

**FACTORS AFFECTING UTILIZATION OF SAFE
MOTHERHOOD SERVICES IN NEPAL**

A Dissertation

**Submitted to the Faculty of Humanities and Social Sciences of
Tribhuvan University in Fulfillment of the Requirements for the**

Degree of

DOCTOR OF PHILOSOPHY

in Population Studies

By

Sunil Kumar Acharya

Ph.D. Roll No. 17/63 (Magh)

Tribhuvan University Regd. No.: 00-98-91

January, 2017

LETTER OF RECOMMENDATION

We certify that this dissertation entitled “FACTORS AFFECTING UTILIZATION OF SAFE MOTHERHOOD SERVICES IN NEPAL” is prepared by Sunil Kumar Acharya under our guidance. We hereby recommend this dissertation for final examinations by the Research Committee of the Faculty of Humanities and Social Sciences, Tribhuvan University in fulfillment of the requirements for the Degree of DOCTOR OF PHILOSOPHY in POPULATION STUDIES.

Dissertation Committee

Professor Dr. Bal Kumar KC
Supervisor

Professor Dr. Ram Sharan Pathak
Co Supervisor

Date: January, 2017

DECLARATION

I hereby declare that this dissertation is my own work and that it contains no materials previously published. I have not used its materials for the award of any kind and any other degree. Where other authors' sources of information have been used, they have been acknowledged.

Sunil Kumar Acharya

Date: January, 2017

ACKNOWLEDGEMENTS

This thesis would not have been possible without the support and guidance of a number of important people, for which I would like to take this opportunity to acknowledge and thank them.

I am extremely grateful for all the help and guidance from my primary thesis Supervisor Prof. Dr. Bal Kumar KC. His encouragement and unwavering support throughout this process has been invaluable, and I am so thankful for him. I want to thank my Co-supervisor Professor Dr. Ram Sharan Pathak, Head of Central Department of Population Studies (CDPS), Tribhuvan University for his input and support. I would like to thank my colleague Mr. Pawan Kanel, Lecturer at (CDPS), for his untiring support in data processing and analysis.

I am thankful for continuing support and positivity from my wife Junu and sons, Sujal and Suhel for this work.

Sunil Kumar Acharya

January, 2017

ABSTRACT

The main objective of the study is to analyze the safe motherhood services utilization by women aged 15-49 years in Nepal. The specific objectives are to analyze the effects of demographic, social and economic factors on antenatal care, birth preparations, institutional delivery, and post-partum care practices in Nepal. The study has included 3 sets of variables that determine use or nonuse of safe motherhood services as independent variables. The three sets of variables are categorized as demographic, social and economic. The dependent variables included utilization of ANC services at least four times, birth preparation practice, institutional delivery practice, PNC service utilization and safe motherhood practices of women in their last pregnancy.

The study has utilized secondary source of data from Nepal Demographic and Health Survey 2011. This is a nationally representative survey and was carried out using systematic sampling with probability proportional to size (PPS). The total household included in the survey was 10,826 with 9,280 from rural areas and 1,546 from urban areas. From these households a total of 12,674 women and 4,121 men were included as respondents in the survey. As the current study aimed to analyze safe motherhood utilization practices of women, it included only the currently married women aged 15 to 49 years who had given birth to a child within the last 5 years preceding the survey date. Thus the total unweighted sample size of this study was a total of 4079 married women. Data analysis has been done after weighting the data. Data is analyzed using NDHS data files with the aid of STATA version 12 and SPSS version 20.

Cross tabulations of background characteristic of respondents has been done on the basis of dependent and independent variables. Bi-variate logistic regression has been done to analyze the effects of each independent variable on the utilization of components of safe motherhood services by women. Logistic regression is well suited for describing and testing study hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables.

The study findings showed that highest proportions (80%) of respondents were concentrated within the ages of 20 to 34 years. Nearly 6 in 10 women had 1 to 2 children ever born. About 2 in every 5 respondents had a history of pregnancy termination (induced abortion) in the past years. About 40 percent each of respondents were from Tarai and Hill regions. Twenty-two percent of respondents were from urban areas and great majorities (78%) were from rural areas. Majority of respondents were Hindu. Highest percentages of respondents (33.6%) were from Hill and Tarai Janjati ethnic groups followed by Brahmin/Chhetri and other groups (30.9%). About 17 percent and another 10 percent respectively were Dalit and other Tarai caste/groups.

A high percentage of respondents (43.9%) had no formal education. Only about 4 percent respondents utilize all three mass media - newspaper, radio and TV at least once in a week or less than once in a week. Over one-half of the respondent's occupation was agriculture and about 10 percent respondents' occupation was in service/trade sector. Over one-half of the respondents (56.1%) were currently employed. About one-third of the respondents were in rich category in terms of their household wealth and 21 percent were in middle and nearly one-half (45.3%) were in poor category.

