. On two occasions, respondents mentioned that the mother-in-law would be socially ostracized if something were to happen to her daughter-in-law because she had not sought to procure a facility birth. Jordan's theory on Authoritative Childbirth resonates in our study. Staff and some community members are discussing changing the place for

childbirth from home to facility as a 'modern and necessary' move. This is similar to findings from Sharma et al. (2013) in Gujarat India, where previously home birth with traditional attendants had been preferred, it came to be seen as old fashioned and dangerous. Community decision-making may be more common than previously believed in Nepal, with FCHV holding women's group meetings to create awareness of the benefits of health system maternity care. Researchers have found that when at least a third of community women participate in health education discussion groups, the maternal and neonatal mortality and morbidity decreased and care seeking increased (MacPherson et al., 2010; Prost et al., 2013).

I found that both shyness and shame were barriers to seeking skilled attendance at birth. This barrier was related to health education messaging, fearing poor treatment by health personnel, and fear of genitals being exposed. The emphasis on family planning in Nepal in the past decades has been successful in reducing family size, but those who were unable or unwilling to limit the number of pregnancies felt shame in attending a health facility. Since the nurses were seen to be the enforcers of family size, mothers with many children said that they were afraid of nurses and also of the disapproval of other mothers who had fewer children. Even the thought of being ridiculed was enough for mothers not to go to facilities for birth. The Authoritative Childbirth theory explains the reasons that people agree to the concept of a small family insofar as community members have adopted the doctor's and nurses' authoritative stance on implementing family planning methods to reduce family size. Most people in this study appear to have accepted and internalized the idea that 'two children make a happy family'.

Mothers felt shame in exposing their genitals during procedures in labour and birth. In our study, mothers reported being exposed, hands inserted vaginally and being cut. These intrusive actions, carried out against the wishes of the birthing mothers and discussed widely in the community, resulted in barriers to facility-based care. The pressure to have a facility birth was prone to further marginalizing women who are viewed as 'non-compliers' when they do not use maternal services. In Kvernflaten's study (2017) rural women in Nicaragua resisted hospital delivery. They felt shame in being exposed in front of nurses and especially male doctors. Women in Nepal

expressed similar concerns (Morrison et al., 2014, Shah et al., 2018). Having vaginal exams performed on them and having their bodies exposed was a barrier to facility care. For some women in both in Nicaragua and Nepal, being made to deliver lying flat on their backs being exposed to staff in facilities was also a reason to avoid facility-based birth at all costs.

Kvernflaten (2017) applied Jordan's views on 'Authoritative Knowledge' in defining what women need in childbirth as the medical model of institutionalization when referring to government directives for women in Nicaragua regardless of their wishes. The women in Kvernflaten's study, similar to findings from our study, were offended by the use of routine episiotomies. Although childbirth has become medicalized in both Nepal and Nicaragua, women did not want to be exposed or be cut in childbirth, they were blamed for having a 'lack of awareness' of what was good for them. In both countries health volunteers explained to women the need to deliver in hospital, emphasizing that the medical way of delivery was now the norm. Women's refusal to use facilities in Nepal in order to preserve their modesty was discussed as a barrier to care rather than voicing that changes of policy and procedures were needed to protect women's modesty and to respect women's choices (Morrison et al., 2014; Shah et al., 2018). I argue that providing women with choice of birthing position, explaining procedures and respecting women's wishes is critical to providing culturally-sensitive care.

The concept of 'authoritative knowledge' may be applied to the acceptance of power of physicians over SBA-trained nurse-midwives in our research sites. I found that nurse-midwives working in birthing centers did not have 'agency' in making decisions, but were governed by physicians' rules which differed from their scope and description of practice. I found that nurse-midwives were often dependent on physicians, even though physicians were usually not trained to carry out maternity practices. Midwives in Nepal are not autonomous practitioners, and do not hold authority around birth when a physician is in the facility.

Say and Raine (2007) have described the importance of context in accounting for variations in use of facilities for childbirth. Other authors (Byrne et al., 2014)

acknowledged that to increase access, maternal health programs need to take cultural beliefs into account, and described how coordinating with local shamans increased facility birth attendance in Guatemala and in remote eastern Nepal. Several authors however, have described the use of shamans by pregnant mothers in the community as barriers to timely care seeking (Khatri et al., 2017). In our research area, I found that shamans in remote villages met a need for spiritual care, and were also consulted in the absence of maternity workers for concerns of pregnancy and early labour. Local shamans were seen by some study participants as a 'parallel system' for health care. Some health care workers, at the request of the District Health Office organized what was called 'Dhami training' to explain to Dhamis the need for skilled birth attendance. In many remote communities, Dhamis performed their rituals and treated discomforts of pregnancy but only diagnosed labour in the absence of any maternity care provider in the village. Our research found that all but one of the Dhamis then recommended that women use facilities for birth, and the other indicated that he did not give advice on place of birth. Utilizing a Dhami did not contradict 'authoritative knowledge' because the spiritual treatment did not take the place of a facility delivery; rather it was a complementary healing mode. Some nurses however, berated women for bringing the Dhami to the health center, because they did not feel that modern childbirth included use of spiritual healers. Dhamis did not see themselves as alternatives to birth attendants and neither did the women. Their sphere was the spiritual one, leaving women more confident to deliver their babies. There were several cases however, where Dhamis were consulted for related problems and medical care not sought, such as breast infection. There was only once instance where the Dhami told me that in his opinion, bleeding in pregnancy was a sign of ghosts that needed to be treated through incantations and shamanic healing. Dhamis are an important part of the rural Nepalese culture, and should probably be integrated into rural maternity schemes as long as they serve a spiritual need. Several authors have recommended integration of community healers such as TBAs and spiritual healers into the medical system (Byrne et al., 2014; Lassi et al., 2014), and I argue that Dhamis continue to have an integrated role if a mother or family wishes.

One of the Dhamis mentioned that the world was changing, and modern medicine was arriving in rural Nepal, chasing the ghosts to the far reaches of remote areas so that their services were not as needed as in previous times.

In urban area, because of medical care [and] medicines the spirits have run away into the corners of these rural areas (Dhami, Interview #45)

6.3 Facility Services for Pregnancy and Birth

I found that the provision of maternal care services was problematic in many areas, especially in terms of access to quality care. All of these barriers to care have been identified in previous studies (Gabrysch & Campbell, 2009; Baral et al., 2010; Campbell et al., 2016; Say & Raine, 2007; Sharma et al., 2014). I summarize my findings below.

Increasing the use of facility-based birth will not reduce maternal and newborn mortality unless quality of care is present. In the WHO document, 'Skilled Attendant at Birth' (2004) it is argued that the skilled birth attendant at any level of care must be able to provide antenatal, childbirth and postpartum care for mothers and babies, as well as identify, manage and refer complications to a higher level of care. So-called 'enabling' factors such as equipment, supplies, referral systems, policies and a regulatory framework are required for adequate provision of services (WHO, 2004).

