

Women's Social Networks, Use of Skilled Birth Attendants, and Experience of Quality in
Delivery Services in Jabi Tehinan Woreda of Amhara Region, North West Ethiopia

Kerebih Asrese Sibhat

A Dissertation submitted to the School of Social Work

Presented in fulfillment of the requirements for the Degree of Doctor of Philosophy

(Social Work and Social Development)

Addis Ababa University

Addis Ababa, Ethiopia

June 2014

Addis Ababa University
School of Graduate Studies

This is to certify that the thesis prepared by Kerebih Asrese Sibhat entitled: *Women's Social Networks, Use of Skilled Birth Attendants, and Experience of Quality in Delivery Services in Jabi Tehinan Woreda of The Amhara Region, North West Ethiopia* and submitted in fulfillment of the requirements for the Degree of Doctor of Philosophy (in Social Work and Social Development) complies with the requirements of the university and meets the accepted standards with respect to originality and quality.

Examining Committee

Internal Examiner: <u>Prof. Mesganaw Fantahun</u>	Signature ----- Date -----
External Examiner: <u>Prof. Yigzaw Kebede</u>	Signature -----Date -----
Advisor: <u>Prof. Margaret E. Adamek</u>	Signature ----- Date -----

Women's Social Networks, Use of Skilled Birth Attendants, and Experience of Quality in
Delivery Services in Jabi Tehinan Woreda of Amhara Region, North West Ethiopia

Kerebih Asrese Sibhat

Addis Ababa University, 2014

Abstract

High maternal mortality has remained an unmet public health challenge, particularly in the developing world. Though maternal mortality ratio estimates for Ethiopia vary considerably due to methodological differences, most agree that maternal mortality is among the highest in the world. Since most maternal deaths occur during labor, delivery, and the immediate postpartum period, skilled birth attendants (SBAs) at every delivery have been recommended to bring a marked reduction in maternal mortality. Nonetheless, the majority of women in Ethiopia give birth at home assisted by untrained traditional birth attendants, relatives, or neighbors. This study investigated women's social networks, use of SBA, and the quality of facility delivery services experienced by women in Jabi Tehinan Woreda of Amhara Region, North West Ethiopia. The study employed mixed methods research design. Quantitative data were collected retrospectively from 134 women who had uncomplicated births at health facilities and 140 women who had uncomplicated births at home within a year preceding the survey. Eight women who had uncomplicated births at a health facility and 11 women who had uncomplicated births at home also participated in the qualitative study. Univariate and multivariate logistic regression were used to analyze quantitative data. The qualitative data were transcribed

and themes were developed for analyses. The results indicated that social network variables were significantly associated with SBAs use for delivery. Social networks better explain use of a facility for delivery services than women's individual attributes. Women embedded within homogeneous network members were 2.493(95% CI: 1.251-4.969) times more likely to deliver at health facilities than women embedded within less homogeneous network members and the odds of women delivering at a health facility increased with increasing network size. Women embedded within high SBA endorsement network member were 7.849 (95% CI: 3.906-15.773) times more likely to deliver at health facilities than women embedded within low SBA endorsement network members. Social networks facilitate SBA utilization by serving as a reference for the behavior and sharing information about the available facility delivery services and the quality of the services. The odds of urban women to deliver in a health facility is 3.246 (95% CI: 1.362-7.734) times higher than rural women. The odds of women who had better knowledge of obstetric complications to deliver in a health facility is 3.224 (95% CI: 1.564-6.647) times higher than women who had limited knowledge about the complications. Nearly half of the women (48%) who delivered at a health facility evaluated the quality of delivery services as poor. Informants shared that attendants are not sympathetic for women's pains and feelings and there is lack of privacy associated with the birthing position at health facilities. These findings inform health professionals and other stakeholders to understand the roles of women's social networks and the quality of facility delivery services in designing interventions to increase the proportion of women who deliver at health facilities. The findings are also important for social work education and designing social work interventions with pregnant women and their families.

Acknowledgements

There are many people who helped me reach at this stage of the dissertation and to whom I am greatly indebted. I would like first to thank my advisor, Margaret E. Adamek, a Professor and Director of PhD Program at Indiana University School of Social Work, who generously provided guidance, advice, and continuous inspiration that helped me to stay focused during the dissertation process. Thank you for always having kind words to encourage me and the dedication you have for empowering. I will never forget your guidance even when I still needed to find myself. You will forever be a role model in my life.

I am grateful to Dr. Terefe Degefa and Dr. Mengistu Legesse for their valuable comments during the dissertation proposal defense. I am thankful to all women who participated in the study, who were so generous in their time and share their experiences. I am also grateful to the supervisors and data collectors, who devoted their time and energy to walk long distances to interview the respondents.

I am especially thankful to my wife, Sr. Alemtsehay Mekonnen, who informed me of what was needed to do the work, helped me to the place where the work was to take place, reviewed the content of the data collection instrument, and allowed me to be on the work and find my way.

Abbreviations

AIDS	Acquired immunodeficiency syndromes
DHS	Demographic and Health Surveys
ESHE	Essential Service for Health in Ethiopia
HEWs	Health Extension Workers
HSEP	Health Service Extension Program
ICM	International Confederation of Midwives
IFGO	International Federation of Gynecologists and Obstetricians.
MDGs	Millennium Development Goals
MMR	Maternal Mortality Ratio.
MOH	Ministry of Health
NEM	Network-Episode Model
SBAs	Skilled Birth Attendants
STDs	Sexually Transmitted Diseases
TBA	Traditional Birth Attendants.
UN	United Nations
UNICEF	United Nations Children's Fund
UNFPA	United Nations Fund for Population Activities
WHO	World Health Organization

TABLE OF CONTENTS

Abstract.....	iii
Acknowledgements.....	v
Abbreviations.....	vi
TABLE OF CONTENTS.....	vii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Statement of the Problem	4
1.3 Purpose of the Study.....	7
1.4 Research Questions	7
1.5 Hypotheses	8
1.6 Conceptual Framework.....	8
1.6.1 The network-episode model.....	9
1.6.2 The behavioral model.....	14
1.6.3 Summary of the conceptual framework.....	17
1.7 Significance of the Study.....	20
1.8 Operational Definition of Terms and Concepts	21
1.9 Scope of the Study	22
1.10 Summary	23
CHAPTER TWO: REVIEW OF RELATED LITERATURE.....	26
2.1 Maternal Mortality and use of SBA to Reduce Maternal Mortality	26
2.1.1 Maternal mortality.....	26
2.1.2 SBA as a strategy to reduce maternal mortality.....	28
2.1.3 Health status, maternal mortality, and use of SBAs in Ethiopia	33
2.1.3.1 Health status	33

2.1.3.2 Maternal mortality and use of SBAs in Ethiopia	36
2.2 Factors Influencing SBA utilization.....	38
2.2.1 Socio-economic/demographic, environmental, and health system-related factors....	40
2.2.1.1 Socio-economic, cultural, and demographic factors	40
2.2.1.2 Environmental factors.....	45
2.2.1.3 Health service related factors	46
2.2.1.4 Factors that influence SBA utilization in Ethiopia.....	48
2.2.2 Social Network and health service utilization.....	52
2.2.2.1 The concept of Social Network	52
2.2.2.2 Social networks and health service utilization.....	55
2.2.2.3 Research on the impact of social networks on health service utilization	57
2.2.2.4 Social networks and maternal health service utilization	61
2.3 Summary	65
CHAPTER THREE: METHODS	68
3.1 Description of the study area.....	68
3.2 Research Approach	72
3.2.1 The quantitative phase	73
3.2.1.1 Research Design.....	73
3.2.1.2 Study Participants	74
3.2.1.3 Sample Size Determination.....	75
3.2.1.4 Sampling Procedures	77
3.2.1.5 Data Collection Instrument.....	79
3.2.1.6 Recruitment and Training of Interviewers.....	81
3.2.1.7 Data Collection Procedures	82
3.2.1.8 Variables	83

3.2.1.8.1 <i>Dependent Variables</i>	83
3.2.1.8.2 <i>Independent Variables</i>	84
3.2.1.9 Data Analysis	89
3.2.2 Qualitative phase	97
3.2.2.1 Study Participants	97
3.2.2.2 Data gathering Instrument	98
3.2.2.3 Data Collection Procedure	99
3.2.2.4 Data Analysis	99
3.3 Protection of Human Subjects	99
3.4 Limitations of the Study	100
3.5 Summary	101
CHAPTER FOUR: FINDINGS	103
4.1 The Quantitative Findings	103
4.1.1 Distribution of Respondents by Background Characteristics	103
4.1.2 Results for Hypotheses and Research Questions	108
4.1.3 Summary for quantitative findings	124
4.2 The Qualitative Findings	125
4.2.1 Background Characteristics of Informants.....	125
4.2.2 Roles of social networks during pregnancy	128
4.2.3 Roles of Social Networks during labor and Delivery	130
4.2.4 Reasons for facility delivery	132
4.2.5 Quality of Facility Delivery Services	136
4.2.6 Reasons for home delivery	139
4.2.7 Summary of qualitative findings	144
4.3 Summary of Findings.....	146

CHAPTER FIVE: DISCUSSION, CONCLUSION, AND IMPLICATIONS	149
5.1 Discussion.....	150
5.2 Conclusion.....	164
5.3 Implications.....	165
References.....	174
Annexes.....	200
Annex I Questionnaire	201
Annex 2: Informed consent form for survey respondents	211
Annex: 3 Informed consent form for Interview participants.....	212
Annex IVA Interview Questions: home delivery	213
Annex IVB Interview questions: Facility delivery	215
Annex V Health Centers and Number of Deliveries in 2011/2012	217

List of Tables

Table 4.1 Percentage distribution of respondents by background characteristics and place of delivery (n = 274)	104
Table 4.2 Percentage distribution of respondents by network characteristics and place of delivery for recent born children (n = 274).....	107
Table 4.3 Hierarchical Logistic Regression analysis of women's individual attributes and their social network variables predicting place of birth, odds of facility delivery (N = 274).....	111
Table 4.4 Stepwise Logistic Regression analysis of women's social network variables predicting place of birth, odds of facility delivery (n = 274)	113
Table 4.5 Percent distribution of women by SBA endorsement and actual place of delivery for recent born children (n = 274).	115
Table 4.6 Percent distribution of women by SBA endorsement and quality of services experienced during labor and delivery (n=134)	116

Table 4.6 Percent distribution of women by SBA endorsement and quality of services experienced during labor and delivery (n=134).....	116
Table 4.7 Percent distribution of respondents by their experience of quality during labor and delivery for their recent born children (n= 134).	122
Table 4.8 Percent distribution of women who delivered at home by reasons for home delivery (n = 140).	123
Table 4.9 Background characteristics of respondents who participated in in-depth interview	127

List of figures

Figure 1 Network-Episode Model	13
Figure 2 Conceptual framework of the study	18
Figure 3 Health Center Distribution in Jabi Tehinan Woreda	70
Figure 4 Visual display used to illustrate for respondents understand Network Tie Strength.....	210

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The health of mothers has been acknowledged to be a cornerstone of public health. Since the 1980s, an unacceptably high level of maternal mortality has been an agenda of global health and development discussions (Carlougha & McCall, 2008). Pregnancy and childbirth-related complications are now widely recognized as a leading cause of death and disability among women of reproductive ages in developing countries (Baraté & Temmerman, 2009; Reed, Koblinsky, & Mosley, 2000). Worldwide, 358,000 women die every year from pregnancy and childbirth-related causes. Developing regions account for 99% of such deaths (World Health Organization [WHO], 2010).

Maternal mortality is often characterized as the “tip of the iceberg.” For every woman who dies, 20 or more women suffer severe morbidity (injury, infection, or disease) that can affect them for the rest of their lives (Nanda, Switlick, & Lule, 2005, p.4). Morbidity related to pregnancy and childbirth is estimated at more than 7 million women annually (WHO, 2010). These statistics are especially appalling knowing that almost all cases of maternal morbidity and mortality are preventable (Baraté & Temmerman, 2009; United Nations [UN], 2011; WHO, 2007).

The death of women during pregnancy, childbirth, and the immediate postnatal period remains the health statistic that shows the greatest disparity between developed and developing countries and between the rich and poor within countries (UN, 2011; Wirth et al., 2008). For example, in developing regions, the adult lifetime risk of maternal death (the probability that a 15-year-old female will die eventually from a maternal

cause) is 1 in 120, whereas in developed regions, the risk is 1 in 4,300 (WHO, 2010).

Moreover, in the poorest countries where maternal mortality is the highest, improvement in reducing maternal mortality is the slowest compared to other regions (UN, 2011).

Therefore, improving the health of women and reducing their death during pregnancy and childbearing remains a global priority (WHO, 2007).

The death or illness of a woman of reproductive age has implications for a nation's productive capacity, labor supply, and economic well-being, and also translates into substantial economic loss and social hardship for her family (Reed et al., 2000). Pregnancy-related disease burden and associated poor maternal health and pregnancy complications drains women's productive energy, limits their income-earning capacity, and contributes to their poverty (Nanda et al., 2005). In addition, children whose mothers die or are disabled in childbearing have very diminished prospects of leading a productive life. It is estimated that about two-thirds of the 8 million infant deaths each year are largely due to poor maternal health and hygiene, inadequate care, inefficient management of delivery, and lack of essential care of newborns (WHO, 1999).

Reducing maternal mortality thus, became one of the major concerns of several international summits and conferences, including the global Millennium Summit in 2000 (UN, 2008). One of the eight Millennium Development Goals calls for improving maternal health (MDG 5). Within the MDG monitoring framework, the international community committed itself to reducing the Maternal Mortality Ratio (MMR) by 75% between 1990 and 2015, i.e., a desire to achieve an annual average decline of 5.5% MMRs (WHO, 2007). Nonetheless, the achievements have been less promising. WHO (2010) reported that the global MMR declined by 34% between 1990 and 2008, i.e., an

annual average decline of 2.3%. The same report indicated that MMR in Sub-Saharan Africa declined by 26% during the same period, i.e., an annual average decline of 1.7%. The evidence indicates that a lot remains to be accomplished in reducing maternal deaths, particularly in developing countries.

Previous strategies to reduce maternal mortality tended to focus on training traditional birth attendants and prenatal screening to identify women at high risk of developing obstetric complications (Starrs, 1997). However, it is difficult to predict which women will develop obstetric complications and thus all pregnant women are at risk (Canavan, 2009; Hussein et al., 2004; Starrs, 1997). Knowing that the majority of maternal deaths occur around the time of labor and delivery, the focus of maternal health programs shifted emphasis to strategies that prioritize skilled delivery care at birth and the management of complications to save women's lives (Ronsmans & Graham, 2006). The presence of skilled birth attendants (SBAs) at delivery helps to prevent, detect, and manage the major obstetric complications. Together with the equipment, drugs, and other supplies essential for effective management, use of SBAs at delivery is suggested as the single most important strategy to prevent maternal deaths (WHO, 1999). Evidence indicates that timely emergency obstetric care by SBAs saves women's lives and reduces maternal mortality (Paxton, Maine, Freedman, Fry, & Lobis, 2005).

In developed countries, the use of a skilled attendant at delivery is nearly universal. However, only 65% of pregnant women in developing countries deliver with the assistance of skilled health personnel. In Sub-Saharan Africa 46% of births are attended by skilled health personnel compared to about 99% in developed regions (UN, 2011). In Ethiopia, use of SBAs at birth is the lowest in the world. The 2011 National

Demographic and Health Survey results indicated that only 10% of births in the five years preceding the survey were delivered with SBAs. Ninety percent of births occurred at home under unhygienic conditions (Central Statistical Agency and ORC Macro, 2012). This low utilization of delivery services was reported despite access to health services within 2 hours walking distance reaching 90% (Ministry of Health [MOH], 2009) and despite the government's strong commitment to increase use of SBA (MOH, 2005).

1.2 Statement of the Problem

Understanding the social and economic impacts of maternal mortality, the Ethiopian government is a strong advocate for improving maternal health. Reducing maternal mortality is one of the priority goals within its successive Health Sector Development Programs (MOH, 2002, 2005). As part of the Health Sector Development Program, the government introduced the Health Extension Program (HEP) in 2003 to improve access to health services in an equitable manner and to increase demand for health services among the population (MOH, 2005).

The HSEP has 16 health packages. Maternal health is one of the family health packages in the program. It includes safe delivery, antenatal care services, family planning, and postnatal care services (MOH, 2007). The HEWs are expected to impart knowledge on birth preparedness and complication readiness to the population and improve delivery services utilization in health institutions. They are also expected to provide clean and safe delivery services and refer women to the higher health facility for better services (Federal Democratic Republic of Ethiopia, 2010). Through these activities, the HSEP was premised to attain the health -related millennium development goals of the country i.e., improve maternal health, reduce child mortality, promote gender

equality and empower women, and combat HIV/AIDS, malaria and other diseases (MOH, 2005).

Considerable achievements of the HSEP have been recorded so far. A representative survey in Amhara, Oromiya, and Southern Nations Nationalities and Peoples conducted by the ESHE project demonstrated that access to health facilities within 2 hours walking distance increased from 60% in 2003 to above 90% in 2008 (ESHE, 2008). Deliveries assisted by skilled health professionals increased from 6% in 2005 (Central Statistical Agency and ORC Macro, 2006) to 10% in 2011 (Central Statistical Agency and ORC Macro, 2012). Nevertheless, the improvement is less than optimum for reducing maternal mortality to reach the MDG 5 target committed to by the government (Karim et al., 2010). While the supply of health services is improving through the expansion of HSEP, building demand for professionally-assisted delivery remains a major challenge in the country (Koblinsky et al., 2010). Thus, research is needed to understand the factors that serve as barriers or that contribute to skilled birth attendant utilization for delivery and thereby design appropriate interventions to increase service utilization.

Previous studies that assessed maternal healthcare utilization in the country documented individual attributes and external environmental barriers to service utilization (Central Statistical Agency and ORC Macro, 2001; 2006; Mekonnen, 2003; Mekonnen & Asnakech, 2002; Mesfine, Damen, & Getnet, 2004). These studies indicated that age, women's educational status, husbands' educational status, parity, income, availability and accessibility of services, cost of services, and residence are deterrents to maternal health service utilization. Other studies (Berhane, Gossaye,

Emmelin, & Hogberg, 2001; Mesganaw, Olwit, & Desta, 1992; Warren, 2010) pointed out perceptions of poor quality of services as one of the determinants of service utilization.

Though these studies make important contributions with respect to identification of relevant variables, they do not indicate the condition of service utilization, i. e., whether women used the service to prevent unforeseen complications (normal biology of pregnancy and uncomplicated childbirth) or for curative purposes after certain complications happened. Importantly, the existing studies do not fully explain the social networks--interpersonal, family, and community interactions that may facilitate or constrain service use- a social context in which individual determinants are known to operate (Smith & Christakis, 2008). Though the existing studies identified perception of poor quality of services as barriers for maternal health service utilization, women's experience of quality in delivery care is not well-investigated.

Overseas studies demonstrated that social networks, i.e., interpersonal interactions, can facilitate or hinder healthcare utilization (Pescosolido, 1992; Sluzki, 2010). The interpersonal interactions can provide information on institutional details of the health care system, and can alter the demand for services by affecting the perceived usefulness of the available services (Devillanova, 2007). Social networks provide social support (both perceived and actual), social influence (norms and social control), social engagement, person-to- person contacts, and access to resources (money, jobs, and information), thus affecting health service utilization (Smith & Christakis, 2008). There is no study in Ethiopia known to the writer that investigated the influence of social network variables on the use of skilled birth attendants, particularly for women without

complicated births. This study assessed the contribution of social network variables (structure and content) and individual characteristics on SBA utilization and women's experience of quality in delivery care among women who experienced uncomplicated childbirth.

1.3 Purpose of the Study

The main purpose of this study is to explore the network variables (structure and content of the network) that contribute to the use of skilled birth attendants and to assess women's experience of quality of delivery care services. The specific purposes are:

- To identify the important variables that contribute to SBA utilization during uncomplicated birth,
- To identify the social network relationships that predict SBA utilization,
- To investigate the relationship between social network content and SBA utilization,
- To describe the quality of delivery care as experienced by women,
- To investigate the relationship between social network content and experience of quality in delivery care, and
- To assess the barriers to facility delivery service utilization.

1.4 Research Questions

1. What are the important variables that predict SBA utilization during uncomplicated birth?
2. What are the important social network variables that predict SBA utilization?

3. Is there relationship between social network content and SBA utilization?
4. Is there a relationship between social network content and actual quality of delivery care?
5. How do women who delivered at a health facility evaluate the quality of delivery services they experienced?
6. What are the important barriers for utilization of facility delivery services?

In line with the first four research questions, the study proposed four main hypotheses. The fifth and the sixth research questions were treated descriptively.

1.5 Hypotheses

1. Women's social network variables better predict SBA utilization for their recent born children than their individual attributes.
2. Women's social network content better predict SBA utilization than their network structures.
3. Women embedded in high SBA endorsement networks are more likely to delivery at health facility.
4. Social network content (SBA endorsement) is significantly associated with good quality of delivery service experienced by women at a health facility.

1.6 Conceptual Framework

Utilization of health services is a complex behavioral phenomenon. Empirical studies of preventive and curative services have often found that the use of health services is related to the availability, quality and cost of services, as well as social structure, health beliefs, and personal characteristics of the users (Andersen & Newman,

2005). In such areas of inquiry, more than one perspective is suggested for understanding the problem to the fullest extent possible (Ulin, Robinson, & Tolley, 2005). For this study, the Network-Episode Model (NEM) and the Behavioral Model (BM) were used as the conceptual framework of the study. In addition, since the main interest of the study was the utilization of maternal health services (SBA utilization), a framework for the evaluation of quality of care in maternity services developed by Hulton, Matthews, and Stones (2000) was used as a component of the conceptual framework of the study. The models and their relevance to the proposed study are described below.

1.6.1 The network-episode model.

The NEM is a dynamic conceptual framework of healthcare utilization and compliance, derived from decision-making, social exchange, and social network theory (Edmonds, 2010). It was developed by Pescosolido (1991), a sociologist, to specify the nature of influence of social networks on health care decisions among people with mental illness. The NEM starts with a basic assumption: dealing with health problems is a social process that is managed through the contacts (or social networks) that individuals have in the community. The model asserts that,

...interaction in social networks forms the mechanism through which individuals recognize health problems, contact health facilities, and comply with medical advice. ...the structure (the number, strength, type of ties) and function (advice, material aid, emotional support) interact with cultural content (attitudes and beliefs toward illness and medical care) to influence critical decisions that individuals make through the onset and course of a health problem. (p.161)

According to the NEM, medical care decisions are embedded in a social process where individuals' network ties provide support and advice during illness episodes and are the sources of beliefs, attitudes and knowledge about medical options, their availability, and the seriousness of the health problem. Individuals, in consultation with their social network, make medical care choices depending on previous actions and their results (Pescosolido, 1991).

Four basic assumptions underlie the NEM model. First, all societies hold a vast reserve of people who can be and are consulted during an illness episode. Second, bounded rationality rather than economic rationality underlies decision-making. The third assumption of the NEM is that the process of decision-making for individuals is dynamic. Individuals experience a series of decisions across time and space. The patterns and the sequence of advisor choices form strategies for help-seeking. And, fourth the mechanism underlying the decision-making process is interaction that is embedded within social networks. That is, through their network ties, people recognize the need for services, receive information about access and options for care, and mobilize support to facilitate or constrain movement toward use of formal or traditional services (Pescosolido, 1991).

The NEM theoretical model contains three conceptual domains: the social content/episode base, the social support system, and the illness career. The social content/episode base domain includes the background characteristics of the individual and the nature of the illness. Background individual characteristics include gender, age, education, work status, marital status, income, occupation, and personal health history. Attributes of the health episode include severity, visibility, duration, and the acute or chronic nature of the episode. The social support system domain consists of the social

network characteristics- structure (such as size, density, strength of tie), function (what ties or relations do) and content (beliefs and attitudes of individuals). The illness career domain includes concepts of key entrances, exits, and timing and sequencing (Figure 1.1). All three conceptual domains are dynamic in nature and influence each other by interaction at critical points, which in turn influence decisions and outcomes (Pescosolido, 1991).

The NEM framework illustrates that decision-making to use health services precedes or occurs simultaneously with health-seeking behavior. It is an on-going process with final decisions either to use or non-use of services (Pescosolido, 1992). According to the model, the structure and function of networks interact with the content of the network to influence critical decisions that individuals make through the onset and course of a health problem (Pescosolido, 2006). The model was initially developed to understand how individuals recognize and respond to health and illness problems (Pescosolido, 1991). Edmonds (2010) modified the original model into the Social Network Model of Social Interaction and Healthcare Utilization Decision-Making and used it to predict preventive healthcare seeking behavior, i.e., place of birth (at home or at a facility) in Bangladesh. Edmonds found that NEM, together with the decision-making process, has relevance for studying preventive health-seeking behaviors.

During the childbearing period, women use health services for preventive care or for emergency care as a result of a complication (Matthews, Brookes, Stones, & Hossain, 2005). This study focused on the use of preventive healthcare services during childbearing-specifically, the use of SBA for uncomplicated childbirths. Thus, the NEM is modified to understand preventive healthcare utilization. The content in the original

model- social content or episode base - was modified to include women's individual attributes and childbearing episode that influences childbirth service utilization. The network functions in the original model are not fully displayed in the conceptual framework of this study. Rather, the network functions in this study are conceptualized by the contribution of network members in giving advice about where to give birth.

Women in Ethiopia have low autonomy to decide where to give birth (Central Statistical Agency and ORC Macro, 2001, 2006, 2012). Family members, relatives, and neighbors share the decision-making process on place of birth. There are cultural and traditional practices that reinforce home births (Warren, 2010). Thus, the NEM may give strong conceptual understanding and explanation of utilization of SBA in this society where many people surrounding the woman claim to be stakeholders on owning the birthing process and deciding place of birth.

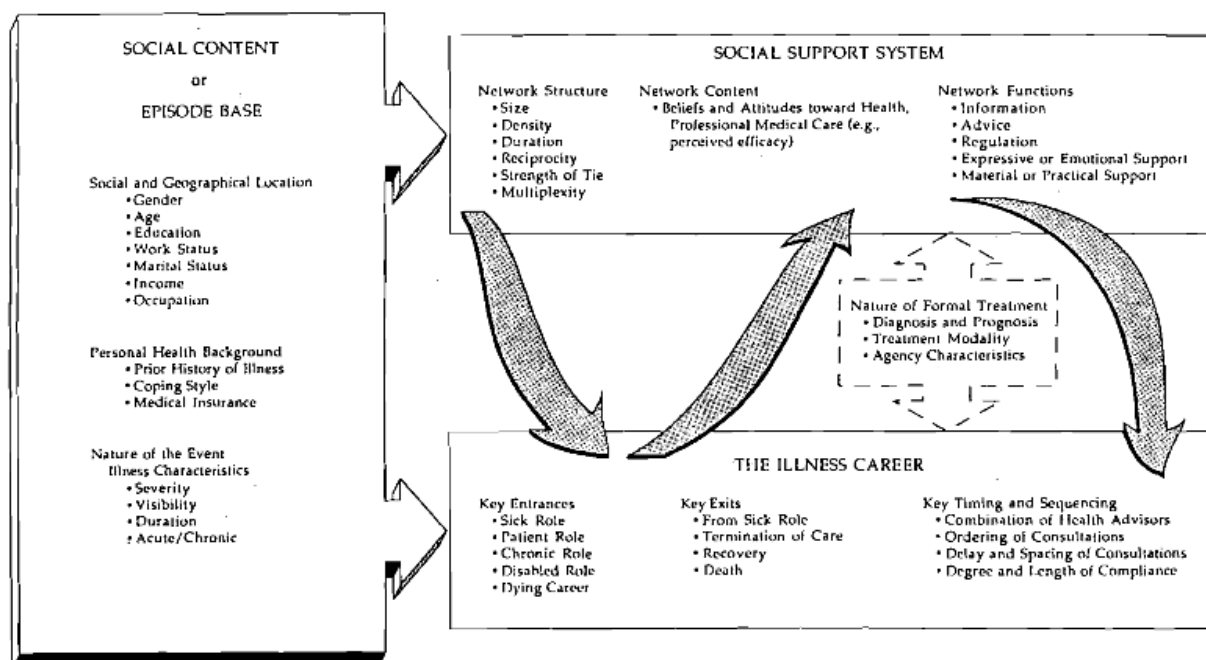


Figure 1 Network-Episode Model

Source: Pescosolido, 1991, p.173.

1.6.2 The behavioral model.

The behavioral model was developed in the late 1960s to explain access to health services/health services utilization (Anderson, 1995). The model views the utilization of health services as an individual behavior influenced by predisposing factors, enabling resources, and the need for services. These three components influence the decision-making process for utilizing health services (Anderson & Newman, 2005).

The model posits that each component in the model predicts and explains health service utilization (Anderson, 1995). The predisposing domain in the model suggests that some individuals have a propensity to use services more than other individuals. These propensities toward service use can be predicted by individual characteristics which exist prior to the onset of specific episodes of illness and are classified into three groups: 1) demographic variables (age, sex, marital status, past illness); 2) social structural variables (education, occupation, and ethnicity, family size, religion) that indicate the status of the individual in the society, and 3) health beliefs (values concerning health and illness, attitudes toward health services, knowledge about disease) that shape the belief that medical care can be helpful in treating illness. The enabling domain includes personal and community resources (income, availability of health facilities, number of health personnel, and price of health services) that make health service resources available to the individual for service use to take place. The third domain is the need characteristics and includes individual's perceived need (the individual assessment) and the evaluated need (the clinical diagnosis) which represents the most immediate cause of health service use. Proponents of the model reiterated that these three sets of variables

determine whether or not an individual seeks health services (Anderson, 1995; Anderson & Newman, 2005).

Moreover, the revised behavioral model encompassed the external environment, the health care system (i.e., national health policy and the resources and their organization in the health care system), and the outcome of health service (consumer satisfaction or experience of quality health services) as determinants of health service utilization (Anderson, 1995). The model is comprehensive in its organization of possible factors and is widely used by health services researchers (Mackian, Bedri, & Lovel, 2004). It explains the how and the why of health service utilization (Anderson, 1995). Thus, the model provides an important framework for examining women's use of professionally assisted delivery services in Ethiopia where the service use is at a low level. It will help to identify the potential enabling factors as well as barriers to service utilization.

Regarding the quality of health care as a factor in service utilization, Hulton, Matthews, and Stones (2000) asserted that the existence of maternal health services does not guarantee their use by women. The use of maternal health services may not bring an optimal outcome for women. Women may not use the services at all, may come for the services late, or may suffer an avoidable outcome because of the quality of care of health services. Women's perception of quality of care in health facilities related to their own experience or those of people they know influences their service utilization (Thaddeus & Maine, 1990).

Hulton et al (2000) defined quality of care as "the degree to which maternal health services for individuals and populations increase the likelihood of timely and appropriate

treatment for the purpose of achieving desired outcomes that are both consistent with current professional knowledge and uphold basic reproductive rights” (p.9). The authors maintained that this definition distinguishes quality into two forms: the quality of the provision of care within the institution and the quality of the care experienced by users. These divisions indicate that use of services and outcomes are the result of the quality of the services provided by the institution and women’s experience of the care.

The quality of care experienced by women is one of the foci of this study. The experience of quality in delivery care is conceptualized as having four components: a) human and physical resources; b) cognition; c) respect, dignity and equity; and d) emotional support. Women’s experience of care related to human and physical resources refers to their perception of the state of the infrastructure and actual contact with qualified staff. Cognition refers to whether a woman received sufficient information about her health status or procedures, knows what is happening, and has her questions answered. Respect, dignity and equity are valuing privacy and cultural sensitivity during treatment. Emotional support refers to the psycho-social support and empathy towards women in labor (Hulton, Matthews, & Stones, 2000).

Prior studies reported that perception of poor quality of care is one of the deterrents to giving birth in health facilities (Dogba & Fournier, 2009; Mesganaw et al., 1992; Mills, Bos, Lule, Ramana, & Bulatao, 2007; Mutharayappa, & Prabhuswamy, 2003; Warren, 2010). Nevertheless, the evidence was reported from non-users of the services. Current evidence from users of the services such as women who had uncomplicated birth may shed light on the actual quality of existing maternal healthcare services.

1.6.3 Summary of the conceptual framework

The NEM and behavioral models of health service utilization have common elements. The behavioral model posits that population characteristic, the health care system, and the external environment influence an individual's decision about health service utilization (Anderson, 1995). The NEM conceptualizes how these characteristics come to influence health care decisions in a social context by constraining or facilitating network relationships. Networks, in turn, determine how individuals evaluate need, gather information, and perceive the socio-cultural fit of medical options (Pescosolido, 1992). Both models have been used to examine health service utilization for curative purposes. In this study, the models are extended to examine preventive health service utilization (i.e., use of facility delivery services during uncomplicated births). The inclusion of the experience of quality of care in delivery services within the conceptual framework may improve the understanding of the conditions of SBA service provision. A diagram of the conceptual framework for the study is depicted in Figure 1.2 below.

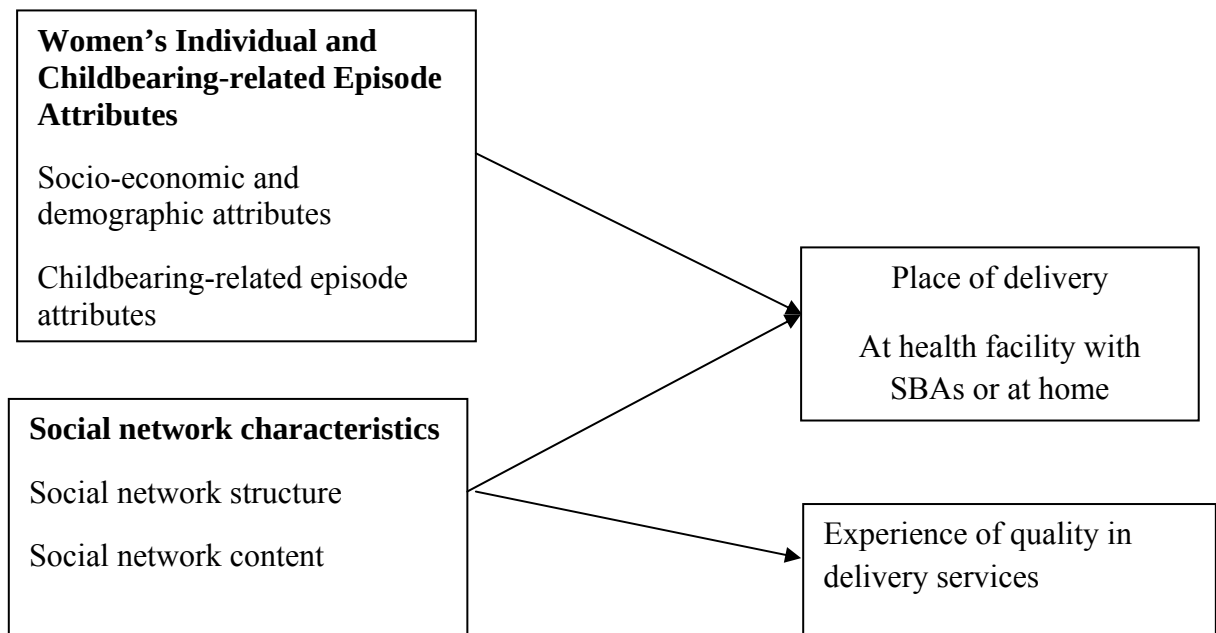


Figure 2 Conceptual framework of the study

Adapted from Pescosolido, 1991 the Network-Episode Model of Utilization and Compliance and Edmonds, 2010, Social Network Model of Social Interaction and Healthcare Utilization Decision-Making.