The study found that young age, age at 1st birth, parity and number of children less than 5 years of age has strong effects on use of 4 or more ANC visits. The result is significant at 5% level. Women's caste/ethnicity, religion, place of residence (rural, urban) and education has strong effects on the utilization of 4 or more ANC visits. Women with higher level of education are more likely to utilize at least 4 ANC than women with no education. Access to media shows strong effect on the utilization of ANC services. The likelihood of ANC 4 service utilization is strong among women who have access to all three media channels. Women from rich categories are strongly likely to utilize ANC 4 or more times than the women from poor category.

Women's age does not have strong positive effect on birth preparations. However, women who have 1 and 2 CEB and women who have utilized ANC services 4 or more times are

more likely to practice birth preparations. A strong likelihood of birth preparations was among Brahmin/Chhetri and Newar caste/ethnic groups of women. Women living in urban areas are also more likely to practice BP than those living in rural areas. The study also found that women who use different media channels like newspaper, radio and TV are more likely to practice birth preparations. Women's and their husband's education also has some positive effect on the practice of birth preparations. Women whose occupation is service/trade were more likely to practice birth preparations than women whose occupation is manual or agriculture.

The study found that women of younger ages (15-19 and 20-24 years) are more likely to practice institutional delivery than older women. Low parity women, those who have 1 child and women who have 2 children respectively are more likely to deliver their pregnancy at a health institution. Newar and Brahmin/Chhetri caste/ethnic groups are more likely to have institutional delivery than women from other caste/ethnic groups. Hindu women are also more likely to have institutional delivery than non-Hindu women. Women's and husband occupation and household wealth have significant effect on the use of institutional delivery services.

The study found women who are below 30 years of age, those who have low parity has positive relationship with postnatal care. Women whose age at first birth is 20 or more years, who have 1 under 5 children and women who have utilized ANC services 4 or more times are highly likely to use PNC services. Women from Newar and Brahmin/Chhetri caste/ethnic groups and Hindu women are more likely to utilize PNC services. The study also found more likelihood of women in urban areas to utilize PNC services than rural women. High level of education and good access to mass media significantly increased the likelihood of PNC utilization.

The study showed young women have more likelihood of utilizing full safe motherhood services in Nepal. The study further found that, women's low CEB status, utilization of ANC services 4 or more times are also more likely to practice safe motherhood. Women from Brahmin/Chhetri and Newar caste/ethnic groups and women who belong to Hindu

religion are more likely to use safe motherhood services. Urban residence, higher levels of educational attainment also was found to have strong positive effect of safe motherhood service utilization. Women who are currently employed are more likely to use full safe motherhood services. Household wealth does have strong likelihood effect on safe motherhood utilization in that women belonging to rich and middle wealth household were more likely to utilize full safe motherhood services.

On the basis of analysis of dependent and independent variables the study concludes that demographic variables of women like age, parity, age at first birth, number of children less than 5 year old have strong influence in the utilization of different components of safe motherhood services. Women who utilize ANC services 4 or more times are also strongly likely to utilize all components of safe motherhood. Women from various Tarai caste/ethnic groups, Dalits and women from Muslim community are vulnerable to maternal morbidity and mortality since the safe motherhood practices among them is very low. Women's educational attainment has played significant role in ensuring safe motherhood. Safe motherhood practice among women who are not working or are working in agriculture sector is very low. Women who are not currently employed and are from poor household wealth status have low utilization of the various components of safe motherhood.

Against these findings the study recommends that the government safe motherhood programs focus more on implementation of appropriate policy and program measures that address the existing variations and gaps in safe motherhood utilization among sub-groups of women with varying demographic and economic backgrounds. The policies and programs needs to be aimed at changing behaviors on marriage, child bearing, and use of family planning. Further, the study recommends that in-depth research, both qualitative and quantitative, that address the demographic, social and economic diversity are recommended to be implemented which could help in understanding people's knowledge, attitudes, and practices on safe motherhood. These researches need also to focus on the existing barriers in safe motherhood services utilization among women in Nepal.

TABLE OF CONTENTS

	LETTER OF RECOMMENDATION	i
	APPROVAL LETTER	ii
	DECLARATION	iii
	ACKNOWLEDGEMENTS	iv
	ABSTRACT	v
	TABLE OF CONTENTS	ix
	LIST OF TABLES & FIGURES	xiii
	LIST OF ACRONYMS/ABBREVIATIONS	xvi
Chapter 1	INTRODUCTION	1-14
1.1	Background	1
	1.1.1 The Global Context: maternal mortality and safe motherhood	3
	1.1.2 The Nepalese context: maternal mortality and safe motherhood	6
1.2	Statement of the problem	8
1.3	Objectives of the study	11
1.4	Hypothesis	12
1.5	Rationale of the study	13
1.6	Delimitation of the study	14
Chapter 2	LITERATURE REVIEW	15-82
2.1	Overview of maternal health and mortality in the world	15
2.2	Theoretical literature	19
	2.2.1 Safe motherhood, maternal health, morbidity and mortality	19
	2.2.2 Determinants of maternal morbidity, mortality and safe motherhood services utilization	23
	2.2.3 The three delays model	25
2.3	Empirical literature	28
	2.3.1 Social-cultural, political and economic factors and maternal health and mortality	28
	2.3.2 Safe motherhood services utilization and maternal morbidity and mortality	36
2.4	The evolution of maternal and newborn health programs	59
	2.4.1 Maternal Health policy and Programs	60
2.5	Maternal Health Policy in Nepal	64
	2.5.1 Safe Motherhood Policy, 1998	64
	2.5.2 National Safe Motherhood Plan (2002-2017)	65