My Service Availability and Readiness Assessment (SARA) showed that basic infrastructure, including running water and dependable electricity, was missing in all six facilities surveyed, indicating lack of enabling factors for care. Most basic supplies and equipment needed for normal childbirth were available in all of the facilities with the exception of the partograph for monitoring labour, some intravenous materials, and urinary catheters. Most caregivers would consider these items necessary for caring for parturient women in remote areas. There were important medications lacking in most of the facilities, especially to treat pre-eclampsia and sepsis, and only first-line medication for postpartum hemorrhage was available. In the WHO Health Systems Framework (2014), effective health services should include adequate building structures, material, equipment and supplies to provide adequate care. The ability to provide adequate

services is influenced by leadership and financing, two other building blocks in the framework. In our study, physicians and nurses stated that as a result of poor coordination and governance there were inadequate equipment, supplies and medications. These problems were indicated to negatively affect care, a finding consistent with other Nepalese research (Maru et al., 2016; Khatri et al., 2017).

One of the main jobs of a skilled birth attendant is to save mother and newborn lives at birth. In our study, although most mothers and FCHVs said that SBA nurse and health facilities provided safety at birth through trained human resource and medications, some women spoke of larger well-equipped centers with 24-hour physician services being preferable. Whether referring to a small health care center or the hospital, most respondents stated that saving mothers from excessive bleeding was the main benefit. I did not find that facilities were able to competently provide these critical services.

In South Asia, as is the case in Nepal, excessive bleeding continues to be the major cause of mortality (Countdown to 2030 Collaboration, 2018). In our SARA survey of six facilities, there was no facility having 24-hour availability to safely remove retained products of conception, or to transfuse blood. Only 50% of facilities had personnel present who could manually remove the placenta, part of the skill set of midwives in basic emergency obstetric and newborn care (Pattinson et al., 2015). I found that the necessary skills were absent to manage the most common obstetrical problems in these remote areas. Only two nurses out of twelve were scored as 'very competent' in management of shock resulting from postpartum hemorrhage, and one nurse was scored as 'very competent' in the area of managing pre-eclampsia. Pre-eclampsia was not often seen in the mountainous research area, possibly leading to complacency regarding nurses' lack of skills and medication availability at the local level for treatment of this condition.

The Nepal SBA Assessment Evaluation Survey (2013) found similar results in that nurses scored poorly on 'shock resulting from postpartum hemorrhage' and in pre-eclampsia simulations. They also found nurses with recent SBA training scored better than those who had taken training earlier. Our sample was too small to make

generalizations comparing these categories, but amongst participants, assessments in knowledge testing, normal delivery, autoclaving, and partograph simulations scored higher in recently-trained participants, likely due to higher recall with less than three years since training.

Several nurses in the research areas had been trained through a short course to provide obstetrical ultrasound. In our study, many participants mentioned ultrasound examinations as a beneficial part of the institutionalization of birth. Facilities offer ultrasound scans during regular ANC, thereby health workers use this technology for estimated dates of delivery and acting accordingly to induce labour in post-dated pregnancies. Some female community health volunteers said that not knowing the due date was a serious and potentially life-threatening problem.

Unexpected and potentially dangerous outcomes may result after an ultrasound program is instituted unless there is adequate education about the limitations of the technology given to health care workers or mothers. Some mothers reported being terrified when after ultrasound screening, they had passed their given expected due date, not understanding that it was an estimate of dates and could be quite inaccurate, especially if done after the first trimester (13 weeks of gestational age). Mothers were asked to travel several days to the district hospital when they had gone past their due date by one or more weeks. In these cases, travel en route would be more dangerous than staying at the village health facility with an overdue fetus, and costlier as well. In addition, some mothers explained that they were not permitted to deliver in the facility if they had been asked to move to the district hospital. In these cases, they had to deliver at home alone.

Globally there is a shortage of skilled human resources for health affecting low resource countries' ability to reach SDGs (Lassi et al., 2016; Simkhada et al., 2006). Solutions like using team approaches, training in emergency care, task-shifting and involving communities have been tried with some success (Lassi et al., 2016; Byrne et al., 2014). Due to a shortage of SBAs in Nepal, policies for birthing centers only required one skilled birth attendant to be hired, making full coverage difficult (Khatri et al., 2017). I found that 66.6% of facilities in the study area had two or more SBA employed.

However, only five out of the six facilities surveyed had 24-hour service for childbirth, and skilled birth attendants were available 24-hours in only two facilities. Another two facilities said SBA nurses were 'sometimes available'. I found no staff accommodation or food facilities near one birthing center which did not offer 24-hour care and Khatri et al. (2017) echoed this finding as a barrier to 24-hour birthing care. One nurse also mentioned security problems as a reason for not staying alone in a birthing center far from the center of town.

When families were referred to the district hospital, there was only one doctor who could provide surgical interventions. Staff referred families to another hospital for some cases when a doctor was not at the site, even when surgery was not likely needed. However, at least one SBA trained nurse attended complicated births such as twins and breech when necessary. While most families thought nurses at all levels were skilled, one physician at the hospital stated that rural birthing centers had inadequately trained staff, lack of equipment and medications for managing complications, and were unprepared for saving lives.

The third area of provision of service is respectful care during childbirth. In our study, a few women and FCHVs reported that they and women in their communities would not attend a facility due to reports or personal experiences of unconsented treatment, verbal abuse, or being exposed to others during childbirth. Our survey on facility readiness showed that most facilities did not permit a companion to be present during delivery, and did not allow women freedom of positions during labour (one facility only) and delivery (all facilities). Interview respondents reported being viewed during vaginal examinations by several male health care workers with no provision for privacy, not being permitted freedom of movement in labour or to deliver in the position of their choice. Several experienced verbal abuse. These findings demonstrate deterrents to accessing skilled attendance at birth, and are in line with the findings of a recent systematic review about mistreatment during childbirth (Bohren et al., 2015). Nurses were mostly blamed for poor behaviours, rather than doctors; however, doctors were also implicated in not respecting women's choices. Sometimes women that we interviewed expressed fear of nurses and the treatment that they would receive in birthing facilities, so they vowed not to go. Similarly, in Burkino Faso (Melberg et al.,

2016) and in Malawi (Kumbani et al., 2013) women avoided facility birth due to poor treatment. There were no comments about poor treatment in the Maru et al. (2016) study of a rural Nepalese birthing facility, but nurses and institution related community health workers enumerated and interviewed mothers, who might not have wanted to report poor treatment. Mutual accommodation of both community and maternity care provider as studied by Davis-Floyd (2000), Gabrysch et al. (2009), and Llamas and Mayhew (2016) could bring comfortable and beneficial traditional practices to the facilities, for example, encouraging a childbirth companion, enabling hot foods and drinks and traditional birthing positions. This has not been discussed by authors examining the Nepal birthing context.