As presented in Figure 2, the episode base of the framework includes the socio-economic and demographic attributes of women and their childbearing episode attributes. The socio-economic and demographic characteristics that are known to impact delivery health service utilization include age, educational status, husband's educational status, residence, women's autonomy in household decisions, knowledge of obstetric complications, attitude towards facility delivery service use, and intention to use SBA. The childbearing-related episode attributes encompass variables that either exposed women to the experience of the childbearing event or help them impart knowledge of the

childbearing process. These variables include parity, ever-use of SBA, use of antenatal care (ANC) services, number of ANC checkups, and previous pregnancy outcomes. The relevance of these attributes to the use of SBA is well- documented. Nonetheless, the roles of these attributes in using SBA for uncomplicated births have not been investigated.

The social network characteristics consist of social network structural variables and social network content. The structural variables are formed from network members' relations (Scott, 2000). Network size, homogeneity/heterogeneity of network members, dispersion of networks, and strength of tie were included in this domain. In this study, place of birth endorsement, i.e., the perception of the respondents on the opinion, attitude, or suggestion given by the network members about the place of delivery for their recent born children (either at home or at a health institution with SBA) is the network content. The contribution of the social network structure and content variables on health and health service utilization is well documented. Their role in maternal health service utilization is not well developed or documented, particularly in Ethiopia.

Women may suggest a facility delivery (social network content) for their network members when they had experience of the service and satisfied with it or heard good quality delivery services. Thus, in this study it is assumed women embedded within high SBAs endorsement network will evaluate the service good because of the group norm. Such a relationship is not assessed by previous studies.

1.7 Significance of the Study

Since the launch of the Safe Motherhood Initiative in 1987, there has been growing attention to the vital role of essential obstetric care services in the prevention of maternal deaths (Starrs, 1997). As all pregnant women are at risk of obstetric complications, access to obstetric care may prevent complications leading to maternal deaths (UN, 2008). Nevertheless, the existence of such care does not guarantee service utilization and improved maternal health outcomes. Various socio-economic and cultural factors, along with individual and group perceptions and experiences of quality of care, influence maternal health care utilization (Hulton et al., 2000). Therefore, exploring the contribution of social network variables to the use of SBA and women's experience of quality in delivery services has theoretical and practical implications. The proposed study will develop local knowledge that highlights the need to look beyond individual factors and the quality of services when assessing the use of SBA at delivery. It will inform policymakers and health and social work practitioners regarding the design of relevant interventions to improve service utilization and thus decrease maternal mortality. The findings can inform curriculum for graduate and undergraduate social work students who are expected to be experts in community development and community development practice, respectively. The results will also inform researchers in the field to consider the social context along with individual characteristics and the quality of services in their effort to improve demand for skilled delivery services in the country so as to reduce maternal mortality.

1.8 Operational Definition of Terms and Concepts

Place of delivery: Place of delivery is the site women delivered their children (at home or at a health facility).

Place of delivery endorsement: Place of delivery endorsement is the opinion, advice, or suggestion given by the network members to respondents about where they should give birth to their recent born children.

Skilled birth attendant: A skilled birth attendant is an accredited health professional who assists childbirth in a health facility.

Skilled birth attendant utilization: Skilled birth attendant utilization is giving childbirth with the assistance of SBAs. In the study setting, women will give birth with the assistance of SBAs when child birth occurs at a health facility. Thus, skilled birth attendant utilization and facility delivery service utilization are used interchangeably.

Uncomplicated birth: Uncomplicated birth is the occurrence of spontaneous vaginal delivery of a child.

Uncomplicated birth at health facilities: Uncomplicated birth at health facilities is the occurrence of spontaneous vaginal delivery of a child at a health facility with the assistance of SBAs without using delivery instruments such as vacuum and forceps.

Uncomplicated birth at home: uncomplicated birth at home is the occurrence of spontaneous vaginal delivery for a child at home and mothers did not visit health facilities for help due to complication or illness during labor, delivery, and post-natal period within a month.

Social network: Social network is the relationship between the respondents and their network members.

Social network structure: Social network structure is the patterns and regularities of relationships between respondents and their network members.

Social network content: Social network content is the perceptions of the respondents about the advice, suggestions, and attitude of their network members about the place of delivery for their recent born children (either at home or at health facilities).

Social network size: Social network size is the number of members in a respondent's network.

Strength of tie: Strength of tie is the respondents' perceptions of their relationships with their network members expressed in terms of their feelings of closeness or intimacy.

Name generator: Name generator is a question asked to identify the respondents' network members. In this study, respondents were asked to freely list the names of individuals with whom they discussed the place of delivery for their recent born children.

Name interpreters: Name interpreters are questions asked to obtain information about the characteristics of the network members and their relationships with the respondents.

1.9 Scope of the Study

The study was conducted in Jabi-Tehinan woreda of West Gojjam zone in Amhara Region, North West Ethiopia. The study investigated the social network characteristics of women and assessed the roles of the network variables and their individual attributes on SBA utilization among women who had uncomplicated childbirth

within a year preceding the survey. The study also assessed the quality of health service experienced by women during facility delivery and the barriers to facility delivery service utilization. Data were collected from women who delivered at 7 health centers in the woreda and women who delivered at home in 14 kebeles surrounding the health centers.

There were time and budget concerns while selecting the study setting. The researcher knows the area very well. It is the area where he grew up and completed his primary and secondary education. Knowing the geographical setting and the cultural context of the population minimizes costs and time that might be used to become familiar with the overall setting of the study site and to understand the cultural context of the population. This opportunity also may allow the researcher to work with the local stakeholders to design interventions based on the results of the study.

1.10 Summary

Maternal mortality in Ethiopia is one of the highest in the world. The country is 5th with the highest number of maternal deaths in the world (WHO, 2010). Since most maternal deaths occur during labor, delivery, and the immediate postpartum period, the presence of skilled birth attendants at every delivery is recommended to reduce maternal mortality (Ronsmans & Graham, 2006). Though the government has increased access to potential health services and showed strong commitment to increase facility delivery services utilization, only 10% of women in Ethiopia delivered at health facility. Ninety percent delivered at home assisted by either traditional birth attendants or family members (Central Statistical Agency and ORC Macro, 2006, 2012). Thus, this study inquires why some women delivered at a health facility and others delivered at home

though facilities providing delivery services are relatively available and many stakeholders are advocating facility delivery service utilization in the country.

Previous studies that assessed maternal healthcare utilization in Ethiopia documented individual attributes and external environmental barriers to service utilization. Studies in other parts of the world demonstrated that social networks, i.e., interpersonal interactions, can facilitate or hinder healthcare utilization. However, knowledge about the roles of individual attributes, external environments, and social networks for preventive health service utilization (i.e., use of facility delivery during uncomplicated births) is limited. This study assessed the impact of social networks on facility delivery service utilization. The study also examined the contribution of individual attributes on place of facility delivery, the quality of facility delivery services, and barriers to facility utilization.

The study employed the NEM and the BM as the conceptual framework of the study. The BM emphasizes the roles of individual attributes and external environments for health service utilization. The model conceptualizes the roles of group influence or interpersonal interaction as additional factors influencing use of facility services (Anderson, 1995). The NEM postulates that the social context or interpersonal interaction as major factors for health service utilization. Social networks are conceptualized as primary and individual attributes as secondary for health service utilization (Pescosolido, 1991). Both models have been used to examine health service utilization for curative purposes. In this study, the models are extended to examine

preventive health service utilization (i.e., use of facility delivery services during uncomplicated births).

The following chapter (Chapter 2) presents what is known about the problem (magnitude of maternal mortality) and factors that influence utilization of maternal health services. The chapter includes analysis of peer-reviewed journals, published books, and other related literature sources on maternal health and factors that influenced maternal health service utilization.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

This review of literature was conducted using several electronic databases (PubMed, Global Health, Medline, Jstore, Sage publications, World Health Organization), along with hand- searching of relevant articles and reports from the Addis Ababa University library and government reports focusing on Ethiopia. Both qualitative and quantitative studies were considered in the review.

The review has two parts. Part I presents the topical issues of the study: maternal mortality and its magnitude globally and SBA utilization as a strategy devised to reduce maternal mortality. An overview of health status, maternal mortality, and SBA utilization in Ethiopia is presented. Part II presents factors that influence SBA utilization. Part II has two parts. The first part summarizes the literature on the socio-cultural/demographic, environmental, and health system factors that influence SBA utilization. The second part presents literature on social networks and health service utilization. In this section of the review, the concepts of social networks, social networks and health service utilization, and the role of social networks in maternal health care service utilization are summarized.

2.1 Maternal Mortality and use of SBA to Reduce Maternal Mortality

2.1.1 Maternal mortality

Maternal mortality is a major public health concern globally. As the estimate indicates, 358,000 women between the ages 15-49 died worldwide from complications arising from pregnancy and childbirth in 2008 (WHO 2010). About 99% of these deaths occurred in developing countries, mainly in Sub-Saharan Africa and South Asia. For every woman or girl who dies, between 20 and 30 more suffer morbidity, such as

obstetric fistulas, ruptured uterus, or pelvic inflammatory disease that can affect them for the rest of their lives (Baraté, & Temmerman, 2009; WHO, 2007). With 204,000 maternal deaths, Sub-Saharan Africa is the highest mortality region in the world. While 1 in 4300 women in developed regions risks dying from maternal causes in her reproductive life-time, 1 in 31 women in Sub-Saharan Africa risks dying from the same causes. In the region, the adjusted MMR was 640 deaths per 100,000 live births in 2008 (95% CI: 470- 930). The adjusted MMR in the developed region was 14 deaths per 100,000 live births (95% CI: 13-16) (WHO, 2010).

The Tenth Revision of the International Classification of Diseases (ICD-10) defined a maternal death as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy or its management but not from accidental or incidental causes” (WHO, 2007, p. 4). Most maternal deaths result not from disease, but during the normal life-enhancing process of procreation (Nanda et al., 2005). Nearly two-thirds of maternal deaths worldwide are due to five direct causes: hemorrhage, sepsis, complications from unsafe abortion, eclampsia and obstructed labor (Canavan, 2009; Nanda et al., 2005; WHO, 2004). Indirect causes, accounting for one-third of maternal deaths, include existing diseases exacerbated by pregnancy or diseases developed during pregnancy, such as iron deficient anemia, heart disease, HIV/AIDS, and malaria. If detected in time and managed appropriately, these problems do not have to lead to death or severe disability (Baraté & Temmerman, 2009; Canavan, 2009; WHO, 2004).

Maternal mortality is both a health and development indicator. It indicates the inequity between developed and developing countries and between regions within countries (Baraté & Temmerman, 2009). Of all the indicators commonly used to compare levels of development between countries and regions, levels of maternal mortality show the widest disparities. While 1 in 120 women risks dying from maternal causes in her lifetime in developing countries, only 1 in 4300 women risks dying from maternal causes in her lifetime in developed regions (WHO, 2010). Maternal mortality indicates the status of women, their access to health care, and the adequacy of the health care system in responding to their needs. Death or poor maternal health brings costs and incurs losses at the household level, the community level, and at the national level (WHO, 1996).

Because of the magnitude and the negative consequences of maternal mortality, efforts at reduction have mobilized the international community. Improving maternal health became one of the key objectives in the Millennium Development Goals (MDGs). Although some developing countries in South Asia have shown progress in reducing maternal mortality, progress remains slow and levels of maternal mortality are persistently high in much of the developing world, especially in Sub-Saharan Africa (WHO, 2010).

2.1.2 SBA as a strategy to reduce maternal mortality

Since the launch of the Safe Motherhood Initiative in 1987 by WHO, UNICEF, UNFPA, and the World Bank, maternal health has been recognized as a core component of reproductive health and has become a key theme in world health and development. Many international commitments and treaties have promised to reduce maternal mortality

(Baraté, & Temmerman, 2009). In the early years of the interventions, most program recommendations rested on the hypothesis that obstetric complications could be prevented or predicted by good care during pregnancy. Antenatal care programs were expanded and improved in hopes that routine monitoring and improved health practices during pregnancy would enable early recognition of women who may develop complications (Bergsjø, 2001). However, it was found that high-risk women account for only a small percentage of all maternal deaths; the vast majority of deaths occur in women with no known risk factors (Sloan, Winikoff, & Fikree, 2001). Many of the most life-threatening complications of pregnancy and childbirth are difficult to predict, thus many of the standard components of antenatal care may not be effective in reducing maternal mortality (De Brouwere, Tonglet, & Lerberghe, 1998; Koblinsky & Campbell, 2003).

Recognizing that most women in high-mortality countries deliver at home, early programs also focused on training traditional birth attendants in safe and hygienic practices (Starrs, 1997). Although training programs for traditional birth attendants may improve the routine delivery care that mothers receive, these interventions proved ineffective in reducing maternal deaths (De Brouwere et al., 1998). Neither trained traditional birth attendants nor any other category of minimally trained community health worker can prevent the vast majority of obstetric complications from happening, and once the complications occur, there is almost nothing traditional birth attendants can do to avoid maternal deaths (Freedman et al., 2003).

Therefore, the global consensus is that during pregnancy and labor, any woman can develop serious life-threatening complications that require medical care. Because

there is no reliable way to predict which women will develop these complications, it is essential that all pregnant women have access to obstetric care throughout their pregnancies, especially during and immediately after childbirth when most complications arise. Since most maternal deaths occur during labor, delivery, and the immediate postpartum period, the presence of skilled birth attendants at every delivery can lead to a marked reduction in maternal mortality (Canavan, 2009; Hussein et al., 2004; Koblinsky & Campbell, 2003; Mpembeni et al., 2007; Paxton et al., 2005; Ronsmans & Graham, 2006; Starrs, 1997; UN, 2006; UNFPA, 2004; WHO, 1999). Graham, Bell, and Bullough (2001) estimated that 16% to 33% of all maternal deaths can be avoided by skilled attendance at delivery. When complications arise, having SBAs combined with emergency obstetric care could eliminate 75% of maternal deaths (Baraté & Temmerman, 2009).

In 2004 the WHO, the International Confederation of Midwives (ICM), and the International Federation of Gynecology and Obstetrics (IFGO) defined a skilled birth attendant as “an accredited health professional such as a midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postpartum period, and in the identification, management and referral of complications in women and newborns” (WHO 2004, p.1). Traditional birth attendants (TBAs), trained or not, are excluded from the category of skilled attendant, despite evidence of positive significant associations between TBA’s referral activities and maternal health service use (Bergström & Goodburn, 2001).

A skilled attendant at every birth is recommended based on an inverse relationship between the proportion of deliveries assisted by a skilled attendant and the maternal mortality ratio. History tells us that reduction in maternal mortality occurred in Scandinavia and Western Europe in the nineteenth century with the deployment of skilled professional midwives. In a country such as Malaysia, which dramatically lowered maternal mortality in the 1960s and 1970s, midwives were the backbone of the program (Pathmanathan et al., 2003). The ICM and IFGO propose one person with midwifery skills per population of 5,000 be available although the ratio is lower in countries successful in reducing maternal mortality (Koblinsky, 2003). Countries in South East Asia with MMRs less than 100 have at least 85% of deliveries conducted by SBAs (e.g., Thailand 85%, Sri Lanka 95%). At the special session of the United Nations General Assembly in 1999, it was agreed that globally 80%, 85% and 90% of all births should be assisted by skilled attendants by 2005, 2010, and 2015, respectively (Adegoke & Broek, 2009). The overall association of SBA use and reduction of maternal mortality provides the evidence underpinning the recommendation that a skilled attendant assist every birth (irrespective of site of birth) (Bale, Stoll, & Lucas, 2003).

Because the timing of maternal mortality is clustered during labor, delivery, and in the immediate postpartum period, the presence of skilled birth attendants during this time is important to prevent, detect, and manage the major obstetric complications (Ronsmans & Graham, 2006). Along with the equipment, drugs, and other supplies essential for their effective management, the availability of skilled birth attendants is the single most important strategy in preventing maternal deaths (Campbell & Graham, 2006; WHO, 1999).

To achieve their purpose, skilled birth attendants provide the following signal functions: 1) safe conduct of a normal delivery using aseptic techniques; 2) active management of the third stage of labor; 3) immediate care of the newborn, including resuscitation as needed for complications; 4) management of postpartum hemorrhage through use of parenteral oxytocics and abdominal massage; 5) manual removal of the placenta; 6) management of eclampsia through provision of parenteral antihypertensive drugs; 7) management of postpartum infection through use of parenteral antibiotics; 8) assistance with vaginal delivery through the use of a vacuum extractor; and 9) management of incomplete abortion through manual vacuum aspiration procedures (Maine et al., 1997). In addition to preventing complications, SBAs provide the critical link between identification of women having complications and referral to more comprehensive emergency obstetric care. They also are trained to deliver other essential clinical services to prevent common maternal morbidities.

In summary, three main rationales informed the decision to promote the concept of skilled attendance at birth (Adegoke & Broek, 2009). First, the presence of skilled attendants will enable complications to be identified early and managed appropriately. This observation is essential as we cannot predict which woman will have complications at childbirth. Having a skilled attendant functioning within an enabling environment during the time of birth is vital as two-thirds of maternal deaths occur at this time (Campbell & Graham, 2006). The second observation centers on how maternal mortality has been reduced in other countries. Historical evidence shows that countries that have been able to reduce maternal mortality have improved women's access to skilled health professionals. Documentation of the current evidence which links availability of skilled

attendants with the reduction in maternal mortality is now widely available (Lerberghe & Brouwere, 2001). Thirdly, a shift to skilled attendants has been further strengthened when programs that focused on training of Traditional Birth Attendants (TBAs) failed to produce a reduction in maternal mortality (Bergström & Goodburn, 2001; Pathmanathan et al., 2003). Though it is recognized that TBAs may be more available and accessible within the community, their inability to acquire life-saving skills, lack of supportive supervision, lack of integration into the health care system, and absence of emergency back-up systems have been identified as reasons for their ineffectiveness (Bergström & Goodburn, 2001).

2.1.3 Health status, maternal mortality, and use of SBAs in Ethiopia

2.1.3.1 Health status

Widespread poverty along with general low income levels of the population, inadequate access to clean water and sanitation facilities, and poor access to health services have contributed to the high burden of ill-health in Ethiopia (Ministry of Health, 2002; 2005). Examining the nature, magnitude, and root causes of the prevailing health problems and new emerging health problems, the government issued a national health policy in 1993. The health policy emphasizes the importance of achieving access for all segments of the population to a basic package of quality primary health care services via a decentralized state system of governance (Transitional Government of Ethiopia, 1993).

As a means of achieving the goals of the health policy, the government formulated a twenty-year health sector development program (HSDP), which is being implemented through a series of five-year plans. The HSDP is a general blue-print

designed to translate the health policy statements into action. It was developed in the context of a strong government commitment to decentralize health services, and was designed explicitly to respond to the health needs of the rural population who constitute about 85% of the total population. The HSDP proposes long-term goals for the sector, and the means to attain them. The program demonstrates the priority that the government gives to health, and was backed by a commitment to allocate the necessary internal and external resources to facilitate health service provision (MOH, 2002).

The HSDP prioritizes prevention aspects of health care and the provision of comprehensive, integrated, and equitable primary health care. The HSDP focused primarily on maternal and child health programs such as reproductive health and immunization, communicable diseases such as malaria and HIV/AIDS, and nutritional disorders. To ensure universal coverage of primary health care to the community at the grass-root levels, the government has introduced the health service extension program (HSEP) - a community-based health service delivery system. The main objective of HSEP is to improve access and equity to preventive essential health interventions provided at kebele and household levels with a focus on sustained preventive health actions and increased health awareness. It also serves as an effective mechanism for shifting health care resources from being dominantly urban to the rural areas where the majority of the country's population resides (MOH, 2005). The health extension service provides different packages of essential health services targeting households, particularly women/mothers at the kebele level (MOH, 2002). The health extension service is expected to bring about concrete changes at the kebele and household levels in improving access to and equity of basic health care, thus improving the health status of the country.

So far, positive improvements have been observed in potential health service coverage and health outcomes. Access to health facilities within 2 hours walking distance increased from 60% in 2003 (MOH, 2003) to above 90% in 2008 (ESHE, 2008; MOH, 2009). Between 2005 and 2011, infant mortality decreased from 77 to 59 deaths per 1000 live births; child mortality decreased from 50 to 31 deaths per 1000 live births, and under 5 mortality decreased from 123 to 88 deaths per 1000 live births. Moderate results were also seen in maternal health. The contraceptive prevalence rate increased from 15 to 29%, antenatal coverage increased from 28 to 34%, and births assisted by health professionals increased from 5 to 10% between 2005 and 2011 (Central Statistical Agency and ORC Macro, 2006; 2012).

Nevertheless, the current levels of health indicators are less than optimal to reach the health MDG targets committed to by the government of Ethiopia. The Ethiopian government has made a strong commitment to the MDGs and reaching each of the MDG targets is central to its national development strategy. In line with MDG 5- improving maternal health, the HSDP target is to reduce maternal mortality ratio from 871 maternal deaths per 100,000 live births in 2000 to 218 maternal deaths per 100,000 live births by the year 2015. A 2008 mid-term review of the HSDP-III found that this is unlikely to happen given the program's present status. Other major observations of the mid-term review related to maternal health at the community level were that there has been limited progress in implementing the prescribed reproductive Health strategy, educating communities regarding danger signs during pregnancy and child birth, and establishment of community referral mechanisms (HSDP III Independent Review Team, 2008). Moreover, though use of facility delivery service by professionals was planned to

reach 32% by 2010 (MOH, 2005), only 10% of the deliveries were attended by professionals in 2011 (Central Statistical Agency and ORC Macro, 2012). While the potential health service coverage within 2 hours walking distance reached 90% (ESHE, 2008; MOH, 2009), the outpatient utilization rate is only 32% (HSDP III Independent Review Team, 2008). This shows that the increased availability of services does not guarantee utilization. At the same time, despite the increasing trends, the country still has poor maternal and child health outcomes compared to other low income countries (MOH, 2005).

2.1.3.2 Maternal mortality and use of SBAs in Ethiopia

With a population of about 74 million in mid-2007, Ethiopia has a high number of deaths compared to other nations. The national census results show that 839, 038 people died in 2007. Of these, 451,910 were males and 387,128 were females. From the total female deaths, 37,225 were maternal deaths. Thus, in 2007, maternal deaths accounted for about 32.4% of total female deaths in the reproductive age group (Federal Democratic Republic of Ethiopia Population Census Commission, 2010).

The maternal mortality estimated by WHO, UNFPA, UNICEF, and the World Bank for 2008 shows that Ethiopia has a MMR of 470 deaths per 100,000 live births (range of uncertainty for MMR estimates 270 - 790). With 14,000 women dying each year, Ethiopia is among the top five countries with the highest number of maternal deaths worldwide (WHO, 2010). On the other hand, the 2007 national census report showed that Ethiopia had 37, 225 maternal deaths (Federal Democratic Republic of Ethiopia Population Census Commission, 2010). The 2011 Demographic and Health Survey also reported that Ethiopia has an estimated maternal mortality of 676 deaths per 100,000 live

births (range of uncertainty for the estimates was 541-810) (Central Statistical Agency and ORC Macro, 2012). This estimate is similar to the 2005 estimated MMR of 673 deaths per 100,000 live births (range of uncertainty for MMR estimates 548 - 799) (Central Statistical Agency and ORC Macro, 2006). These estimates indicate that the maternal mortality experience remains unchanged for a decade. Though the differences in the figures are attributed to variation in the methodology used for estimation, the fact is that maternal mortality in Ethiopia is one of the highest in the world (Solomon, 2010). A woman's lifetime risk of dying from maternal causes in Ethiopia is currently estimated at 1 in 40 compared to 1 in 2,100 in the United States or 1 in 11,400 in Sweden (WHO, 2010). Lifetime risk of maternal death takes into account both the probability of becoming pregnant and the probability of dying as a result of the pregnancy cumulated across a woman's reproductive lifespan.

In response to this unacceptably high loss of maternal lives, Ethiopia has designed a health policy and strategies to improve health service delivery and attain its health-related millennium development goals. Though some improvements are observed in maternal health services utilization such as antenatal care coverage, use of family planning, and Tetanus Toxoid immunization (Koblinsky et al., 2010; Mesganaw, 2010), delivery assisted by skilled attendants remains very low. The 2005 Demographic and Health Survey reported that only 6% of the births were assisted by skilled birth attendants. Ninety-four percent of births were delivered at home assisted by either traditional birth attendants (28%) or by relatives or neighbors (61%). Five percent of all births were delivered without any type of assistance at all (Central Statistical Agency and ORC Macro, 2006). The recent demographic and health survey result shows that 10% of

births were assisted by skilled birth attendants in health facilities (Central Statistical Agency and ORC Macro, 2012), showing improvement between 2005 and 2011. Despite the encouraging trend, the proportion of births attended by skilled health attendants in Ethiopia is the lowest in the world. Moreover, wide variation is observed between rural and urban residents and across regions. SBA utilization was 42.4% and 50% for urban and 2.3% and 4% for rural areas in 2005 and 2011, respectively (Central Statistical Agency and ORC Macro, 2006, 2012).

2.2 Factors Influencing SBA utilization

A large number of studies on determinants of skilled birth attendant at delivery have investigated many potential influential factors. In their article “Too far to walk: Maternal mortality in context,” Thaddeus and Maine (1990) reviewed literature and summarized these factors under a “three delays conceptual framework:” delays in deciding to seek care, delays in reaching a medical facility, and delays in receiving adequate medical treatment. Their focus was on factors that affect the interval between the onset of an obstetric complication and its outcome, i.e., on care-seeking for obstetric emergencies. Under phase 1 delay they identified factors that shape the decision to seek care on the part of the individual women, the family, or both. Such factors include the status of women, illness characteristics, distance from the health facility, financial and opportunity costs, past experience in the health care system, and perceived quality of care. Under phase 2 delay, accessibility factors such as distribution of facilities, travel time from home to facility, availability and cost of transportation, and condition of roads are considered. Shortage of supplies, equipment, and trained personnel, the competency

of available personnel, and adequacy of referral systems are factors at work under phase 3 delays.

In their article, “Still too far to walk” Gabrysch and Campbell (2009) reviewed more than 80 original articles on determinants of maternal health care utilization. They identified 20 determinants which they grouped under four themes in an adapted framework: socio-cultural factors, perceived benefit/need of skilled attendants, economic accessibility, and physical accessibility. With their adapted framework, Gabrysch and Campbell expanded Thaddeus and Maine’s (1990) three delays framework to conceptually distinguish emergency care-seeking and preventive care-seeking.

In both frameworks, the roles of socio-cultural and demographic factors, environmental factors, and the health service system factors in health service utilization are well-documented. Though they are not mutually exclusive, these domains are the most commonly used in the literature to explain maternal health service utilization. While similar factors are considered by the two frameworks, their relative importance differs and acts in different ways. For example, cost is involved in both frameworks. Cost of transport is likely to be a greater deterrent for preventive than for emergency care-seeking. Physical accessibility may exert its role on preventive care-seeking mainly through influencing the decision to seek care, while in the case of emergency care-seeking, reaching the facility in time may be the main problem. While quality of emergency care in Thaddeus and Maine’s (1990) framework is thought to influence the third delay (receiving adequate and appropriate treatment) to manage complications and the decision to seek care (first phase delay), good quality preventive care for facility deliveries in Gabrysch and Campbell’s (2009) framework is thought to prevent some

complications from arising. In both frameworks, perceived quality of care is thought to influence the decision for service utilization. Thus, the following review of literature is organized in line with these frameworks.

2.2.1 Socio-economic/demographic, environmental, and health system-related factors

2.2.1.1 Socio-economic, cultural, and demographic factors

A variety of factors under this domain affect the decision to seek service utilization. Factors commonly examined include barriers in the socio-cultural environment that shape values, beliefs, and attitudes; the socio-economic conditions that shape access to money and information; the financial environment that determines the cost of service; and the institutional context that shapes access to and organization of services and the quality of care provided (Gabrysch & Campbell, 2009; Thaddeus & Maine, 1990). Factors such as household wealth (Chowdhury, et al., 2006; Collin, Anwar, & Ronsmans, 2007; Fotso, Ezech, & Essendi, 2009; Jayaraman, Chandrasekhar, & Tesfayi, 2008; Mayhew, et al., 2008; Titaley, Hunter, Heywood, & Dibley, 2010; Tuladhar, 2009), maternal age (Magadi, Agwanda, & Obare, 2007; Reynolds, Wong, & Tucker, 2006), marital status (Stephenson, Baschieri, Clements, Hennink, & Madise, 2006), beliefs or tradition (Some, Sombie, & Meda, 2011), family composition (Chakraborty, Islam, Chowdhury, Bari, & Akhter, 2003), woman's educational status (Amin, Shah, & Becker, 2010; Anwar, et al., 2008; Collin et al., 2007; Fotso et al., 2009; Mayhew, et al., 2008; Tuladhar, 2009), husband's educational status (Tuladhar, 2009), women's autonomy (Furuta & Salway, 2006; Matthews, et al., 2005; Mutharayappa, & Prabhuswamy, 2003; Stekelenburg, Kyanamina, Mukelabai, Wolffers, & Roosmale,

2004), residence (Jayaraman, Chandrasekhar, & Tesfayi, 2008; Ronsmans et al., 2003; Rööst, Jonsson, Liljestrand, & Essén, 2009), use of antenatal services (Anwar, et al., 2008; Collin et al., 2007; Jayaraman et al., 2008), and quality of care (Mutharayappa, & Prabhuswamy, 2003; Some, Sombie, & Meda, 2011) are the most common factors investigated by researchers.

It has been suggested that mother's age may serve as a proxy for the women's accumulated knowledge of health care services, which may have a positive influence on the use of health services. On the other hand, because of improvements in educational opportunities for women in recent years, younger women might have an enhanced knowledge of modern health care services and place more value upon modern medicine, thus increasing service utilization (Chakraborty, Islam, Chowdhury, Bari, & Akhter, 2003; Gabrysch & Campbell, 2009). Age is highly correlated with parity, and, in some settings, with educational level. It is also associated with marital status, wanted pregnancy, and socioeconomic status and decision-making power (Magadi et al., 2007).

Nonetheless, the influence of age on maternal health care utilization is inconclusive. Using DHS data from 21 Sub-Saharan African countries, Magadi et al (2007) examined the use of maternal health services by teenagers and older women. Controlling for the effect of background characteristics, their results showed that teenagers have poorer maternal health care than older women with similar background characteristics. Reynolds, Wong, and Tucker (2006), on the other hand, explored adolescents' use of maternal health care services in 15 developing countries using DHS data and found mixed results. In four countries (one in Latin America and three in Asia), adolescents 18 years old or younger were significantly less likely than older mothers to

use skilled delivery care. This result does not appear in African countries. The results indicated that except in Uganda, there were no differences in health care use by mother's age in the African countries considered in the study. Similar results were reported by Chakraborty and colleagues (2003) for Bangladesh.

Stephenson et al (2006) used DHS data from 6 African countries and examined the influence of individual, household, and community level factors on the decision to deliver a child in a health facility. Though the pattern and magnitude of the relationship differed among the 6 countries, the results demonstrated that maternal age, parity, educational status, previous experience of facility delivery, use of antenatal service, residence, and marital status influenced a woman's decision to deliver her last child in a health facility. The age of the respondent showed a significant association with delivering a child in a health facility in three countries (Malawi, Tanzania, and Kenya) but not in Burkina Faso, Ivory Coast, or Ghana. Relative to women aged 20 to 29 years old, women of all higher age groups were more likely to have delivered their last child in a health facility. Except Burkina Faso and Ivory Coast, women at all higher parities were less likely to have delivered their last child in a health facility relative to women who had given birth once or twice in all countries included in the study.

Stephenson et al (2006) also reported mixed results in the association between a mother's education and her decision to deliver her last child in a health facility. In Malawi, Kenya, Burkina Faso, and Ghana, women with a secondary education or higher were more likely than women with no education to have delivered in a health facility, and there was no association with maternal education in Ivory Coast. Urban residence increased the likelihood of a woman reporting delivery of her latest child in a health

facility in Malawi, Tanzania, and Ghana. In all countries, previous experience of delivery in a health facility and use of prenatal care was significantly associated with delivery in a health facility. Regarding marital status, Stephenson and colleagues further looked separately at monogamously married, polygamous married, never-married and formerly-married mothers. Results vary from showing no association (Tanzania, Ghana, and Burkina Faso), to monogamous women seeking care more often than the other groups (Ivory Coast and Kenya), and to formerly-married and polygamous women seeking more care (Malawi).

Another study by Ochako, Fotso, Ikamari, and Khasakhala (2011) used the 2003 DHS data and assessed the utilization of maternal health care services among young women (15-24 years old) in Kenya. The results reveal that place of residence, household wealth, education, ethnicity, parity, marital status and age at birth of the last child had strong influences on the type of delivery assistance received. Women from rich households, educated women, urban women, low parity women, and women who used antenatal services about twice or more were more likely to use professionals for delivery services. Wagle, Sabroe, and Nielsen (2004) investigated whether socio-economic factors such as distance to maternity hospital, ethnicity, type and size of family, obstetric history, and antenatal care received in present pregnancy affected the choice between home and hospital delivery in a developing country. They found that low socio-economic status was a predictor for place of delivery. The results indicated that low household wealth, primary and lower education, long distance to the maternity hospital, not having antenatal care utilization, and multiparity were all significantly associated with an increased likelihood of home delivery. Mpembeni et al. (2007) noted that discussions with the male partner on

place of delivery (OR = 2.37, 95% CI: 1.75– 3.22), advice to deliver in a health facility during antenatal care service (OR = 1.43, 95% CI: 1.25–2.63), and knowledge of pregnancy risk factors (OR= 2.95, 95% CI: 1.65–5.25) showed significant association with the use of skilled care at delivery even after controlling for confounding factors.

The abovementioned studies investigated factors such as age, parity, maternal education, household wealth, and other factors associated with SBA utilization. The impact of these factors can be measured quantitatively, thus are usually collected in surveys. A number of qualitative studies also identified socio-cultural factors such as beliefs, attitudes, and behavior that impact SBA utilization. In a semi-urban setting in Nepal, Tuladhar (2009) reported that childbirth is a family concern preferred to take place at home. The family viewed childbirth as a natural event and part of the ongoing life experience of the family. In West Java, Indonesia, Titaley, Hunter, Heywood, and Dibley (2010) found that the community did not understand the importance of maternal health care services. Instead the residents widely used the services of traditional birth attendants for maternal and child health care services. The community believes that a health facility services are needed only if obstetric complications occurred.