	2.5.3	National Policy on Skilled Birth Attendance, 2006	66
	2.5.4	Health Service Delivery System in Nepal	67
	2.5.5	The Safe Motherhood Program	68
	2.5.6	The Aama Programme	70
2.6		Conceptual framework of the study	71
2.7		Operational Definition of Dependent and Independent Variables and Measurement Indicators	74
	2.7.1	Dependent Variables	74
	2.7.2	Independent variables	77
Chapter 3		METHODOLOGY	83-95
3.1		Research paradigm	83
3.2		Source of data	87
	3.2.1	Sampling frame of NDHS 2011	87
	3.2.2	Sample Selection	88
	3.2.3	Sample size	89
	3.2.4	Sampling weights	89
	3.2.5	Data collection method and tools	90
	3.2.6	Response rates	90
3.3		Study methods	90
	3.3.1	Study variables	91
	3.3.2	Wealth index	92
3.4		Data analysis	93
	3.4.1	Logistic regression analysis	93
Chapter 4		BACKGROUND CHARACTERISTICS OF WOMEN	96-107
4.1		Population and social characteristics of Nepal	96
4.2		Demographic characteristics of respondents	98
	4.2.1	Current age and age at marriage	98
	4.2.2	Pregnancy and child bearing	99
4.3		Social characteristics	100
	4.3.1	Spatial Distribution and Rural Urban Residence	100
	4.3.2	Religion and caste/ethnicity	102
	4.3.3	Education and media habits	103
4.4		Economic Characteristics	104
4.5		Safe motherhood characteristics	105
Chapter 5		UTILIZATION OF ANTENATAL CARE SERVICES	108-125
5.1		Antenatal care practices	108
5.2		Effects of demographic, social and economic factors on ANC use	110
	5.2.1	Demographic variables and utilization of 4 or more ANC services in Nepal	115
	5.2.2	Social variables and utilization of 4 or more ANC	119

	5.2.3	Economic variables and utilization of 4 or more ANC	123
Chapter 6		BIRTH PREPAREDNESS PRACTICES	126-143
6.1		Birth preparedness practices	126
6.2		Effects of demographic, social and economic factors on birth preparedness practices	129
	6.2.1	Demographic variables and birth preparedness practices in Nepal	134
	6.2.2	Social variables and birth preparedness practices in Nepal	138
	6.2.3	Economic variables and birth preparedness practices in Nepal	141
Chapter 7		INSTITUTIONAL DELIVERY PRACTICES	144-165
7.1		Institutional delivery practices	144
7.2		Effects of demographic, social and economic factors on ANC use	147
	7.2.1	Effects of demographic variables on utilization of institutional delivery services in Nepal	155
	7.2.2	Effects of social variables on utilization of institutional delivery services in Nepal	158
	7.2.3	Effects of economic variables on utilization of institutional delivery services in Nepal	163
Chapter 8		POSTNATAL CARE PRACTICES	166-182
8.1		Postnatal care practices	166
8.2		Effects of demographic, social and economic variables on PNC use	168
	8.2.1	Effects of demographic variables on utilization of PNC utilization in Nepal	173
	8.2.2	Effects of social variables on utilization of PNC in Nepal	176
	8.2.3	Effects of economic variables on utilization of PNC services in Nepal	181
Chapter 9		UTILIZATION OF SAFE MOTHERHOOD SERVICES	183-203
9.1		Safe motherhood practices	183
9.2		Hypotheses testing	187
9.3		Effects of demographic, social and economic variables on utilization of safe motherhood	188
	9.3.1	Effects of demographic variables on utilization of safe motherhood services in Nepal	190
	9.3.2	Effects of social variables on utilization of safe motherhood services in Nepal	193
	9.3.3	Effects of economic variables on utilization of safe motherhood services in Nepal	198
9.4		Stepwise logistic regression analysis	202

Chapter 10	SUMMARY OF FINDINGS, CONCLUSION AND RECCOMENDATIONS	204-213
10.1	Summary of findings	204
10.2	Key Findings	207
10.3	Conclusion	212
10.4	Recommendations and further research	213
APPENDIX		214-219
REFERENCES		220-233