In summary, factors affecting the use of SBA were contingent on the context – the remote mountainous area. Distance and cost were barriers to access care and financial incentives become facilitating factors when the amount provided was adequate. When distance and cost were not barriers to care, some women still preferred to follow traditional practices at home.

Both shortages in human resources and skills affected access to both basic emergency obstetric and comprehensive obstetric care. Families and communities usually wished to access facilities closest to them when they encountered difficulties in birth, but essential services were not always adequate locally. Many of the birthing centers and facilities were considered uncomfortable by the women, but these discussions were tempered with comments about the safety of delivering in facilities with trained nurses and doctors. Mothers and FCHVs did not discuss poor quality of care in the facilities, but our study found many gaps in life-saving abilities, and missing materials and supplies. Doctors were available in some levels of facilities, but their lack of SBA training limited the care they could provide. However, they were still expected to provide assistance in emergencies, and received respect as the highest level of care provider.

Respectful care in pregnancy and childbirth had not reached this remote area. Women lacked basic choices for companions, and labour and birthing positions. Outdated procedures such as performance of frequent episiotomies and uncomfortable supine positions for birth were barriers to care-seeking.

Chapter 7.

Conclusion

This study demonstrated the difficulties and successes in providing culturally acceptable safe maternal infant services to women and their families living in remote mountainous areas. The main interventions provided in the Solukhumbu district were having SBA-trained maternity care providers, establishing community birthing centers, one referral center with caesarean section and emergency care capability, and community-based female community health volunteers (FCHVs). According to the findings of the study, some of the interventions were relatively successful. These included attempting to place SBA trained nurses in each remote facility, one doctor for emergency caesarean section, and providing transportation incentives and free facility care for childbirth. Given the austere living conditions, preference for urban living, limited road access, and lack of government funding available, these efforts were laudable. Having at least one dedicated doctor who can perform caesarean sections and manage more complex deliveries was important, but like most rural and remote areas in Nepal, more skilled human resources are needed. A doctor at the referral hospital who can manage obstetrical problems should be present at all times. Midwives, a cadre of providers currently being trained in Nepal, could potentially fill some of the identified service gaps, and may have an important role in rural maternity care.

There are clearly problems with a policy of moving all births to health facilities. Multiple barriers exist; some are modifiable and some are not. There was a misalignment between the insistence on attending a facility for birth, and the barriers of transportation and cost. The study area had many remote villages where travel was not feasible at night or during the rainy season with its inevitable landslides blocking roads and trails. Even as more roads are built, the geography will continue to be a barrier.

The study district was home to many economically disadvantaged people who do not have enough money to pay the food and lodging of carriers in order to reach a birthing facility. The government stipend for travel was clearly inadequate to cover costs. Although an increase to this stipend has recently been announced, it is not yet known

whether this new amount will be sufficient in remote areas such as the one where this study was done. Since some people did not have cash available for travel, and do not receive the travel funds until after the birth, a financial barrier may still exist. Community-based savings and lending groups may assist with unforeseen expenditures. The influence of education and women's autonomy over their own decision-making was an important theme, but community-based education about childbirth choices could be more effective given the culture of family decision-making. A policy with choices of facility birth or home birth, with community-based distribution of misoprostol for prevention of excessive bleeding, would make birth safer for at least some of the women who live remotely.

The lack of supplies and medications to manage hemorrhage or pre-eclampsia would prevent nurse-midwives from saving lives, even if they know what to do. Scarcity of essential materials and supplies at the birthing centers was due to inadequacies in the district health supply chain. Auxiliary nurse-midwives and nurses need periodic refreshment of skills, mentoring, supervision in both the area of normal delivery skills, and in essential but uncommon emergency skills. The new cadre of registered midwives, if highly educated with appropriate lifesaving and culturally appropriate childbirth attendance skills, will have an important role in remote Nepal.

The importance of providing respectful maternity care is now a common theme in global maternal and infant health discourse, and is backed up by WHO and UN performance standards and documents, and by 2018 Nepal government statutes. Interviewed community members related stories of lack of choices in childbirth ranging from prohibition of companion at delivery and of choice in birthing and delivery positions, to being forced to endure harmful and out of date procedures such as routine episiotomy. There was a general feeling that being at home provided comfort as did the idea of following ancestral ways. Traditional practices can be romanticized, but in this study, some traditional practices were shown to be beneficial, while others were potentially dangerous. Changes in medical practices will only occur when district health officials are involved in improving care and are up to date themselves on current evidence-based procedures. Routine episiotomies and supine birthing positions are out of date and unnecessary procedures that cause mothers unnecessary pain and were

unacceptable to mothers. The over-arching power of the medical system influences childbirth changes and discourages traditional birthing systems, even though some practices in traditional birthing are aligned with current best practices. The policies of using FCHV for family planning information and establishing mothers' groups have been successful in rural Nepal. Community-based learning and participation to increase knowledge about childbirth and newborn care have been successful in improving maternal health. For care providers and the district health office, reciprocal learning about cultural and respectful practices and making an action plan to enforce respectful childbirth would improve access to care. I plan to speak with the district health office about working with facilities to improve respectful care. I have already left summaries of the surveys with them and have discussed the initial interview findings with maternity caregivers. The 2018 Act for Respectful Maternity Care opens up opportunities to introduce this concept and teach ways to operationalize respectful care.

There are concrete plans for a midwifery educational program at the vocational school in Solu. The new cadre of Nepalese midwives, educated using evidence-based and culturally sensitive practices, could be an important addition to rural health service provision. Parturient women in mountainous remote areas are among the most disadvantaged women in Nepal, and deserve a better chance for improved health and survival.