Rööst, Jonsson, Liljestrand, and Essén (2009) explored how health care-seeking behaviors of mothers were conditioned in an urban Bolivian setting that offers free and easily accessible maternal health care. In this study, Rööst and colleagues identified two groups of women: those who planned home delivery and those who planned facility delivery. Women who had no personal or family experience of antenatal visits or obstetric care planned to deliver at home. For these women, facility delivery was sought when life-threatening complications occurred. On the other hand, women who had

previous family or personal experience of maternal health care through antenatal checkups or in earlier pregnancies planned to deliver at health facilities. Similarly, in their study of women's perceptions of homebirths in rural Burkina Faso, Some et al. (2011) reported that the reference to the past home deliveries of relatives was one of the determinants of recent home births. These results indicate that traditions and composite experiences within the family shaped women's care-seeking behavior during pregnancy and labor.

2.2.1.2 Environmental factors

The factors under this domain are thought to affect use of maternal health services through their influence on reaching the source of care, a delay which is affected by geographical accessibility of facilities, availability and cost of transport, and road conditions. The majority of studies on delivery service use include distance (Anwar et al., 2008; Chakraborty et al., 2003; Frankenberg, Buttenheim, Sikoki, & Suriastini, 2009; Mesko et al., 2003; Mutharayappa, & Prabhuswamy, 2003; Some et al., 2011; Titalley et al., 2010), cost of transportation (Rööst et al., 2009; Titalley et al., 2010; Thaddeus & Maine, 1990), and road conditions (Some et al., 2011; Titalley et al., 2010) as factors affecting service utilization.

Distance to health services exerts a dual influence on use, as a disincentive to seeking care and as an actual obstacle to reaching care after a decision has been made to seek care (Thaddeus & Maine, 1990). Many pregnant women do not even attempt to reach a facility for delivery since walking many kilometers is difficult in labor and impossible if labor starts at night, and transport means are often unavailable. Those trying

to reach a distant facility often fail, and women gave birth along the road side (Some et al., 2011).

The obstacle effect of distance is stronger when combined with lack of transport and poor roads, and its disincentive effect is less pronounced if women have serious complications or the service is of good quality (Thaddeus & Maine, 1990). Even where facilities are conveniently located, they are underused if their quality is considered bad. Where people have the choice between several facilities, they sometimes travel further if the target facility is perceived to offer good quality care (Parkhurst, & Ssengooba, 2009). Distance is an important deterrent to delivering in facilities, in particular when labor starts unexpectedly or at night and in the absence of transport options (D'Ambruoso, Abbey, & Hussein, 2005). For example, in their study of community members' perspectives on barriers to maternal health care utilization, Titalley et al. (2010) found that physical distance to health facilities coupled with poor road infrastructure and the limited availability of health services especially in remote areas contributed to low facility service utilization for delivery.

2.2.1.3 Health service related factors

The perception of the quality of services provided at health institutions exerts an important influence on the health care-seeking behavior of potential users. People assess the quality of services provided by a facility based on their own experience with the health system and on the experiences of other people they know (Gabrysch & Campbell, 2009; Thaddeus & Maine, 1990). This judgment influences their health care-seeking behavior from the facilities. The adequacy of facilities (infrastructure, equipment,

supplies) and staffing (their number, attitude, and competence) (Thaddeus & Maine, 1990) are the key factors investigated by researchers under this domain.

Many studies of maternal health service utilization reported that quality of care is one of the important determinants of care-seeking (Dogba & Fournier, 2009; Harris et al., 2010; Mutharayappa, & Prabhuswamy, 2003; Pitchforth, Teijlingen, Graham, Dixon-Woods, & Chowdhury, 2006; Röst et al., 2009). Harris et al. (2010) found that the poor quality of hospital services in rural China and the cultural inappropriateness of birthing practices encouraged women to give birth at home. Röst et al. (2009) explored health care-seeking behavior of women in urban Bolivia and reported that distrust of authority and mistreatment by staff, such as not being kept informed about their condition or the course of their treatment reinforced a preference for home delivery. In rural Burkina Faso, poor treatment at health facilities was one of the reasons for home births. Women reported dissatisfaction with rude, arrogant and neglectful behavior of staff at health facilities and preferred the care of a TBA or relative at home (Some et al., 2011).

In a qualitative study, D'Ambruso et al. (2005) investigated women's perceptions and experiences of care in terms of factors that influenced place of delivery, satisfaction with services, expectations of care, and whether they would recommend the services. The findings showed that women expect humane, professional and considerate treatment from health professionals and a reasonable standard of physical environment. However, they encountered poor staff attitudes that included rudeness, shouting at women in labor, lack of empathy, refusal to assist, and lack of moral support and encouragement of women exhausted by labor. D'Ambruso and colleagues suggested that staff attitudes had considerable influence on acceptability and utilization of services. Women will

consciously change their place of delivery and recommendations of the services to others if they experience degrading and unacceptable behavior.

2.2.1.4 Factors that influence SBA utilization in Ethiopia

In Ethiopia, as elsewhere in the developing world, various socio-cultural, environmental, and health system factors influence maternal health service utilization (Ethiopian Society of Population Studies, 2008). Although the proportion of professionally assisted delivery is low in the country, there is substantial variation by residence, religion, marital status, parity, number of living children, age, access to mass media, and women's autonomy (Ahmed, 2010; Central Statistical Agency and ORC Macro, 2001; 2005; 2012; Alemayehu, Fekadu, & Solomon, 2012; Mekonnen, 1998; Mekonnen, & Asnakech, 2002; Mesfine et al., 2004). In a community-based cross-sectional study in North Gondar Zone, Mesfin and colleagues (2004) reported that women with high school and above education were about 11 times more likely to give birth at health institutions than illiterate women (OR= 10.6, 95% CI: 6.7-16.7). The same study noted that antenatal care utilization and previous experience of delivery complications significantly predicted safe delivery service utilization in health institutions. Women without antenatal visits were less likely to give birth at health facilities (OR= 0.09, 95% CI: .06-.15). Women with a past history of intrapartum complications were more likely to seek safe delivery care than women without such histories (OR= 1.63, 95% CI: 1.1-2.4).

Alemayehu, Fekadu, and Solomon, (2012) also investigated institutional delivery service utilization and associated factors in Sekela district and reported being urban resident (OR=4.6, 95%CI: 1.91-10.9), ANC visit during last pregnancy (OR= 4.26,

95%CI: 1.1- 16.4), maternal education level (OR=11.98, 95%CI: 3.36, 41.4), and knowledge of mothers on delivery services (OR = 2.97, 95%CI; 1.1- 8.6) had significant associations with institutional delivery service utilization. Parity significantly predicts place of birth. Women are more likely to deliver their first births at a health facility than their second and higher order births. The trend shows that as parity increases utilization of safe delivery service in health institutions decreases (Mekonnen, 2003; Mekonnen & Asnakech, 2002; Mesfine et al., 2004). That is, delivery in a health facility is more common among younger mothers. Children born in urban areas are more likely to be delivered in a health facility than children born in rural areas (Central Statistical Agency and ORC Macro, 2001; 2006, 2012).

The reasons for non-use of the services may be many. For example, the 2005 Demographic and Health Survey reported that 81% of Ethiopian women did not seek medical care for birth because of their concern that there would be no provider. About 7 of every 10 women stated that concerns about money for treatment, no female health provider, lack of transport, and no one to complete household chores were major barriers to seeking care. Distance to a health facility and not wanting to go alone are perceived as major concerns by more than 6 in 10 women. About a third of the respondents perceived lack of permission to go for treatment as a barrier to service utilization (Central Statistical Agency and ORC Macro, 2006). The lack of awareness of the importance of skilled attendants at birth, the rapid onset of labor, the lack of accessible roads, harsh terrain and weather conditions, high transport costs to reach the facilities, and the high costs of treatment within the facilities are also documented as barriers to service utilization (Koblinsky et al., 2010; Mekonnen, 2003; Mekonnen & Asnakech, 2002; Society of

Population, 2008; Warren, 2010). Alemayehu, Fekadu, and Solomon (2012) also reported that seeking closer attention from family members and relatives (60.9%), home delivery is usual practice (57.7%), unexpected labor (33.4%), no problem at the time of delivery (21.6%) and family influence (14.4%) were reason for home delivery.

Other studies identified quality of services as a factor in the low utilization of health facilities for delivery services. In their study of women's health in a rural setting in Butajira, South Central Ethiopia, Berhane and colleagues (2001) found that women perceive health providers as insensitive and unduly harsh specifically if they come late for service and as unresponsive to community beliefs and practices. Women felt that the health facilities were staffed by incompetent practitioners (Berhane, Gossaye, Emmelin, & Hogberg, 2001). In many parts of the country, delivery procedures at health facilities are perceived by women as unfamiliar and unnatural. Such perceptions act as a significant deterrent to facility births. Referral to another health facility may be seen as a measure of incompetence and only exacerbates existing suspicion of incompetence and inefficiency of both health facilities and providers (MOH, 2006).

In a recent qualitative study at the national level, Warren (2010) explored the knowledge, attitudes, and beliefs which influence maternal healthcare-seeking behavior and practices in pregnancy and childbirth. The findings indicate that home is the preferred place for birth. Many respondents prefer delivering at home in the company of known and trusted relatives and friends where customs and traditions can be respected. The results also revealed that women have limited autonomy to decide where to give birth. The decision about the location of birth place is largely determined by the husband and other senior family members such as the mother-in-law or older sister-in-laws.

Women may be referred for facility delivery when complications are recognized. Even then, the decision-making process for facility service involves other people around the women- the traditional birth attendant, the husband, and various relatives to varying extents (Warren, 2010). Kolinsky, Tain, and Solomon (2010) also identified cultural barrier in the desire for community ownership of the birthing process as well as geographical factors which influence SBA utilization in many parts of Ethiopia.

In all of the studies reviewed above, the factors shown to be associated with SBA use were primarily among women with perceived or actual complications. No study assessed the factors influencing use of SBA among women with uncomplicated births. Many of the studies focused on individual attributes of women. Individual woman interacts with family and neighborhoods. The social relations encompass a broad range of interpersonal and household factors that led to many of the beliefs, attitudes, and behaviors which may impact SBA use. For example, qualitative findings indicated that women's decision-making authority in the household is low and often husbands and in-laws are responsible for the final decision about place of birth (Furuta & Salway, 2006; Some et al., 2011). Women need approval to seek care outside of the home and may face objections, discouraging attitudes, and refusals by influential persons in the household (Mutharayappa, & Prabhuswamy, 2003). Women who decide to go to a facility need accompaniment of a known person or family member in that facility who could assist in caring for mother and child and they may need the availability of friends or family members for post-delivery assistance (D'Ambruoso et al., 2005). To overcome environmental barriers such as transportation and costs, network support may be required

(Pitchforth, Teijlingen, Graham, Dixon-Woods, & Chowdhury, 2006). These contextual differences account for variations in SBA utilization (Say & Raine, 2007).

To better understand the contextual differences, the literature on the roles of social interaction in health and health service utilization was reviewed. A summary of the concept of social network and its function in health and health service utilization is presented. Understanding the role of social networks in maternal health care service utilization is the main interest of this paper.

2.2.2 Social Network and health service utilization

2.2.2.1 The concept of Social Network

A social network is a social structure made up of network members connected by specific types of relationships. It consists of a set of actors (nodes) and the ties between these actors (Ell, 1984; Wassermann & Faust, 1994). The nodes in the social network may be individuals, organizations, or societies, and the ties are the relations between the actors. There can be many kinds of ties between the nodes such as communication ties (information or advice), formal ties (reporting), affective ties (trust or respect), material or work flow ties (giving resources), proximity ties (spatial closeness), and cognitive ties (knowing someone). Through these connections, social networks operate at many levels such as individuals, organizations, or societies and play a significant role in achieving presumed goals (Katz, Lazer, Contractor, & Arrow, 2004).

The network approach is a multidisciplinary field. It borrows concepts from sociology, social psychology, mathematics, political science, communication, anthropology, economics, and epidemiology (Katz et al., 2004). It also has its own principles that distinguish the perspective from other research traditions: (1) actors and

their actions are viewed as interdependent rather than independent, autonomous units, (2) relational ties (linkages) between actors are channels for transfer or flow of resources (either material or nonmaterial), (3) network models focusing on individuals view the network structural environment as providing opportunities for or constraints for action, (4) network models conceptualize structure (social, economic, political, etc) as lasting patterns of relations among actors (Wasserman & Faust, 1994). Under the horizon of these principles, a network study focuses on relationships between components in the group system-individual-to-individual ties within a group, individual-to-group ties, or group-to- environment ties rather than on features of these components (Katz et al., 2004).

Social network analysis differs from other social and behavioral sciences research methods. The social and behavioral research methods focus on attributes of individual units, the associations among these attributes, or the usefulness of one or more attributes for predicting the level of another attribute. The network perspective focuses on the characteristics of the social units as arising out of structural or relational processes or focuses on properties of the relational systems themselves. That is, the interest of social network analysis is to understand principles of the social structural environment and how these structural properties influence observed characteristics and associations among characteristics (Scott, 2000; Wasserman & Faust, 1994). Put another way, in network perspective, relational ties among actors are primary and attributes of actors are secondary.

Because membership is frequently established based on obligations and reciprocity emerging from role changes throughout life, social networks are dynamic

groups. They consist of people from various sources, such as family, friends, neighbors, co-workers, and formal helpers (Ell, 1984). Network ties can be classified as either strong (close-knit and intimate relationships) or weak (loose-knit and casual acquaintances). This distinction can involve a multitude of facets, including affect, mutual obligations, reciprocity, and intensity. Strong ties are particularly valuable when an individual seeks socio-emotional support and often entail a high level of trust. Weak ties are more valuable when individuals are seeking diverse or unique information from someone outside their regular frequent contacts (Granovetter, 1973).

Social network studies examine social relationships of individuals (egocentric networks) at a micro level or the whole networks of communities or groups are studied at the macro level (Hersberger, 2003). In the egocentric study, only direct links to the focal individuals (the egos) are considered. In such a study, networks can be mapped by gathering information about the social contacts from the ego. In the whole network study, networks include both direct and indirect ties and map the entire group (population), i. e., both sets of actors who influence and those being influenced are considered (Smith & Christakis, 2008).

This study is an egocentric type. In this type of study, an individual's social network can be described along structural and interactional dimensions including size, source of ties, member homogeneity, frequency of contacts, and content that examines the nature of resource exchange (Hersberger, 2003). This study assessed women's social networks and their impact on use of health services. The roles of structural characteristics of women's relationships within their social environment and the content of the relationship for maternal health service utilization were investigated.

2.2.2. 2 Social networks and health service utilization

Social networks in which individuals are embedded and through which ideas, norms, and supports flow have health impacts. A substantial body of literature documents that social networks play roles in shaping individuals' health behavior (Achat et al., 1998; Asher, 1984; Bassel, Chen, & Cooper, 1998; Ell, 1984; Haines & Hurlbert, 1992; Hintikka, Koskela, Kontula, Koskela, & Viinamiki, 2000; House, Landis, & Umberson, 1998; Kana-Iaupuni, Donato, Thompson-Colon, & Stainbac, 2005; Pescosolido, Wright, Alegria, & Vera, 1998; Seeman, Seeman, & Sayles, 1985; Sluzki, 2010; Specht, 1986; Thoits, 2011). Sluzki (2010) pointed out that social networks provide emotional support, a sense of worth, and practical aid, and act as referral agents, increasing the appropriateness and timely use of health services, and assisting members into recovery. Sluzki further maintained that "individuals with good personal social networks show enhanced emotional resilience, ... getting sick less and recovering more readily from disease, surgery, or accidents than those with a meager social network" (p.6). From her substantial review of research on social networks and social support, Ell (1984) pointed out that social ties increase individual well-being, and seem to enhance people's immunity to physical illnesses and psychological disorders, and increase the likelihood of positive outcomes. Ell suggested that supportive social ties help individuals maintain a balance between environmental demands and personal resources, thereby enhancing resistance to pathogenic agents such as disease and stress.

Members in a social network play a crucial role in recognizing the need for services, providing information about access and options for care, and mobilizing support to facilitate or constrain movement toward use of formal or traditional health services

(Andersen & Newman, 2005; Pescosolido, 1992). Devillanova (2007) stated that social networks influence health service utilization by providing information about the availability of services and their location and by changing the demand for services. “Interactions in social networks form the mechanism through which individuals recognize the problems, contact health facilities, and comply with medical advice” (Pescosolido, 1991, p. 161). In times of illness, network members may offer counseling on the meaning of symptoms, suggest tentative diagnoses, communicate information concerning appropriate behaviors and practices for the promotion of good health, and determine the need for professional help (McKinlay, 1973). For example, women may exchange information about accessibility of health services, quality of services, and the advantages or disadvantages of service use. By doing so women may assess their family and peers’ approval or disapproval of service utilization within their social networks.

Social networks affect health behavior in a variety of ways. Berkman, Glass, Brissette, and Seeman (2000) suggested that network structure and function influence health through provision of social support (i.e., emotional, instrumental, appraisal, and informational), social influence, social engagement and participation, and access to resources and material goods. These psychosocial and behavioral processes influence health status through their impact on physiological stress, psychological states and traits (e.g., self-esteem, self-efficacy, and security), and health-promoting behavior such as appropriate health service utilization, medical adherence, and exercise. Social networks may also expose individuals to health-damaging behaviors (e.g., tobacco consumption or high-risk sexual activity), and infectious disease agents such as HIV, other sexually transmitted diseases (STDs), or tuberculosis (Smith & Christakis, 2008).

Social interaction within the social network is thought to influence health service utilization through social learning and social influence (Helleringer & Kohler, 2005; Kohler, Behrman, & Watkins, 2001; Montgomery, Casterline, & Heiland, 2001). Social learning emphasizes the role of information in reducing uncertainty. Conversations and interactions help reduce the uncertainty associated with new behaviors and practices. Learning about other women's experiences through social interactions may reduce the uncertainty and thus the woman herself will adopt the behavior (Kohler et al., 2001; Madhavan, Adams, & Simon, 2003). For example, discussion with other women in one's network on place of delivery may increase a woman's perception of risk of home births and decrease her uncertainty about the safety of facility-based services.

Social influence extends beyond social learning. The social environment either reinforces or alters the members' behavior in line with the prevailing social norm in a community (Montgomery & Casterline, 1996). Shared norms around health behaviors (e.g., alcohol and cigarette consumption, health care utilization, treatment adherence or dietary patterns) might be powerful sources of social influence with direct consequences for the behavior of network members (Berkman et al., 2000). For example, a woman's network members may encourage facility delivery while explaining associated risks at home delivery. On the other hand, a woman's network members may suggest home delivery by emphasizing the values of traditional ceremonies at home delivery.

2.2.2.3 Research on the impact of social networks on health

service utilization

The eclectic mix of theoretical approaches from Sociology, Anthropology, and Psychology coupled with Epidemiology form the foundation of research on social

networks and health (Berkman et al., 2000). As discussed above, social networks affect health status through psychological and behavioral pathways (social support, social influence, social engagement, and access to resources). This section presents research conducted on social networks and health service utilization. Many studies investigated the influence of social network structure characteristics (density, homogeneity/heterogeneity, strength, size, frequency of contact, geographical proximity) and content (beliefs and attitudes of members in the network towards the issue under consideration) on health and health service utilization through these pathways.

Using data from the National Co-morbidity Survey, Thoits (2011) examined the relationship between the occurrences of mental disorders- the types of disorders (mood, anxiety, and substance abuse) and frequency (severity) of these disorders within a year and the role of social support for entry into mental health treatment, controlling for other socio-economic and demographic variables that may influence service utilization. The results showed that social support plays a complex role in mental health service utilization. More perceived social support significantly reduced the likelihood of entering mental health treatment for respondents with less severe mental disorders. Conversely, a high level of perceived social support significantly increases the probability of entering treatment for respondents with severe mental disorders. A relative lack of social support significantly increases the probability of service utilization. This pattern suggests that informal social support substitutes for professional treatment, diminishing people's need for formal assistance for minor disorders.

Other studies explored health service utilization of poor individuals with mental illness. The results revealed diverse patterns of service utilization based on severity of

mental health problems, the interaction between the size of one's network, the perceived level of available social support, and beliefs about mental health care. Large and supportive networks decreased use of formal mental health services (Pescosolido et al., 1998). On the other hand, Maulik, Eaton, and Bradshaw (2009) collected longitudinal data and examined the association between specific sources of social network and social support (friends, relatives, and spouse) and mental health services use. The results indicated that reduced frequency of meeting with friends or relatives was generally associated with reduced odds of accessing general medical services, whereas increased social support of friends or spouse was associated with increased odds of general medical service use. Compared with meeting a friend every day, never meeting a friend was associated with a 60% reduction in the odds of using general medical services.

Kana'-Iaupuni et al. (2005) explored the health status effects of several dimensions of social networks, including network size, kinship roles, and interaction (proximity, contact, and co-residence) on social support for mothers and child health. Kana'-Iaupuni and colleagues found that networks containing more extended kin and co-resident ties offer greater support resources to mothers with young children, especially among the poorest households. Network structures characterized by more social support and greater interaction with extended, rather than immediate, kin help sustain healthier children.

Michael, Colditz, Coakley, and Kawachi (1999) investigated the health maintenance effects of social network characteristics among a healthy cohort of women. Controlling health behaviors and confounding variables, the authors reported that having close friends and relatives and the presence of a confidante are strong predictors of high

functioning among older women. The same study reported that the absence of close friends or relatives was associated with a 3.95 point decrement (95% CI: -6.8, -1.9) in mental functioning and the lack of confidante was associated with a 4.44 point decrement (95% CI: -7.0, -1.9) in physical functioning.

Helleringer and Kohler (2005) used longitudinal data to examine the effects of social interactions among peers, relatives, and community members on perception of risk and the attitudes of residents towards AIDS. The results revealed that social networks are important sources of information about the disease and in encouraging respondents to assess their own risk of infection. Social networks appear as a resource for individuals to learn about and evaluate new behavioral strategies in the face of the AIDS epidemic.

In addition to health service utilization, Achat et al. (1998) examined the association between social networks and aspects of mental functioning among middle and old age women and reported that social networks are positively associated with mental functioning in women. Compared to the most socially integrated, women who were socially isolated had reductions in mental health. A greater degree of social isolation was associated with an increased risk of poor health status. Using an ethnographic and survey study, Freidenberg and Hammer (1998) examined the impact of several aspects of social networks on meeting medical needs and mode of utilization of the medical system. Findings indicated that strong social networks predict addressing medical needs and utilization of the health care system on a more regular basis.

Social networks facilitate health service utilization by providing information on the availability of services and their location. Controlling for all individual and ethnic characteristics in undocumented immigrants in Milan, Devillanova (2007) found that

information from strong social ties about available health service reduces the initial time to visit the health facilities by 30%. Berkanovic and Telesky (1982) found that general characteristics of social networks (e.g., frequency of contact, network size, amount of support obtained from network members, degree to which individuals depends on others for advice) may affect the decision to seek care only when the opinion of social network members is incongruent with an individual's beliefs. Taken together, these findings suggest associations between networks variables such as density, tie strength, and the composition of the social network (homogeneity/heterogeneity) with health care utilization.

All of the above-mentioned studies demonstrated the importance of social networks in health service utilization in a variety of contexts. The present study considers the influence of network structure and content on SBA use in Ethiopia. The study assessed the roles of social network in SBA utilization in a country where the utilization of the SBAs services is the lowest in the world.

2.2.2.4 Social networks and maternal health service utilization

The use of professional assisted services during pregnancy (to diagnose either pre-existing health problems or to detect certain complications), during labor and delivery, and in the immediate post-natal period (to treat complications that may arise) are important for maternal and new-born health (Ethiopian Society of Population Studies, 2008). Couples who are potential users of these services are members of social groups with different social networks and meet the attitudes and behaviors of other people in their group bounded by the larger community. The social networks of couples may influence utilization of the services either by giving advice about the use of the services

or by serving as a model in using the service. Literature on the role of social networks on utilization of maternal health services is limited.

Clair, Smerigliop, Alexander, and Celentanop (1989) examined the contribution of social network structural characteristics and socio-demographic factors for prenatal care utilization to prevent unforeseen health complications among pregnant women. They considered size of the network (the number of people with whom the individual maintains contact) , the strength of relational ties (the emotional intimacy and frequency of interpersonal contact), density of the network (the extent the members of an individual's social network knows and contact one another), the dispersion of the network (geographical proximity of members for face-to-face contact), and the diversity of the network (the number of different types of relationships an individual maintains) as measures of network structural characteristics. The findings revealed that social networks have a significant influence on individuals' utilization of prenatal health services. Respondents who used prenatal care services reported having larger numbers of relatives, have larger friendship networks, and lived farther from their relatives and nearer to friends. On the other hand, respondents who underutilized prenatal care reported having strong ties with relatives, and lived closer to relatives and farther from friends. The findings indicated that women were more likely to underutilize care if they were embedded in strong-tie, non-disperse networks where most members were immediate family or relatives. In a similar vein, Mckinlay (1973) investigated the role of social networks used as lay consultants to utilize prenatal health services before using the services. The results indicated that women who utilized the services appeared to live

closer to friends, independent of their kinship networks, had less frequent contact with relatives, and higher frequency of contact with friends.

A recent retrospective study by Edmonds (2010) examined the role of social networks in SBA utilization among women who had uncomplicated births in Matlab, Bangladesh. The author differentiated network structure, network content and attributes of individual women to assess their importance in facility delivery. Density, strength of tie, and homogeneity of kin were selected as measures of network structure. Place of birth endorsement (either at home or facility) was selected to measure the influence of network content or women's perception of the type of advice given to them by network members. The results revealed that irrespective of network structural characteristics (low/high density, homogeneous/heterogeneous network, or high/low strength of tie), network content was significantly associated with facility delivery. Women with high SBA endorsement are more likely to have health facility deliveries than women with low SBA endorsement. The findings demonstrated that network content variables representing perceived norms regarding place of birth was highly significant in predicting place of birth. Network content is more strongly associated with place of birth than women's individual attributes alone (i.e., parity, education, and income). The results also revealed that women behave in accordance with how they perceive the advice given to them by members of their discussion networks, regardless of whether the advice supports home or facility delivery. This study clearly indicated that the type of advice given by the social network (network content), not the network structure, is important in predicting use of health services for uncomplicated births.

In addition, the demographic and reproductive health literature documents the effects of social networks on diffusion of innovation regarding family planning. For example, Kohler, Behrman, and Watkins (2001) explored the effects of social network structure measured by network density (the extent to which network partners know each other) and social network content measured by the proportion of members of a network who use or approve of family planning on adoption of contraceptive use in rural Kenya. The findings indicated that both structure and content of the social network were important in explaining contraceptive use in the study area. In an ongoing longitudinal study, Behrman, Kohler, and Watkins (2002) found that the effect of social networks (i.e., number of family planning users in the network) on attitudes and behaviors regarding family planning were significant even when controlling for unobserved factors (e.g., homophily) that might determine the social network itself.

Godley (2001) studied the effects of kinship networks on women's contraceptive choice in rural Thailand and found that extended kinship ties affect contraceptive choice. This study revealed that households who had more extended kinship tie using contraceptive methods were more likely to use the methods used by their kinship networks. Godley further maintained that the number of ties as well as the location of the extended kinship ties had differential effects on the types of contraceptive methods individual women choose. Gayen and Raeside (n.d) also reported that kinship social networks significantly predicted contraceptive use in rural Bangladesh.

The studies mentioned above demonstrate the role of social networks in maternal and reproductive health care utilization. Such studies are lacking in Ethiopia. In a qualitative study, Warren (2010) reported the influence of social networks on deciding

place of birth in Ethiopia. Warren maintained that the decision on place of delivery for a woman is largely determined by the husband and other senior family members as well as other people around the women- the traditional birth attendant and various relatives to varying extents. Nevertheless, the study did not clearly indicate which characteristics of the network affect the decisions. Owing to its nature, the study did not indicate the resultant behavior (actual place of delivery) as a result of the network influence and the relative role of networks in SBA utilization. This study investigated the characteristics of women's social networks (structure and content) and their individual characteristics to assess their roles in SBA utilization among women who had uncomplicated childbirth.

2.3 Summary

This chapter outlines a review of the literature that highlights the magnitude of the problem (maternal mortality) and the strategy devised to address the problem. The chapter also presents studies that treated the factors that influence maternal health service utilization in general and facility delivery service utilization in particular. These studies documented various socio-cultural, individual, and external environmental factors that contributed to facility delivery service utilization. Though these studies contributed a lot to identify important variables, there remains a gap in the literature regarding the variables that facilitate service utilization or serve as barriers to service utilization due to the methodological and conceptual limitations of the studies. These studies did not indicate whether women used the service for prevention or curative purposes. The studies also emphasized individual's characteristics and environmental barriers and did not consider the role of interpersonal interactions.

Some studies qualitatively reported the importance of socio-cultural factors and interpersonal interaction in deciding place of delivery. These studies did not quantify the relative importance of social interactions compared to individual attributes. Other studies identified perception of poor quality of services as barriers for maternal health service utilization. The studies qualitatively collected data from non-users of the services; hence the actual quality of services experienced by women is not well-investigated. The studies did not indicate the different aspects of quality of services. In addition, quantitative evidence about the quality of facility delivery services is lacking.

Studies in other parts of the world reported that social networks can facilitate or constrain healthcare utilization. These studies demonstrated the roles of social networks mainly for curative health service utilization. Knowledge about the roles of social networks for preventive health service utilization (i.e., use of facility delivery during uncomplicated births) is limited. Evidence from the qualitative studies in Ethiopia indicated that family members and people around the women are important stakeholders in the birthing process. In such a social context, social networks may heavily influence facility utilization during uncomplicated deliveries. The importance of social networks in predicting facility delivery service utilization may be better understood by examining their roles independently and together with individual characteristics.

In conclusion, the literature reviewed indicates that many researchers reported quantitative evidence of factors that influence SBA utilization during delivery. Others provide qualitative descriptions of factors that influence SBA utilization. This study mixed these approaches to fully understand the factors that determine facility delivery service utilization during uncomplicated births. The study employed sequential mixed

methods design. The quantitative component was used to statistically test the hypotheses proposed in the study and to describe the research questions for which hypotheses were not proposed. The qualitative component was used to complement and clarify the quantitative findings. The following chapter outlines the methods of the study.

CHAPTER THREE: METHODS

3.1 Description of the study area

The study was conducted in Jaabi Tehinan Woreda, West Gojjam Zone of the Amhara Region, North West Ethiopia. The Amhara Region is one of the nine Regional States in the country. With an estimated area of 154,708.96 square kilometers, the region is home for 17, 221,976 people. Orthodox Christianity (83%) and Islam (17%) are the two dominant religions in the region. About 12% of the population lives in urban areas. Only 38% of the total population of the region was literate in 2007 (Central Statistical Agency and ORC Macro, 2012)

The Amhara region is divided in to 11 zones and 138 woredas. The study site, Jabi Tehinan woreda is one of the 138 woredas in the region. It is located about 180 km south of Bahir Dar, the capital city of the Amhara Region. The woreda has a total area of 1200.5 square kilometers and it is home for 178,649 people. About 7% of the population lives in urban areas. More than 97% of the populations are followers of the Orthodox Christian religion and 2% are Islam. Almost all the people belong to the Amhara linguistic group (Central Statistical Agency and ORC Macro, 2012).

Administratively, Jabi Tehinan woreda is found in West Gojjam Zone and is divided into 5 urban and 39 rural kebeles. There are government and privately owned health facilities in the woreda. The government runs 37 health posts, 12 health centers, and 1 hospital. There are 13 clinics and 8 drug vendors owned privately. These health institutions provide health services for the population including maternal health services. Delivery services are mainly given at government health facilities- at health centers and

at the hospital. The hospital is a referral institution for the health centers in the woreda and other neighboring woredas. Seven out of 12 health centers have midwifery (Jabi Tehinan Woreda Health Office, 2012). The study was conducted within 5 kilometers around these health centers (Figure 3).

Maternal health service utilization is at a low status in the woreda. At the time of the survey, the proportion of women who attended ANC service at least 4 times was 6.6% in the rural and 17.2% in urban areas. SBA utilization was 9% for the rural and 10% for urban areas and post-natal service utilization was 35% in rural areas and 28% for urban women (Jabi Tehinan Woreda Health Office, 2012).

Kinship and descent are important aspects of Amhara life (Agazi & Kiros, 2006). As other people in the region, people in the Jabi Tehinan woreda trace kinship relationships up to the seventh degree of continuity. Kinship is traced through both father's and mother's lines. There are also relationships created through baptism. A man may be godfather for a baby boy and a woman godmother for a baby girl. These individuals are co-parents creating blood-like relationships with the real parents of the children, including their relatives. These kinship ties involve economic and social obligations for the members in different life aspects. Having a larger kinship network means having more family members to count on in hard times, or having more family members to support (Werger, 2009).