LIST OF TABLES AND FIGURES

Table 2.1	Study variables, DHS 2011 data file codes and recoded names for data analysis	74
Table 2.2	Demographic variables. DHS 2011 data file codes and recoded names for data analysis	77
Table 2.3	Social variables. DHS 2011 data file codes and recoded names for data analysis	79
Table 2.4	Economic variables, DHS 2011 data file codes and recoded names for data analysis	81
Table 4.1	Age distribution of respondents, 2011	98
Table 4.2	Distribution of respondents by age at marriage at exact age, 2011	99
Table 4.3	Distribution of respondents by age at first birth and children ever born, 2011	99
Table 4.4	Distribution of respondents by children under 5 years and pregnancy termination history, 2011	100
Table 4.5	Spatial, regional, and rural – urban distribution of respondents, 2011	101
Table 4.6	Distribution of respondents by religion and caste/ethnicity, 2011	102
Table 4.7	Distribution of respondents by educational attainment and mass media habits, 2011	104
Table 4.8	Distribution of respondents by occupation and employment status, 2011	105
Table 4.9	Distribution of respondents by household wealth status, 2011	105
Table 4.10	Distribution of respondents by utilization of components of safe motherhood services	106
Table 5.1	Distribution of respondents by ANC service utilization, 2011	115
Table 5.2	Use of 4 or more ANC services in Nepal according to demographic characteristics of women	117
Table 5.2	Effects of selected demographic variables on utilization of ANC 4 or more times in Nepal using logistic regression	118
Table 5.3	Use of 4 or more ANC services in Nepal according to social characteristics	120
Table 5.4	Effects of selected social variables on utilization of ANC 4 or more times in Nepal using logistic regression	122
Table 5.5	Use of 4 or more ANC services in Nepal according to economic characteristics, 2011	124
Table 5.6	Effects of selected economic variables on utilization of ANC 4 or more times in Nepal using logistic regression	125
Table 6.1	Birth preparation practices in Nepal according to demographic characteristics of women	136
Table 6.2	Effects of selected demographic variables on birth preparation practices in Nepal using logistic regression	137

Table 6.3	Birth preparation practices in Nepal according to social characteristics of women	139
Table 6.4	Effects of selected social variables on birth preparation practices in Nepal using logistic regression	140
Table 6.5	Birth preparation practices in Nepal according to economic characteristics of women	142
Table 6.6	Effects of selected economic variables on birth preparation practices in Nepal using logistic regression	143
Table 7.1	Institutional delivery practices in Nepal according to demographic characteristics of women	156
Table 7.2	Effects of selected demographic variables on utilization of institutional delivery services in Nepal using logistic regression	157
Table 7.3	Institutional delivery practices in Nepal according to social characteristics of women	159
Table 7.4	Effects of selected social variables on utilization of institutional delivery services in Nepal using logistic regression	162
Table 7.5	Institutional delivery practices in Nepal according to economic characteristics of women	164
Table 7.6	Effects of selected economic variables on utilization of institutional delivery services in Nepal using logistic regression	165
Table 8.1	Use of PNC services in Nepal according to demographic characteristics of women	174
Table 8.2	Effects of selected demographic variables on utilization of PNC services in Nepal using logistic regression	176
Table 8.3	Use of PNC services in Nepal according to Social characteristics of women	178
Table 8.4	Effects of selected social variables on utilization of PNC services in Nepal using logistic regression	180
Table 8.5	PNC services utilization in Nepal according to economic characteristics of women	181
Table 8.6	Effects of selected economic variables on utilization of PNC services in Nepal using logistic regression	182
Table 9.1	Distribution of women who used different components of safe motherhood among the women who used or did not used ANC services 4 or more times in their last pregnancy, 2011	189
Table 9.2	Use of safe motherhood services in Nepal according to demographic characteristics of women	191
Table 9.3	Effects of selected demographic variables on utilization of safe motherhood services in Nepal using logistic regression	193
Table 9.4	Use of safe motherhood services in Nepal according to social characteristics of women	195
Table 9.5	Effects of selected social variables on utilization of safe motherhood services in Nepal using logistic regression	197
Table 9.6	Use of safe motherhood services in Nepal according to economic characteristics of women	199

Table 9.7	Effects of selected economic variables on utilization of safe motherhood services in Nepal using logistic regression	200
Table 9.8	Stepwise logistic regression (full model: forward) of selected sets of independent variables and the dependent variable at $p < 0.05$ level	201
Table 9.9	Stepwise logistic regression (empty model: backward) of selected sets of independent variables and the dependent variable at $p < 0.05$ level	202
Figure 1	Conceptual Framework	72
Figure 2	Research Paradigm	84

LIST OF ABBREVIATION/ACRONYMS

AHW	Auxiliary Health Worker
AIDS	Acquired Immune deficiency Syndrome
ANC	Ante Natal Care
BMMS	Bangladesh Maternal Mortality Survey
BP	Birth Preparedness
BPCR	Birth preparedness and complication readiness
CBS	Central Bureau of Statistics
CEB	Children Ever Born
CI	Confidence Interval
CS	caesarean sections
DHS	Demographic and Health Survey
DLHS	District Level Household and Facility Survey
DoHS	Department of Health Services
EAs	Enumeration Areas
FCHV	Female Community Health Volunteer
FCI	Family Care International
FHD	Family Health Division
FWCW	Fourth World Conference on Women
GDHS	Ghana Demographic and Health Survey
GoN	Government of Nepal's
HIV	Human Immuno-deficiency Virus
ICD	International Classification of Diseases
ICPD	International Conference on Population and Development
IIPS	International Institute for Population Sciences
MCHW	Maternal and Child Health Worker
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio