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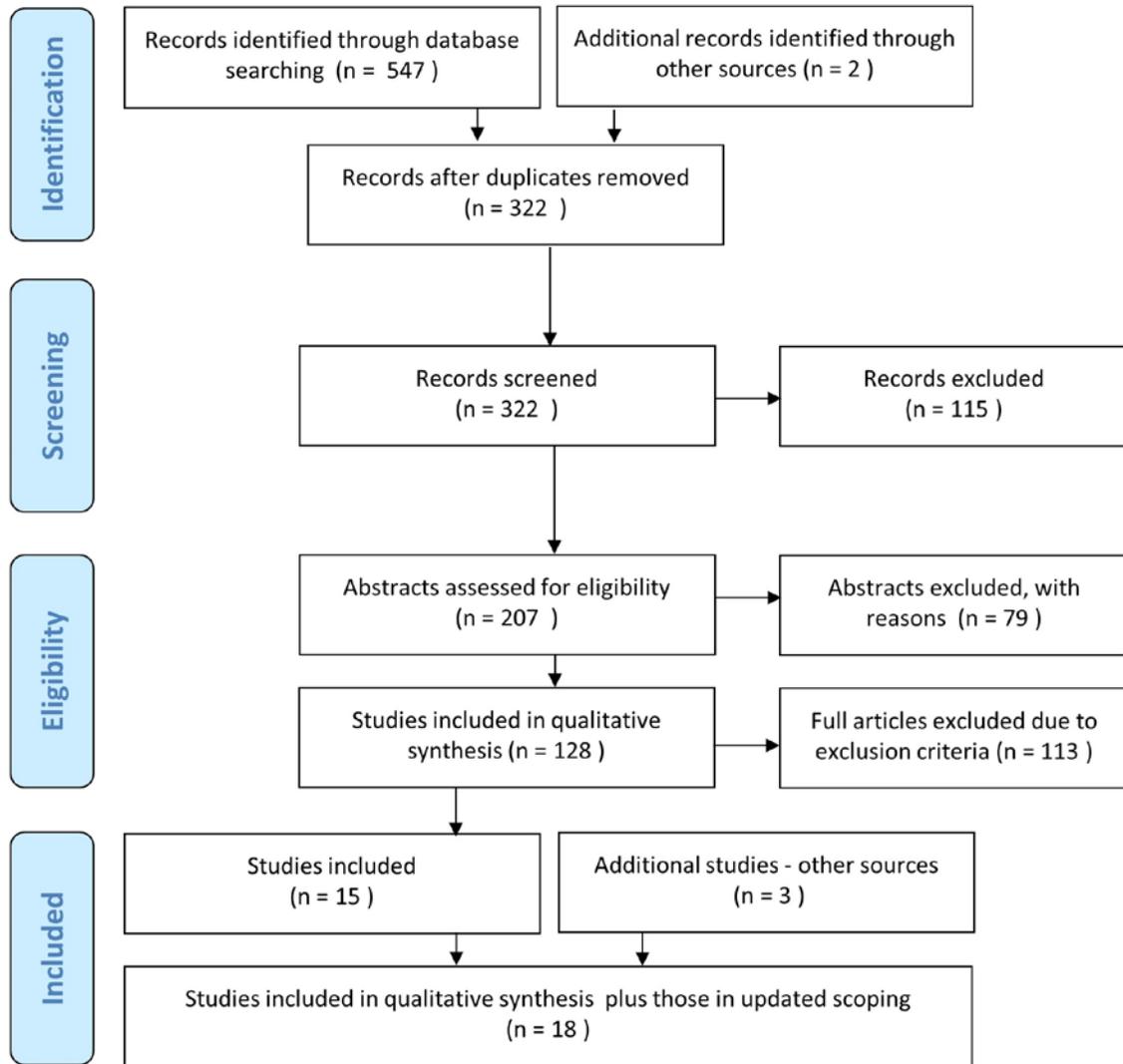
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Appendix A

PRISMA Diagram

Figure A1 PRISMA 2013 Culturally appropriate ways to increase access to midwifery care in rural and remote areas of Nepal



Appendix B

Scoping Review Summary

Table B1

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Amin, R., Shah, N., Becker, S. 2010	Socio-economic factors differentiating maternal and child health seeking behaviour in rural Bangladesh: A Cross-sectional analysis	Household Survey in 128 villages with 3,498 married women	Higher wealth quintiles resulted in more facility delivery,	NA	NA	Higher education resulted in more facility birth
Ager, A., Pepper, K. 2005	Predictors of health service utilization and perceptions of needs and services in rural Orissa	219 semi structured interviews across 66 villages	Physical accessibility, cost	Often uses TBA because ANM not available or skillful	Reputation and perceived illness resolution affected SBA use; ANM often absent, uncaring, and poorly trained	NA
Baral, Y., Lyons, K., Skinner, J., Van Teijlingen, E. 2010	Determinants of skilled birth attendants for delivery in Nepal	Literature review	Less use of SBA with rural women; Distance a barrier in hilly and mountains. Financial burden found when living far from care	Home birth customary; most attended by family member. Cultural and religious factors affect use of SBA; range of caregivers used.	Unaware of risks with complications; TBA more polite and encouraging; SBAs do not manage privacy and confidentiality	Mother-in-law main decision maker, but decision making associated with age, ethnicity, residence, education, job.

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Basnyat, I. 2011	Beyond biomedicine;health through social and cultural understanding	Indepths interviews with young Nepalese women in poverty	Distance, cost, transport were all barriers to care	Home was the primary space where health was maintained;hospital was the alternative; for problems. Preferred home birthing.	Discusses lack of respect and dehumanizing treatment in hospital.	Self, family members and community norms. No decision making once in hospital for birth
Brunson, J. 2010	Confronting maternal mortality, controlling birth in Nepal: The gendered politics of receiving biomedical care at birth	Mixed method approach including participant observation;30 case studies;interviews and observations	Semi urban location; hospital available by taxi, no barrier	Yes used traditional healer; Cultural conditions and norms	Birth usually considered normal physiological event, no need for hospital. Hospital with best reputation used when needed. Only one hinted of bad treatment	Husband makes decisions. Community norms are important. Mothers did not want to bother family members or to be demanding.
Byrne, A., Hodge, A., Jimenez-Soto, E., Morgan, A. 2014	What works? Strategies to increase reproductive, maternal and child health in difficult mountainous locations: A systematic literature review.	Systematic literature review from 5 data bases	Telemedicine, incentive for facility delivery inadequate, removal of user fees and community-led planning encouraged facility births: strengthened role for community health workers	Engaging traditional healers doubled facility birth, respect for cultural beliefs; extension of outreach services	Improve supplies and human resources to delivery quality. Culturally sensitive care needed	NA

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Dhakal, S., Teijlingen, E., Raja ,E., Dhakal ,K. 2011	Skilled care at birth among rural women in Nepal; practice and challenges	Cross sectional study; structured questionnaire		SBA or unskilled people for normal births. Sought care in hospital late. 15% sought care from a traditional healer when problems occurred	Many did not perceive problems in pregnancy and birth. Wanted to treat the problems within the community. No SBA in village.	When problems in labour, family members made decisions
Gabrysch, S., Campbell, O. 2009	Still too far to walk: Literature review of the determinants of delivery service use	Review of reviews from 5 data bases	Poorer women less likely to have SBA but in some studies no difference. Usually less service use in rural and remote areas	Mixed results. Large differences in some studies, others not.	Quality of care an influence, previous facility delivery, lower parity and use of ANC encouraged SBA	Womens autonomy plays a role; Sometimes the community influences use; community decision making
Iyengar, K., Iyengar, S. 2009	Emergency obstetric care and referral: experience of two midwife -led health centers in rural Rajasthan, India	Case studies of two health centers managed by nurse midwives	Distance to hospital and caregivers	No	SBA took personal responsibility for care and transport	Perceived illness severity, decision for referral more for mother than for infant
Jeffery, P., Jeffery, R. 2010	Only when the boat has started sinking: a maternal death in rural north India	Ethnographic research with villagers in a Muslim village	Cost of transportation to reach facility and private facility costs	They used TBA for deliveries	Fear abuse in government facilities; lack of good care; mistrust of staff; depends on severity of problem for care seeking	Depends on husband
Kaphle, S., Hancock, H., Newman, L. 2013	Childbirth traditions and cultural perceptions of safety in Nepal: Critical spaces to ensure the survival of mothers and newborns in remote mountain villages	In-depth interviews in two remote Nepalese villages	Distance and remoteness	Tradition and custom, spiritual beliefs main influence associated with birth in 'goth'; rituals provide cultural security	Safe-care meant following spiritual beliefs for them	Women preferred traditional home birthing. 3 men encouraged facility birth