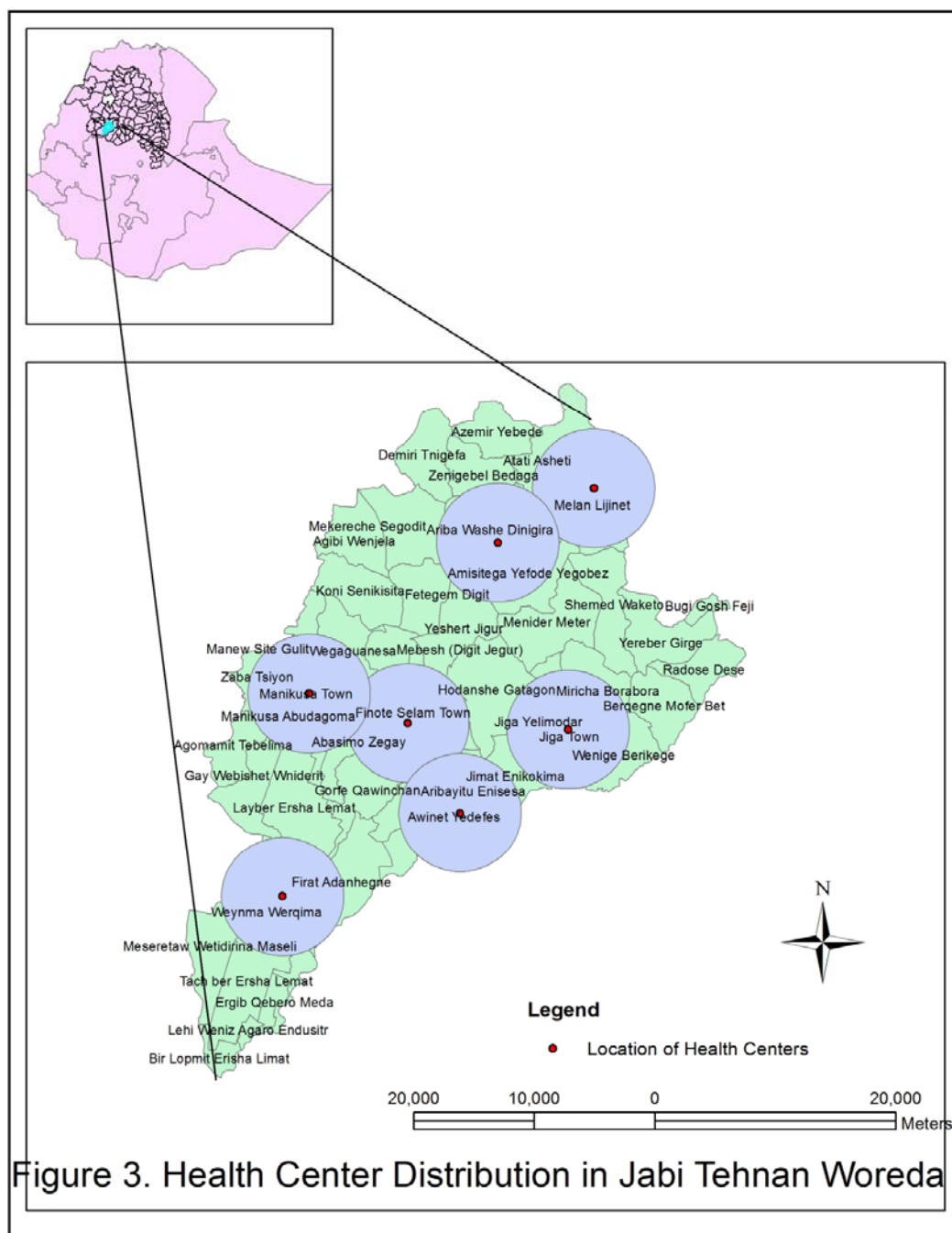


Figure 3 Health Center Distribution in Jabi Tehnan Woreda

In addition to sharing and helping among the kinship network members, it is also common practice to assist friends and neighbors when they are in need. There are various forms of voluntary organizations such as *idir*, *iquib*, and, *mahiber* within which people interact and provide social support. These organizations are usually established based on close acquaintance, reciprocity, trust, and friendship. They are established for identified social, economic and spiritual demands. People living in the neighborhood submit themselves voluntarily to these institutions and cooperate on specific areas of interest as long as they reach to a consensus. These institutions maintain social bonds among the members. Through these traditional institutions, the societies preserve and maintain Indigenous practices and knowledge that have gained wide acceptance.

As stated above, 97% people in Jabi Tehinan woreda are mainly Orthodox Christians. They celebrate festivals on major Christian holidays of the country like *Meskel* (the day for the commemoration of the founding of the True Cross), *Timket* (Epiphany), *Genna* (Christmas), and *Fasika* (Easter). On holidays, people produce feasts and invite each other. In most cases, neighbors or relatives celebrate these holidays together.

In sum, people in Jabi Tehinan woreda have strong relations that include trust and reciprocity. Social interaction is part of their daily life. Through such relational bondages, members support each other when there is a need, celebrate their special worship days, share their experiences, and transfer their experience to younger generations. Having social relations is also a coping mechanism for the needy during adverse conditions. Therefore, in such a social setting, social networks may facilitate or

constrain health service utilization, particularly preventive health service utilization like facility delivery service utilization during uncomplicated births.

3.2 Research Approach

The main purpose of the study was to investigate the influence of social networks on health facility utilization during uncomplicated births. The study also assessed other related factors that predicted use of a health facility for delivery services during uncomplicated birth, the quality of services provided at health facilities, and barriers to facility utilization. To attain these purposes, the study employed a mixed methods research design. A mixed method research design combines quantitative and qualitative research approaches and techniques in one study (Creswell, 2009; Johnson & Onwuegbuzie, 2004; Leech & Onwuegbuzie, 2009). It is premised that the use of quantitative and qualitative approaches in combination provide a better understanding of research problems than either approach alone (Creswell, 2009; Creswell, & Garrett, 2008; Woolley, 2009). Mixed methods offers strengths that offset the weaknesses of separately applied quantitative and qualitative research methods (Johnson & Onwuegbuzie, 2004).

The study employed a sequential explanatory mixed methods design. In this design, quantitative data are collected and analyzed, followed by qualitative data collection and analysis (Creswell, 2008; 2009). Priority is given to the quantitative data. The qualitative data complemented the quantitative survey data by providing an interpretive aid to understanding the statistical patterns that emerged. Subsamples of the survey respondents who completed the survey were invited to take part in the individual

interviews. Such a sampling approach is the most desirable sampling strategy while using mixed methods (Yin, 2006).

Data collection with all methods was linked by addressing the same substantive issue of the influence of social networks for facility delivery, quality of facility delivery service, and barriers to facility delivery, i.e., the items in the two phases of the study complement each other. “The more that the items overlap or complement each other; the more that the mixed methods can be part of a single study” (Yin, 2006, p.44). Moreover, data analysis is connected, and integration occurs at the data interpretation stage and in the discussion (Creswell, 2008; Hanson, Creswell, Clark, Petska, & Creswell, 2005). This design is useful for explaining relationships and/or to elaborate, illustrate, and clarify the quantitative findings (Combs & Onwuegbuzie, 2010; Doyle, Brady, & Byrne, 2009).

Since there were no previous studies that investigated social networks and use of health facility for delivery in the study setting, an exploratory study was undertaken before the main study. The exploratory study was undertaken to better understand the phenomenon considered in the study, to assess the feasibility of the study, and to develop data collection instruments for the study (Kreuger & Newman, 2006; Ulin et al., 2005). The quantitative phase and the qualitative phases of inquiry and their designs are discussed below.

3.2.1 The quantitative phase

3.2.1.1 Research Design

The study employed a retrospective cross-sectional case control survey design and used techniques of social network analysis. This approach provides theoretical and

methodological approaches to investigate problems related to underutilization of preventive health care (Edmonds, 2010). Social network analysis is a multidisciplinary method with its origin in the disciplines of psychology, anthropology, and sociology. The method is useful to identify, measure, and test hypotheses about the structural forms and content of relations among actors (Wasserman & Faust, 1994) presumed to influence the behavior in question.

Social network studies use either whole-network or egocentric network designs (Butts, 2008; Marsden, 2005). Whole-network studies examine sets of interrelated objects or actors that have bounded social collectives and clear boundaries before the study commences. At the whole-network level, complete enumeration of a closed population is considered for analytic techniques. Egocentric studies, on the other hand, focus on a focal actor and the relationships to the actor. Egocentric network designs collect data on relationships involving an ego and the network members to which the ego is linked. This design sampled egos from a larger population and draws representative samples of the social environments surrounding a particular issue. It is compatible with conventional statistical methods of generalization to large populations (Marsden, 1990, 2005). This study employed an egocentric network design to examine place of delivery among a subset of women's personal networks. Network boundaries were set during data collection based on respondents' free recall of names stimulated by a name generator question (Burt, 1984).

3.2.1.2 Study Participants

Ever married women in the reproductive age group (15-49) (Central Statistical Agency and ORC Macro, 2012) who had uncomplicated births within a year preceding

the survey and had living children participated in the study. The participants were divided into groups based on place of delivery. One of the groups comprised of women who had uncomplicated birth in a health facility. A list of women who delivered within the preceding year was obtained from the delivery registration books from health institutions providing delivery services. Those women who had uncomplicated deliveries were selected and included in the study. The other group included women who had uncomplicated deliveries at home. As distance is one of the barriers for delivery service utilization in the country (Central Statistical Agency and ORC Macro, 2001, 2006, 2012), two kebeles within 5km. distance from the health institutions that are providing delivery services were identified in the district. Lists of women who delivered within a year in those kebeles were obtained from the health posts' vaccination registration books in each selected kebele and women who had uncomplicated deliveries were selected and participated in the study.

3.2.1.3 Sample Size Determination

The key issue in deciding a sample is that it represents the population from which it is drawn. A popular question that is usually asked in this regard is the size of the sample required to infer research findings back to a population. Methodologists suggest that the levels of precision estimated to be achieved, statistical level of confidence, and variability or variance expected in the population are important considerations in sample size determination (Bartlette, Kotrlik, & Higgins, 2001; Cohen, Manion, & Morrison, 2000; Israel, 2009; Singh, 2007).

Level of precision refers to the amount of sampling error (difference of sample value from population value) researchers are willing to accept. Precision is directly

related to sample size, i.e., larger samples are more precise than smaller samples. Other things being equal, a larger sample size is needed when the researcher wants less sampling error, the population size is larger, or the population is more heterogeneous. Level of confidence is an idea encompassed under the central limit theorem that states that when a population is repeatedly sampled, the average value of the attribute obtained by those samples is equal to the true population value. And the degree of variability in the attributes being measured refers to the distribution of attributes in the population (Cohen, Manion, & Morrison, 2000; Israel, 2009; Monette, Sullivan, & Dejong, 2005; Singh, 2007). Within the framework of these suggestions, the sample size for the study was computed using the following formula (Israel, 2009).

$$n = \frac{z^2 pq}{e^2}, \text{ where}$$

n= the sample size,

Z= the corresponding confidence interval for 95% level of significance (1.96),

P = the estimated proportion of an attribute present in the population. P in this study is

10% of SBA utilization at birth (Central Statistical Agency and ORC Macro, 2012),

q= 1-p, and

e= the desired level of precision or margin of error accepted (0.05 in this study).

Based on this formula, the sample size for this study is,

$$n = \frac{(1.96)^2 (.1)(.9)}{(0.05)^2} + 5\% \text{ (for non-response)} = 144 \text{ respondents.}$$

The participants in this study were stratified by the use/non-use of SBA at delivery, which is the outcome variable in the study. In the study site, childbirths in health institutions are assumed to happen with the assistance of SBAs. And home births generally occur without the assistance of SBAs (Central Statistical Agency and ORC Macro, 2001, 2006, 2012). Stratifying respondents by the outcome variable under study reduces the sampling error (Monette et al., 2005). As a result, 144 respondents who did not use SBA during labor and delivery were included for comparison. Thus, the total sample size was 288 respondents.

3.2.1.4 Sampling Procedures

Sampling considerations are basic issues in network studies. At the whole-network level of analysis, sampling of units is generally not a concern. A complete enumeration or saturation sample can be obtained. For egocentric studies, conventional random sampling procedures are applicable to gather egocentric network data and generalize results about the networks to a large population (Marsden, 1990). Thus, different activities were undertaken to select the participants of the study.

There are 7 health centers and a hospital providing delivery services with SBAs in the woreda. Based on the location of these health institutions, the woreda was divided into 7 sub-regions (the hospital and one of the health centers are located in the same locality). Seven health centers providing delivery services and the sub-regions around these sites were considered to conduct the study.

The participants who delivered in health institutions were selected as follows.

Lists of women who had uncomplicated births in the preceding year in each health institution providing delivery service were obtained from the delivery registration books in each health institution. The samples for each institution were assigned proportional to the number of women who had uncomplicated birth in each institution within a year. Systematic random sampling was employed to select the participants from each institution. In this sampling technique, the unit is selected on a random basis and then additional sampling units were selected at an evenly spaced interval until all desired units are selected (Singh, 2007).

The participants who delivered at home were selected in a similar way. Two kebeles around the selected health institutions within 5km distance (an hour walking distance) from the selected institutions were selected. The lists of children born within a year in the selected kebeles were obtained from the vaccination registration books in the health posts. Then, systematic random sampling technique was used to select children from the list and their mothers were approached. Mothers who reported uncomplicated deliveries at home for these children participated in the study. The samples for the selected kebeles were assigned proportional to the size of uncomplicated births in the health institutions.

From 288 selected respondents, 274 (140 women who delivered at home and 134 women who delivered at health facilities) participated in the study. Four women who delivered at home did not participate in the study. Among these women, two women had their last born children about 2 years old, hence excluded from the study. A woman got sickness during the data collection weeks and she was not comfortable to respond to

questions. A woman was not available at her home for two visits. Ten women who delivered at health facilities did not participate in the study. Among these women, 8 women declared that they went to the health facilities because of post-natal complications (retained placenta and bleeding), hence excluded from the study. Two women changed their residence and we could not get their new residence.

3.2.1.5 Data Collection Instrument

A structured questionnaire was used to collect data (Annex 1). The questionnaire has four parts. Part I includes items on the women's individual attributes, childbearing-related attributes, knowledge of obstetric complications, and women's autonomy within the household. Part II contains items that asked respondents about the quality of delivery care they experienced. Women who delivered at a health facility were asked these items. The indicators for the measure of experience of quality of care are adapted from a framework for the evaluation of quality of care in maternity services developed by Hulton et al. (2000). The results of the exploratory study helped to modify some of the items to fit the local context. In Part III, women who had uncomplicated births at home were asked reasons for home deliveries. The items for this part were developed from the existing literature and from the results of the exploratory study.

Part IV included items on women's social network characteristics. This part of the instrument has two types of questions: a name generator question that is used to identify the respondents' network members and name interpreter questions that were used to obtain information on the members' characteristics and their relationships with the respondents (Butts, 2008; Marin, 2004; Marsden, 2005). The questions were adapted from Edmonds' (2010) name generator and name interpreter questions developed to

measure women's social networks and social interaction in healthcare utilization decision-making. The name generator is a free-recall question that delineates network boundaries (Burt, 1984; 1997). Using the name generator question, women in this study were asked to freely name individuals with whom they discussed issues related to place of birth during their recent pregnancy. After the names of network members were listed, women were asked a series of questions (name interpreters) to collect information about the networks' characteristics and their relationships with them. In the name interpreter questions, respondents were asked about the socio-demographic characteristics of network members (age, sex), members' relationship to the ego, strength of the relationship, proximity of residence between the respondents and their network members, and the members' advice or opinion on place of delivery. The name interpreter questions provided many of the indices of network structure and content sought in the study.

Once the instrument was developed, it was given to two PhD candidates in the School of Social Work, Addis Ababa University for review. The review helped to improve the sequence and wording of the items. In addition, two faculty public health specialists with midwifery background in Bahir Dar University reviewed the instrument. Their feedback improved the content of the questionnaire.

The structured questionnaire was also pilot-tested to examine potential problems and to address them before the main survey administration (Rothgeb, 2008; Singh, 2007). The pilot-test was administered on respondents who had similar characteristics as the survey respondents. Sudman, cited in Presser et al., (2004) suggested that 20- 50 cases are sufficient to discover flaws in a questionnaire. In this study, 30 cases including 17

respondents who delivered at home and 13 respondents who delivered at a health facility participated in the pilot-test.

Four interviewers participated in the pilot-test. The pilot test lasted for three days. At the end of the pilot-test, a discussion session was organized and each interviewer debriefed their experience on the field. The principal investigator (PI) and the interviewers went through the questionnaire question by question and some items that needed further clarification were identified (e.g., determining kin/non-kin status of respondents' network members and labeling the type of relationship between respondents and their network members). Items that respondents replied "I do not know" (e.g., average annual income and educational status of network members) were dropped from the final instrument. Respondents in the pilot test were all Orthodox Christians; therefore, religion was dropped from the final instrument. The pilot-test also helped to improve the sequencing of questionnaire items, the wording of items, and indicated the average time needed to complete the interview (55 minute to an hour and 20 minutes). The English version of the questionnaire was translated into Amharic for the final data collection. A PhD candidate pursuing linguistics prepared the translation.

3.2.1.6 Recruitment and Training of Interviewers

Experienced data collectors and supervisors were recruited for data collection. Through his informal personal network, the PI identified two individuals who had experience with data collection in the woreda. These individuals were asked to identify other potential data collectors. A total of 7 individuals (5 females and 2 males) were registered as potential data collectors. Female applicants were part-time data collectors in the Population Council Office. Male applicants were part-time supervisors in the Woreda

Malaria Prevention Program. Among the female applicants, three had four years data collection experience in the Population Council Office. One applicant had two years data collection experience and one applicant had a year data collection experience in the same office. Male applicants had 2 years supervision experience in the Woreda Malaria Prevention Program. Based on their earlier related experiences, four female data collectors and 2 male supervisors were selected to participate in the data collection process. The PI briefed the data collectors and supervisors about the purpose of the study and informed them about the compensation for training and data collection.

Four days of intensive training was given on the overall data collection process. The training focused on the purpose of the study, the content of the questionnaire, and interviewing techniques such as introducing self, asking questions, clarifying questions, probing techniques for the name generator question, recording responses, and data quality. Discussion, demonstration, and role-playing techniques were employed during training. The training was given by the principal investigator.

3.2.1.7 Data Collection Procedures

A support letter offering cooperation to conduct the study in the woreda was obtained from Bahir Dar University. The PI submitted copies of the support letter to the woreda administration office and to the woreda health office and asked for permission to conduct the research in the woreda. Up-on receiving permission, the PI asked the woreda health officer to write a support letter to the selected health institutions and health posts in the selected kebeles within 5 km distance from these institutions. A copy of the permission and the support letter was given to the selected kebele administration offices and a copy of the documents was given to the HEWs working in the selected kebeles.

The PI explained the purpose of the research to the HEWs and asked for their support to facilitate the data collection in the kebeles.

With the support of the kebele HEWs and local administrative bodies, guides were arranged to reach the selected respondents. With assistance from the guide, the trained interviewers visited the selected respondents at home and read the informed consent to the respondents (Annex II). Once the interviewers obtained the respondents' verbal consent to participate in the study, the time and site of interviewing were arranged considering the respondents' comfort. Because the literacy rate is very low in the study setting, the data were collected through interviews. The interviewer read each item in the questionnaire and marked the answers given by the respondents. The interviews were conducted on an individual basis at convenient sites. Data collection in the field was monitored by two supervisors. The PI supervised the overall data collection process and data quality. The data quality and its completeness were checked daily.

3.2.1.8 Variables

3.2.1.8.1 Dependent Variables

Place of delivery: This is a dichotomous variable collected by asking women the place of delivery for their recent born children. The responses were coded as follows: 0 = home, 1 = facility. Those who delivered at a health facility were compared to those who delivered at home.

Experience of quality in delivery service: The measures of quality of delivery services experienced by women were informed by the framework that enables the measurement of quality of institutional maternal delivery services. The framework was comprised of four

broad areas: contact with and experience of human and physical resources; cognition (i.e., the level to which the woman understands what is happening to her and why); the respect, dignity, and equity of care she received in her stay in the facility; and the emotional support she received during labor and delivery (Hulton, Matthews, & Stones, 2000). A total of 16 items were developed to measure this variable. Women were asked to rate the quality of delivery service they experienced using a four point scale (0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree). To assess whether the items included construct the quality of service experienced score formed a reliable scale, Cronbach's alpha was computed. The alpha for the 16 items was .75, which indicates that the items form a scale that has reasonable reliability (Leech, Barrett, & Morgan, 2005). Data for this measure were collected from women who delivered at a health facility.

3.2.1.8.2 Independent Variables

The independent variables in the study included the network variables and the respondents' individual characteristics. The conceptual frameworks of the study were used as premises to select these variables.

Social network variables: respondents' network structural variables and network content were examined. The network structural variables examined in the study were comprised of network size, network tie strength, homogeneity of network, neighborhood status of the network members, and residence of the respondents in relation to their relatives. The social network content is the measure of place of delivery endorsement (SBA endorsement). Each variable was measured as follows.

Network size: Network size was indicated by the number of individuals in a woman's network mentioned by the name generator question. Using the name generator question, respondents were asked to list those individuals with whom they discussed the place of delivery for their recent born children during their pregnancy. The sum of the network members who discussed the phenomenon with the respondent yielded the network size.

Network tie strength: Using the name interpreter question, respondents were asked to scale the strength of the relationship with the network members mentioned in the name generator question. Using survey data on friendship ties, Marsden and Campbell (1984) applied multiple indicator techniques to construct and validate measures of tie strength and suggested that measures of closeness or intensity were the best indicators of tie strength. Thus in this study, respondents were asked to rate how close they felt to each member of the network mentioned using a four point scale (distant = 1, less close = 2, close = 3, and very close = 4). Respondents would rate their relationship with the network member very close when they had closest contact, met more often, discussed secrets, and supported each other. They would rate the relationship as close when they met occasionally and they felt that they were friends. Respondents would rate the relationship as less close when they had relationships but no desire to develop a friendship. They would rate the relationship as distant when the contact happened if necessary. A visual display of concentric circle that has four circles was used for illustration to help respondents locate their network members in one of the circles. For example, they would locate the very close network member in the inner most circle and distant network members in the outer most circle. Then, the sum of valid responses was divided by the

number of valid responses and the summary measure of network tie strength was computed.

Homogeneity of network: Respondents were asked whether the network members mentioned in the name generator question were kin or non-kin. Networks that were comprised of parents and relatives who had biological relationships were considered as kin. Network that were established among friends, neighbors, work mates, and other types of relationships due to social obligations such as religion and other civic associations were considered as non-kin. The responses were coded as kin = 1, non-kin = 0. The sum of valid responses divided by the number of valid response was used to compute the summary measure of network homogeneity of the respondents.

Network content: Network content related to the place of delivery endorsement.

Respondents were asked about the advice, opinion, and suggestion of their network members about the place of delivery for their recent born children using a three point scale (at home = 1, at a health facility if there would be complication = 2, and at a health facility = 3). Assuming the suggestions of place of delivery at a health facility if there was any complication was equivalent to at home without complication, the first and the second response options were merged together and recoded as home delivery, and the responses became dichotomous: home delivery was coded 0 and facility delivery was recoded 1. Then the summary measure of SBA endorsement (health facility delivery endorsement) was obtained by dividing the sum of valid responses by the number of valid responses.

Geographical dispersion of network: This information was measured using a single survey item. Respondents were asked the neighborhood status of the network members mentioned in the name generator question as a measure of the geographical proximity between their residence and those of their network members. The responses were coded as non-neighbor = 1, and neighbor = 2. Then, the sum of valid responses was divided by the number of valid responses and the summary measure of the neighborhood status of the respondents was computed.

Individuals' attributes: These are variables that included the socio-demographic and childbearing-related characteristics of respondents that might influence delivery service utilization.

Socio-demographic variables: Variables considered in this category are: age, residence, women's educational status, husbands' literacy status, marital status of respondents. Other variables in this category are the following.

Women's autonomy: Women were asked four questions about decision-making in the household. The items were adapted from a standardized questionnaire used to measure the same phenomenon by the Ethiopian Demographic and Health Surveys (Central Statistical Agency and ORC Macro, 2001, 2006). Respondents were asked to rate their participation in decision-making using a 4 point scale, i.e., whether the decisions are made by the woman alone, women and husband jointly, husband alone, or someone else. The sum of valid responses divided by number of valid responses was used to measure the summary measure of women's autonomy in household decisions.

Knowledge of obstetric complications: Respondents were asked 7 items that have nominal response options (1=yes, 0=no) to measure their knowledge of obstetric complications that may occur during labor and delivery. The sum of valid responses divided by the number of valid responses produced the summary measure of their knowledge about obstetric complications.

Attitude towards facility delivery: Respondents' attitude towards facility delivery was assessed using three items: intention about place of delivery for future pregnancy (response options were 0 = at home, 1 = at a health facility if there will be complication, and 2 = at a health facility), advice for other women about place of delivery (response options were 0 = at home, 1 = at a health facility if there will be complication, 2 = and at a health facility), and belief that giving birth at a health facility prevents obstetric complications (responses were 0 = no and 1 = yes). The responses for the first two items (at home and at facility if there is complication) were merged and recoded as one response option- home delivery. Then the responses for the two items were coded as follows: home delivery = 0, health facility = 1. Then, the sum of valid responses divided by the number of valid response was computed to obtain the summary measure of attitude towards facility delivery.

Reasons for non-use of facility delivery services: Women who had home births for their recent born children were asked 11 items about the possible reasons for their non-use of health facility delivery services for their recent born children using nominal responses.

Childbearing-related variables: Parity (number of births), ANC use for previous pregnancy/pregnancies, ever-use of SBA, ANC use during recent pregnancy, number of

ANC checkups during recent pregnancy (frequency of visits to health facilities for ANC services), and intention about place of delivery for recent born child.

3.2.1.9 Data Analysis

Data were entered into SPSS version 15 and univariate analysis was run to check for missing values and correct entries of the values. Based on the result, four missing values and incorrectly recorded values (e.g., values recorded as 12 to record either 1 or 2) were corrected by reviewing the original questionnaire. Data then were summarized using means and medians for variables measured at the interval level and using frequencies and percentages for categorical variables. Considering their distribution, the interval variables were changed into categorical variables using the summary measures (median cut points). Chi-square test of independence was computed to test whether there were relationships between the categorical independent variables and the dependent variable (place of delivery for the recent born children). These statistics were also computed to evaluate the proportion of cells with expected counts of less than 5. To test the hypotheses, multivariate logistic regression was computed. Logistic regression analysis predicts the values on one dependent variable from one or more independent (predicting) variables when the dependent variable is dichotomous (Foster, Barkus, & Yavorsky, 2006). In this study, the dependent variable is dichotomous (facility delivery or home delivery). Thus, logistic regression is an appropriate model for data analysis. A significance level of $\alpha = 0.05$ was selected for all analyses. The hypotheses and research questions included in the study were analyzed as follows.

Hypothesis 1: *Women's social network variables better predict SBA utilization for their recent born children than their individual attributes.*

To test this hypothesis the conceptual framework of the study was used to select variables to be entered in the analysis (Hosmer & Lemeshow, 2000). As stated in chapter one, the NEM and the BM were used to conceptualize the problem. Acknowledging the importance of individual attributes, the NEM emphasized that health service utilization is a social process influenced by the social networks that individuals are embedded in within a community. The model states that the network structure (number, type, and strength of tie) and network functions (advice, in-kind support, and emotional support) interact with the cultural content (attitudes and beliefs towards service utilization) to influence an individual's decision to use services. On the other hand, the BM conceived health service utilization as individual behavior influenced by social and demographic variables and health beliefs (attitude towards health services and knowledge of the diseases that shape the beliefs about the service), the resources to use the services, and the need for the services.

Thus, the network structural variables (network size, strength of network tie, neighborhood status of network members, and homogeneity of network members) and social network content (the perceptions of the respondents' about the advice given by their network members about place of delivery) were used for analysis. The categorical versions of the variables were used for analysis. The categorical versions of the network variables are computed as follows.

The summary measures of network tie strength ranged from 1.7 to 4. Using the median cut point (2.7), the network tie strength scores of respondents were categorized into two groups. Respondents with average network tie strength scores less than the median were categorized as embedded within weaker networks and those with average network tie strength scores equal to and above the median value were categorized as embedded within strong network. In a similar way, the summary measure of network homogeneity ranges from 0 to 1, with higher scores indicating higher homogeneity. Women with average network homogeneity scores below the median (.7) were categorized as having a less homogeneous network and those women who had average network homogeneity scores greater or equal to the median were categorized as having a relatively homogeneous network. The summary measures of SBA scores ranged from 0 to 1. Using the median cut point (.5), respondents were categorized into two groups according to their average SBA endorsement scores. Respondents with average SBA endorsement scores below the median were grouped as having network with low SBA endorsement and those with SBA endorsement scores equal to or above the median were categorized as having network with high SBA endorsement. Network size was categorized into three considering mean $\pm$ standard deviation.

Among women's individual characteristics, age, residence, parity, use of ANC services, literacy status of the women, husband's literacy status, knowledge of obstetric complications, women's autonomy in household decisions, intention about place of delivery, and attitude towards facility delivery services were used as predictor variables for use of SBA for delivery. Previous studies reported that these variables are important

determinants of maternal health service utilization in Ethiopia (Central Statistical Agency and ORC Macro, 2006, 2012; Mesfine et al., 2004).

Once the variables were identified, the selection of variables to include in the logistic regression model was carried out as follows. First, bivariate analyses were conducted with the dependent variable to evaluate the proportion of cells with expected counts of less than 5. The variables with no cell frequencies with expected counts of less than 5 were considered as potential candidates. The bivariate tests were also used to assess the relationship between the potential predictor variable and the dependent variable. The predictors with a significant association were considered as candidates for the multivariate analysis.

Two network variables (homogeneity of network members and network tie) and two individual attributes of women (age and parity) were weakly associated with the dependent variable according to the bivariate analysis ($p < .10$), these variables were considered as candidates for inclusion in the multivariate model. While discussing variable selection for multivariate analysis, Hosmer and Lemeshow (2000) suggested that some variables which are weakly associated with the outcome variable can become an important predictor of the outcome variable when taken together.

Second, univariable logistic regression analyses (regression between one independent variable and the dependent variable) were computed and the significance level ($p < .05$) was used to select a potential predictor variable for multivariate analysis. In the univariable analysis, the odds ratio of each predictor variable was assessed for the potential confounding effects for further analysis (Hosmer & Lemeshow, 2000). The results of the univariable analysis indicated that two variables- intention about place of

delivery for recent born children (OR= 47.600, CI: 23.265, 97.388) and attitude towards facility delivery (OR= 41.241, CI= 20.583, 82.035) (Table not indicated) - produced large odds ratios that warn of their confounding role in further analyses. Thus, these variables were excluded from the regression model.

Moreover, the interaction effects between predictor variables were also assessed. The differences between the likelihood ratio tests of the full model that included the interaction effects and the reduced model (without interaction effects) were carried out by considering the model Chi-square values for the two models (Garson, 2008). The results showed no significant difference between the likelihood ratio tests. Thus, the interaction effects were dropped in the final analyses.

Third, the tolerance test was computed to assess problems of multicollinearity (overlap between predictors). The tolerance value above $(1 - R^2)$ indicates no problem of multicollinearity (Leech, Barrett, & Morgan, 2005). The adjusted R^2 that indicates the percentage of variance predicted from the independent variables was .327. The tolerance values for all the variables entered in the model ranged from .794 to .978, well over $(1 - R^2)$, hence, showed no problems of multicollinearity.

The main intent of the research hypothesis was to understand whether the women's social networks or individual attributes were important in predicting the use of SBAs during uncomplicated delivery for their recent born children. To test this hypothesis, hierarchical binary logistic regression analysis using the Enter method was run. Hierarchical regression involves theoretically-based decisions for how predictors are entered into the analysis. The focus is on the change in predictability associated with predictor variables entered later in the analysis over and above that contributed by

predictor variables entered earlier in the analysis (Aron, 1997; Petrocelli, 2003). The social network analysis considers the social structural or relational processes as primary and individuals' attributes as secondary in influencing the observed behavior of individuals (Scott, 2000; Wasserman & Faust, 1994). Thus, in this study, women's individual attributes that showed significant associations with the dependent variable in the bivariate analysis were entered first in the model and the network variables were entered later in the model. Then, the significant of improvement in predicting the dependent variable was assessed based on the -2log likelihood ratio tests for the first block that included the individual attributes and the second block that included the network variables (Aron, 1997; Cohen, cited in Petrocelli, 2003).

Hypothesis 2: *Women's social network content better predicted SBA utilization than their network structures.*

The hypothesis was proposed to assess the relative importance of the network variables in predicting facility delivery. Thus, forward stepwise logistic regression was run. This technique is useful to identify the explanatory variables which are likely to be important in predicting the outcome variable when the outcome being studied is relatively new and the important covariates may not be known and associations with the outcome are not well understood (Demaris, 2003; Hosmer & Lemeshow, 2000). In the Forward Stepwise logistic regression, variables are selected either for inclusion or exclusion from the model in a sequential manner based on preset criteria. Since the choice of entry criterion at $p = 0.05$ often excludes most important variables from the model, the selection criterion for entry was set at $p = 0.15$ and the exclusion criterion was set at $p = 0.20$, as suggested by Demaris (2003) and Hosmer and Lemeshow (2000). The

p-values in this procedure indicate the relative importance of variables. The variable with the smallest p-value is the most important variable in predicting the response variable (Hosmer & Lemeshow, 2000).

Hypothesis 3: *Women embedded in networks with high SBA endorsement are more likely to deliver in a health facility.*

The summary measure of SBA endorsement was calculated and respondents were categorized into two groups according to their average SBA endorsement scores. Respondents with average SBA endorsement scores below the median were grouped as having network with low SBA endorsement and those with SBA endorsement scores equal to or above the median were categorized as having network with high SBA endorsement. Next, Chi-square test of independence was run to evaluate the proportion of cells with expected counts less than 5. And logistic regression model was run to determine how the odds of facility delivery increase or decrease given that women are embedded within high SBA endorsement network members.

Hypothesis 4: *Social network content (SBA endorsement) is significantly associated with good quality of delivery service experienced by women at a health facility.*

To test this hypothesis, women who delivered their recent born children at a health facility were considered in the analysis. The summary measures of the quality of services experienced by women were computed and divided into two based on the median cut point. Women whose quality of service scores were below the median were considered as having had experienced poor quality of services and those women with quality of service score equal to or above the median were considered as having had

experienced good quality of services during labor and delivery in the health facility. This measure was then cross-tabulated with the SBA endorsement variable that was computed in a similar way to evaluate the proportion of cells with expected counts less than 5. Then, logistic regression model was run to determine how the odds of the quality of facility delivery service increase or decrease given that women are embedded within high SBA endorsement network members.

Research question 5: *How do women who delivered at a health facility evaluate the quality of service they experienced?*

Women who delivered at health facility were asked to rate the quality of services they experienced in the health facility during labor and delivery. Based on a wide body of research and evidence-based best practices, Hulton, Matthews, and Stones (2000) developed a framework to measure the quality of institutional maternal delivery services. The framework comprised of four broad areas: her contact with and experience of human and physical resources; her cognition (i. e., the level to which she understands what is happening to her and why); the respect, dignity, and equity of care she receives in her stay in the facility; and the emotional support she receives during labor and delivery. In this study, the quality of services women experienced in health facilities during labor and delivery were assessed in line with these premises.

A total of 16 items were used to assess the quality of services women experienced during labor and delivery for their recent born children. Respondents were asked to rate the quality of service they experienced on a four point scale. Composite measures of

women's experience of quality of services in the four domains were computed by aggregating the responses for the items in each respective domain. Finally, the responses for all items in the four domains were aggregated together and the overall quality of services experienced by women during facility delivery services was computed.

Research question 6: *What are the important barriers for utilization of facility delivery services?*

To answer this research question, data were collected from women who delivered at home. Respondents were asked 11 questions using nominal responses (yes/no) to determine whether each item was a reason to deliver at home or not. Those responding yes were compared to those who responded no.

3.2.2 Qualitative phase

This phase of the study is a follow-up study carried out to complement the quantitative findings. Two groups of respondents participated in this phase of the study. The first group consisted of women who had uncomplicated deliveries at home. The second group was comprised of women who had uncomplicated deliveries at a health facility within a year preceding the survey. Eleven women who had uncomplicated home deliveries and living children and 8 women who had uncomplicated facility deliveries and living children participated in the study.

3.2.2.1 Study Participants

Women who had uncomplicated deliveries at a health facility were selected from the Jiga and Mankusa health centers. These health institutions were selected purposely. Compared to other health institutions included in the study, these institutions provided

delivery services for greater numbers of women (Annex V). Lists of women who had uncomplicated deliveries in these institutions and those who participated in the survey was obtained. Eight women (4 women from each health institution) participate in the study. In a similar way, a list of women who had uncomplicated home deliveries registered in the selected kebeles around these health institutions and participated in the survey was obtained. Eleven women (6 women from the Jiga health center catchment area and 5 women from the Mankusa health center catchment area) participated in the study. All selected informants participated in the interview.