MoHP	Ministry of Health and Population
NDHS	Nepal Demographic and Health Survey
NIECS	National Information, Education and Communication Strategy
OR	Odds Ratio
PCA	Principal Component Analysis
PDHS	Pakistan Demographic and Health Survey
PMNCH	Partnership for Maternal, Newborn, and Child Health
PMTCT	Prevention of Mother to Child Transmission
PNC	Post Natal care
PPS	Probability Proportional to Size
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goals
SM	Safe Motherhood
SMHP	Nepal safe motherhood policy
SPSS	Statistical Package for Social Sciences
TBA	Traditional Birth Attendant
UI	Uncertainty Interval
UN	United Nation
UNFPA	United Nation Population Fund
UNICEF	United Nation Children Fund
USAID	United States Agency For International Development
VDC	Village Development Committee
VHW	Village Health Worker
WFP	World Food Programme
WHO	World Health Organization

Chapter 1

INTRODUCTION

1.1 Background

More than 136 million women give birth a year in the world. About 20 million of them experience pregnancy-related illness after childbirth. The list of morbidities is long and diverse, and includes fever, anemia, fistula, incontinence, infertility and depression. About 16 million girls aged between 15 and 19 give birth each year, accounting for more than 10 percent of all births. In the developing world, about 90% of the births to adolescents occur in marriage. In low - and middle-income countries, complications from pregnancy and childbirth are the leading cause of death among girls 15-19 (WHO, 2012).

In developing countries, conditions related to pregnancy and childbirth constitutes the second leading causes (after HIV/AIDS) of death among women of reproductive age. The four main killers are: severe bleeding, infections, unsafe abortion, and hypertensive disorders (pre-eclampsia and eclampsia). Bleeding after delivery can kill even a healthy woman, if unattended, within two hours. Most of these deaths are preventable (WHO, 2012).

Until early 1980s maternal mortality was not a major national or international priority. It was often the overlooked component of maternal and child health programs (Rosenfield and Maine, 1985). The issue of maternal mortality gradually came into light only after the conference on safe motherhood/maternal health organized in Nairobi, Kenya in 1987. Later that year, the Safe Motherhood Inter-Agency Group (IAG) was established to realize the goals of the Initiative. As a group and as individual organizations, these agencies raised international awareness about safe motherhood, set goals and programmatic priorities for the Initiative, stimulated research, mobilized resources, and shared information to make pregnancy and childbirth safer (FCI, 2010).

Safe motherhood means ensuring that all women receive the care they need to be safe and healthy throughout pregnancy and childbirth. After the launch of global Safe Motherhood Initiative representatives from a range of international agencies and governments committed themselves to the goal of reducing maternal deaths. Since then, much has been learned about which interventions are most effective, and the focus has shifted from trying to predict or prevent obstetric complications to trying to manage them appropriately. Experts from around the world now acknowledge that almost all maternal deaths could be prevented with appropriate care. The most essential intervention, therefore, is to ensure that all women are cared for by a professional health worker (midwife, nurse, or doctor) with midwifery skills during the most dangerous period during and immediately after childbirth. Skilled attendants, when supported by a functioning referral system, can fill the following critical functions (FCI, 2010):

- Ensure that all deliveries are conducted hygienically and according to accepted medical practices, thereby preventing complications that are caused or exacerbated by poor care;
- Identify complications promptly and manage them appropriately either by treating or referring them to a higher level of care;
- Provide high-quality, culturally appropriate, and considerate care, ensuring necessary follow-up and linkages with other services, including antenatal and postpartum care, as well as family planning, post-abortion care, and treatment of sexually transmitted infections.

In the 21st century, safe motherhood has achieved greater prominence on the international agenda, with increasing visibility, resources, and attention being directed toward it. Many agencies and organizations now have dedicated programs focusing on maternal health; donors have prioritized safe motherhood in their funding programs; governments have developed national strategies and programs to reduce maternal mortality; and there is greater knowledge and awareness of the problem and how to address it. There is broad agreement that good-quality maternal health services need to include skilled care for both routine and complicated cases, including emergency obstetric services for life-threatening

complications, and a functioning referral system to ensure timely access to appropriate care (FCI, 2007).

1.1.1 The Global Context: maternal mortality and safe motherhood

WHO has defined maternal death as: death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (WHO, 2010).

Globally, approximately 287,000 women died from causes related to pregnancy and childbirth in 2010. Of these, 162,000 were in Sub-Saharan Africa and 83,000 were in South Asia. The maternal mortality ratio (MMR defined as the number of women who die during pregnancy and childbirth per 100,000 live births) ranges from 16 in the developed countries to 220 in South Asia and 500 in Sub-Saharan Africa (WHO, 2012). Lack of access to and utilization of health care services for delivery are among the main reasons for the high maternal and neonatal mortality rates in these regions. Maternal death can occur anytime in pregnancy, but delivery is by far the most dangerous time for both mother and baby.