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Karkee, R., Lee, A., Binns, C. 2013	Birth Preparedness and Skilled Attendants at Birth in Nepal: Implications for Achieving MDG 5	Community based Prospective cohort design	Arranging transport and saving money was associated with use of SBA	NA	Birth preparedness packages encouraged women to seek care at facilities	NA
Karkee, R., Lee, A., Binns, C. 2013	Bypassing Birth Centres for childbirth	Prospective cohort study of pregnant women; followup postpartum	Richer women bypassed more. Total use of SBA in study was 73%,	A high number possibly due to birth preparedness; higher parity resulted in less bypassing	Quality of care perceived better in hospital than birthing center (no equipment, no trained staff). Decision making not influenced by staff attitude.	NA
Karkee, R., Lee, A., Pokharel, P. 2014	Womens perception of quality of maternal services; a longitudinal survey in Nepal	701 interviews before and after birth	Lived within half hour of health facility to have facility birth, those delivering at birth centers were poor, low cast and lived far from hospital	NA	Private hospitals were perceived to have higher quality. Public hospitals lacked clean environments and equipment, disrespectful treatment.	NA
Khatri, R., Dangi, T., Gautam, R., Shrestha, K., Homer, C. 2017	Barriers to utilization of childbirth services of a rural birthing centre in Nepal: A qualitative study	In depth interviews with service users, providers; focus groups with key informants	Difficult geography, delay in cash incentives; geographical - hard to carry, no access during night labour or in rainy season; inadequate finances for travel	Poor birth preparedness; belief in birth as normal, traditional healers for prolonged labour; harmful traditional practices; ideas of ritual pollution.	Poor quality services; inadequate infrastructure; previous poor experiences cause low level of trust; no staff quarters	Decision-making by family members especially mothers in law

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Kibria, G., Ghosh, S., Hassen, S., Barsha, R., Sharmeen, A., Uddin, S. 2017	Factors affecting deliveries attended by skilled birth attendants in Bangladesh	Cross sectional data analysis	Living in Rural area resulted in home delivery, cost & distance; higher wealth quintile resulted in facility birth	Higher education in women and husbands; ANC by SBA; Birth interval 3 or more years predicted facility birth	Having known complications; having a follow up visit from SBA in pregnancy.	Women working outside of the home less use of SBA. No association between head of household and use of SBAs
Maru, S., Rajeev, S., Pokhrel, R., Poudyal, A., Mehta, P., Bista, D., Borgatta, L., Maru, D., 2016	Determinants of institutional birth among women in rural Nepal: a mixed-methods cross-sectional study	Cross sectional survey: quantitative and qualitative methods	Distance from hospital determined access to care (by home birthers); ambulance recommended to increase access; wealth predicts facility births but less so in higher wealth quintile.	Higher age and wealth resulted in facility birth except for land owners; poor birth planning preparedness; harmful traditional practices; no new TBAs being trained	Facility birth group mention safety and good care in facility but not village clinic; previous maternal deaths influenced care-seeking; unskilled SBA; delays in referral.	Mother-in-law; partner support; no one to accompany to hospital;
McPherson, R., Kadka, N., Moore, J., Sharma, M. 2006	Are birth-preparedness programmes effective: results from a field trial in Siraha district, Nepal	30 cluster baseline and endline household surveys of mothers with infants.	Cost, transport, distance,	TTBa's provided BPP info and also services in childbirth to some mothers; unaware of SBA services	ANM and CHW not trained; no poor regard for institution; no SBA in community; low quality of facilities	Father-in-law made decisions regarding transport and finances

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Metcalf, R., Adegoke, A. 2013	Strategies to increase facility-based skilled birth attendance in South Asia: A literature review	Literature review	Living more than 1 hour to hospital resulted in home birth; travel time, cost of travel and companion time; increase use with financial incentives;	Preference for home births; birth seen as polluting; social difference between mother & SBA a barrier, participatory learning increased use	Prior adverse event resulted in facility birth, SBA with perceived poor attitude and poor quality of care were barriers.	Male and mother-in-law decision-makers resulted in home birth; women as decision-makers resulted in use of SBA, employed women controlling their earnings used SBA
Montagu, D., Sudhinaraset, M., Diamond-Smith, N., Campbell, O., Gabrysch, S., Freedman, L., Kruk, M., Donnay, F. 2017	Where women go to deliver: Understanding the changing landscape of childbirth in Africa and Asia	Secondary analysis of data from 43 demographic and health surveys	Urban setting resulted in more facility births; incentive programs resulted in more facility births; More wealth resulted in more facility care.	NA	When poor quality, often bypass to larger facilities. Low volume facilities may have lower quality. With urgent need women go to closest facilities maybe with least practiced providers.	Women with choices are able to judge poor quality and react accordingly.

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Morrison, J., Thapa, R., Basnet, M. Budhathoki, B., Tumbahangp he, K., Manandhar, D., Costello, A., Ostin, D. 2014	Exploring the first delay: A qualitative study of home deliveries in Makwanpur district Nepal	Qualitative study to explore reasons of home deliveries	Financial incentive insufficient, arranging men to carry a barrier, night labour a barrier - difficult path; high cost for feeding carriers	Status in home, shame to expose body, lack of family support affected use of SBA, home birth customary; lack of birth position, choice and privacy were barriers	Past bad experience and poor quality service resulted in barriers to SBA use; poor quality of care; health post closed after 2pm	Mother-in-law & husband decide, low status in family resulted in no access to money; no one to accompany
Paudel, M., Javanparast, S., Newman, L., Dasvarma, G. 2018	Health system barriers influencing perinatal survival in mountain villages of Nepal: Implications for future policies and practices.	Interviews with families who had experienced perinatal deaths	Small financial incentive; no timely receiving of incentives	Not allowed choices in hospital, ;infrequent outreach services to counsel and educate women; ;Hospital Cultural practices such as not bathing newborn and not early breastfeeding unacceptable; healthcare volunteers' roll diminished;	Fear and distrust health care workers; poor health system accountability and support; lack of trained staff; no monitoring or adequate equipment	Women were reluctant to attend facilities because they felt controlled by the service providers. No allowed to make decisions.
Pokhrel, B., Sharma, P., Bhatta, B., Bhandari, B., Jha, N., 2012	Health seeking behaviour during pregnancy and child birth among Muslim women of Biratnagar, Nepal	Cross sectional study of 200 mothers using questionnaire	Costs	Male doctors not culturally acceptable	Lack of awareness	Male head of household makes decisions; 6% of respondents not allowed hospital delivery by husband