3.2.2.2 Data gathering Instrument

A semi-structured interview guide was used to collect data. Two interview guides were developed and administered to the respective respondents separately. The interview guides had open-ended questions. Additional questions were raised based on clues from the participants. For example, women who delivered at a health facility were asked the roles of network members during pregnancy, the network members' opinions about place of delivery, their roles during labor and delivery, why they went to health facility for delivery, the quality of services they experienced. In a similar way, women who delivered at home were asked about the roles of network members during pregnancy, the network members' opinions about place of delivery, their roles during labor and delivery, why they delivered at home, who assisted them during labor and delivery, their knowledge of obstetric complications, and whether there was any complication and how the complication was managed. The interview guides were developed in English and translated into Amharic for administration (Annex IV A & B).

3.2.2.3 Data Collection Procedure

With the support of the HEWs and a guide in the selected kebeles, women who were selected to participate in the study were identified. The researcher explained the purpose of the study, read the consent form to each respondent and asked them to participate in the study (Annex III). Once their consents were obtained, an interview date and place of interview were arranged in advance with each respondent. Those respondents who were ready to be interviewed on the first contact were interviewed on the same day of first contact. All interviews were conducted separately at home. On the average, the interviews lasted for 40 minutes. All interviews were tape-recorded. The PI conducted all the interviews. Interviews were conducted to the point of data saturation.

3.2.2.4 Data Analysis

The data were transcribed verbatim. The transcription of data was undertaken on the same date of each interview. The transcript of each interview was read and re-read thoroughly to understand the content and concepts discussed in the interview and to look for differences and similarities in the data (Kalof, Dan, & Dietz, 2008). Then, data were coded and categorized into themes based on the research questions raised in the study. Such approach in qualitative data analysis is appropriate when the qualitative data were collected to provide further understanding of the quantitative findings (Ulin et al., 2005) and when the research question is clearly defined and the categories of analysis have been established (Ezzy, 2002).

3.3 Protection of Human Subjects

Ethical issues were considered to protect the rights of the participants of the study. Before both phases of the study were commenced, the interviewers explained the

purposes of the study and the potential benefits of participation. The participants were informed that their participation in the study will help to understand factors that are either barriers or facilitators for SBAs service utilization during delivery. This information will help to design appropriate intervention strategies to increase SBAs services utilization thereby reduce maternal mortality. The interviewers informed the participants that their participation in the study was on a voluntary basis and they can refuse to answer all or part of the interview and withdraw from the study at any time during the interview. The participants were informed that the names of their network members will not be associated with the data. The interview was conducted at individual basis. The interviewer read the informed consent document for all participants. Those who gave verbal consent participated in the interviewed.

3.4 Limitations of the Study

The study investigated women's social network characteristics and their individual attributes and assessed their roles in SBA utilization. Respondents were asked retrospectively to identify their network members and explain their network members' opinions, attitudes, and approval regarding place of delivery for their recent born children. The study also assessed the experience of quality in delivery care and barriers for facility delivery service utilization. In such a study, there may be memory lapses and women may not report all their network members who had a role during their pregnancy and childbirth in the previous year. They may forget their network members' approval of where they should give birth.

Similarly, the measures of the quality of health facility delivery services were obtained from questions that asked women to report what they experienced during facility

delivery in the past. It is possible that women's ability to recall what happened and what they felt may be flawed. Respondents/informants may also provide answers that they see as being expected or acceptable.

Individual differences among interviewers may also affect the respondents' ability to recall their network members and their influence on the events of their childbirth. To minimize these potential influences, caution was taken during interviewer training to ensure similar administration. Role-play, demonstration, and practical interviewing exercises were used during training to help interviewers develop relatively similar techniques of interviewing. Interviewers were trained on different context-based probing techniques to elicit relevant information from respondents.

3.5 Summary

This chapter presents the methods of the study. The study employed a sequential mixed methods approach- quantitative component followed by qualitative component. Women 15-49 years old who had uncomplicated deliveries within a year prior to the survey and living children participated in the quantitative component of the study. A total of 274 women participated in this phase of the study. Pilot-tested structured questionnaire was used for data collection. Univariate, bivariate, and multivariate techniques were used for data analyses. Univariate techniques (percentages, mean, and median) were used to summarize and describe data. Bivariate technique (Chi-Square) was computed to assess the relationship between the outcome variable of interest and the selected independent variables and to evaluate the proportion of cells with expected counts less than 5. Multivariate logistic regressions were run to test the hypotheses.

A sub-set of 19 women who participated in the quantitative phase of the study participated in the qualitative component of the study. The qualitative component of the study was meant to illuminate and clarify the quantitative data. A semi-structured interview guide was used to collect data. Data were transcribed verbatim and themes were developed for analyses. The following chapter presents the findings of the quantitative and qualitative phases of the study.

CHAPTER FOUR: FINDINGS

This chapter presents the results of the study. The quantitative findings are presented first followed by the qualitative findings.

4.1 The Quantitative Findings

The quantitative findings are presented as follows. First, the background characteristics of the study population are presented. Second, results pertaining to the research questions and hypotheses are addressed.

4.1.1 Distribution of Respondents by Background Characteristics

Table 4.1 presents background characteristics of the respondents by place of delivery. The study included 274 women who had uncomplicated births within a year prior to the survey. One hundred forty (51%) respondents delivered at home and 134(49%) delivered at a health facility. The respondents' ages ranged from 18 to 40 years with a mean age of 27 years. Twenty- three percent, 46%, and 31% of the respondents, respectively are in the age group 18 to 23, 24 to 29, and 30 years and above. Seventy-five percent of the respondents live in rural areas and about 25% live in urban areas. Among the respondents, 63% were illiterate, 26% completed primary education (grades 1 to 8), and 11% had high school and above education level. About 57% of the respondents had literate husbands and 43% had illiterate husbands.

Table 4.1 Percentage distribution of respondents by background characteristics and place of delivery (N = 274)

Background characteristics	Home delivery (n= 140)	Facility delivery (n= 134)	Total (N= 274)	χ^2
Age				
18-23	28(44.4%)	33(55.6%)	63(23%)	1.44
24-29	67(53.2%)	59(46.8%)	126(46%)	
>=30 years	45(52.9%)	40(47.1%)	85(31%)	
Residence				
Rural	119(57.8%)	87(42.2%)	206(75.2%)	14.78***
Urban	21(30.9%)	47(69.1%)	68(24.8%)	
Educational status				
No education	96(55.8%)	76(44.2%)	172 (62.8%)	26.74***
Primary (1-8)	42(58.3%)	30(41.7%)	72(26.3%)	
Secondary and above (>=9)	2(6.7%)	28(93.3%)	30(10.9%)	
Husband's Literacy status				
Illiterate	75(65.2%)	40(34.8%)	115(43.1%)	15.64***
Literate	62(40.8%)	90(59.2%)	152(56.9%)	
Parity				
1-2 children	64(48.9%)	67(51.7%)	131(47.8%)	2.46
3-4 children	60(56.6%)	46(43.4%)	106(38.7%)	
>=5 children	16(43.2%)	21(56.8%)	37(13.5%)	
ANC use				
No	43(70.5%)	18(29.5%)	61(22.3%)	11.81**
Yes	97(45.5%)	116(54.5%)	213(77.7%)	
Knowledge of obst. Compli.				5.77*
Limited knowledge	51(62.2%)	31(37.8%)	82(29.6%)	145.95***
Better knowledge	89(46.4%)	103(53.6%)	192(70.1%)	
Attitude to facility delivery				
Less favorable	123(86%)	20(14%)	143(52.2%)	152.12***
Favorable	17(13%)	114(87%)	131(47.8%)	
Intention of place of delivery				
At home	120(88.9%)	15(11.1%)	135(49.3%)	152.12***
At a health facility	20(14.4%)	119(85.6%)	138(50.7%)	
Autonomy at HH decisions				.43
Lower	10(58.5%)	7(41.2%)	17(6.2%)	
Higher	130(50.6%)	127(49.4%)	257(93.8%)	

Note: *p < .05, **p < .01, ***p < .001

As presented in Table 4.1, close to half (47.8%) of the respondents had 1 or 2 children, 38.7% had 3 to 4 children, and 13.5% had 5 or more children. Nearly 78% of the respondents had ANC check-ups during their recent pregnancy. Seventy percent of the respondents had better knowledge and 30% had limited knowledge of obstetric complications. Of all respondents, 47.8% had relatively favorable attitudes and 52.2% had less favorable attitudes toward health facility delivery. More than half of the respondents (50.7%) reported that they planned to deliver their recent born children at a health facility and the remaining 49.3% planned to deliver at home.

Respondents were also asked about their participation in household decisions such as health care, large purchases, small purchases, and visits to relatives. More than 93% reported that they had relatively higher participation in deciding on the concerns assessed in the study. Only 6.2% reported that they had limited autonomy to decide on those household concerns.

As stated above, two groups of respondents (women who delivered at home and those who delivered at health facilities) participated in the study. As presented in Table 4.1, a greater proportion of women living in urban areas delivered at health facilities than their rural counterparts (69.1% vs. 42.2%). Compared with women who delivered at home, those who delivered at a health facility were more literate (42.6 %vs. 57.4%), were more likely to have literate husbands (40.8% vs. 59.2%), and were much more likely to have health facility delivery experience before the recent birth (16.2% vs. 83.8%). Moreover, compared to women who delivered at home, women who delivered at a health facility were more likely to have ANC follow-ups during their recent pregnancy (45.5%

vs. 54.5%), had somewhat better knowledge about obstetric complications (46.4% vs. 53.6%), had more favorable attitudes toward health facility delivery (13% vs. 87%), and had intended to deliver their recent child at a health facility (14.4% vs. 85.6%).

Table 4.2 presents the percent distribution of respondents by network characteristics and place of delivery. The network size of respondents ranged from 2 to 16 with a mean network size of 9.72 members. The network size of the respondents was summarized into three categories based on mean $\pm$ 1 standard deviation: 2 to 6 network members, 7 to 12 network members, and 13 to 16 network members. The data revealed that the proportion of women who delivered in health facilities increased with increasing network size (19.7% in the category 2 to 6 network members to 62.9% in the category 13 to 16 network members). Conversely, the proportion of women who delivered at home decreased with increasing network size (80.3% in the category 2 to 6 network members to 37.1% in the category 12 to 16 network members).

About 54% of respondents had strong tie networks and 45.6% had weaker tie networks. Among respondents embedded in weaker networks, 47.2% delivered at home and 52.8% delivered at a health facility. Of those respondents embedded in strong tie networks, 54.4% delivered at home and 45.6% delivered at a health facility. Compared to women who delivered at home, women who delivered at a health facility had weaker tie network scores (47.2% vs. 52.8%) . Nearly 60% of the respondents had a homogeneous network and 41% had a less homogeneous network. Among women embedded in homogeneous network, 47.8% delivered at home and 52.2% delivered at a health facility.

Table 4.2 Percentage distribution of respondents by network characteristics and place of delivery for recent born children (N = 274)

Network characteristics	Home delivery (n= 140)	Facility delivery (n= 134)	Total (N= 274)	χ^2
Network size				
2-6 network members	49(80.3%)	12(19.7%)	61(22.3%)	28.13****
7-12 network members	65(45.5%)	78(54.5%)	143(52.2%)	
13-16 network members	26(37.1%)	44(62.9%)	70(25.5%)	
Network tie strength				
Weaker tie	59(47.2%)	66(52.8%)	125(45.6%)	1.39
Strong tie	81(54.4%)	68(45.6%)	149(54.4%)	
Homogeneity of network				
Less homogeneous	63(55.4%)	50(44.2%)	113(41.2%)	1.67
Homogeneous	77(47.8%)	84(52.2%)	161(58.8%)	
SBA endorsement				
Low	95(71.4%)	38(28.6%)	133(48.5%)	47.76****
High	45(31.9%)	96(68.1%)	141(51.5%)	
Network neighborhood				
Non-neighbor	55(50.5%)	54(49.5%)	109(39.8%)	.029
Neighbor	85(51.5%)	80(48.5%)	165(60.2%)	

Note: ***p < .001

Furthermore, 48.5% of women were embedded within low SBA endorsement networks and 51.5% were embedded within high SBA endorsement network. Of those women who were embedded within low SBA endorsement networks, 71.4% delivered at home and 28.6% delivered at a health facility. Among respondents with high SBA endorsement network, 31.9% delivered at home and 68.1% delivered at a health facility. The results indicated that women who delivered at a health facility had larger SBA endorsement score than those who delivered at home.

4.1.2 Results for Hypotheses and Research Questions

Results for the hypotheses

This research proposed four hypotheses. A hypothesis was proposed to examine whether women's individual characteristics or their social network characteristics were important in predicting health facility delivery service utilization. The second hypothesis was proposed to compare the relative importance of the network variables in predicting facility delivery. The third hypothesis was stated to examine the role of social network content (SBA endorsement) in predicting facility delivery service utilization. The fourth hypothesis was proposed to examine the relationship between SBA endorsement and quality of delivery service experienced by women who delivered in a health facility. Multivariate logistic regression was run to test the hypotheses.

Hypothesis 1: *Women's social network variables better predict SBA utilization for their recent born children than their individual attributes.*

In the study setting, women give birth either at home with the assistance of relatives, neighbors, or traditional birth attendants or they give birth at a health facility with the assistance of health professionals. When delivery occurred at a health facility, the SBAs assist women during delivery. This hypothesis compared the roles of women's social network characteristics and their individual attributes in predicting SBA utilization.

The main intent of the research hypothesis was to understand whether the women's social networks or their individual attributes were important in predicting the use of SBAs during uncomplicated delivery for their recent born children. The Hierarchical binary logistic regression analysis using the Enter method was used for analysis and the presence statistical improvement in prediction was assessed based on the -2log likelihood ratio tests for the first block that included the individual attributes and the second block that included the network variables. The -2log likelihood for the first block with the individual attributes were added is (313.836). The -2log likelihood for the second block after the network variables were added is (245.685), indicating a reduction in error associated with the inclusion of the network variables in predicting facility delivery service utilization. The block Chi-square in block 2 showed that there is significant difference between the -2log likelihood ratio at block 1 and -2log likelihood ratio at block 2 is significant ($\chi^2 = 134.116$, $df = 15$, $N = 274$, $p < 0.001$). The overall correct classification of respondents into home delivery and facility delivery improved

from 69.3%% for the first block (that included women's individual attributes) to 77.4% for the second block (that included the individual attributes and the network variables).

The results indicate that there is statistically significant improvement in predicting facility delivery use with the network variables i.e., the network variables are important predictors for distinguishing between respondents who delivered at home and those who delivered at a health facility after controlling for women's individual attributes. Thus, the research hypothesis that stated women's social network variables better predict facility delivery for their recent born children than their individual attributes was supported.

The odds of women who were embedded within a homogeneous network members to deliver in a health facility is estimated to be 2.527 (95% CI: 1.264- 5.062) times higher than women embedded within less homogeneous network members. Women who were embedded within high SBA endorsement network member were 7.975 (95% CI: 4.071-12.167) times more likely than women who were embedded within low SBA to deliver in a health facility. The data also indicated that the odds of women delivering at a health facility increased with increasing network size. The odds of facility delivery is 1.298 (95% CI: 1.164-1.448) times higher for every increase in network size.

Table 4.3 Hierarchical Logistic Regression analysis of women's individual attributes and their social network variables predicting place of birth, odds of facility delivery (N = 274)

variables	β	Odds ratio	95% CI	
			lower	upper
Age	-.058	.943	.856	1.029
Husband's literacy status				
Illiterate®		1.00		
literate	.532	1.702	.843	3.437
Educational level of respondents				
No education®		1.00		
Primary (1 – 8)	-.601	.548	.252	1.194
High school and above	2.089	8.073*	1.365	17.648
Use of ANC during recent pregnancy				
No®		1.00		
Yes	.624	1.866	.834	4.174
Residence				
Rural®		1.00		
Urban	1.201	3.323**	1.371	8.053
Knowledge of obstetric Complications				
limited®		1.00		
Better knowledge	1.102	3.011**	1.467	6.178
Parity				
1 -2 children®		1.00		
3 – 4 children	-.155	.856	.381	1.925
5 children and above	.856	2.354	.569	9.729
Network tie strength				
Weak®		1.00		
Strong	-.311	.733	.347	1.549
Network homogeneity				
Less homogeneous®		1.00		
Homogeneous	.927	2.527**	1.264	5.062
SBA endorsement				
Low®		1.00		
High	2.199	7.975***	4.071	12.167
Network size	.261	1.298***	1.164	1.448
constant	-2.042	.000		

Note: ® reference category, β = beta coefficients, CI = confidence interval, *P < .05, ** P < .01,

*** P < .001

As indicated in Table 4.3, women's individual attributes (residence, respondents' educational status, and knowledge of obstetric complications) and their network variables (network size, homogeneity of network, and SBA endorsement) significantly predicted

facility delivery. The odds of women who had high school and above education level to deliver at a health facility is 8.073 (95% CI: 1.365-17.648) times higher than illiterate women. The odds of women who had better knowledge of obstetric complications to deliver in a health facility is 3.011 (95% CI: 1.467-6.178) times higher than women who had limited knowledge about the complications. The odds of urban women to deliver at a health facility is 3.325(95^CI: 1.371-8.053) times higher than their rural counterparts.

Hypothesis 2: *Women's social network content better predicted SBA utilization than their network structures.*

The hypothesis tested the relative importance of the network variables in predicting facility delivery. Thus, forward stepwise logistic regression was run. The p-values in this procedure indicate the relative importance of variables. The variable with the smallest p-value is the most important variable in predicting the response variable. The likelihood ratio test of the model (-2LL = 292.729) is significant ($\chi^2 = 86.985$, df = 5, N = 274, $p < .001$) indicating that the independent variables significantly predicted whether or not a woman delivered in a health facility. The classification with the constant alone was 51.1%, and this was improved to 68.2%, of which the independent variables correctly distinguished 67.1% of women who delivered at home and 69.4% of women who delivered at a health facility. The Hosmer and Lemeshow goodness of fit statistics indicates that the model adequately fit the data ($\chi^2 = 6.690$, df = 8, $p = .570$).

Table 4.4 Stepwise Logistic Regression analysis of women's social network variables predicting place of birth, odds of facility delivery (N = 274)

Variables	β	p-value	Odds	95% CI	
			ratio	lower	upper
Tie strength					
Weaker tie®			1.00		
Strong tie	-.777	.014	.460	.248	.852
Homogeneity of network					
Less homogeneous®			1.00		
homogeneous	.929	.003	2.535	1.362	4.704
SBA endorsement					
Low®			1.00		
High	2.056	.000	7.813	4.209	14.502
Network size					
2 -6 networks			1.00		
7-12 networks	2.029	.000	7.605	3.311	17.470
13-16 networks	2.758	.000	15.769	6.022	41.290
constant	-3.388				

Note: ® reference category, β = beta coefficients, CI = confidence interval,

The results revealed that women's network variables are important predictors of their facility delivery. Among the variables considered in the study, the variables network size and SBA endorsement have the smallest p –values ($p < 0.001$) followed by homogeneity of network members ($p < .01$), and network tie strength ($p < .05$). Thus, network size and SBA endorsement of network members are relatively more important in predicting health facility delivery. Thus, the result partially supported the research hypothesis.

Hypothesis 3: *Women embedded in networks with high SBA endorsement are more likely to deliver at a health facility.*

This hypothesis was tested using SBA endorsement as a predictor variable and place of delivery for recent birth (home or health facility) as the outcome variable. Thus, women embedded within low and high SBA endorsement networks were considered in the analysis. Table 4.2 presented the percent distribution of respondents by place of delivery. The data indicated that 48.5% of the respondents were embedded within low SBA endorsement networks and 51.5% were embedded within high SBA endorsement networks. Among women embedded within low SBA networks, 71.4% delivered at home and 28.6% delivered in a health facility. Of those women embedded within high SBA endorsement networks, 32% delivered at home and 68% delivered in a health facility. The bivariate analysis showed that there was a significant association between SBA endorsement and place of delivery for the recent born children ($\chi^2 = 42.674$, $df = 1$, $N = 274$, $p = .001$) (Table 4.2). The logistic regression result also showed that the odds of women embedded within high SBA endorsement networks to deliver in a health facility is 5.33 times higher than for women embedded within low SBA endorsement networks (95% CI: 3.181- 8.941) (Table 4.5). The results supported the hypothesis that women embedded within high SBA endorsement networks were more likely to deliver in a health facility.

Table 4.5 Percent distribution of women by SBA endorsement and actual place of delivery for recent born children (n = 274).

Variables	Place of delivery			χ^2	OR	95% CI	
	Home	Facility	Total			lower	upper
SBA endorsement							
Low	85(71.4%)	38(28.6%)	133(48.5%)	42.764***	5.33	3.181	8.941
High	45(31.9.9%)	96(68.1%)	141(51.5%)				

Hypothesis 4: *Social network content (SBA endorsement) is significantly associated with good quality of delivery service experienced by women at a health facility.*

To test this hypothesis, women who delivered their recent born children at a health facility were considered in the analysis. Among women embedded within low SBA endorsement networks, 71% reported poor quality of delivery services and 29% reported good quality of delivery services during labor and delivery at health facilities. Among women embedded within high SBA endorsement networks, 38.5% reported poor quality of delivery services and 61.5% reported good quality of delivery services in health facilities. The cross-tabulation between SBA endorsement and quality of delivery services experienced at health facilities showed a significant association between the two variables ($\chi^2 = 11.533$, $df = 1$, $n = 134$, $P < .01$). The logistic regression analysis revealed that the odds of women embedded within high SBA endorsement networks to experience good quality of delivery services were 3.914 times higher than women embedded within low SBA endorsement network (95% CI: 1.737-8.822). The results support the

hypothesis that network content significantly associated with the quality of services women experienced at a health facility during labor and delivery.

Table 4.6 Percent distribution of women by SBA endorsement and quality of services experienced during labor and delivery (n=134)

Variables	Quality of service experienced		χ^2	OR	95% CI	
	Poor	Good			lower	upper
SBA endorsement						
Low	27(71.1%)	11(28.9%)	11.53**	3.914	1.737	8.822
High	37(38.5%)	59(61.5%)				

Note: *p < .01, OR= odds ratio, 95% CI= 95% confidence interval

4.1.4 Results of the research questions

Answers were sought for two research questions raised in this study. The first research question was raised to assess and describe the quality of facility delivery services at health facilities. The second questions asked about reasons for home delivery.

Research question 5: *How do women who delivered at a health facility evaluate the quality of service they experienced?*

This question was presented to a subset of respondents (women who delivered their recent born children at a health facility). Woman's experience of care in institutional delivery comprised of four broad areas: her contact with and experience of human and physical resources; her cognition (i. e., the level to which she understands what is happening to her and why); the respect, dignity, and equity of care she receives in her

stay in the facility; and the emotional support she receives during labor and delivery. The quality of services women experienced in health facilities during labor and delivery were assessed in line with these domains. By aggregating the four domains together, the overall quality of services experienced by women during facility delivery services was also assessed

Physical and human resources

The quality of physical and human resources refers to the women's impression of the state of the infrastructure and their experience of actual contact time with the qualified staff. This domain was assessed using four survey items which asked respondents to rate to what extent they agreed or disagreed with the following statements during their recent birth: 1) The maternity ward and the facilities (beds, sheets) were at good standards, 2) There was quality food and drinks in the health facility, 3) There was sufficient contact time with the birth attendant, and 4) The birth attendant was available when needed. The response choices were 0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree.

A composite measure of experience of quality of physical and human resources was computed by aggregating the responses for each item in the domain. The sum of valid responses for each item was divided by the number of valid responses to obtain the summary measure of the quality of physical and human resources experienced by women. Then, using the median cut point, women's assessment of physical and human resources were grouped into two. Women with scores below the median were considered

as having experienced poor quality in that domain and those with scores equal to or above the median were considered as having experienced good quality in that domain. The data showed that 40.3% of the women experienced poor quality physical and human resources and 59.7% experienced good quality physical and human resources during labor and delivery for their recent born children (Table 4.10).

Cognition

Cognition refers to the extent to which a woman feels she understands what is going on, received adequate feedback to her questions, that she received sufficient information, and she and her family understood it. The quality of women's cognition during labor and delivery was assessed using six items: 1) Medical and birth history examinations were taken at arrival, 2) The first diagnosis was explained to the woman, 3) The attendants properly answered the women's questions, 4) The attendants explained the specific interventions and procedures, 5) The attendants explained to women about choice of birth position, and 6) The attendant advised mothers to use post-natal services. The response choices were 0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree.

By aggregating the responses given to each item a composite measure of the domain was computed. The sum of valid responses for each item was divided by the number of valid responses to obtain the summary measure of the quality of cognition experienced by women. Then, using the median cut point, women's experiences of cognition were grouped into two. Women with scores below the median were considered as having experienced poor quality of the domain and those with the scores equal to or

above the median were considered as having experienced good quality of the domain.

The results showed that 44% of the respondents experienced poor quality of cognition and 56% experienced good quality of cognition during labor and delivery for their recent born children (Table 4.10)

Respect, dignity and equity

Respect, dignity, and equity refer to the latent dimensions of provider-client interaction that may be reflected by differences in the status, power, and culture of participants. In the study, this domain was assessed using four survey items: 1) The attendants respected mothers while giving services, 2) Cultural practices are respected (such as mothers preferred birthing position, praying, hugging), 3) There was no impartial service provision, and 4) The costs of services were reasonable. Respondents were asked to rate their experiences using a four point scale. The response choices were 0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree.

A composite measure of experience of respect, dignity and equity was then computed by aggregating the responses given for each item in the domain. The sum of valid responses for each item was divided by the number of valid responses to obtain the summary measure of the quality of respect, dignity and equity experienced by women. Then, using the median cut point, women's experiences of respect, dignity and equity were grouped into two. Women with scores below the median were considered as having experienced poor quality of the domain and those with scores equal or above the median were considered as having experienced good quality of the domain. The results showed

that half of the respondents (50%) experienced poor quality of respect, dignity and equity and half (50%) reported experiencing good quality of respect, dignity and equity during labor and delivery for their recent born children (Table 4.10).

Emotional support

Emotional support refers to the psychological support, attentiveness to the feelings and needs of women in labor, and encouragement given by the attendant. This domain was assessed using two survey items: 1) Companionship of mother's choice during labor and delivery was allowed and 2) The attendants were considerate of mothers' feelings and emotions. Respondents were asked to rate their experiences of emotional support using a four point scale. The response choices were 0 = strongly disagree, 1 = disagree, 2 = agree, and 3 = strongly agree.

The two items were aggregated to compute a composite measure of the quality of this domain experienced by women during labor and delivery. The sum of valid responses for each item was divided by the number of valid responses to obtain the summary measure of the quality of emotional support experienced by women. Then, using the median cut point, women's experiences of emotional support were grouped into two. Women with scores below the median were considered as having experienced poor quality of emotional support and those with scores equal to or above the median were considered as having experienced good quality of the domain. The results showed that 48.5% of the respondents experienced poor quality of emotional support and 51.5%

experienced good quality of emotional support during labor and delivery for their recent born children (Table 4.10)

Using the responses to all items, the overall quality of services women experienced in the facility during labor and delivery was also computed. For this analysis, the responses rated using the four point scale for each item in the four domains were aggregated together. The sum of valid responses for each item was divided by the number of valid responses to obtain the summary measure. Using the median cut point, this summary measure was used to divide the women into two groups. Women with the summary measure below the media were considered as having experienced poor quality of health facility delivery service and those with scores equal to or above the median were grouped as having experienced good quality of health facility delivery services. The data revealed that 47.8% of women experienced poor quality of services and 52.2% experienced good quality of facility delivery services for their recent born children (Table 4.10). The data demonstrated that nearly half of the respondents experienced poor quality delivery services at health facilities. Compared to the four components of quality indicators, emotional support was the lowest quality followed by respect, dignity and equity measure.

Table 4.7 Percent distribution of respondents by their experience of quality during labor and delivery for their recent born children (n= 134).

Indicators of experience of quality	Quality experienced	
	Poor	Good
Physical and human resources	54 (40.3%)	80(59.7%)
Cognition	59(44%)	75(56%)
Respect, dignity, and equity	67(50%)	67(50%)
Emotional support	65(48.5%)	69(51.5)
Overall delivery service quality	64(47.8%)	70(52.2%)

Research question 6: *What are the important barriers for utilization of facility delivery services?*

Women who delivered at home were asked 11 questions using nominal responses (yes/no) to determine whether each item was a reason to deliver at home or not. As presented in Table 4.13, 75% reported that they delivered at home because they went into labor during the night. More than 90% of women delivered at home because of easy labor and 83% delivered at home because of rapid labor. About 73% of women reported that they delivered at home because they did not experience complications during labor and delivery and 63% reported that they had previous experience of home delivery; hence, they delivered at home. About 77% of women reported that they delivered at home because of lack of privacy at health facilities. More than 28% of women reported that they delivered at home because of the perception of poor quality of health facility services. Other reasons for home delivery mentioned by women included long distance to health facilities (10%), problem of transportation to health facilities (10.7%), lack of

decision-making power to deliver in a health facility (7.1%), and lack of knowledge about the existence of health facility delivery services (4.3%).

Table 4.8 Percent distribution of women who delivered at home by reasons for home delivery (n = 140).

Reasons for home delivery	Response options	
	Yes	No
Labor was easy	127(90.7%)	13(9.3%)
Labor was rapid	116(82.9%)	24(17.1%)
Lack of privacy in health facilities during labor and delivery	110(78.6%)	30(21.4%)
Labor started during the night	105(75%)	35(25%)
There was no complication during labor and delivery	102(72.9%)	38(27.1%)
There was previous experience of home delivery	88(62.9%)	52(37.1%)
The quality of services at health facilities is poor	40(28.6%)	100(70.4%)
There was problem of transportation to health facility	15(10.7%)	125(89.3%)
The health facility is located at distant places	14(10%)	126(90%)
Other people were decision-makers on where to give birth	10(7.1%)	130(92.9%)
There is lack of knowledge about the existence of the services	6(4.3%)	134(95.7%)

The data indicated that each reason was considered an important barrier to delivering at a health facility by considerable proportions of respondents. Of all reasons, easy labor was the most important barrier to deliver at a health facility, followed by rapid progression of labor, lack of privacy at health facilities, and night labor. Lack of knowledge about facility delivery services was the least barrier for facility delivery

followed by lack of decision-making power to deliver at a health facility, distance, and lack of transportation to reach a health facility.

4.1.3 Summary for quantitative findings

A total of 274 respondents participated in the quantitative phase of the study. Among respondents, 134 (48.9%) women delivered at health facilities and 140(51.1%) women delivered at home. The quantitative component of the study sought answers for the hypotheses and the two research questions.

The findings revealed that social network variables significantly predicted facility delivery service utilization. Social network variables better explain facility delivery service utilization than women's individual attributes. Among the network variables, social network size and social network content were more important in predicting facility delivery. Social network content (SBA endorsement) significantly predicted good quality facility delivery service experiences. Nonetheless, the quantitative findings did not explain the following questions: How do social networks facilitate or constrain facility delivery service utilization? When/where did network members discuss facility delivery? How do they describe the quality of facility delivery services they experienced? What are women's accounts of home deliveries?

Explanations to these questions may help to better understand the roles of social networks for facility delivery service utilization and the contexts of discussions about the phenomenon. Thus, qualitative data were collected on the same substantive issues addressed by the quantitative data. The qualitative data were collected to clarify the quantitative findings.

4.2 The Qualitative Findings

This phase of the study was stimulated by the quantitative results. The qualitative phase was undertaken from July to August 2013. The results are presented as follows: background characteristics of the informants presented first followed by the main results described under four themes.

4.2.1 Background Characteristics of Informants

A total of 19 women, 8 of whom had uncomplicated facility delivery and 11 women who had uncomplicated delivery at home participated in the study. Table 4.12 presents the background characteristics of informants who participated in the interview. The informants' age ranged from 21 to 44, with mean age of 32.75. As presented in Table 4.12, 16 were married, 2 were divorced, and 1 was widowed. Of all informants, 8 were illiterate and 11 were literate. Among the literate informants, their educational level varied, 5 reporting primary first cycle education (1 – 4 grades), 5 reporting primary second cycle education (5 – 8 grades), and 1 reporting college graduate. The parity of women ranged from 1 to 6, 4 women were parity 1, 5 women were parity 2, 1 woman was parity 3, 6 women were parity 4, 1 woman was parity 5, and 3 women were parity 6. Of women who were parity 1, 3 delivered at a health facility. All parity 6 women delivered at home. Furthermore, of all the informants, 14 live in rural area and 5 live in urban area. Among all informants, 17 attended ANC service at least once.

A majority of the informants knew about facility delivery services. Some heard about facility delivery services during ANC follow-ups. Others mentioned that they heard of it at TV, during informal discussion with neighbors, or at church by health extension workers. A few stated that they had experience of facility delivery service. However,

majority of the informants did not know many of the obstetric complications. All informants mentioned that hemorrhage before delivery and after delivery is an obstetric complication. A few informants also mentioned retained placenta. One informant (trained traditional birth attendant) mentioned that prolonged labor (labor that lasted 2 days or more) and presentation of the fetus (transverse and breech presentations) as an obstetric complication.

Table 4.9 Background characteristics of respondents who participated in in-depth interview

Background characteristics		Facility delivery (n = 8)	Home delivery (n= 11)
Marital status	married	7	9
	divorced	1	1
	widowed	-	1
Educational status	illiterate	3	5
	literate	5	6
Educational level	1-4 grades	3	2
	5-8 grades	2	3
	>= High school	-	1
Parity	1	3	1
	2	2	3
	3	1	-
	4	1	4
	5	1	-
	6	-	3
ANC use	no	-	2
	yes	8	9
Residence	rural	6	8
	urban	2	3

Informants' knowledge about birth preparedness was found to be very limited. Almost all informants mentioned that they prepared edible items such as '*tella*' (locally prepared alcoholic drink), grinded cereals for soup and porridge, and butter for the postnatal period. Though some informants mentioned that they planned to deliver at a

health facility, their preparation did not include specific details of birth preparedness activities such as selecting place of delivery, preparing essential items for delivery, knowledge of complication signs and when to seek help, arranging access to funds and means for emergency transportation and medical care, and identification of blood donors (Del Barco, 2004).

The main findings of the qualitative phase of the study are explained under the following themes: the role of social networks during pregnancy, labor, and delivery; reasons for use of facility delivery services; quality of facility delivery services; and reasons for home deliveries. As it is explained above, the informants are of two groups- those who had uncomplicated facility delivery and those who had uncomplicated home delivery. Among the themes identified in the analysis, data about reasons for facility delivery and quality of facility delivery services were obtained from informants who delivered at a health facility. Data about reasons for home delivery were collected from informants who delivered at home. Data for the remaining themes were collected from both informants. The names given to the narratives are pseudonyms.