An estimated global total of 13.6 million women have died in the 25 years between 1990 and 2015 due to maternal causes. Over the course of that time, however, the world has made steady progress in reducing maternal mortality. The global MMR has fallen by 44% (UI 33.1% to 47.5%), from the 1990 level of 385 (UI 359 to 427) to the 2015 level of 216 (UI 207 to 249). This translates to a decrease of over 43% in the estimated annual number of maternal deaths, from 532 000 (UI 496 000 to 590 000) in 1990 to 303 000 (UI 291 000 to 349000) in 2015, and a more than halving of the approximate global lifetime risk of a maternal death from 1 in 73 to 1 in 180. Worldwide, MMR declined by an average of 3.0% (UI 2.1% to 3.4%) per year between 2005 and 2015, more than doubling the estimated average annual decline of 1.2% (UI 0.5% to 2.0%) between 1990 and 2000 (WHO, 2015).

According to WHO MMR is considered to be high if it is 300–499, very high if it is 500–999 and extremely high if it is ≥ 1000 maternal deaths per 100 000 live births. The most

recent estimate shows that 303 000 maternal deaths will occur globally in 2015, yielding an overall MMR of 216 (UI 207 to 249) maternal deaths per 100 000 live births for the 183 countries and territories covered in this analysis (i.e. all those with a population higher than 100 000). The global lifetime risk of maternal mortality is approximately 1 in 180 for 2015. Table 2 provides point-estimates of global and regional maternal mortality indicators, and the range of uncertainty for each MMR point-estimate. For the purpose of categorization,

The overall MMR in developing regions is 239 (UI 229 to 275), which is roughly 20 times higher than that of developed regions, where it is just 12 (UI 11 to 14). Sub-Saharan Africa has a very high MMR¹² with a point-estimate of 546 (UI 511 to 652). Three regions – Oceania (187; UI 95 to 381), Southern Asia (176; UI 153 to 216) and South-eastern Asia (110; UI 95 to 142) – have moderate MMR. The remaining five regions have low MMR. Developing regions account for approximately 99% (302 000) of the estimated global maternal deaths in 2015, with sub-Saharan Africa alone accounting for roughly 66% (201 000), followed by Southern Asia (66 000). Among the developing regions, the fewest maternal deaths (an estimated 500) occurred in Oceania.

The lifetime risk of maternal mortality is estimated at 1 in 36 in sub-Saharan Africa, contrasting sharply with approximately 1 in 4900 in developed countries. Developing regions with the lowest lifetime risk are Eastern Asia (1 in 2300) and Caucasus and Central Asia (1 in 1100) (WHO, 2015).

The major complications that account for 80 percent of all maternal deaths are severe bleeding and infections after childbirth, high blood pressure during pregnancy and unsafe abortion (WHO, 2012). Antenatal care, delivery by skilled health professionals, and postnatal care would ensure timely management and treatment of complications to reduce maternal deaths. Despite the importance of institutional delivery in preventing maternal death, about 42 percent of the births in developing countries were delivered outside a health facility, and 35 percent were not attended by trained personnel. Non institutional delivery made up more than 80 percent of the births in a few less developed countries such as Ethiopia (95 percent), Afghanistan, Bangladesh, Lao People's Democratic Republic, and

Nepal (UNICEF, UNFPA & World Bank, 2012). Complications related to pregnancy and childbirth is among the leading causes of mortality for women of reproductive age in many parts of the developing world. The tragedy is not only of mortality but for every pregnant woman that dies around 20-30 more mothers will have short and long term complications related to pregnancy and child birth that leads to disability of the woman. These disabling complications include obstetric fistulas, ruptured uterus and pelvic inflammatory diseases.

Around 80% of causes of maternal death are direct causes like hemorrhage, infection, obstructed labor, unsafe abortion and high blood pressure. Severe bleeding usually occurring after the mother gave birth is the single most feared complication claiming the life of most mothers. There are also some health conditions that may have developed before or during pregnancy which may lead indirectly to the death of a mother, some of these conditions include malaria, anemia, hepatitis, heart diseases and HIV/AIDS (WHO, 1999).

The conditions that lead to the death of the mother or that leaves her with the severe complications not only have an impact on her but also on the baby she is carrying. More than a million children lose their mothers each year due to maternal mortality. Evidences show that these children have a 3-10 times higher risk of dying than children who live with both parents within two years after birth. Globally it is estimated that about 5.1 million deaths of children occur only in the first month of life. This comprises 37% of deaths among under-five children. About three million of these deaths occur in the first week after birth and an additional 4.3 million fetal deaths before or during delivery. These huge numbers of newborn deaths each year are due mainly to poorly managed pregnancies; delivery and poor neonatal care. Most of these deaths are believed to be averted with provision of good care during pregnancy and delivery (WHO, 1999).

The concepts which apply to maternal death and its determinants have been well documented and the health care solutions for preventing and treating the complications during pregnancy are available. The majority of maternal and prenatal deaths could be avoided by access to basic maternity care which is supported by adequate medical and surgical care (Kwast, 1996).