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Prochaska, E., Uniyal, V., Lanham, M., Heisler, M., Quasin, S., Bisht, M. 2016	A survey of obstetric healthcare utilization in the rural Western Indian Himalayas	Face to face surveys with 197 women	Remote location , low income resulted in more home delivery (last 7 y) ; distance resulted in barrier for treatment of obstetric problems but not institutional deliveries; In recent delivery group statistical risk factor for home delivery was low income,	Effect of caste and education not significant for place of birth choice	Remote location influenced not seeking care for self reported obstetric problems.	NA
Rai, S., Dasgupta, R., Das, M., Singh, S., Devi, R., Arora, N. 2011	Determinants of utilization of services under MMJSSA scheme in Jakarkhand "client perspective": A qualitative study in a low performing state of India	interviews and focus groups with community members	Transport, distances. Receiving financial incentive was not mentioned as reason for facility birth	TBAs attended most home births but in some places "doctors" attended home birth who were possibly informal practitioners.	Decision to seek care affected by past experience and shared information	Family influenced choice of birth place
Randive, B., San S., Miguel; De Costa, A., Lindholm, L. 2014	Inequalities in institutional delivery uptake and maternal mortality reduction in the context of cash incentive program, Janani Suraksha Yojana: Results from nine states in India	Secondary Data from Demographic health Survey - India	Financial incentive insufficient; Low wealth quintile did not use SBA even with incentives; unequal access to emergency care for poor	No association between female education & facility birth; Male literacy affected use of institutional delivery	Poor services resulted in low use	Males make decisions

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Sarker, B., Rahman, M., Rahman, T., Hossain, J., Reichenbah, L., Mitra, D. 2016	Reasons for preference of home delivery with traditional birth attendants (TBAs) in rural Bangladesh: A qualitative exploration	Qualitative cross-sectional study with service providers and community	Poverty resulted in home birth; cost, poor road conditions and lack of transportation was a barrier to facility use	Comfort and trust with TBA; barriers included lack of knowledge of facilities, male doctors, social status of family down-graded with facility birth, low education, religious mobility limitations	Fear of CS because of cost and physical harm to women	Elderly women and males decision makers, prefer home; cultural restriction on women's mobility in labour (not to leave home)
Say, L., Raine, R. 2007	A systematic review of inequalities in the use of maternal health care in developing countries; examining the scale of the problem and the importance of context	Systematic review of 4 data bases	A high quality study showed no effect of economic status; moderate quality studies more use of SBA by wealthy. More urban than rural woman used facilities. One study in Nepal found no difference (semi-urban).	SBA use dependent on context: women reported important beliefs related to formal and informal maternal care	Midwives authoritarian; no social support in facility; medical facilities free but low quality and perceived 'unsafe'	Autonomy determined by continued links with parental family because women could then go where they wanted.
Shah, R., Rehfuess, E., Paudel, D., Maskey, M., Delius, M. 2018	Barriers and facilitators to institutional delivery in rural areas of Chitwan district, Nepal: a qualitative study	Qualitative study: part of a feasibility study	Lack of road and transport, inadequate financial incentive; no one to carry, difficult trails; ambulance takes long to arrive	Belief that birth is normal event; more education of family meant more SBA use; barriers included: no free movement, shame, male doctors	Perceived incompetence of midwives; poor conditions and quality of care of health posts; belief midwives incompetent & too young;	Most decision-making by husband and parents-in-law; facility delivery when women's decision-making supported by husbands

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Sharma, B., Giri, G., Christensson, K., Ramani, K. 2013	The transition of childbirth practices among tribal women in Gujarat, India - a grounded theory approach	Grounded theory approach with focus groups and interviews	Incentive schemes promote facility birth, overall economic growth	Socialized to medical interventions; loss of self-reliance around birth, deskilling of TBAs; trade off between comfort at home, safety in hospital; years of free outreach services	Hospital life saving; discomfort with medical procedures; TBA role changed - now partner with government to promote facility birth.	Decision making toward hospital birth attributed to thinking 'hospital births as progressive'
Sidney, K., Tolhurst, R., Jehan, K., Diwan, V., DeCosta, A. 2016	'The money is important but all women go to hospital for childbirth nowadays' - a qualitative exploration of why women participate in a conditional cash transfer program to promote institutional deliveries in Madhya Pradesh, India	Indepth interviews with women who gave birth recently	Cash incentive inadequate and barriers to receive; cash incentive motivated half those interviewed, high out of pocket expenses. Barriers: transportation problems, night labour, no one to accompany	Institutional delivery became the social norm, social pressure for facility birth; think facility is important regardless of expenses	Distrust of public facility for complicated delivery; perception of poor quality, fear of assistant health workers when home birth occurs	Main decision-makers supported institutional delivery
Story, W., Burgard, S., Lori, J., Talib, F., Ali, N., Haque, D. 2012	Husbands involvement in delivery care utilization in rural Bangladesh: A qualitative study	Semi-structured interviews with wives and husbands	Those with one child had higher income and used facility birth. Distance and cost were barriers	When TBA was used at home husbands uninvolved. Believed childbirth should follow tradition.	Childbirth perceived as risky, but that did not assure use of facility	Husband was decision maker. Husband's social support for wife related to facility birth.

Author	Title	Methodology	Economic and physical accessibility barriers to access	Socio-cultural: use of traditions and traditional care givers	Perceived need, benefit: quality of care and reputation of caregiver affects access	Autonomy (socio-cultural) determinants of decision making
Vieira, C., Potela, A., Miller, T., Coast, T., Leone, T., Marsden, C. 2012	Increasing the use of skilled health personnel where traditional birth attendants were providers of childbirth care: A systematic review	Systematic review 26 databases	Increases use of SBA: financial vouchers, deploying SBA in communities, SBAs coordinating care with community health workers and TBAs	Social and economic status affects use of SBA	Including community carers increased use of SBA	NA
Vidler, M. 2016	Utilization of maternal health	Qualitative study of community groups through focus group discussions and interviews, for a cluster randomized controlled trial of a community-based treatment package for pre-eclampsia	Facilitators were financial and material incentives; financial support by women's groups or local self government. Barriers included difficult access and night labour	Healthcare providers accompany women to referral facilities & provide service in home; target health information to family;	Trust of care provider increased use of SBA; perceived poor quality of facilities limited use; lack of recognition of complications;	Husbands and mothers-in-law make decisions, designated decision-maker needed for facility birth; decision-making power for women slowly changing

Appendix C

Field Notes Excerpt

An excerpt from field notes gives the feel for the rigours of travel in the district that fieldwork sometimes entailed.