4.2.2 Roles of social networks during pregnancy

Informants described that social networks have great roles during pregnancy. Informants who delivered at a health facility and those who delivered at home described the roles of their social networks during pregnancy in a similar way. Many of the informants shared that members of their social networks assisted them in household chores such as fetching water, grinding cereals, preparing '*tella*', and shopping. The support of social networks for pregnant women increases with increasing gestation

period. The informants stated that the community believes that heavy workload and poor nutrition during pregnancy bring complication during labor and delivery. Thus, social networks are source of different advice such as to decrease workload, to get rest, to eat well, to visit doctors during illness, to attend ANC services, sanitation, and other related issues. The following text from Tiringo reveals what her social networks did for her during her pregnancy which is also reiterated by other informants.

My home is neighbor to my relatives. Once they know that I am pregnant, they will worry as if they were pregnant themselves. They often asked me how old was the pregnancy, what household activities were left which they will help me, whether I took my food, what food items I wanted... They advised me to take rest, to avoid lifting or carrying heavy objects, to decrease work load, to attend ANC follow-ups, and to be vaccinated (Tiringo, parity 3).

The informants demonstrated that the community is sympathetic to pregnant women. Once the pregnancy status of a woman is noticed (she may be relative, neighbor or friend) her network members often show concern for her. They may not necessarily go to her home to show their sympathy. They may express their concern when they meet her along the road, at church, at *mahiber* (traditional institution in which members prepare feasts on the name of one of the Angels on monthly basis and invite the members in turns) or at coffee ceremony. They often give emotional support and express good wishes for her pregnancy. The level of concern towards pregnant women varies by type of relationships (level of closeness): the closer the relationship, the greater the concern.

More support and concern is expected from relatives or kinship network members and best friends than non-kin network members. One of the informants said that:

I am living close to my husband's relatives. I rely on my mother-in-law and my sister-in-laws during my pregnancy. I always had poor appetite at that time. I disliked eating at my home. That is my unique They often assist me in accomplishing household chores. They prepare food I liked the most... I also do the same when they become pregnant (Tiruaalem parity 5).

The informants' narrative reveals that the roles of her social networks during her pregnancy were not limited to showing concern, emotional support, and labor support. Her network members also supported her in kind (e.g., provision of food). She discussed that pregnant women are given foods they like to eat because the society believe that the baby will have some kind of mark on its skin if the mother didn't eat what she desired during pregnancy. Such support roles are made on a reciprocal basis.

4.2.3 Roles of Social Networks during labor and Delivery

Informants described that their social networks played significant roles during labor and delivery of their recent born children. A majority of the informants reported that members of their social networks prayed for them during their labor and delivery. The informants shared that husbands were informed first when labor started. Other network members knew the event through their husbands or other household members. The following text presents how Aster's networks knew about the event and what they did for her:

When labor started I told my husband and he told his sister who was living very close to our home. She came and reassured me.... my husband also told my mother. Other relatives and neighbors who heard the event also came to our home. They were praying-*mariam, mariam*, to shorten the duration of labor and to make the event smooth. People were supporting and encouraging me being with me during that critical time (Aster, parity 4).

Tiringo described that her husband facilitated transport to reach the health facility for delivery. She stated that, “we are living away from both relatives. When labor started, I told my husband. He immediately called on a transport and we went to the health facility.” Tatu also had similar accounts. She reported that:

It was my first child. I was new for labor pain. When I felt unusual pain, I told my husband. He told my mother what I felt. She came She guessed that it was labor. Of course, it was.... After a while, other relatives heard the event. There was praying. The labor was long. ... My mother wanted me to deliver at home. However, my husband called an ambulance and we went to a health facility for delivery (Tatu, parity 1).

The discussion with informants indicated that during labor and delivery, the immediate family members were the important social networks with whom they shared their pains first. These family networks bridge the information to reach other members in the network. Their networks supported them by giving emotional support, praying, and assisting them during delivery. Others reported that the family networks facilitated transport to go to a health facility for delivery.

Moreover, the informants described that their social networks also have great roles during the post-natal period. Immediately after delivery, people around the woman will celebrate the birth with joyful events. There are foods and drinks prepared according to their tradition. People will laugh and chat by reviewing what the woman and/or her husband said during the severe birthing process. Many informants had pleasant memories of the time. They stated that the immediate post-natal period is the time they were relieved from the pain and celebrate the coming of their new children. One of the informants stated that, "... this is the time I enjoyed the most. When my family chats together, I feel that they were with me and they shared my pain" (Mulu, parity 6). The informants stated that the support of their network members continued for some weeks: they considered it as "nursery time" till the mother was strong enough to accomplish the household chores.

4.2.4 Reasons for facility delivery

Informants ascribed different reasons for facility delivery of their recent born children. While some described the roles of their social networks, others described the absence of social networks to care for them at home as reasons for facility delivery. Still others reported that their previous facility delivery experience as reasons for facility delivery of their recent children. The following text reveals how Tatu delivered her child at a health facility though her mother preferred that she deliver at home, assertion situation similar to others.

It was my first birth. I stayed long on labor, about 12:00. People were praying all the day expecting that I would deliver soon. Around sunset, my husband proposed

that I should go to health facility. He expected there might be a complication.

Mother asked, ‘why?’ She said, ‘I delivered all my children at home.... There is no need to go to health facility.’ Other relatives supported his idea.... Thus, I delivered at a health facility (Tatu, parity 1).

The informant’s narrative demonstrates that she was not the decision maker where to deliver her child. Rather, her network members trade-off on place of delivery for her child. Considering her previous delivery experience, her mother recommended that she deliver her child at home. On the other hand, her husband proposed facility delivery after several hours of labor at home. The role of other relatives in favor of her husband’s proposal was also substantial for her place of delivery.

On the other hand, Zinash planned to deliver at a health facility because she had information about the importance of facility delivery from different sources:

I knew the importance of facility delivery even before pregnancy. I heard it from TV, and I knew some people who delivered at a health facility. Sometimes, we discussed the place of delivery. Especially when someone delivered recently, neighbors and relatives celebrate her delivery. In those occasions, we used to ask how the labor was and we chat on the overall procedure. I think I learned a lot from such discussions. During recent pregnancy, the HEW told me to deliver at facility. The attendant at the ANC follow-up also told me repeatedly. Just a month or so before, my friend delivered at a health facility. I accompanied her to the health facility. I observed Even, she joked at me that the next will be my

turn. When labor started, I went to health facility. My husband and a few other people accompanied me (Zinash, parity 1).

A third of informants described that they delivered at a health facility because they had previous experience of facility deliveries. For example, Tiringo stated that, “I knew the advantages of facility delivery. I delivered my earlier children at a health facility. For my recent child, I planned ahead to deliver at a health facility.” Others also had similar accounts.

A variation to the above is the story of Zenebu and Shita. The informants described that they delivered at a health facility because they worried about the absence of network members who would assist them at home during delivery. The following text describes Shita’s account of facility delivery, which is similar to Zenebu’s.

We are living in new residence away from both relatives. Around the date of delivery, my husband was not at home. I was living with my sister. We did not have relatives in the new residence. We had not yet established close relationships with the neighbors. I worried a lot. I was thinking who will assist me during the pain. I knew health facilities provide delivery services. During ANC follow-up, the HEWs advised me to deliver at a health facility. Thus, when labor started, I went to the health center for delivery (Zenebu, parity 2).

The informant’s narrative indicated that she believes that social networks are important to support/assist women during labor and delivery. She also described that both relatives and neighbors are important during labor and delivery. Because of the absence

of relatives and neighbors who could assist her during labor and delivery, she went to the health facility. Her narration is suggestive that facility delivery is not needed in the presence of relatives or neighbors who could assist a woman during labor and delivery. Shita also cited the problems of cleanliness and contamination at home delivery. She reported that, “While I was at health center for ANC follow-up, I heard a health professional teaching that home delivery exposes for HIV and other infections. Thus, I preferred to deliver at a health facility to avoid contaminations.”

The reason for Enyish differed from the group. She demonstrated that she delivered at a health facility because of her obstetric complication experience during her earlier pregnancy. She stated her heartbreaking experience as follows:

I delivered two of my children at home; there was no problem at all. But, that was not the same for my earlier pregnancy. I was healthy throughout the pregnancy. I attended the required ANC follow-up. The HEWs advised me to deliver at a health facility. I knew some people who delivered at a health facility; some said that it was good; others said that it was inconvenient. Anyway, I When labor started, I became indecision. My husband asked me to go to health facility. I said let me try it at home. After about half a day, I got the child out. But, the placenta was not removed. We left the child at home and we went to the facility for help. They helped me. When I returned back home, I found my child gone forever... During this pregnancy, I planned ahead. The family was also thinking to do so (Enyish, parity 4).

The informants' narrative reveals that she knew the facility delivery service. Her mixed information about the quality of the service made her reluctant to use the service. She attributed the loss of her earlier child to her home delivery. The scar informed her to plan to deliver at a health facility for the recent delivery.

4.2.5 Quality of Facility Delivery Services

The informants' judgments about the quality of delivery services they experienced at a health facility were mixed. While some informants described that they experienced good quality delivery services, others evaluated the service as poor. The following text presents a description by one of the informants who experienced good quality of delivery services at a health facility.

Facility delivery is not my first experience. I delivered my earlier children at a health facility. The service at the health facility was very good. They treated me as closest relatives. While discussing with other women at home, I heard that the service was poor- the attendants leave the mother alone, they insulted mothers, etc. During my delivery, the service was very good (Tiringo, parity 3).

The informant explained that contrary to the information she heard from her network members about the quality of facility delivery services, she evaluated that the facility delivery services were good. Her evaluation of the quality focuses on the availability of the attendants and their emotional support. She discussed that the attendants were supportive and considerate of her pains. Alemitu also described similar judgments. She stated that "I think the service was good. The attendants were with me as relatives. They did a lot for me during that painful experience."

On the other hand, Tatu explained that she experienced poor quality of facility delivery services despite she had the information that health facilities provide good quality delivery services. Tatu described that:

I had labor all the day. I was very exhausted. We went to the health facility in the evening. We got a man who looked angry. During examination, I asked the attendant the status of the fetus, with indifferent feeling, he said, ‘first you should think about yourself.’ well, I delivered after severe frustrating pain. I knew from others’ experience that infants usually cry just after delivery. Mine kept quiet. He wrapped her by green sheet and put her on a table. Again, I asked him her status. He ignored my question. When I moved to the side to see her, he shouted at me, ‘do not move, the delivery is not yet completed... the placenta is not removed.’ I was afraid of him. Nobody was with us in the delivery room. At that time, I thought that the pregnancy was lost, my daughter was died. Thanks, to God, I got my daughter alive (Tatu, parity 1).

Tatu’s narrative pointed out that she went to the health facility expecting good quality of services. However, she was not happy with the services. She stated that the attendant was not considerate of her concern. He was reluctant to answer her basic questions-knowing the survival status of her daughter. She did not know whether her child was alive or not till the delivery procedure was completed.

Some informants evaluated the quality of the service considering different aspects of the service: the quality of service during reception, delivery, and the immediate period after delivery. One of the informants described that the attendant helped her well during

that frustrating pain; nevertheless, his finishing was not good: "... after delivery, I asked the attendant to support me to walk to the bed room from the delivery room. He did not want me to touch him. He said, you are ok, you can walk yourself." The informant evaluated that the overall delivery service was good. However, the service just after delivery was not satisfying. She stated that "the cleaner saw her from a distance staggering to walk. She assisted me to go to the bedroom."

Degie's evaluation of the quality of delivery service she experienced at a health facility differed from others. She evaluated not only her experience but also what others at a similar state experienced at the health facility. Degie explained the delivery service for her was good at the health facility. However, another woman in her bed room suffered a lot.

... the overall service was good for me. However, a woman who shared the bedroom with me did not get such service. She had frequent contraction and severe pain around mid night. She worried about the absence of her relatives. It was only her husband who accompanied her. She delivered at the bed. Just after she delivered, the attendant came and shouted at her why she did not call him in advance. Unfortunately, nobody was around while her husband was searching for their help. Her husband complained that he could manage her in that manner at home with family. He said, there is no need to come to health facility for delivery (Degie, parity 2).

The narration illustrates that all women who delivered at a health facility may not experience similar quality of delivery services. While some experience good quality,

others may experience poor quality. Such experiences may communicate blurred information for the potential users of the service. As to the narrative, the husband, whose wife delivered at the bed in the facility, noted that the service provided to his wife was similar to their experience at home, thus he had the opinion that there is no need to go to health facility for delivery services.

4.2.6 Reasons for home delivery

Informants who delivered at home described different reasons for their home delivery. The majority of informants described that they delivered at home because of fast and easy labor and others described that they delivered at home because they were healthy and they did not have difficult labor. A number of informants also depicted variation of these reasons such as quality concern, privacy, and roles of social networks.

Out of 11 informants 5 explained that they delivered at home because labor was fast and easy. Both of these informants described that they planned to deliver at a health facility. However, they delivered at home because of fast and easy labor. Four informants guessed that they had labor that lasted from 3 to 8 hours. One informant reported that she delivered within an hour since starting labor. The following description by an informant represents a common experience among the group.

I am living in a new residence. Earlier, I was living in Addis Ababa. My husband is working in Addis Ababa. He was not with me around the end of the gestation period. I was praying that labor would start during day time. If it started during night, nobody will accompany me to the health center. Fortunately, labor was started during day time, around 3:00 (local time). Immediately, I asked my

neighbor to accompany me to the health center. Before we leave to the health center, we agreed to take coffee. Around the middle of the coffee ceremony, the pain became frequent, frequent... around 6:00, I delivered my daughter (...laughing) (Tihun, parity 4).

Three informants had almost similar explanations for home delivery. They delivered at home because they did not have difficult labor. The informants in this group believe that women should not go to health facility for delivery under normal conditions. The informants approved facility delivery for women who had either pre-identified illness or for those who experienced difficult labor during delivery. Tizita shared:

Around the end of the gestation period (just two days before delivery), I became depressed. I went for check-up at the health facility. The doctor told me that I was healthy and the fetus was also at healthy condition. He told me that the delivery date was approaching and I should deliver at a health facility. Labor started during night. The next day late morning I delivered without any problem. Since I was told that all are at good conditions, why should I go to health facility for delivery? (Tizita, parity 2).

The informant sounds emotional while expressing this opinion. On additional probes, she discussed that home delivery is the norm in the community. Women will not go to health facility unless there are known reasons for professional support. Women in her locality disliked the birth position at a health facility. At a health facility women are required to lie down and everybody observe the woman's private organ. Such delivery

position is different from the usual birth position at home (squat position). She suggested that, “if women bend down, they will deliver safely.”

Two other two informants described different reasons for home delivery. While both externalized the reasons, their reasons differ, too. One of the informants pointed to people in her network and the other informant referred to the quality of delivery service and privacy concern at the health institution. Tirualem is one of the informants in this group. She delivered at home because she expected that people in the health facility would not assist her. She had a bad experience with the attendants during her pregnancy. The following text reveals how Tirualem interpreted her interaction with the attendants during her pregnancy that deterred her utilization of delivery services.

During my recent pregnancy, I got sickness, around 5 months of gestational age. I went to the nearby health facility for support. I found the attendants in a group. I expected that they are students. One of them asked me some questions. Then she took me to the bed and asked me to lie on back on the bed. Other attendants also came to the bedside. All were staring at me. They asked me many questions such as how many deliveries, how many children are alive, etc. which were not related to my illness. I begged them to help me treat my illness instead of asking unrelated questions for their learning. At this time, one of the attendants shouted at me. She warned me that they would not help me unless I became cooperative to their work. I did not expect such a response. I asked, why? I was annoyed very much. I stood up to go to home. The same attendant warned me further, she said, ‘we would not help you even during labor and delivery.’ Her warning did not

change my decision. I left the health facility and I went to the private clinic for support. When labor started, I remembered what she warned me. When labor became long (two days) my family and neighbors proposed that I should go to the health facility. I did not accept their proposal. I guessed, those people would not help me well. I did not want those people to stare at me while I was on the bed with my legs pulled apart. I delivered at home (Tirualem, parity 5).

Tirualem's experience presents that she conceptualized the attendants at the health facility as less experienced and unable to help her well. She was not comfortable with the services and the number of attendants she had encountered during pregnancy. When labor started, she remembered her disagreement with the attendants. Though her networks advised her to deliver at a health facility, she did not go to the facility. Her narration indicates that she had three concerns not to go the health facility: whether the facility would help her, whether the attendants were competent to help her, and the issue of privacy.

The issue of privacy is also main concern for Mulu. Mulu delivered all her children at home. She stated that home delivery is the norm she learned from her elders. She disliked the birthing position and lack of privacy at health facility. She stated that she accompanied one of her neighbors and she observed the birth position at a health facility. She stated that, "I saw her lying on the back, her legs pulled apart and other people in front of her." She considered the event as misfortune. Mulu believed that a lucky woman delivers at home with the warm support of her relatives and neighbors. She equated giving birth at a health facility to a great misfortune which she will not wish to happen

even for animals. She said that, “if I go to a health facility to give delivery, the labor will not advance anymore; it will regress back.”

Aster delivered at home because the majority of her network members preferred her to deliver at home. She asserted that:

When labor started early in the morning, my husband called for my mother. She immediately came and reassured me. Other relatives and neighbors who heard the event came to our home. Everybody was praying-*mariam, mariam, mariam*. My mother became more concerned about the event. ... she suggested that I should go to health facility for delivery. However, other people did not support her. They argued, it was not long time since labor was started. There was no sign of any difficulty. The doctors will do nothing in the normal condition; she will lie on the back and they will say push. It is St. Mary who will bring positive outcome. Let us pray to St. Mary together. In the afternoon, I delivered at home (Aster, parity 4).

Agerie's reason was also different from the group. She described that she delivered at home because the attendants at health facility could not help her.

I had long labor at home that lasted for two days. I did not have such experience earlier. Neighbors and relatives who visited me became more overwhelmed. They advised me to go to a health facility for support. Since I was becoming weak, I accepted their advice. They prepared '*kareza*' and they took me to the health facility. Up on arrival, the doctor examined me and told me that the pregnancy

was past-term (the delivery date was passed), and he could not manage such case in the health center. He wrote a referral paper to hospital for better support. I became hopeless. We are poor. We could not afford travel and waiting costs. Even, I doubted what people at the hospital will do for me. I decided, I should go and die at home. I told my husband ... I should go to home. I insisted to go home. They carried me to my sister's home, relatively nearer to the nearby urban area. As soon as I reached home, I delivered without any problem, it was God's miracle. All tension and sadness was changed to delight (Agerie, parity 4).

Agerie shared that the attendants are incompetent to help mothers. They may successfully help a woman by chance. We may consider that as their success. The reality is that if they could not do that, they may refer her to another facility without knowing the real causes. A woman on labor will move here and there and face additional challenges for empty promise. Agerie used her experience to illustrate her opinion. She believed that, "safe delivery is in the hands of God and his mother, St. Mary. If it is God's wish, it will be uneventful. That was what happened to me."

4.2.7 Summary of qualitative findings

Eight women who delivered their recent born children at health facilities and 11 women who delivered at home participated in the qualitative phase of the study. Informants shared different experiences during their recent delivery: the birth preparedness activities accomplished during pregnancy; knowledge of obstetric complications; the roles of their networks during pregnancy, labor and delivery; the

quality of facility delivery services; and different reasons for either home or facility delivery of their recent-born children.

The informants as a group had limited knowledge of obstetric complications. Their birth preparedness activities were limited to edible item preparations for the post-natal period. Many of the informants indicated that their social networks assisted them during pregnancy with household chores, emotional support; and by giving advice about their health and their fetuses. During labor and delivery, social network members participated in praying, providing emotional support, and assisting during delivery.

For some informants social networks facilitated facility delivery service utilization by sharing information about the available facility services and the quality of services at health facilities as well as by facilitating transport to reach health facilities. On the other hand, for some informants, social networks constrained facility delivery service utilization by preferring home deliveries and approving the practice as a norm in their localities.

Some informants shared that they discussed the place of delivery during informal chats at churches and neighborhood visits and when labor started for a woman. Some informants learned about health facility delivery from neighbors who delivered at a health facility. Others learned about health facility delivery at health posts from health workers during the ANC visits. Some informants shared that they learned about facility delivery services on television.

Informants who delivered at health facilities described different reasons for facility delivery. Some informants described the roles of their social networks (shared information about facility delivery services and the quality of the services). Others described the absence of social networks to care for them at home as reasons for facility delivery. Still others reported that their previous facility delivery experience as reasons for facility delivery of their recent children. While some informants reported that the quality of facility delivery service as good, others stated that the quality was poor.

Informants who delivered at home suggested different reasons for home delivery. The majority shared that they delivered at home because of fast and easy labor (labor that lasted between three to eight hours). Others stated that they delivered at home because there were no complications during labor and delivery. They argued that under normal circumstances, home delivery is the norm in their locality. Some informants delivered at home because of lack of privacy and poor quality of facility delivery services.

4.3 Summary of Findings

The findings of the study revealed that women's social network characteristics better explain use of facility delivery services during uncomplicated births than their individual characteristics. Adjusting the influence of other independent variables, network structural variables-network homogeneity and network size and social network content (SBA endorsement) were statistically significant in predicting facility delivery service utilization. Among women's individual attributes, women's educational status, residence, and knowledge of obstetric complications were also statistically significant in predicting facility delivery service utilization.

Social networks provide emotional support, assist in household chores, and are sources of advice for mothers' and their fetuses' health during pregnancy. During labor and delivery, social network members provide emotional support, assist during delivery, and/or facilitate transport to reach health facilities for delivery. Some informants also shared that their social networks had roles in deciding the place of delivery for their recent born children.

Discussions about place of delivery among network members were often held either following a new birth for one of the members or when labor started for one of the members. Information about place of delivery is also shared when there is a visit to health facilities and during informal discussions at churches and neighborhood visits. Such social contexts allow network members to share their experiences and knowledge about the overall birthing processes thereby mothers learn which delivery sites are better for their health and their babies' health.

Social networks contributed to facility delivery service utilization by sharing information about the available facility services and the quality of services at health facilities. Social network content (SBA endorsement) significantly predicted the quality of services experienced by women. Women embedded within high SBA endorsement network were more likely to experience good quality facility delivery services than women embedded within low SBA endorsement networks. About half of the respondents who delivered at a health facility reported that the quality of facility delivery service was poor. Lack of sympathy and emotional support on the part of delivery attendants and the

lack of privacy associated with the birthing position while a woman is giving birth are the quality concerns mentioned by informants.

Women who delivered at home identified different reasons for home deliveries. Easy labor, fast labor, and the absence of complications during labor are the three primary reasons for home delivery. Informants who were in labor from three to eight hours indicated that they delivered at home because of easy and fast labor. Some informants indicated that they delivered at home because it is the norm in their locality. Women may go to a health facility for delivery if she had known health problems or when complications were recognized. Concern about the quality of facility delivery services and the preference of social network members for home delivery were also mentioned as reasons for home delivery.

CHAPTER FIVE: DISCUSSION, CONCLUSION, AND IMPLICATIONS

Reducing maternal mortality and morbidity through improving maternal health has been an important agenda since the launch of the MDGs at the millennium summit in 2000. Yet, maternal mortality has remained an unmet public health challenge, particularly in developing countries (UN, 2008). Similar to other developing countries, Ethiopia has a maternal mortality ratio that is one of the highest in the world. Since many of the maternal deaths are clustered during labor, delivery, and the immediate postpartum period (Canavan, 2009; Hussein et al., 2004), it is recommended that every woman deliver at a health facility with the assistance of SBAs. The presence of SBAs at every delivery equipped with supplies and equipments is significantly associated with reduction in maternal mortality (Bale, Stoll, & Lucas, 2003; Pathmanathan et al., 2003). However, only 10% of women in Ethiopia deliver at health facilities.

The purpose of the study was to investigate the influence of social networks on place of delivery during uncomplicated births. The study also assessed women's experience of quality in delivery service at health facilities and the barriers to use of facility delivery service. The study employed a cross-sectional mixed methods design. Data were retrospectively collected from two groups of women: those who had uncomplicated deliveries at health facilities and those who had uncomplicated deliveries at home.

The findings of this study may have limitations owing to the data quality. Since women were asked to recall retrospectively their network members and their roles, there may be memory lapses that affect the accuracy of recall. Women may report inaccurate

data or they may give responses which they believed to be expected or acceptable. The study is confined to the health centers providing delivery services. Thus, the results related to the quality of facility delivery services may not be generalized to other health institutions (e.g., hospitals) staffed with many specialists and providing comprehensive services. In addition, the participants of study were women who had uncomplicated deliveries and confined within 5km distance from the health centers. The roles of social networks may be more important during complicated deliveries and in remote areas.

Although limitations are inherent, the findings are useful to communities of similar settings. Social networks may influence SBAs utilizations during uncomplicated birth in diverse geographical areas where the behavior is not well practiced. In addition, information on the quality of facility delivery services by different indicators may assist professionals to find strategies to improve the quality of care at similar health facilities.

This chapter presents salient findings of the study. First findings are discussed in line with the purposes of the study. Next, an overarching conclusion is presented. Finally, implications for policy, research, education, and practice are presented.

5.1 Discussion

The discussion of the findings is presented in three themes: influence of social networks on place of delivery, quality of facility delivery services, and barriers for facility delivery service utilization. The findings in these themes are examined in line with the existing literature.

Influence of Social Networks on Place of Delivery

To investigate the influence of social networks on place of delivery, the study hypothesized that during uncomplicated births, women's social network structure (tie strength, homogeneity of networks, and size of networks) and social network content (perception of suggestions and advice from network members about place of delivery) explain use of facility delivery service more than their individual attributes (such as educational status, residence, knowledge of obstetric complications, use of ANC services, and husband's literacy status). The study also hypothesized that social network content will better explain use of facilities for delivery than network structural variables.

As expected, the results revealed that social network variables predict use of health facilities for delivery of uncomplicated births more so than individual attributes. The hierarchical logistic regression indicated that there is a hierarchical relationship between the social network variables and place of delivery. The network variables significantly reduced the error in predicting the use of facility delivery services. The results demonstrate that use of facility delivery services was better predicted with the addition of network variables than women's individual attributes alone. The results support the relevance of NEM in predicting preventive health behavior.

Though literature on the influence of social networks on the use of facility delivery services is limited, the significance of social networks for health service utilization has been extensively documented by earlier studies (Andersen & Newman, 2005; Devillanova, 2007; Freidenberg & Hammer, 1998; Haines & Hurlbert, 1992; Hintikka et al., 2000; Kana-Iaupuni et al., 2005; Pescosolido et al., 1998; Sluzki, 2010;

Thoits, 2011). Andersen and Newman (2005), Pescosolido (1992), and Devillanova (2007) explained that social networks play important roles for health service utilization by recognizing the need for services, providing information about available services, and mobilizing support to use the services. Sluzki (2010) also described that social networks provide emotional support, practical aid, and act as referral agents for their members, thus facilitate health service utilization. In addition, Helleringer and Kohler (2005) reported that social networks are important sources of information for individuals to learn about and evaluate the behavioral strategies to maintain their health.

A majority of the informants in the qualitative study shared that their social networks played different roles during pregnancy, labor, and delivery. During pregnancy, the network members provide emotional support, gave advice about health, and assisted with household chores. During labor and delivery, the network members participated in the identifying of the symptoms, praying, and assisting during the birthing process. Some of the informants who delivered at a health facility indicated that their network members told them about facility delivery and the quality of delivery services at the health facility. Others described that their social networks helped them to reach the health facility for delivery. The above descriptions illustrated that social networks contributed to facility delivery service utilization by suggesting facility delivery services for their network members, giving information about the quality of facility services, and by assisting women in reaching a health facility once labor started.

Among the network structural variables considered in the study, network size and network homogeneity were significantly associated with SBA utilization. The odds of pregnant women delivering at a facility increased with increasing network size. Similarly,

the results revealed that women embedded in homogeneous networks (many of the network members are kin) are more likely to deliver at a health facility than women embedded in heterogeneous networks. The results are consonant with earlier studies that reported significant associations between social network structure variables and maternal health services utilization (Behrman et al., 2002; Berkanovic & Telesky, 1982; Clair et al., 1989; Devillanova, 2007; Godley, 2001; Helleringer & Kohler, 2005; Kohler et al., 2001; Maulik et al., 2009).

In their study of the roles of social network structural variables on prenatal care utilization to prevent unforeseen health complications, Clair et al. (1989) reported that women embedded within large networks where many of the network members were relatives (homogeneous) were more likely to use the service. Kohler et al. (2001) also explored the effects of social network variables on reproductive health service utilization in rural Kenya and reported that social network structure and content were important in explaining women's service utilization in the study area.

The strength of network ties and network neighborhood status did not significantly explain use of facility delivery services for uncomplicated births. The regression coefficient indicates that network tie strength was negative, i.e., women embedded in strong networks were less likely to use facility delivery services for their recent born children than women embedded in networks with weaker ties. Previous research on the impact of network tie strength on health service utilization is mixed. The inconsistency of the results may reflect the different reasons for health service utilization, i.e., whether the health service is preventive or curative. For people with an illness, Freidenberg and Hammer (1998) reported that strong tie networks predict utilization of

health services. In the case of preventive health service utilization (maternal health care services), other researchers reported that strong ties within homogeneous neighborhood networks declined utilization of services (Clair et al., 1989). Still others reported that network structural variables did not have an effect on use of facility delivery services for uncomplicated births (Edmonds, 2010). This study is consistent with the earlier research reports.

The qualitative data indicated that some informants delivered at a health facility because of a lack of trusted network members who would assist them during labor and delivery at home. The informants described that they were living in a new residence where relatives and former friends and neighbors were not around. They did not have well established relationships in the new residence. Thus, they delivered at a health facility. These results suggest that in the study setting, women are not likely to go to a health facility for delivery service if relatives or dependable network members are available to assist at home. This might be true in the study setting where 90% of deliveries occurred at home, with the assistance of relatives (65%) or traditional birth attendants (28%) (Central Statistical Agency and ORC Macro, 2012), and home delivery is the norm (Warren, 2010).

In this study, social network content (perceptions of women about the opinion and advice of their network members about place of delivery for their children) was significantly associated with utilization of facility delivery services. Women who perceived that their network members suggested facility delivery were more likely to deliver at a health facility. In addition, network content significantly predicted use of facility delivery services regardless of network homogeneity, network tie strength, and

neighborhood status of the networks. The result corroborates earlier research reports (Edmonds, 2010; Kohler et al., 2001). In her study of the effect of social networks on SBA utilization among women in Bangladesh, Edmonds (2010) reported that social network content was significantly associated with facility delivery.

Overall, the results indicated that social networks better explain facility delivery service utilization among women who had uncomplicated births than women's individual attributes. Among the network variables, social network size (number of individuals in one's network) and social network content (SBA endorsement) better predict facility delivery followed by network homogeneity and network tie strength. As to the writer's knowledge, there are no previous studies in Ethiopia that assessed the roles of social networks for facility delivery service utilization. Do research that assessed the issue under consideration are also scant. The results herein partially supported Edmonds's (2010) study that examined the role of social network variables on SBA utilization in Bangladesh and reported it was social network content not social network structures that was significantly associated with use of SBA for delivery.

One possible reason for this discrepancy may be the low status of facility delivery service utilization in Ethiopia and the study setting. Facility delivery service utilization with the assistance of SBAs in the study setting was 9% in 2012 (Iabi Tehinan Woreda Health Office, 2012). Women may depend on their network members to learn how to use the services. Thus, the structural network characteristics are likely to have larger effects on the behavior in question since the behavior is not widely practiced (Behrman et al., 2002). On the other hand, facility delivery service utilization was 69% in Matlab, Bangladesh in 2010 (Edmonds, 2010). In such an environment where the majority of

women use the service, knowledge about facility delivery service may be high and the uncertainties about the behavior may be low. Individuals may know the services well. Thus, social network content may better motivate women to use the service than the network structure as far as women knew and understood the service.

Another possible reason for the observed difference may be the different social context between the study sites. Edmonds (2010) conducted the study in Matlab, Bangladesh where women's social and economic activities outside the home are very much restricted by tradition (Pitt, Khandker, & Cartwright, 2006; Schaffer, 1986). In Ethiopia, particularly in the study site Jabi Tehinan woreda, women have relative freedom to go out of home and participate in different social activities, such as at church, *mahiber*, market, *iqub*, *idir*, and other social institutions. These are voluntary institutions established among neighbors or close friends to attain different social objectives. In such social institutions, women may share different life events including facility delivery service utilization. Participation in such social institutions may increase their networks and increase their range of information from different people. From such social interactions, women may learn a lot about the behavior that may strengthen their decision to deliver at a health facility.

A plausible explanation similar to the above is obtained while discussing the reasons for facility delivery with the informants in the qualitative study. They described various roles of their social networks. Some informants shared that their network members were a source of information about facility delivery and about the quality of facility delivery service. Others reported that they learned about the available services at health facilities during discussions with neighbors who recently delivered at a health

facility. Many of the informants also stated that their network members helped them to reach the health facility.

Though the overall hierarchical regression model result indicated that social network variables predicted the odds of facility delivery better than women's individual attributes, the Wald test indicated significant associations between some of women's individual attributes and utilization of facility delivery services. The data showed that women's individual attributes were significantly associated with facility delivery service utilization. The results supported the applicability of the behavioral model for preventive health service utilization.

Women's individual attributes that showed a significant association with the dependent variable in the bivariate analyses (women's educational status, use of ANC during pregnancy, husband's educational status, residence, and knowledge of obstetric complications) were entered in the model for further analysis. The result indicated that women's educational status, residence, and knowledge of obstetric complications significantly predicted use of facility delivery services. Compared to rural women, urban women were more likely to deliver at a health facility (42.2% vs. 69.1%). Women with relative better knowledge of obstetric complications during labor and delivery were more likely to deliver at a health facility than women with limited knowledge (53.6 %vs. 37.8%). Women with high school and above educational status were also more likely to deliver at a health facility than women with no education (93.3% vs. 44.2%). The results are consistent with several studies (Jayaraman et al., 2008; Ronsmans et al., 2003; Rööst et al., 2009; Stephenson et al., 2006; Tuladhar, 2009), including studies specific to

maternal health care utilizations in Ethiopia (Central Statistical Agency and ORC Macro, 2005, 2012; Mekonnen, 1998; Mekonnen, & Asnakech, 2002; Mesfine et al., 2004).

The consecutive national Demographic and Health Surveys of Ethiopia reported that urban women are more likely to deliver at a health facility than their rural counterparts and women with secondary education and above are more likely to deliver at a health facility than women with no education (Central Statistical Agency and ORC Macro, 2001, 2006; 2012). Knowledge of pregnancy risk factors showed a significant association with the use of skilled care at delivery even after controlling for confounding factors (Mesfine et al., 2004; Mpembeni et al., 2007).

In the bivariate analysis ANC follow-ups during pregnancy were also found to have a significant association with facility delivery service utilization. Women with ANC follow-ups were more likely to deliver at a health facility than women without ANC follow-ups (54.5% vs. 29.5%). Previous studies also reported the significant roles of ANC for facility delivery service utilization (Central Statistical Agency and ORC Macro, 2001; 2005; 2012; Mekonnen, 1998; Mekonnen, & Asnakech, 2002; Mesfine et al., 2004; Society of Population Studies, 2008). Children are more likely to be delivered at health facility from mothers who had ANC visits than from mothers without ANC visits (Central Statistical Agency and ORC Macro, 2001; 2005; 2012).