There is historical evidence that indicate the significant positive changes that can be observed when certain interventions are in place for maternal health care in the form of safe motherhood or maternal care. Experiences from Sweden showed that the reduction of maternal mortality in the 1800s was due to a national policy that promoted establishment of standard care of pregnancy and delivery with midwifery care for all births. As a result, in Sweden, by the beginning of the twentieth century maternal mortality was the lowest in Europe 230 per 100,000 live births as compared to 500 per 100,000 in the mid-1800s (Hogberg, Wall & Brostrom, 1986).

1.1.2 The Nepalese context: maternal mortality and safe motherhood

In 1994 an International Conference on Population and Development (ICPD) was held and, as a signatory to the plan of action, Nepal formed a task force on safe motherhood and developed a safe motherhood plan of action (1994-1997). In 1998 a national reproductive health strategy included safe motherhood as one of the key components of the reproductive health package. Also in 1998 the results of a national ‘safe motherhood and maternal mortality and morbidity’ study were published. This laid the basis for the formulation of a National Safe Motherhood Plan (2002-2017) which is working on the basis of the implementation of various interventions aiming at ensuring safe motherhood of expecting mothers. In 1996 the Nepal Family Health Survey (NFHS) estimated Nepal’s MMR at 539 per 100,000 the highest ratio in South Asia. In the late 90’s, high priority was given to the National Safe Motherhood Programme (NSMP) within the Nepal Health Sector Strategy Plan (NHSSP). The 10th five year plan set a goal of meeting the five year plan/Poverty Reduction Strategy Plan (PRSP) and MDG to reduce the MMR by 75% by 2015. The Demographic and Health Survey conducted in 2006 in Nepal estimated MMR to be 281 per 100,000 live births which was much reduced but still one of the higher MMRs globally.

Similarly, the maternal Mortality and Morbidity study conducted in Nepal in 2008 in 8 of the 75 districts of the country found MMR to be 229 per 100,000 live births, ranging from a MMR of 153 in Okhaldhunga district to 301 in Rasuwa. The study also showed

considerable variation in MMR between women of various ages and caste/ethnicity. Maternal deaths accounted for 93% of pregnancy related deaths, so that the pregnancy related mortality ratio only slightly higher at 247 per 100,000 live births, making this a good proxy indicator for maternal mortality. Just over one in ten deaths (11%) among women of reproductive age were due to maternal causes, making it the third major cause of death, an improvement on the 1998 study, in which maternal deaths were the leading cause of WRA deaths, accounting for one in five (21%). However, the most recent estimates for Nepal done by WHO in 2015 is 258 which is slightly higher than the previous estimates of MMR reported by the study in 2008 (Suvedi et al, 2009).

Though these studies have given varying estimates the findings suggests that MDG has already been achieved by Nepal though this MMR is still high compared to several other developing countries. In 2015 UN introduced Sustainable Development Goals (SDGs) and set targets for achieving sustainable development in various development sectors including maternal mortality. The SDG target is to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030. With this target, Nepal will also have to put much policy and programmatic effort to reduce MMR to desired level.

Underutilization of safe motherhood services is considered as the main factor contributing to high maternal mortality, for example, more than 60 percent of births still take place at home, many without skilled health providers, utilization of ANC visit is low and the trend of birth preparation is still low. These trends have resulted in complications during pregnancy and childbirth such as hemorrhage, sepsis, abortion complications, pre-eclampsia and eclampsia, and prolonged/obstructed labor that are the leading causes of death and disability among women of reproductive age in Nepal. Available data shows that women in Nepal still lack access to adequate skilled care during the period of pregnancy and child birth and post-partum periods. Even the women who have access to maternal care or safe motherhood services are not utilizing the services due to several demographic, social and economic factors surrounding them. It is in this context that this study is designed to analyze factors affecting utilization of safe motherhood services in Nepal.

1.2 Statement of the Problem

In the 21st century, safe motherhood has achieved greater prominence on the international agenda, with increasing visibility, resources, and attention being directed toward it. Many agencies and organizations now have dedicated programs focusing on maternal health; donors have prioritized safe motherhood in their funding programs; governments have developed national strategies and programs to reduce maternal mortality; and there is greater knowledge and awareness of the problem and how to address it. There is broad agreement that good-quality maternal health services need to include skilled care for both routine and complicated cases, including emergency obstetric services for life-threatening complications, and a functioning referral system to ensure timely access to appropriate care.

Progress has been achieved on a number of key indicators of safe motherhood, including the proportion of pregnant women receiving antenatal care, and the proportion of births attended by a skilled birth attendant. Since 1990, coverage of antenatal care in developing countries has increased by 20%, and more than 50% of women receive at least the four recommended antenatal visits. Between 1990 and 2003, the presence of a skilled attendant at delivery increased significantly, from 41% to 57% in the developing world as a whole. Despite these achievements, the Safe Motherhood Initiative has fallen short of the goal that it set almost 20 years ago: to reduce maternal mortality by 50% by the year 2000. While a few countries have experienced sustained reductions in maternal mortality, little or no progress has been achieved in those countries with the highest levels of mortality, and in some countries, it appears that they have worsened. Maternal mortality remains high even in some countries where utilization of maternal health care (such as antenatal and delivery care) has improved; this underscores the importance of improving not just the availability of care, but its quality. In addition to the risk of dying during pregnancy and childbirth, women can suffer from short- and long-term maternal disabilities and illnesses. According to the 2005 World Health Report, 20 million women each year will experience maternal disability, which can range from fever and depression to severe complications such as obstetric fistula and uterine prolapse. The exact magnitude and scope of maternal morbidity

is unclear, due to under reporting, poor record keeping systems, and definitional/classification problems. Investing in maternal health saves individual women's lives and safeguards their wellbeing.