It was already our second day of waiting for the roads to be cleared. Landslides tumbled rocks and debris down the steep mountainsides behind us and in front of us, but we were safe. Our proposed trip of 9 to 12 hours by jeep to our first research site had stretched to two nights and we were into our third day. We were a team of four: my translator, a bachelor degree educated nurse with an enviable way of relating to everyone we encountered; my translator's auntie, a strong warm unmarried woman who farmed but was caregiver for the translator's six-month-old infant girl for this research endeavour, and me, the midwifery researcher.

The first evening of our travel, we had spent the night in a small village that had available accommodation and food, just 20 minutes past a large town where we had requested food and lodging but found none available. After 14 hours on the road, we were hungry and tired. Water poured down onto our tarpaulin-covered baggage on the roof, rushing down mountainsides and through village streets. The rain turned to fog so thick one could only see the edge of the pavement with its white markers and occasional signs warning of hair-pin turns. The driver's previous good posture turned to hunching and clutching of the wheel as he carefully directed his jeep through the swirling icy fog and delivered us to food, beds and relative warmth. During that night, the rain continued.

The next morning at 6 AM we were back in our jeep after having black tea and we felt more confident despite the light rain and fog because it was daytime. We stopped for breakfast a few hours later as our driver said, "it was the only place" and had legumes and potatoes with tea. After that, we did not get very far until we came to another blockage, this time with many jeeps and trucks parked and passengers who had stepped into local diners, waiting. It appeared this time that it would take much longer to clear as the slides ahead were very large. It was altogether four days before we were able to reach our research site.

Appendix D

Interview Questions

Interview Questionnaire for Mothers

1. Residence:
2. Age:
3. Total number of pregnancies:
4. Total number of children born:
5. Total number of children alive:
6. Ages of living children:
7. Education level:
8. Occupation of Mother:
9. Occupation of husband:
10. Places child/children were born:
11. How did you (or your family) decide where to have your babies?
12. Did you make any plans in late pregnancy for where you would give birth, who would assist you? Please discuss.
13. Will you please describe your labour and birth(s)?
14. How long does it take to reach the health facility for birth? Means of transport?
15. What is easy about having a health facility birth?
16. What is difficult about giving birth in a health facility?
17. What is good about having a health facility birth?
18. What is 'bad' about giving birth in a health facility?
19. What is easy about staying at home for your birth?
20. What is difficult about staying at home for birth?
21. What is 'good' about staying at home for birth?
22. What is 'bad' about staying at home for birth?
23. Who cares about the place where you deliver your baby?
24. Describe the kind of birth attendance that you and mothers in your community need.

Interview Questionnaire for Maternity Care Workers

1. What reproductive, maternal and newborn services does your institution provide?
2. Describe factors influencing use of antenatal care and birthing services.
3. What is good about working as a maternity care worker in this rural area?
4. What is difficult about working as a maternity care provider in this rural area?
5. What are the barriers?
6. What would make it better and easier for maternity care providers to live and work in rural and remote areas?
7. Who cares about the barriers to working in rural and remote areas?

Interview Questionnaire for Female Community Health Workers

1. How do the mothers in the community decide where to have their babies?
2. What is easy about having a health facility birth?
3. What is difficult about giving birth in a health facility?

4. What is good about having a health facility birth?
5. What is 'bad' about giving birth in a health facility?
6. What is easy about staying at home for your birth?
7. What is difficult about staying at home for birth?
8. What is 'good' about staying at home for birth?
9. What is 'bad' about staying at home for birth?
10. Who cares about the place mothers give birth?
11. Describe the kind of birth attendance that mothers in your community need.

Interview Questionnaire for Doctors

1. Describe factors influencing use of antenatal care and birthing service?
2. What is good about working in in this rural hospital?
3. What is difficult about working as a doctor in this rural area?
4. Can you talk about the barriers to providing excellent care?
5. What would make it easier for staff to live and work in rural and remote areas?
6. Who cares about the barriers to working in rural and remote area?

Interview Questionnaire for Key Informants

1. How did you (or your family) decide where to have your babies?
2. Did you make any plans in late pregnancy for where you would give birth, who would assist you? Please discuss.
3. Will you please describe your labour and birth(s)?
4. How long does it take to reach the health facility for birth? Means of transport?
5. Who cares about the place where you deliver your baby?
6. Describe the kind of birth attendance that you and mothers in your community need.

Interview Questionnaire for Spiritual Healers

1. How long have you been *Dhami Jhankri* in this community and how did you learn to be *Dhami Jhankri*?
2. Can you describe the experience you had when you realized you had ability to be *Dhami Jhankri*?
3. What is the difference between *dhami* and *Jhankri*?
4. What kinds of things affect pregnant and birthing mothers in a spiritual realm?
5. How does it affect pregnancy and childbirth?
6. What can the *dhami Jhankri* do to help these problems?
7. What is easy/ good about having a health facility birth?
8. What is difficult/bad about health facility birth?
9. What is easy/ good about having a home birth?
10. What is difficult/bad about staying at home for birth?

Appendix E

Forward Backward Translation from WHO

(Adapted from http://www.who.int/substance_abuse/research_tools/translation/en/).

Implementation of this method includes the following steps:

1. Forward translation
2. Expert panel
3. Back-translation
4. Pre-testing and cognitive interviewing
5. Final version

1. Forward translation

One translator, preferably a health professional, familiar with terminology of the area covered by the instrument and with interview skills should be given this task. The translator should be knowledgeable of the English-speaking culture but his/her mother tongue should be the primary language of the target culture.

Instructions should be given in the approach to translating, emphasizing conceptual rather than literal translations, as well as the need to use natural and acceptable language for the broadest audience. The following general guidelines should be considered in this process:

- Translators should always aim at the conceptual equivalent of a word or phrase, not a word-for-word translation, i.e. not a literal translation. They should consider the definition of the original term and attempt to translate it in the most relevant way.
- Translators should strive to be simple, clear and concise in formulating a question. Fewer words are better. Long sentences with many clauses should be avoided.
- The target language should aim for the most common audience. Translators should avoid addressing professional audiences such as those in medicine or any other professional group. They should consider the typical respondent for the instrument being translated and what the respondent will understand when s/he hears the question.
- Translators should avoid the use of any jargon. For example, they should not use: technical terms that cannot be understood clearly; and terms that cannot be understood by common people in everyday life.

- Translators should consider issues of gender and age applicability and avoid any terms that might be considered offensive to the target population.

2. Expert panel

A bilingual (English and Nepali speaking) expert panel should be convened. The goal in this step is to identify and resolve any inadequate expressions/concepts of the translation. The expert panel may question some words or expressions and suggest alternatives. Experts should be given any materials that can help them to be consistent with previous translations. Principal investigators and/or project collaborators will be responsible for providing such materials. The number of experts in the panel may vary. In general, the panel should include the original translator, experts in health, as well as experts with experience in instrument development and translation.