Nevertheless, in this study, when the effects of other predictor variables were controlled for the multivariate analysis, ANC visits failed to significantly predict facility delivery ($p > 0.05$). A possible reason for this result may be the content of the ANC counseling provided at health facilities. Women may not get appropriate counseling during the ANC sessions about the benefits of giving deliveries at health facilities. For

example, one of the informants described that around the end of the gestation period, she felt discomfort and she went to the health facility for a check-up. The professional told her that the pregnancy was in good condition; however, she delivered at home. She explained that, “Since I was told that all are at good condition, why should I go to health facility for delivery?” Her narration indicated that the professional told her the healthy status of the pregnancy. She interpreted this as sufficient condition for healthy delivery, hence she delivered at home.

Quality of Facility Delivery Service

Women assess the quality of services provided by a health facility based on their own experience with the health care system and on the experiences of other people they know (Gabrysch and Campbell, 2009). In this study, the quality of facility delivery service was assessed considering women’s own experiences. The quality of services women experienced in health facilities during labor and delivery were assessed using four indicators: physical and human resources; cognition; dignity, respect, and equity; and emotional support. The indicators were developed by Hulton et al. (2000) to measure the quality of institutional maternal delivery services. One hundred thirty-four respondents who delivered at health facilities reported the quality of facility delivery services. Sixty percent and 56% of the respondents respectively reported that they experienced good quality of physical and human resources and cognition at a health facility. Half of the respondents and about 52% of the respondents, respectively, reported that there was good client-provider interaction and emotional support at the health facility. Taken all indicators together, the data revealed that about 52% of the respondents experienced good

quality of facility delivery services. In this study, nearly half of the survey respondents (47.8%) reported experiencing poor quality delivery services in a health facility.

Among the four indicators, respondents evaluated that client-provider interaction (respect, dignity, and equity) (50%) as the poorest quality followed by emotional support given by professionals at the health facility during delivery (48.5%). The informants' evaluation of the quality of delivery service they experienced during the qualitative interview also focused on these aspects of quality indicators. Informants repeatedly mentioned the availability of the attendants when needed, the considerateness of the attendants towards the mothers' pain, the responsiveness of the attendants to mothers' concern, and the supportiveness of the attendants during labor and delivery to judge the quality of service they experienced. Some informants indicated that the attendants were aggressive and indifferent to mothers' concerns. Other informants also explained that the attendants were not available when needed.

The results are consistent with the earlier research reports in Ethiopia (Berhane et al., 2001; Warren, 2010) and other parts of the world (D'Ambruoso et al., 2005; Some et al., 2011). D'Ambruoso et al. (2005) investigated women's experiences of care in facility delivery and reported that women encountered poor staff attitudes that included rudeness, shouting at women in labor, lack of empathy, refusal to assist, and lack of moral support and encouragement of exhausted women in labor.

One of the interests of the study was to assess the relationship between network content and experience of quality in facility delivery service. The data revealed that there

was a significant association between these variables. Women embedded within high SBA endorsed networks were more likely to experience good quality delivery service at a health facility than women embedded within low SBA endorsed networks. The study confirmed that social networks are important predictors of facility delivery service utilization and social network content was significantly associated with good quality of facility delivery services. Respondents who experienced poor quality delivery service may not use the service again and they may not recommend the service to others in their networks. Those women who heard poor quality facility delivery services from network members may perceive that facilities are not providing good quality services; hence they may prefer to deliver at home. For example, a perception of poor quality of care was one of the reasons for home delivery for more than 28% of respondents who delivered at home in this study. Perception of poor quality of care at health facilities as a deterrent to giving birth in health facilities was also reported in earlier studies (Dogba & Fournier, 2009; Mesganaw et al., 1992).

Barriers for Facility Delivery Service Utilization

Women reported that they did not deliver at a health facility for various reasons. More than 9 women in 10 (90.7%) reported that labor was easy and more than 8 in 10 (82.9%) stated that labor was so rapid that they did not have time to reach a health facility. Similar explanations were given by informants in the qualitative interview. Some informants explained that they delivered at home because the labor was easy and too fast to make it to a health facility for delivery.

More than 7 women in 10 (72.9%) reported that they delivered at home because they did not have complications during labor and delivery. About a quarter of the informants gave a similar reason for home delivery. They stated that home delivery is the norm in the locality. Women may go to a health facility for assistance when they had complications during labor and delivery. The findings are consistent with earlier research reports. In a community-based cross-sectional study in Sekela woreda Amhara Region, Alemayehu, Fekadu and Solomon (2012) reported that the majority of women delivered at home because they wanted closer attention from family members and relatives (60.9%) and because home delivery is the usual practice (57.7%). The 2011 Ethiopian Demography and Health Survey demonstrated that 61% of the respondents who delivered at home suggested that facility delivery was not necessary and 30% reported that facility delivery was not their tradition (Central Statistical Agency and ORC Macro, 2012).

Concern about privacy (78.6%) and perception of poor quality of delivery services at a health facility (28%) were also reasons for home delivery. The informants indicated that at health facilities women are required to lie down for delivery. This birth position is not customary in the localities, since it exposes mothers' private parts. They also stated that the attendants may come in and stare at the woman while she was in labor, or the attendants may come in and out of the delivery room repeatedly. The informants shared that a culture in the health facilities made them embarrassed to deliver there. In addition, the perception of non-satisfactory treatment at health facilities was suggested as one of the barriers for facility delivery.

Moreover, a reference to the past was mentioned as another barrier for facility delivery. More than 6 women in 10 (62.9%) reported that they delivered at home because

they delivered their earlier children safely at home. Informants with parity four and above who delivered at home without apparent complications before the recent born children gave such a reason. Because of their safe childbirth experiences at home, these women may advise other woman to deliver at home.

Compared to other reasons, the roles of distance and transport as barriers for facility delivery were suggested by a limited proportion of the respondents. One woman in 10 (10 %) reported that she delivered at home because of the distance to a health facility. A similar proportion of women reported that they delivered at home because of lack of transport to reach a health facility. The informants in the qualitative study did not mention distance and transport as reasons for their home delivery. These findings are inconsistent with previous studies that reported problems of accessibility and transport to facilities as barriers (Gabrysch & Campbell, 2009; Thaddeus & Maine, 1990; Wagle et al., 2004; Warren, 2010).

Thaddeus and Maine (1990) stated that distance to the nearest health facility and lack of transport were greater deterrents to preventive health service utilization mainly through influencing the decision to seek care. Use of SBA during uncomplicated birth, the main focus of this study, is considered a preventive health service that mothers should use during labor and delivery to avoid unforeseen complications. Nevertheless, the role of distance and transport for service utilization were negligible among the respondents. One of the reasons for the observed result may be the design of the study. Based on the literature and the exploratory study, it was learned that women may not go to health facilities for delivery during uncomplicated births from distant areas. Women from distant areas may seek care from health facilities when there are complications and all

options at home are not successful. Thus, the influence of distance and transport were controlled in this study by clustering the study areas within 5km (an hour walking distance) from the facilities.

5.2 Conclusion

The majority of women in Jabi Tehinan woreda are embedded within strong tie networks (54%) comprised of mainly homogeneous (kinship) members (59%) and neighborhood networks (61%). Nearly half (51%) of women perceived that their network members approved of their facility delivery service utilization. The results revealed that social network variables (structure and content) better predicted facility delivery service utilization during uncomplicated delivery than respondents' individual attributes. Network size was positively associated with facility delivery service utilization. Women embedded within homogeneous networks were more likely to deliver at a health facility. Women who perceived that their network members endorsed facility delivery were more likely to deliver at a health facility. Informants described that their social networks provided them with information about facility delivery services and the quality of facility delivery services, and assisted them in reaching the health facilities for delivery.

This study also demonstrated that the influence of women's individual attributes on facility delivery was substantial. Residence, women's educational status, and knowledge of obstetric complications were significantly associated with facility delivery. Urban women, women with high school and above educational status, and women with relatively better knowledge about obstetric complication were more likely to deliver at a health facility.

Nearly half of the respondents who delivered at a health facility reported that they experienced poor quality facility delivery services at health facilities for their recent born children. Respondents evaluated that client-provider interaction (respect, dignity, and equity) was the poorest quality followed by emotional support given at health facility during labor and delivery. Informants stated that the attendants were not considerate of mothers' pains during labor and delivery and they were not responsive to mothers' concerns. The informants also described that the attendants were not supportive during labor and delivery and they were aggressive and indifferent to mothers' worries. Women who experienced these problems or heard about these problems from their network members may prefer to deliver at home.

In the study setting, facilities with SBAs are underused. More than 90% of deliveries occur at home (Jabi Tehinan Woreda Health Office, 2012). Easy labor and rapid progression of labor are the two important reasons for home delivery. It appeared that women wait for labor to progress and watch for signs and symptoms of complications as evidence to seek the care of SBAs. Such management allowed time for home-based care. For many of the respondents who delivered at home, use of health facilities for deliveries is associated with the occurrence of complications.

5.3 Implications

Implication for Social Work Education

Social work is a helping profession that facilitates conditions for individuals, families, groups, organizations, and communities attain their goals. Addressing the health

care needs of people and advocating for change to ensure access to health care is one of the intervention areas of social work (National Association of Social Workers, 2005).

Social networks significantly predicted facility delivery during uncomplicated births. Informants who participated in the qualitative phase of the study discussed how their network members motivated them to deliver at a health facility. While some informants described the suggestion of their network members to deliver at health facility, others stated that their network members told them about the quality of the service. On the other hand, some of the informants who delivered at home reported that home delivery is the usual practice they learned from their network members. Overall, the results indicated that social networks have both roles either in facilitating or constraining facility delivery service utilization.

Social workers can use social networks as a means of entry for interventions to improve health service utilization. Social networks provide the context for social work interventions. It is through social networks that social resources can be accessed and norms are exercised (Hill, 2002). Thus, institutions with social work program may offer a course or include content in the existing courses that address social networks and social network analysis. This will help students to understand the concepts of social networks, functions of social networks, and social network data collection and analysis. Such developments will enhance social workers' effectiveness in their practice. For example, the use of tools to identify, measure, and assess social networks may improve social workers' ability to understand how one's immediate social environment influences health and health service utilization. Identifying the social network content and function helps to

understand conditions and opportunities for social support exchange between individuals and their social ties (Ell, 1984).

Maternal mortality is an unmet health challenge in Ethiopia. This is partly attributed to low utilization of maternal health services. Social workers have an ethical obligation to address the healthcare needs of people and advocate for change to ensure access to healthcare (National Association of Social Workers, 2005). To be effective in the healthcare field in identifying social problems affecting the health status of women and the society at large, social workers should be equipped with the knowledge and skills in public health- a field of practice concerned with promoting and protecting population health (Keefe & Evans, 2013). To attain these purposes, educational opportunities for social workers should be considered. Though there are social workers in health settings, it appears that their degrees did not consider the synthesis between the two professions. In other parts of the world, public health social workers, who draw on the rich traditions and complementary methods of the two fields-public health and social work, are gaining prominence in the field (Keefe & Evans, 2013; Ruth & Sisco, 2008). Thus, the Social Work programs in Ethiopian universities should offer public health course(s) or incorporate public health content into the existing courses. The Social Work program may also develop an in-service continuing education program in public health social work.

Implications for Social Work Practice

The results in this study showed that there is poor quality of delivery service at health facilities. The perception of poor quality of delivery services and lack of privacy

during delivery at health facilities are barriers for facility utilization. Social workers can be instrumental in addressing these concerns. They can work concertedly with public health professionals to improve the quality of facility delivery services. They should advocate for women to have their privacy respected and get the type of services with which they feel comfortable.

Moreover, the results of this study indicate that nearly three-fourths of the respondents who delivered at home believe that health facility delivery services are needed only when there are complications during labor and delivery. This result suggests that women did not have adequate knowledge about the importance of facility delivery services. Since social workers have skills in cultural awareness and cultural competence to work with people with diverse needs and interests (National Association of Social Workers, 2005), they should promote maternal health service utilization to increase the proportion of women who deliver at health facilities. Social workers can use the different social contexts such as *mahiber*, *iquib*, *idir*, and church meetings where people come together for different social objectives.

Increasing the proportion of women who deliver at health facilities will decrease morbidity and mortality of women during their reproductive ages (Ronsmans & Graham, 2006). The death or morbidity of women during their reproductive ages brings significant economic loss and social hardship for their families and has implications for a nation's productive capacity, labor supply, and economic well-being (Reed et al., 2000). In addition, children whose mothers die or are disabled during childbearing have very reduced prospects of leading a productive life (Nanda et al., 2005).

Thus, increasing the proportion of women who deliver at health facilities will have interrelated advantages for mothers as well as for their children. Mothers can nurture their children well and educate them well so that children will be productive citizens. Mothers can engage in productive activities so that they contribute to personal and national development (Reed et al., 2000).

Implications for Research

Earlier research reports documented that social networks predicted utilization of health services among people with identified or perceived illness. This study used social network analysis to learn about its roles for preventive health care utilization. As discussed above, the findings illustrated that social networks had a significant influence on the use of preventive maternal health service. Social workers or other practitioners can use social network analysis methods to understand the social network characteristics of their clients and to design interventions to improve their social interaction so as to increase clients' utilization of services.

This study employed a cross-sectional research design. During data collection, respondents were asked retrospectively to remember the roles their network members played in determining their place of delivery and the quality of delivery services they experienced. Such data may be subject to memory lapse. Future study is called on that will employ a longitudinal design where social network data can be collected during the third trimester of pregnancy and the actual place of delivery and associated birth outcomes can be collected after delivery. The study can also employ exit interviews to

collect data about the quality of facility delivery services. Such a design may minimize the flaws that might be associated with retrospective data.

The study was undertaken in a single woreda in the Amhara Region. There are about 138 woredas in the region with different geographical characteristics occupied by people with different cultural and traditional contexts. Future studies should include a number of woredas with different geographical characteristics to examine the consistency of the result among respondents with different cultural and traditional contexts.

Furthermore, the study was conducted within 5km distance from health institutions and on women who had uncomplicated deliveries. The role of social networks during labor and delivery may be significant in remote areas and when complication happened. Thus, future study may consider distant areas as well as women who experienced complications during labor and delivery.

Implications for Policy

Use of facility delivery services in Ethiopia is among the lowest in the world (WHO, 2010). The government has diagnosed the principal problem as the lack of accessible health facilities and is devoting a large share of the health budget to building more facilities (Collier, Dercon, & Mackinnon, 2002). This study was undertaken within 5km distance from the health facilities to control for the impact of distance and transport on service utilization. As in other parts of the country, a majority of women in the study setting deliver at home with the assistance of traditional birth attendants, relatives, and neighbors where the services are available. About half of the respondents who delivered at a health facility evaluated the quality of facility delivery services as poor. Respondents

who delivered at home also mentioned that they delivered at home because of poor quality of delivery services at health facilities. The study suggests that usage of health facilities is sensitive not only to the distance to the nearest facility but also to the perceived quality of facility delivery services. Thus, policy makers should consider improving the quality of facility delivery services in addition to the efforts underway to increase the availability of facilities to improve maternal health service utilization in general and use of facility delivery services in particular. The concerned organization, the Woreda Health Bureau should design in-service refresher training for SBAs on professional ethics and interpersonal communication skills to improve the quality of service provision at health facilities.

Among the network variables considered in this study, network content (SBA endorsement) was relatively more important in predicting health facility delivery. Since late 2012, the Ethiopian government is organizing women development groups comprised of one-to-five networks. This approach is believed to impart preventive healthy behaviors among the society. So far, a total of 1,882,723 one-to-five networks have been formed in the country (MOH, 2013). Much work is needed to involve all eligible women in such networks. Thus, the concerned bodies organizing these networks may clearly identify the content of the health messages to be imparted between network members so that the expected health behavior may be attained.

Implications for Health Institutions/Professionals

Easy labor and fast labor were the two top reasons given for home delivery. Informants stated that labor was very fast and they did not have time to reach at a health

facility. One of the informants, for example, shared that she planned to deliver at a health facility. When labor started, she could not immediately go to the health facility. Rather, she called her neighbors to facilitate getting support from relatives who would accompany her to a health facility. Her neighbors prepared a coffee ceremony as to their tradition and prayed for things to go well. In those activities, she stayed long time at home. She delivered at home three hours after labor started. The narrative indicated that there was a delay to seek care from professionals. As the study setting was within 5km distance from the facility, she could reach in time if she went to the health facility as soon as labor started. Such delay is one of the factors that influence mothers' health service utilization and their health outcomes. Thus, attention should be given during the ANC counseling that mothers should seek health care from professional as soon as labor starts.

The results also illustrated that the majority of women who delivered at home (72.9%) believed that facility delivery service is needed when there are complications during labor and delivery. Informants who participated in the qualitative study also had limited knowledge of obstetric complications. When asked about the birth-preparedness activities they implemented during their pregnancy, all informants mentioned that they prepared edible items and drinks for the postnatal period. Nevertheless, the birth-preparedness activities expected of pregnant women are comprised of the following series of decisions or thoughts: (a) preparation for birth by selecting place of delivery, (b) preparation of essential items for delivery, (c) knowledge of signs complications and when to seek help, (d) knowledge of where to go for help, (e) arranging access to funds and means for emergency transportation and medical care, and (f) prior identification of blood donors (Del Barco, 2004). None of the informants mentioned these activities. Lack

of knowledge about obstetric complications is one of the factors in delay of seeking health care from professionals and lead to undesirable health outcomes (Thaddeus & Maine, 1990). Thus, the health education programs designed to promote maternal health service utilization may revisit the content of the program to include birth-preparedness activities in the plan. Knowledge of birth-preparedness will help pregnant women, their families, and communities to plan for normal pregnancies, deliveries, and postnatal periods and to prepare to manage emergencies if they occur (McPherson, Khadka, Moore, & Sharma, 2006), thereby decreasing maternal morbidity and mortality.

Moreover, the findings in this study indicated that social networks significantly explained facility delivery service utilization during uncomplicated births. Some of the informants who participated in the qualitative phase of the study indicated that their network members contributed a lot to deliver their children at facilities. Given that social networks are important for facility delivery service utilization, the health institutions should improve the quality of their delivery service provision. In doing so, they can benefit a lot from their clients to promote their services among potential users. This may increase the proportion of women who deliver at health facilities and thus decrease maternal morbidity and mortality.

References

- Achat, H., Kawachi, I., Levinet, S., Berkey, C., Coakley, E., & Colditz, G. (1998). Social networks, stress and health-related quality of life. *Quality of Life Research*, 7, 735-750.
- Adegoke,, A. & Broek, N. (2009). Skilled birth attendance-lessons learnt. *An International Journal of Obstetrics and Gynaecology*, 116 (Suppl. 1):33-40.
- Agazi T.& Kiros B.(2005). *Ethiopian village studies II : Yetmen Enemay Wereda East Gojjam Zone, Amhara Region*. Retrieved from http://www.wed-ethiopia.org/docs/cpii_yetmen_no_photos.pdf
- Ahmed A. (2010). Maternal mortality trend in Ethiopia (special issue1). *Ethiopian Journal of Health Development*, 24, 115-122.
- Alemayehu S., Fekadu M., and Solomon M.(2012). Institutional delivery service utilization and associated factors among mothers who gave birth in the last 12 months in Sekela District, North West of Ethiopia: A community - based cross sectional study. *BMC Pregnancy and Childbirth*, doi:10.1186/1471-2393-12-74
- Alston , M. & Bowles, W. (2003). *Research for Social Workers: An introduction to methods* (2nd ed.). Singapore: South Wind Productions.
- Amin, R., Shah, N., & Becker,S. (2010). Socioeconomic factors differentiating maternal and child health-seeking behavior in rural Bangladesh: A cross-sectional analysis. *International Journal for Equity in Health*. Retrieved from <http://www.equityhealthj.com/content/9/1/9>

- Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36(1), 1-10.
- Andersen, R. & Newman, J. (2005). Societal and individual determinants of medical care utilization in the United States. *The Milbank Quarterly*, 83(4), 1-28.
- Anwar, I., Sami, M., Akhtar, N., Chowdhury, M., Salma, U., Rahman, M., & Koblinsky, M. (2008). Inequity in maternal health-care services: evidence from home-based skilled-birth-attendant programs in Bangladesh. *Bulletin of the World Health Organization*, 86, 252–259.
- Aron, A. (1997). *Statistics for behavioral and social sciences*. New York: Prentice Hall.
- Asher, C. (1984). The impact of social support networks on adult health. *Medical Care*, 22(4), 349-359.
- Bale, J., Stoll, B., & Lucas, A. (Eds.). (2003). *Improving birth outcomes: Meeting the challenge in the developing world*. Washington, DC: The National Academy Press.
- Baraté, P., & Temmerman, M. (2009). Why do mothers die? The silent tragedy of maternal mortality. *Current Women's Health Reviews*, 5, 230-238.
- Bartlette, J., Kotrlik, J., & Higgins, C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning, and Performance Journal*, 19(1), 43-50.

- Bassel, N., Chen, D., & Cooper, D. (1998). Social support and social network profiles among women on methadone. *Social Service Review*, 72(3), 379-491.
- Bazeley, P. (2009). Integrating data analyses in mixed methods research. *Journal of Mixed Methods Research*, 3(3), 203-207.
- Behrman, J., Kohler, H., & Watkins, S. (2002). Social networks and changes in contraceptive use over time: Evidence from a longitudinal study in Rural Kenya. *Demography*, 39 (4), 713-738.
- Bergsjø, P. (2001). What is the evidence for the role of antenatal care strategies in the reduction of maternal mortality and morbidity? In V. D. Brouwere & W.V. Lerberghe (Eds.), *Safe motherhood strategies: A review of the evidence* (pp. 35-54). Retrieved from <http://www.mx1.givewell.net/files/DWDA%202009/Interventions/Maternal%20Mortality/SafeMotherhoodStrategies.pdf>
- Bergstroöm, S., & Goodburn E. (2001). The role of traditional birth attendants in the reduction of maternal mortality. In V. D. Brouwere & W.V. Lerberghe (Eds.), *Safe motherhood strategies: A review of the evidence* (pp. 77-96). Retrieved from <http://www.mx1.givewell.net/files/DWDA%202009/Interventions/Maternal%20Mortality/SafeMotherhoodStrategies.pdf>
- Berhane, Y., Gossaye, Y., Emmelin, M., & Hogberg, U. (2001). Women's health in a rural setting in societal transition in Ethiopia. *Social Science & Medicine*, 53, 1525–1539.

- Berkanovic, E. & Telesky, C. (1982). Social networks, beliefs, and the decision to seek medical care: An analysis of congruent and incongruent patterns. *Medical Care*, 20 (10), 1018-1026.
- Berkman, L., Glass, T., Brissette, I., Seeman, T. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine* 51, 843-857.
- Burt, R. (1984). Network items and the general social survey. *Social Networks*, 6, 293-339.
- Burt, R. (1997). A note on social capital and network content. *Social Networks*, 19, 355-373.
- Butts, C. (2008). Social network analysis: A methodological introduction. *Asian Journal of Social Psychology*, 11, 13–41.
- Campbell, O., & Graham, W. (2006). Strategies for reducing maternal mortality: Getting on what it works. *Lancet*, 368, 1284-1299.
- Canavan, A. (2009) *Review of global literature on maternal health interventions and outcomes related to skilled birth attendance* KIT working papers series H3. Amsterdam: KIT. Retrieved from <http://www.kit.nl/workingpapers>
- Carlougha, M., & McCall, M. (2008). Skilled birth attendance: What does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal. *International Journal of Gynecology and Obstetrics*, 89, 200-208.

Central Statistical Authority and ORC Macro. (2001). *Ethiopia demographic and health survey 2000*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Authority and ORC Macro.

Central Statistical Agency and ORC Macro. (2006). *Ethiopia demographic and health survey 2005*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro.

Central Statistical Authority and ORC Macro. (2012). *Ethiopia demographic and health survey 2011*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Authority and ORC Macro.

Chakraborty, N., Islam, A., Chowdhury, R., Bari, W., Akhter, H. (2003). Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International*, 18 (4), 327-336.

Chowdhury, M., Ronsmans, C., Killewo, J., Anwar, I., Gausia, K., Das-Gupta, S., ... Barghi, J.(2006). Equity in use of home-based or facility-based skilled obstetric care in rural Bangladesh: An observational study. *Lancet*, 367, 327–332.

Clair,S, P., Smerigliop, V., Alexander, C., & Celentanop, D. (1989). Social network structure and prenatal care utilization. *Medical Care*, 27(8), 823-832.

Combs, J. & Onwuegbuzie, A. (2010). Describing and illustrating data analysis in mixed research. *International Journal of Education*, 2(2), E13.

- Creswell, J., & Garrett, A. (2008). The movement of mixed methods research and the role of educators. *South African Journal of Education*, 28, 321-333.
- Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education* (5th ed.). London: Rutledge Falmer.
- Collier, P., Dercon, S., & Mackinnon, J. (2002). Density versus quality in health care provision: Using household data to make budgetary choices in Ethiopia. *The World Bank Economic Review*, 16(3), 425-448.
- Collin, S., Anwar, I., & Ronsmans, C. (2007). A decade of inequality in maternity care: Antenatal care, professional attendance at delivery, and caesarean section in Bangladesh (1991-2004). *International Journal for Equity in Health*, 6, 9. doi: 10.1186/1475-9276-6-9
- D'Ambruoso, L., Abbey, M., & Hussein, J. (2005). Please understand when I cry out in pain: Women's accounts of maternity services during labour and delivery in Ghana. *BMC Public Health*, 5, 140. doi: 10.1186/1471-2458-5-140.
- De Brouwere, V., Tonglet, R., & Lerberghe, V. (1998). Strategies for reducing maternal mortality in developing countries: What can we learn from the history of the industrialized west? *Tropical Medicine and International health*, 3(10), 771-782.
- Del Barco, R. (Ed.). (2004). *Monitoring birth preparedness and complication readiness: tools and indicators for maternal and newborn health*. Baltimore: JHPIEGO. Retrieved from http://pdf.usaid.gov/pdf_docs/Pnada619.pdf

- Demaris, A. (2003). Logistic regression. In J. Schinka. & W. Velicer (Eds.). *Handbook of psychology: Research methods in psychology* (Vol. 2, pp. 509 - 532). New Jersey: John Wiley & Sons.
- Devillanova, C. (2007). Social networks, information and health care utilization: Evidence from undocumented immigrants in Milan (accepted manuscript). *Journal of Health Economics*. doi:10.1016/j.jhealeco.2007.08.006.
- Dogba, M., & Fournier, P. (2009). Human resources and the quality of emergency obstetric care in developing countries: A systematic review of the literature. *Human Resources for Health*, 7:7, Retrieved from <http://www.human-resources-health.com/content/7/1/7>
- Doyle, L., Brady, A., & Byrne, G. (2009). An overview of mixed methods research. *Journal of Research in Nursing*, 14 (2), 175–185.
- Edmonds, J. (2010). *Social networks, decision making and use of skilled birth attendants to prevent maternal mortality in Matlab, Bangladesh* (Doctoral dissertation, James T. Laney School of Graduate Studies of Emory University). Retrieved from https://etd.library.emory.edu/file/.../edmonds_dissertation.pdf -
- Ell, K. (1984). Social networks, social support, and health status: A review. *The Social Service Review*, 58 (1), 133-149.
- Essential Services for Health in Ethiopia (ESHE) (2008). *Household end-line survey synthesis report*, Addis Ababa. Retrieved from http://pdf.usaid.gov/pdf_docs/PDACP065.pdf

Ethiopian Society of Population Studies. (2008). *Maternal mortality findings from EDHS 2005: In-depth analysis of the Ethiopian demographic and health survey 2005*, Addis Ababa.

Ezzy , D. (2002). *Qualitative Analysis: Practice and innovation*. Malaysia: Allen & Unwin.

Federal Democratic Republic of Ethiopia. (2010). *Ethiopia 2010 MDGs report: Trends and prospects in meeting the MDGs by 2015*. Addis Ababa: Ministry of Finance and Economic Development.

Federal Democratic Republic of Ethiopia Population and Census Commission. (2010). *The 2007 population and housing census of Ethiopia results for country level*, Addis Ababa.

Foster, J., Barkus,E., & Yavorsky, C. (2006). *Understanding and using advanced statistics: Logistic regression*. DOI: 10.4135/9780857020154.

Fotso, J., Ezeh, A., & Essendi, H. (2009). Maternal health in resource-poor urban settings: how does women's autonomy influence the utilization of obstetric care services? *Reproductive Health*, 6, 9. doi: 10.1186/1742-4755-6-9

Frankenberg, E., Buttenheim, A., Sikoki, B., & Suriastini, W. (2009). Do women increase their use of reproductive health care when it becomes more available? Evidence from Indonesia. *Studies in Family Planning*, 40(1): 27–38.

Freedman, L. Wirth, M., Waldman, R., Chowdhury, M., & Rosenfield, A. (2003).

Millennium development project task force: Background paper on child health and maternal health. New York: United Nations Millennium Project. Retrieved from <http://www.unmillenniumproject.org/documents/tf4interim.pdf>

Freidenberg, J., & Hammer, M. (1998). Social networks and health care: The case of elderly Latinos in East Harlem. *Urban Anthropology*, 27(1), 49-85.

Furuta, M., & Salway, S. (2006). Women's position within the household as a determinant of maternal health care use in Nepal. *International Family Planning Perspectives*, 32(1), 17-27.

Gabrysch, S., & Campbell, O. (2009). Still too far to walk: Literature review of the determinants of delivery service use. *BMC Pregnancy Childbirth*, 9 (1), 1471-2393. doi:10.1186/1471-2393-9-34

Garson, D. (2008). Logistic regression: Retrieved from http://www.wtgrantmixedmethods.com/pdf_files/Garson_2008_Logistic%20Regression.pdf

Gayen, K., & Raeside, R. (n.d.). *Kinship networks and contraception in rural Bangladesh.* Retrieved from <http://iussp2005.princeton.edu/download.aspx?submissionId=52588>

Godley, J. (2001). Kinship networks and contraceptive choice in Nang Rong, Thailand. *International Family Planning Perspectives*, 27(1), 4-10.

- Graham, W., Bell, J., & Bullough, C. (2001). Can skilled attendance at delivery reduce maternal mortality in developing countries? In V. D. Brouwere & W.V. Lerberghe (Eds.). *Safe motherhood strategies: A review of the evidence* (pp. 97-129). Retrieved from <http://www.mx1.givewell.net/files/DWDA%202009/Interventions/Maternal%20Mortality/SafeMotherhoodStrategies.pdf>
- Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78 (6), 1360-1380.
- Haines U, V., & Hurlbert, J. (1992). Network range and health. *Journal of Health and Social Behavior*, 33, 254-266.
- Hanson, W., Creswell, J.W., Clark, V., Petska, K., & Creswell, J.D.(2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology*, 52(2), 224–235.
- Harris, A., Zhou, Y., Liao, H., Barclay, L., Zeng, W., Gao, Y. (2010). Challenges to maternal health care utilization among ethnic minority women in a resource-poor region of Sichuan Province, China. *Health Policy and Planning*, 25, 311–318.
- Helleringer, S., & Kohler, H. (2005). Social networks, perceptions of risk, and changing attitudes towards HIV/AIDS: New evidence from a longitudinal study using fixed-effects analysis. *Population Studies*, 59 (3), 265-282.
- Hersberger, J. (2003). A qualitative approach to examining information transfer via social networks among homeless populations: The new review of information

- behavior research. *Studies of Information Seeking in Context*, 4, 95-108. Retrieved from http://libres.uncg.edu/ir/uncg/f/j_Hersberger_Qualitative_2003.pdf
- Hill, M. (2002). Network Assessments and Diagrams. *Journal of Social Work*, 2(2): 233–254.
- Hintikka, J., Koskela, T., Kontula, O., Koskela, K., & Viinamiki, H.(2000). Men, women and friends- are there differences in relation to mental well-being? *Quality of Life Research*, 9, 841-845.
- Hosmer, D, Lemeshow, S. (2000). *Applied Logistic Regression* (2nd ed.). New York: John Wiley & Sons, Inc.
- House, J., Landis, K., Umberson, D. (1988). Social relationships and health. *Science*, New Series, 241(4865), 540-545.
- HSDP III Independent Review Team (2008). *Ethiopia health sector development program (HSDP III) Mid-Term Review*, Addis Ababa.
- Hulton, L., Matthews, Z., & Stones, R. (2000). *A framework for the evaluation of quality of care in maternity services*. University of Southampton.
- Hussein, J., Bell, J., Nazzar, A., Abbey, M., Adjei, S., & Graham, W. (2004). The skilled attendance index: Proposal for a new measure of skilled attendance at delivery. *Reproductive Health Matters*, 12, 160-170.
- Israel, G. (2009). *Determining sample size*. Retrieved from <http://edis.ifas.ufl.edu/pdf/PD/PD00600.pdf>

Jabi Tehinan Woreda Health office. (2012). *The 2011/2012 plan implementation annual report*, July 2012, Finote Selam.

Jayaraman, A., Chandrasekhar, S., & Tesfayi G. (2008). *Factors affecting maternal health care seeking behavior in Rwanda: DHS working paper No. 59*. Calverton, Maryland, USA, Indira Gandhi Institute of Development Research.

Johnson, R. & Onwuegbuzie, A. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14–26.

Kalof, L., Dan, A., & Dietz, T. (2008). *Essentials of social research*. New York: McGraw-Hill.

Kana' Iaupuni, S., Donatok, K., Thompson-Colon, T., & Stainback, M. (2005). Counting on Kin: Social networks, social support, and child health status. *Social Forces*, 83(3), 1137-1164.

Karim, A., Wuleta B., Samuel Y., Hibret A., Carnell, M., & Mekonnen, Y. (2010). Programmatic correlates of maternal healthcare seeking behaviors in Ethiopia (special issue 1). *Ethiopian Journal of Health Development*, 24, 92-99.

Katz, N., Lazer, D., Contractor, N., & Arrow, H. (2004). Network theory and small groups. *Small Group Research*, 35(3), 307-332.

Keefe, R. & Evans, T. (2013). Introduction to Public Health Social Work. In R. Keefe & E. Jurkowski (eds.). *Handbook of Public Health Social Work* (pp. 3-20). New York: Springer Publishing Company.