The result of this process will produce a complete translated version of the questionnaire.

The team of 4 experts met for 3 hours in a meeting room in a comfortable Nepali restaurant and over food and coffee. The four members consisted of the principal investigator and original translator, a rural maternal health specialist, a university professor in maternal health, a JPHIEGO health care worker who had done work in assessment of rural maternal care, and a nurse with a masters degree who had finished doing some nursing research.

I explained all steps of the translation technique and gave them a hard copy of the abstracted explanation of the technique, followed by an e-copy. I reviewed the hard copies of the translated questions one by one, writing alternate words and phrases in the margins. One very experienced panel member, changes some of the word to 'popular, common terms' so that they would be comfortable understood by all. Some of the phrases were questioned and clarified. There were two questions which the team thought the participants might understand as having same meaning and thus might give same or similar answers to. However the team decided to leave the question as it was and see what the results would be from the pre-testing of the questionnaire with the mothers. The words, maternity health care provider, health care provider and 'skilled birth attendant' were discussed to see which one would have the intended meaning once translated.

Two members of the team selected for their expertise in translation and research were unable to attend but wanted to participate, so we will offer them the opportunity to make changes on the translated questions during the coming week on their own time, but with an opportunity to explain the process to them in person and be available for any questions by phone or email.

Two native English speakers were suggested who are fluent in Nepalese, and they will be approached to see if they are willing to do the Backwards review. To decide which questions are most critical to be included in the backwards translation, the members of the team marked the questions that they thought might possibly be difficult to translate keeping the intended meaning. (4 to 5 questions were selected).

All members decided how many test interviews they could do, and we found that we will have over 10. I will speak to each test interviewer individually when we are ready. This is planned for 3 weeks from now.

The translator, having discussed the proposed changes, took the papers home to make the changes that the team together had agreed on.

Another meeting took place with 3 members explaining in detail how to do the pre-test and others were informed by a detailed written explanation followed up by a phone call.

Nov 5: Next step is to give the 5 questions to the native English Speaker. WE selected the 5 questions that most members thought should go to the back translation because of their possible difficulty to translate.

1. Shovana Rai
2. Rita Pokherel
3. Nani Maiya Kaway
4. Khadga Bdr Shrestha
5. Lata Bajracharya
6. Kiran Bajracharya
7. Kadga Shrestha

3. Back-translation

Using the same approach as that outlined in the first step, the instrument will then be translated back to English by an independent translator, whose mother tongue is English and who has no knowledge of the questionnaire. Back-translation will be limited to items selected as terms / concepts that are key to the instrument or those that are suspected to be particularly sensitive to translation problems across cultures.

As in the initial translation, emphasis in the back-translation should be on conceptual and cultural equivalence and not linguistic equivalence. Discrepancies should be discussed with the team and further work (forward translations, discussion by the bilingual expert panel, etc.) should be done as many times as needed until a satisfactory version is reached.

Particularly problematic words or phrases that do not completely capture the concept addressed by the original item should be brought to the attention of the principal investigator.

4. Pre-testing and cognitive interviewing

It is necessary to pre-test the instrument on the target population. Each section will be fully tested using the methodologies outlined below.

- Pre-test respondents should include individuals representative of those who will be administered the questionnaire but not persons who would be eligible for the main study.
- Pre-test respondents should number 10 minimum for each section. They should represent women from all age groups (18 years of age and older) and different socioeconomic groups.
- Pre-test respondents should be administered the instrument and be systematically debriefed. This debriefing should ask respondents what they thought the question was asking, whether they could repeat the question in their own words, what came to their mind when they heard a particular phrase or term.
- The answers to these questions should be compared to the respondent's actual responses to the instrument for consistency.
- Respondents should also be asked about any word they did not understand as well as any word or expression that they found unacceptable.
- Finally, when alternative words or expressions exist for one item or expression, the pre-test respondent should be asked to choose which of the alternatives conforms better to their usual language.
- This information is best accomplished by in-depth personal interviews although the organization of a focus group may be an alternative.
- It is very important that these interviews be conducted by an experienced interviewer.

A written report of the pre-testing exercise, together with selected information regarding the participating individuals should also be provided.

5. Final version

The final version of the instrument in the Nepali language should be the result of all the steps described above. It is important that a serial number (e.g. version 1; version 2) be given to each version.

6. Documentation

All the cultural adaptation procedures should be traceable through the appropriate documents. These include, at the least:

- Initial forward version;
- A summary of recommendations by the expert panel;
- The back-translation;
- A summary of problems found during the pre-testing of the instrument and the modifications proposed; and

- The final version.

It is also necessary to describe the samples used in this process (i.e. the composition of the expert panel and the pre-test respondent samples). For the latter, the number of individuals as well as their basic characteristics should be described, as appropriate.

Appendix F

Tables

Table F1 Paphlu District Hospital birth statistics 2015 to 2016

	Jul.	Aug	Sept.	Oct.	Nov.	Dec	Jan.	Feb.	Mar.	Apr.	May	Jun.
SVD	24	26	22	26	20	13	18	16	11	12	16	16
LSCS	3	7	1	3	2	2	3	3	3	2	4	3
NND	2	0	0	0	0	0	0	0	0	1	0	0
Vacuum	0	1	1	1	0	0	0	1	0	1	2	0
Breech	0	0	1	0	0	0	0	0	0	0	0	0
PPH	0	2	2	0	0	1	0	0	1	0	1	0
IUFD	0	1	0	2	0	0	1	2	0	1	0	0
Manual removal of placenta	0	0	2	1	0	0	1*	0	1	1	1	1
Road deliveries	1	0	0	0	0	0	1	0	0	0	0	0
Referred out*	1		0	1	0	0	0	0	0	0	0	0
Other	0	Twins	0	Cervical tear	Rh-	0	0	Twins	0	0	0	Bilateral tubal ligation
Coming from outside of Paphlu/Salleri	All but 6	All	All but 2	All but 5	All but 5	All but 2	All but 5	All but 6	All but 4	All but 3	All but 2	All but 3

Notes:

Aug: Vacuum was for one of the twins.

Nov: RH negative mother able to get anti-D from a private pharmacy.

Jan: Mother with retained placenta carried for one day from a remote community with no road access

Mar: Reasons for C/S: non-progressive labour, breech, and oligohydramnios at 42+ weeks.

May: Mother who had PPH carried for one day after a home delivery.

*Referred out may travel to Okaldunga by road or to Kathmandu by plane. It is usually the family's choice of where and how to travel, or whatever is available. Sometimes referrals are due to lack of physician capable of C/S or lack of blood transfusion capabilities.

*Data compiled from the delivery log book, Paphlu District Hospital, Solukhumbu.

*The months and statistics on the Nepali calendar are not the same as our calendar. The twelve months are presented in their approximate corresponding western months.