- Koblinsky, M. (Ed.). (2003). *Reducing maternal mortality: Learning from Bolivia, China, Egypt, Honduras, Indonesia, Jamaica and Zimbabwe*. Washington, D.C.: The World Bank.
- Koblinsky, M., & Campbell, O. (2003). Factors affecting the reduction of maternal mortality. In M. A. Koblinsky (Ed.). *Reducing Maternal Mortality: Learning from Bolivia, China, Egypt, Honduras, Indonesia, Jamaica, and Zimbabwe* (pp. 5- 38). Washington, D.C.: The World Bank.
- Koblinsky, M., Tain, F., Asheber G., Karim, A., Carnell, M., & Solomon T. (2010). Responding to the maternal healthcare challenge: The health extension program (special issue 1). *Ethiopian Journal of Health Development*, 24, 105-109.
- Koblinsky, M., Tain, F., & Solomon T. (2010). Reducing maternal mortality and increasing use of skilled birth attendance: Ethiopia and MDG 5. *Ethiopian Journal of Reproductive Health*, 4(1): 4-15.
- Kohler, H., Behrman, J., & Watkins, S. (2001). The density of social networks and fertility decisions: Evidence from South Nyanza District, Kenya. *Demography*, 38(1), 43-58.
- Last Ten Kilometers Project. (2009). *Baseline Household Health Survey: Amhara, Oromiya, SNNP, and Tigray*. Addis Ababa: JSI Research & Training.
- Leech, N., Barrett, K., & Morgan, G. (2005). *SPSS for intermediate statistics: Use and interpretation* (2nd ed.). London: Lawrence Erlbaum Associates, Publishers.

- Leech, N., & Onwuegbuzie, A. (2009). A typology of mixed methods research designs. *Qualitative and Quantitative*, 43, 265–275. DOI 10.1007/s11135-007-9105-3
- Lerberghe, W., & Brouwere, V. (2001). Of blind alleys and things that have worked: History's lessons on reducing maternal mortality. In V. D. Brouwere & W.V. Lerberghe (Eds.). *Safe motherhood strategies: A review of the evidence* (pp. 7-23). Retrieved from <http://www.mx1.givewell.net/files/DWDA%202009/Interventions/Maternal%20Mortality/SafeMotherhoodStrategies.pdf>
- Mackian, S., Bedri, N., & Lovel, H. (2004). Up the garden path and over the edge: Where might health-seeking behavior take us? *Health Policy and Planning*, 19(3), 137-146.
- Madhavan, S., Adams, A. & Simon, D. (2003). Women's networks and the social world of fertility behavior. *International Family Planning Perspectives*, 29(2), 58–68.
- Magadi, M., Agwanda, A., & Obare, F. (2007). A comparative analysis of the use of maternal health services between teenagers and older mothers in Sub-Saharan Africa: Evidence from demographic and health surveys (DHS). *Social Science & Medicine*, 64, 1311–1325.
- Maine, D., Wardlaw, T., Ward, V., McCarthy, J., Birnbaum, A., Akalin, M., & Brown, J. (1997). *Guidelines for monitoring the availability and use of obstetric services*. New York: UNICEF. Retrieved from http://www.childinfo.org/files/maternal_mortality_finalgui.pdf

- Marin, A. (2004). Are respondents more likely to list alters with certain characteristics? Implications for name generator data. *Social Networks*, 26, 289-307.
- Marsden, P. & Campbell, K. (1984). Measuring tie strength. *Social Forces*, 63(2), 482-501.
- Marsden, P. (1990). Network data and measurement. *Annual Review of Sociology*, 16, 435-463.
- Marsden, P. (2005). Recent Developments in Network Measurement. In J. Peter, J. Carrington, J. Scott, & S. Wasserman (Eds.). *Models and methods in social network analysis* (pp.8-30). New York: Cambridge University Press.
- Matthews, Z., Brookes, M., Stones, R., & Hossain, M. (2005). Village in the city: Autonomy and maternal health-seeking among slum populations of Mumbai. In S. Kishor (Ed.). *A focus on gender: Collected papers on gender using DHS data* (pp. 69-92). Calverton, MD, USA: ORC Macro.
- Maulik, P., Eaton, W., & Bradshaw, C. (2009). The role of social network and support in mental health service use: Findings from the Baltimore epidemiological catchment area study. *Psychiatric Services*, 60(9), 1222–1229.
- Mayhew, M., Hansen, P., Peters, D., Edward, A., Singh, L., Dwivedi, V., ...Burnham , G.(2008). Determinants of skilled birth attendant utilization in Afghanistan: A cross-sectional study. *American Journal of Public Health*, 98 (10), 1849-1856.

- Mc Kinlay, J. (1973). Social networks, lay consultation and help -seeking behavior. *Social Forces*, 51(3), 275-292.
- McPherson, R., Khadka, N., Moore, J. & Sharma, M. (2006). Are birth-preparedness programs effective? Results from a field trial in Siraha District, Nepal. *Journal of Health Popul Nutr*, 24(4):479-488
- Mekonnen, Y. (2003). Patterns of maternity care service utilization in southern Ethiopia: Evidence from a community and family survey. *Ethiopian Journal of Health Development*, 17(1), 27-33.
- Mekonnen, Y., & Asnakech, M. (2002). *Utilization of maternal healthcare services in Ethiopia*. Calverton, MD, USA: ORC Macro.
- Mesfin N., Damen H., & Getnet M. (2004). Assessment of safe delivery service utilization among women of childbearing age in North Gondar Zone, West Ethiopia. *Ethiopian Journal of Health Development*, 18(3), 145-152.
- Mesganaw F., Olwit, G., & Desta, S. (1992). Determinants of antenatal care attendants and preference of site of delivery in Addis Ababa. *Ethiopian Journal of Health Development*, 6(2), 17-22.
- Mesganaw F. (2010). Achieving the Maternal Health Millennium Development Goals in Ethiopia: Where are we and what needs to be done? (Editorial). *Ethiopian Journal of Health Development*, 24, 87-88.

Mesko, N., Osrin, D., Tamang, S., Shrestha, B., Manandhar, D., Manandhar, M., ...

Costello, A. (2003). Care for perinatal illness in rural Nepal: A descriptive study with cross-sectional and qualitative components. *BMC International Health and Human Rights* 2003, 3, 3. Retrieved from <http://www.biomedcentral.com/1472-698X/3/3>

Michael, Y., Colditz, G., Coakley, E., & Kawachi, I. (1999). Health behaviors, social networks, and healthy aging: Cross-sectional evidence from the nurses' health study. *Quality of Life Research* 8(8), 711-722.

Mills, S., Bos, E., Lule, E., Ramana, G., & Bulatao, R. (2007). *Obstetric care in poor settings in Ghana, India, and Kenya* (Health, Nutrition and Population (HNP) Discussion Paper). Washington DC: The World Bank.

Ministry of Health. (2002). *Health sector development program II (2002/03- 2004/05)*. Addis Ababa: Ministry of Health, Planning and Programming Department.

Ministry of Health. (2005). *Health sector development program III (2005/06- 2009/10)*. Addis Ababa: Ministry of Health, Planning and Programming Department.

Ministry of Health (2006). *Report on the safe motherhood community-based survey*. Addis Ababa: Family Health Department.

Ministry of Health. (2007). *Health extension program in Ethiopia*. Addis Ababa: Health Extension and Education Center.

Ministry of Health. (2009). *Health and health related indicators*. Addis Ababa:

Monitoring and Evaluation case Team.

Ministry of Health. (2013). *Health sector development program IV annual performance report (2012/13)*. Addis Ababa: Author.

Monette, D., Sullivan, T., & DeJone, C. (2005). *Applied social research: A tool for the human services* (6th ed.). Australia: Thomson Brook/ Cole.

Montgomery, M., & Casterline, J. (1996). Social learning, social influence, and new models of fertility. *Population and Development Review*, 22, 151-175.

Montgomery, M., Casterline, J., & Heiland, F. (2001). Social networks and the diffusion of fertility control. Retrieved from http://www.demogr.mpg.de/papers/workshops/010221_paper04.pdf.

Mpembeni, R., Killewo, J., Leshabari, M., Massawe, S., Jahn, A., Mushi, D., & Mwakipa, H. (2007). Use pattern of maternal health services and determinants of skilled care during delivery in Southern Tanzania: implications for achievement of MDG-5 targets. *BMC Pregnancy and Childbirth*, 7, 29. doi:10.1186/1471-2393-7-29

Mutharayappa, K. & Prabhuswamy, P. (2003). Factors and consequences of home deliveries: A study in rural Karnataka. *Journal of Health Management*, 5(1), 17-35.

Nanda, G., Switlick, K., & Lule, E. (2005). *Accelerating progress towards achieving the MDG to improve maternal health: A collection of promising approaches.*

Washington D.C.: The World Bank.

National Association of Social Workers. (2005). *Standards for social work practice in health settings.* Retrieved from

<http://www.socialworkers.org/practice/standards/naswhealthcarestandards.pdf>

Ochako, R., Fotso, J., Ikamari, L., & Khasakhala, A. (2011). Utilization of maternal health services among young women in Kenya: Insights from the Kenya

Demographic and Health Survey, 2003. *BMC Pregnancy and Childbirth* 2011, 11,

1. Retrieved from <http://www.biomedcentral.com/1471-2393/11/1>

Osborne, J. (2008). *Best practices in quantitative methods: Binary logistic regression.*

DOI: 10.4135/9781412995627

Parkhurst, J. & Ssengooba, F. (2009). Assessing access barriers to maternal health care:

Measuring bypassing to identify health centre needs in rural Uganda. *Health Policy and Planning*, 24, 377-384.

Pathmanathan, I., Liljestrand, J., Martins, J., Rajapaksa, L., Lissner, C., Silva, A., ...

Singh, P. (2003). *Investing in maternal health: Learning from Malaysia and Sri Lanka.* Washington, D.C.: The World Bank.

Paxton, A., Maine, D., Freedman, L., Fry, D. & Lobis, S. (2005). The evidence for

emergency obstetric care. *International Journal of Gynecology and Obstetrics*, 88, 181-193.

- Pescosolido, B. (1991). Illness careers and network ties: A conceptual model of utilization and compliance. *Advances in Medical Sociology*, 2, 161-184.
- Pescosolido, B. (1992). Beyond rational choice: The social dynamics of how people seek help. *The American Journal of Sociology*, 97(4), 1096-1138.
- Pescosolido, B., Wright, E., Alegría, M., Vera, M. (1998). Social networks and patterns of use among the poor with mental health problems in Puerto Rico. *Medical Care*, 36(7), 1057-1072.
- Pescosolido, B. (2006). Of pride and prejudice: The role of sociology and social networks in integrating the health sciences. *Journal of Health and Social Behavior*, 47, 189–208.
- Petrocelli, J. (2003). Hierarchical multiple regressions in counseling research: Common problems and possible remedies. *Measurement and Evaluation in Counseling and Development*, 36, 9 -22.
- Pitchforth, E., Teijlingen, E., Graham, W., Dixon-Woods, M., & Chowdhury, M. (2006). Getting women to hospital is not enough: A qualitative study of access to emergency obstetric care in Bangladesh. *Quality of Safe Health Care*, 15, 214-219.
- Pitt, M., Khandker, S., & Cartwright, J. (2006). Empowering women with micro finance: Evidence from Bangladesh. *Economic Development and Cultural Change*, 54(4): 791-831.

Presser, S., Couper, M., Lessler, J., Martin, E., Martin, J., Rothgeb, J., and Singer, E. (2004). Methods for testing and evaluating survey questions. *Public Opinion Quarterly*, 68 (1): 109-130. doi: 10.1093/poq/nfh008.

Reed, H., Koblinsky, M., Mosley, W. (Eds.) (2000). *The consequences of maternal morbidity and maternal mortality* (Report of a Workshop). Washington, DC: National Academy Press.

Ronsmans, C., & Graham, W. (2006). Maternal mortality: who, when, where, and why. *Lancet*, 368, 1189-2000.

Ronsmans, C., Etard, J., Walraven, G., Høj, L., Dumont, A., de Bernis, L., & Kodio, B. (2003). Maternal mortality and access to obstetric services in West Africa. *Tropical Medicine and International Health*, 8 (10), 940-948.

Rööst, M., Jonsson, C., Liljestrand, J., & Essén, B. (2009). Social differentiation and embodied dispositions: a qualitative study of maternal care-seeking behavior for near-miss morbidity in Bolivia. *Reproductive Health*, 6, 13. doi:10.1186/1742-4755-6-13

Ruth, B. J., & Sisco, S. (2008). Public health social work. In T. Mizrahi & L. E. Davis (Eds.), *Encyclopedia of social work* (20th ed., Vol. 3, pp. 476–483). Washington, DC: National Association of Social Workers.

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. *Bulletin of the World Health Organization*, 85, 812-819.

- Schaffer, T.(1986). Profile of women in Bangladesh. Retrieved from http://pdf.usaid.gov/pdf_docs/PNAAV683.pdf
- Scott, J. (2000). *Social network analysis: A hand book*. London: Sage.
- Seeman, M., Seeman, T., & Sayles, M. (1985). Social networks and health status: A longitudinal analysis. *Social Psychology Quarterly*, 48(3), 237-248.
- Singh, K. (2007). *Quantitative social research methods*. London: Sage.
- Sloan, N., Winikoff, B., & Fikree, F. (2001). An ecologic analysis of maternal mortality ratios. *Studies in Family Planning*, 32(4), 352-355.
- Sluzki, C. (2010). Personal social networks and health: Conceptual and clinical implications of their reciprocal impact. *Family System and Health*, 28(1), 1-18.
- Smith, K., & Christakis, N. (2008). Social networks and health. *Annual. Review of Sociology*, 34,405-429.
- Solomon T. (2010). A national scoping exercise and strategic recommendations for working with individuals, families and communities to improve maternal and neonatal health in Ethiopia (Special Issue 1). *Ethiopian Journal of Health Development*, 24, 89-91.
- Some, T., Sombie, I., & Meda, N. (2011). Women's perceptions of homebirths in two rural medical districts in Burkina Faso: A qualitative study. *Reproductive Health*, 8,3. Retrieved from <http://www.reproductive-health-journal.com/content/8/1/3>.

- Specht, H.(1986). Social support, social networks, social exchange, and social work practice. *Social Service Review*, 60(2), 218-240.
- Starrs, A. (1997). *The safe motherhood action agenda: Priorities for the next decade* (Report on the Safe motherhood Technical Consultation, 18-23 October, 1997, Colombo, Sri Lanka). New York: Family Care International and the Inter-Agency Group for Safe Motherhood.
- Stekelenburg, J., Kyanamina, S., Mukelabai, M., Wolffers, I., & Roosmale, V. (2004). Waiting too long: Low use of maternal health services in Kalabo, Zambia. *Tropical Medicine and International Health*, 9(3), 390-398.
- Stephenson, R., Baschieri, A., Clements, S., Hennink, M., & Madise, N. (2006). Contextual influences on the use of health facilities for childbirth in Africa. *American Journal of Public Health*, 96 (1), 84-93.
- Thadeus S. & Maine D. (1990). *Too far to walk: Maternal mortality in context* (Findings from a Multidisciplinary Literature Review). New York: Columbia University, Center for Population and Family Health.
- Thoits, P.(2011). Perceived social support and the voluntary, mixed, or pressured use of mental health services. *Society and Mental Health*, 1(1) 4-19.
- Titaley, C., Hunter, C., Heywood, P., & Dibley, M. (2010). Why don't some women attend antenatal and postnatal care services? A qualitative study of community members' perspectives in Garut, Sukabumi and Ciamis districts of West Java

Province, Indonesia. *BMC Pregnancy and Childbirth*, 10, 61. Retrieved from
<http://www.biomedcentral.com/1471-2393/10/61>

Transitional Government of Ethiopia (1993). *Health Policy*, September, 1993.

Tuladhar, H. (2009). Determinants of home delivery in a semi urban setting of Nepal.
Nepal Journal of Obstetrics and Gynecology, 4 (1), 30-37.

Ulin, P., Robinson, E., & Tolley, E. (2005). *Qualitative methods in public health: A field guide for applied research*. San Francisco: Jossey-Bass.

UNFPA (2004). *Maternal Mortality Update 2004: Delivering into good hands*.

Retrieved from

http://www.unfpa.org/upload/lib_pub_file/381_filename_mmupdate05_eng21.pdf

United Nations. (2008). *The millennium development goals report 2008*. New York:

United Nations.

<http://www.un.org/millenniumgoals/pdf/The%20Millennium%20Development%20Goals%20Report%202008.pdf>

United Nations. (2011). *The Millennium Development Goals Report 2011*. New York.

Retrieved from

http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2011/11-31339%20%28E%29%20MDG%20Report%202011_Book%20LR.pdf

Wagle, R., Sabroe, S., Nielsen, B. (2004). Socioeconomic and physical distance to the maternity hospital as predictors for place of delivery: An observation study from

- Nepal. *BMC Pregnancy and Childbirth*, 4,8. Retrieved from <http://www.biomedcentral.com/1471-2393/4/8>
- Warren, C. (2010). Care seeking for maternal health: Challenges remain for poor women (special issue 1). *Ethiopian Journal of Health Development*, 24, 100-104.
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*. New York: Cambridge University Press.
- Wirth, M., Sacks, E., Delamonica, E., Storeygard, A., Minujin, A., & Balk, D. (2008). Delivering on the MDGs: Equity and maternal health in Ghana, Ethiopia and Kenya. *East African Journal of Public Health*, 5(3), 133-141.
- Woolley, C. (2009). Meeting the mixed methods challenge of integration in a sociological study of structure and agency. *Journal of Mixed Methods Research*, 3(1), 7-25.
- Werger, C. (2009). Kinship networks, wealth and economic behavior in rural Ethiopia: does family come at a cost? Retrieved from <http://edepot.wur.nl/14918>, 19/3/2012.
- World Health Organization. (WHO). (1996). *Revised 1990 estimate of maternal mortality a new approach by WHO and UNICEF*. WHO/FRH/MSM/96.11
UNICEF/PLN/96.1
- World Health Organization. (WHO). (1999). *Reduction of maternal mortality* (A Joint WHO/UNFPA/UNICEF World Bank Statement). Geneva: Author.

- World Health Organization . (WHO).(2004). *Making pregnancy safer: The critical role of the skilled attendant* (A joint statement by WHO, ICM and FIGO). Geneva: Author. Retrieved from http://www.who.int/making_pregnancy_safer/documents/9241591692/en/index.html.
- World Health Organization. (WHO).(2007). *Maternal mortality in 2005(estimates developed by WHO, UNICEF, UNFPA, and the World Bank)*. Geneva: Author.
- World Health Organization.(WHO). (2010). *Trends in maternal mortality 1990-2008* (estimates developed by WHO, UNICEF, UNFPA, and the World Bank). Geneva: Author.
- Yin, R. (2006).Mixed methods research: Are the methods genuinely integrated or merely parallel? *Research in the Schools*, 13(1), 41-47.

Annexes

Annex I Questionnaire

The purpose of this questionnaire is to collect data on women's social network characteristics and use of SBAs at birth and to assess the experience of quality of delivery services. The data will help to know the important characteristics that contributed to use of facility delivery services and the existing quality of delivery services. The results will help design context specific interventions to improve facility deliver service utilization so as to improve maternal health and reduce maternal mortality. The information is needed for academic purpose. The information given will be kept confidential.

Thank you in advance for your participation.

Questionnaire ID _____ Health facility code _____ Kebele code _____

Part I. Women's Individual and childbearing-related attributes

Women's individual attributes

Now I would like to ask you some question about you and your household.		
S. No.	Variable descriptions	Answers
101	How old are you?	Age in completed years _____
102	Could you tell me your educational status?	1. Illiterate → q104 2. literate
103	If the response for "102" above is "2", the highest grade level completed is _____	Highest grade level completed _____
104	Could you tell me your marital status at the time of delivery?	1. never married, 2. Separated 3. Divorced 4. Widowed 5. married
105	If the response for "104" is "1", could you tell me your husband's educational status?	1. illiterate → q107 2. literate
106	If the response for "105" above is "2", the highest grade completed	Highest grade level completed _____
107	Where is your usual residence?	1. rural 2. urban
108	Where is your permanent living in relation to relatives?	1. close to natal home, 2. close to nuptial home, 3. nuclear home away from both.
109	Where were you living at the time of your delivery?	1. At natal home 2. At nuptial home 3. At own home
110	Where do most of your husband's kin live?	1. neighbor 2. not neighbor
111	Where do most of your kin live?	0. Neighbor 1. not neighbor

Women's childbearing-related attributes

Now I would like to ask you some questions about your parity and maternal health service utilization		
S. No.	Variable description	Optional answers
112	I understand that you had a delivery recently. How old is your last born child? If the response is "2" stop here.	0. less than a year 2. greater than a year
113	Could you tell me the birth order of your recent born children	1 st , 2 nd , etc. If 1st order → skip to 118
114	How many children do you have now who are living?	Number of living children
115	Have you ever-used ANC services for the previous born children?	0. No 1. Yes
116	Have you ever-used SBAs services for your previous born children?	0. No 1. Yes
117	Where did you deliver your recent born child?	0. At home 1. At health facility
118	During your recent pregnancy had you had problem because of the pregnancy and advised to deliver in a health facility?	0. No 1. Yes
119	Have you had ANC visit(s) for your recent pregnancy?	0. No → skip to 123 1. Yes
120	If the response to "206" is yes, where did you receive care?	1. health post 2. health center 3. hospital 4. private clinic
121	If the response to "206" is yes, number of ANC checkups,	Number of ANC checkups__
Now I would like to ask your opinion on the following questions.		
122	If you become pregnant again, where do you want to deliver?	1. Home 2. Facility only if problems happened 3. Facility 4. Do not want to be pregnant again
123	Where will you advise other Women to deliver?	1. Home 2. Facility only if problems happened 3. Facility
124	Women should use ANC services during their pregnancy.	1. disagree 2. agree
125	Where do you think that women at full gestation period who have no problems should give delivery?	1. At home 2. At health facility
127	Where did you intend to give birth for your recent born child?	1. At home 2. At health facility

Knowledge of obstetric complications

Now I would like to ask you your knowledge of obstetric complications that may happen during labor and delivery and about facility delivery services that can avoid such complications			
S. No.	Variable description	Answers: 0= no, 1=yes	
		0	1
128.1	There may be problem of retained placenta during childbirth		
128.2	Women can face excessive bleeding during delivery		
128.3	Women may face obstructed labor during childbirth		
128.4	Intrauterine fetal death may occur during delivery		
128.5	There may be malpresentation of the fetus		
128.6	Women may lose consciousness		
128.7	The mother may die during delivery		
129	Obstetric complications are preventable (by giving births in health facilities)		

Women's autonomy within the household

I would like to ask you about your participation in household decisions					
S.No.	Variable description	Answers			
	In your house,	0. someone else 1. husband alone 2. woman and husband jointly 3. woman alone			
130	Who usually makes decisions about health care for yourself?	0	1	2	3
131	Who usually makes decisions about making major household purchases? (e.g., land, oxen, TV, etc.).				
132	Who usually makes decisions about making purchases for daily household needs? (e.g., onion, potato, fruits, edible oil, bread, etc.).				
133	Who usually makes decisions about visits to your family or relatives?				

Part II. Experience of quality in delivery care (for respondents who had facility delivery)

Now I would like to ask you about your experience of quality in delivery care in the health facility					
S. No.	Variable description During labor and delivery of your recent born child in the health facility,	Possible answers: 0. strongly disagree 1. disagree 2. agree 3. strongly agree			
		0	1	2	3
201	The maternity ward and the facilities (bed, sheets) were at good standards				
202	There was quality foods and drinks in the health facility				
203	There was sufficient contact time with the birth attendant				
204	The birth attendant was available when needed				
205	The birth attendant took medical and birth history when you reached the health facility				
206	The attendant explained to you the diagnosis				
207	The attendant properly answered your questions				
208	The attendants explained what they were going to do for mothers				
209	The attendant respected women's choice of birth position				
210	The attendant told mothers to follow post natal checkups				
211	The attendant respected mothers while giving services				
212	The cultural practices are respected (praying in group with the mother, supporting the mother at bed etc)				
213	There was no impartial service provision				
214	The cost of services was reasonable				
215	Companionship of mothers' choice during labor and delivery are allowed				
216	The attendants were considerate of mothers' emotions and feelings				
217	The service was satisfying				

Part III. Reasons for non-use of SBA (for respondents who had home delivery)

As you told me, you had home delivery for your recent born child. Which of the following were reasons for not using health facility delivery services for your recent born child? It is possible to choose more than one factor. Mark the reasons women answered spontaneously, and probe the others.			
Var. 300	Variable description: In your recent born child, you did not use SBA because,	Answers: 1= yes , 0= no	
		1	0
1	Labor started during the night		
2	Labor was easy		
3	Labor was rapid		
4	The health facility is located at distant places		
5	There was problem of transportation to health facility		
6	There was no complication during labor and delivery		
7	Other people were decision-makers on where to give birth		
8	There was previous experience of home delivery		
9	There is lack of privacy in health facilities during labor and delivery		
10	The quality of services at health facilities is poor		
11	There is lack of knowledge about the existence of the services		

Part IV. Items on Women's Social Network Characteristics

Name generator question and interpretation will be used for this part.

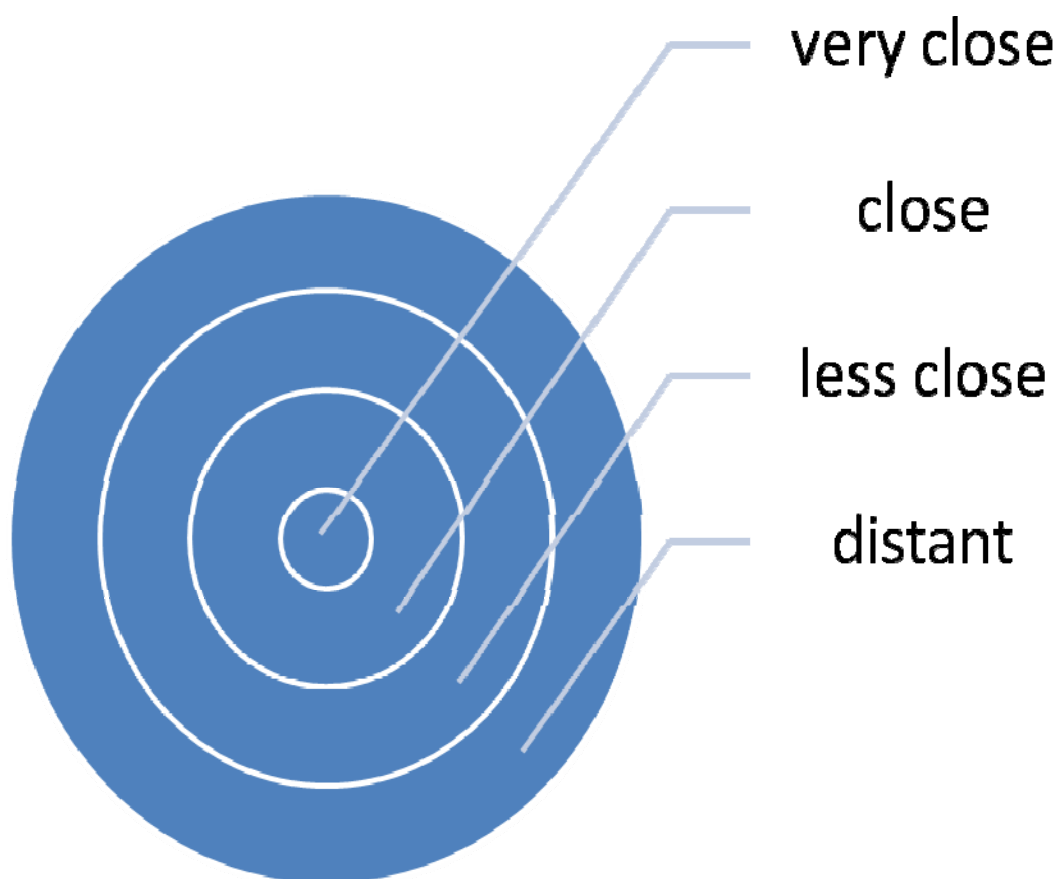
Name generator question: I would like to ask you to mention the names of people who you might have talked to about where to deliver or who had an opinion about where you could deliver for your recent born child. The interviewer will use different probes that may help respondents remember and name people with whom they discussed about place of delivery for their recent born children during their recent pregnancy. The interviewer may repeat the question like: can you list people who you might have talked to about where to deliver or who had an opinion about where you could deliver?

Name interpreter question: Name interpreter question will ask respondents to mention characteristics of each network member mentioned by the respondent by the name generator question. Questions such as sex, age, kin/non-kin status, proximity of residence, feelings of closeness and advice about place of delivery will be asked.

Name interpreter questions and codes

S.No.	Type of probe	Questions	codes
402	Age	Is (name) younger, same age, or older than you?	1. Younger 2. Same age 3. older
403	Sex	Is (name) male or female?	1. male 2. Female
404	Kinship	Do you consider (name) to be kin?	1. Non-Kin 2. kin
405	Proximity of Residence	Where does (name) live?	1. Non-neighbor 2. Neighbor
406	closeness	How close do you feel to (name)?	1. Distant 2. less close 3. close 4. Very close
407	Advice	Where did (name) advise you to deliver?	1. Home 2. Health facility if there is complication 3. Health facility

Figure 4 Visual display used to illustrate for respondents understand Network Tie Strength



Annex 2: Informed consent form for survey respondents

Good morning/afternoon, my name is ----- (the interviewer will introduce her name) and I am here to ask you to participate in a study. I am collecting data from women about their childbirth experience, place of delivery, and the involvement of their social network members for the choice of place of delivery. This information may be used to save lives and improve the health of mothers and newborn babies in the study area.

You have been chosen to participate in the study because of your recent experience with childbirth. There is no risk of participating in the study, except your time to complete the interview. There are no immediate benefits to your participating in the study. Your participation is completely voluntary and you have the right to refuse to participate in the study. You may ask any questions you like, refuse to do the interview or answer any question or end the interview at any time.

There is no right or wrong answer to the interview questions. Your answers will be treated in a confidential manner. I will not record your name. I want only the given name of your network member. The names of individuals you may mention in the interview will not be personally identified in the study report.

Do you have any questions?

Thank you very much for your listening.

Are you willing to participate in this study? (The interviewer should wait for the respondent's verbal permission). 1. Agree to participate 2. Did not agree to participate.

Thank you for your willingness to participate in the study

Respondent No: _____

Name of the interviewer (person who obtained the consent) _____

Signature ----- Date: _____

Annex: 3 Informed consent form for Interview participants

Good morning/afternoon, my name is ----- (the interviewer will introduce her name) and I am here to ask you to participate in a study. I am collecting data from women about their childbirth experience, place of delivery, and the involvement of their social network members for the choice of place of delivery. The information will help to design health interventions that will improve maternal health service utilization.

You have been chosen to participate in the study because of your recent experience with childbirth. There is no risk of harm for participating in the study, except your time to complete the interview. There are no immediate benefits to your participating in the study. Your participation is completely voluntary and you have the right to refuse to participate in the study. You may ask any questions you like, refuse to do the interview or answer any question or end the interview at any time.

During the interview, I will ask you a series of questions related to the roles of social networks to mothers during pregnancy, labor, and delivery. There is no right or wrong answer to the questions. When you answer, please express your thoughts and concerns about each of the questions or any other related issues. Your opinions and ideas are very important to us. I will not record your name. Your answers will be treated in a confidential manner.

A tape recorder will be used during the discussion because I need to pay close attention to what you are saying. Later, I will review the tape and listen carefully to your responses to the questions. I will then take the information from each interviewee and write a report. Please remember that you will not be identified in any way.

Do you have any questions?

Thank you very much for listening.

Are you willing to participate in this study?

1. Agree to participate
2. Did not agree to participate.

Thank you for your willingness to participate in the study.

Respondent No: _____ Date of the interview _____ Signature _____

Annex IVA Interview Questions: home delivery

Age _____ Literacy status _____ Educational status _____ Birth order _____

Marital status _____ Residence /kebele _____ Place of delivery _____

1. When you became pregnant for your recent born child, who did you tell first? Second? Third, etc. Why?
2. How other community members (neighbors, relatives, and other people whom you met at different occasions and circumstances who may be your network members) knew that you were pregnant?
3. What were the responses of these community members towards the pregnancy? What were the suggestions of these people about your place of delivery?
4. What supports did these community members provide for you during your pregnancy?
5. Did you use ANC services during this pregnancy? At what stages of pregnancy did you start the ANC follow up? How frequent was the follow up? Why?
6. What preparations did you accomplish for your coming births? Who informed you the birth preparedness activities? Did your network members (may be neighbors, relatives, and other people whom you met at different occasions and circumstances) assist you during the birth preparedness activities?
7. Where were you when labor started for your recent birth? 1) in nuptial home, 2) in natal home, 3) in own home.
8. When labor started, who did you tell first? Second? Third, etc? Why?
9. What were the roles of the people called on during labor and delivery?
10. As you told me, you delivered your recent child at home,
 - Why did you deliver at home? Why you did not go to health facility for delivery?
 - Who assisted you during labor and delivery at home? Did you experience any complications during labor and delivery? If so, what was the complication? How was it managed?

- How did you evaluate the overall birthing process?
- Could you tell me the obstetric complications that a woman might face during labor and delivery?

11. If other pregnant women asked you advice about place of delivery, where will you recommend them? Why?

12. If you become pregnant in the future, where will you give birth? Why?

Annex IVB Interview questions: Facility delivery

Age _____ Literacy status _____ Educational status _____ Birth order _____

Marital status _____ Residence /kebele _____ Place of delivery _____

1. When you became pregnant for you recent born child, who did you tell first?
Second? Third, etc. Why?
2. How other community members (neighbors, relatives, and other people whom you met at different occasions and circumstances who may be your network members) knew that you were pregnant?
3. What were the responses of these community members towards the pregnancy?
What were the suggestions of these people about your place of delivery?
4. What supports did these community members provide for you during your pregnancy?
5. Did you use ANC services during this pregnancy? At what stages of pregnancy you started the ANC follow up? How frequent was the follow up? Why?
6. What preparations did you accomplish for your coming births? Who informed you the birth preparedness activities? Did your network members (may be neighbors, relatives, and other people whom you met at different occasions and circumstances) assist you during the birth preparedness activities?
7. Where were you when labor started for your recent birth? 1) in nuptial home, 2) in natal home, 3) in own home.
8. When labor started, who did you tell first? Second? Third, etc? Why?
9. What were the roles of the people called on during labor and delivery?
10. As you told me, you delivered your recent child at health facility,
 - Why did you go there for delivery? How did you reach there? (Type of transportation, support by others if any, etc.).

- Who decided for you to go to the health facility for delivery? Who accompanied you?
 - How was the birthing process managed in the facility?
 - How did you evaluate the quality of the services you had in the health facility? (the competency of the attendant; the availability of the attendants; the suitability of delivery room, beds, sheets; the emotional support provided for you during labor and delivery; the cost of service; etc?)
 - Could you tell me the obstetric complications that a woman might face during labor and delivery?
11. How do you think others reacted to your use of facility for delivery?
12. If you become pregnant in the future, where will you give birth? Why?
13. Will you recommend the service for other pregnant women? Why?

Annex V Health Centers and Number of Deliveries in 2011/2012

Health centers	Number of Deliveries	Study participants
Mankusa	100	35
Malan Lijit	19	6
Jiga	120	40
Woinma	30	10
Awunt Yedefas	36	12
Finite Selam	83	28
Maksegnin	39	13
Total	427	144

Declarations

I, Kerebih Asrese, declare that this dissertation is my original Work and that it has not been presented and will not be presented to any university for a similar or any other degree award.

Signature: _____