In the International Conference on Population and Development (ICPD), held in Cairo, 1994, maternal health was situated within the context of the comprehensive approach to reproductive health. Specifically, the ICPD Programme of Action called for (UN, 1994):

Maternal health services, based on the concept of informed choice, [which] should include education on safe motherhood, prenatal care that is focused and effective, maternal nutrition programs, adequate delivery assistance that avoids excessive recourse to Caesarian sections and provides for obstetric emergencies; referral services for pregnancy, childbirth and abortion complications; post-natal care and family planning (1994, p. 61).

In Nepal, although women making ANC visits, health facility delivery and PNC visits to an SBA show an improving trend, it still is below the desired level. In 2011, 58 percent of mothers received antenatal care from a skilled provider (a doctor, nurse, or midwife) for their most recent birth in the five years preceding the survey. Twenty-six percent of mothers received antenatal care from trained health workers such as a health assistant or auxiliary health worker (AHW), a maternal and child health worker (MCHW), or a village health worker (VHW). About 1 percent of women received antenatal care from a female community health volunteer (FCHV). Fifteen percent of women received no antenatal care for births in the five years before the survey. The findings show that 50 percent of pregnant women make four or more antenatal care visits during their entire pregnancy. Thirty-five percent of births take place in a health facility: 26 percent are delivered in a public-sector health facility, 2 percent in a nongovernment facility, and 7 percent in a private facility. Still two-thirds of births (63%) take place at home (MOHP, 2012).

Delivery in a health facility is more common among mothers less than age 34 years (35% - 41%) and mothers of first-order births (54%). Children in urban areas are more than twice as likely (71%) to be delivered in an institutional setting as children born in rural areas (32%). Women who did not deliver in a health facility were asked for their reasons for not

doing so. A large majority of women who did not deliver in a health facility believed that it was not necessary (62%). In addition, 14 percent of women said that the health facility was too far or they had transportation problems, and 10 percent said it was not customary. Eight percent of women reported that the child was delivered before reaching a health facility, and 5 percent reported cost as a barrier to having a delivery in a health facility. More than one-third (36%) of births take place with the assistance of a skilled birth attendant (SBA), which includes doctor, nurse, or midwife. Health assistants or AHWs assist in the delivery of 4 percent of births, FCHVs assist in 3 percent, and traditional birth attendants assist in 11 percent. Two in five (40%) births are attended by a relative or some other person, while 3 percent of births take place without any type of assistance (MOHP, 2012). The further analysis of NDHS data shows differences in components of safe motherhood services utilization by caste/ethnicity, place of residence and other variables also shows variation in safe motherhood services utilization (Pandey, Dhakal, Karki, Poudel & Pradhan, 2013)

More recently the Multiple Indicator Cluster Survey (MICS) conducted by CBS in 2014 shows utilization of safe motherhood services has improved slightly since the year 2011. According to MICS, among women age 15-49 years with a live birth in the last 2 years about 68 percent had taken ANC at least 1 time and nearly 60 percent had taken at least 4 times from a skilled health personnel. Similarly about 56 percent women were attended by skilled health personnel in delivery and 55 percent had undergone institutional delivery of their last pregnancy. The survey further shows that about 58 percent had received PNC within 2 days after delivery (CBS, 2015). These findings show some improvement in safe motherhood services utilization among Nepalese women the percentage of non-users is still high.

As discussed in the literature review of this study (Chapter 2) a few research studies in Nepal have made an attempt to look at the disparities in accessing ANC services, birth preparations, health facility delivery, and PNC visits to an SBA (Dhakal, Chapman, Simkhada, Van, Stephens & Raja, 2007; Karkee, Lee & Binns, 2013; Pandey, Dhakal, Karki, Poudel & Pradhan, 2013; Kaphle, Neupane, Kunwar & Acharya, 2015; Deo et al

2015) in specific geographical locations, rural-urban residence, among specific caste/ethnic groups and population sub-groups with differing income, and occupation. None of these studies however, have done a comprehensive analysis to look at demographic, social and economic contexts that affect the utilization or non-utilization of safe motherhood services in Nepal. All these studies have analyzed a single component rather than analyzing safe motherhood as a composite of 4 service components: ANC, birth preparations, institutional delivery and PNC services utilization. In this context it is necessary to understand the existing information gaps related to effects of demographic, social and economic variables on safe motherhood services utilization practices in Nepal. The study therefore aims to answer following research questions:

- i. What is Nepalese women's Antenatal Care (ANC) services utilization practices according to their demographic, social and economic variables?
- ii. What is the effects of demographic, social and economic variables on birth preparedness practices of Nepalese women?
- iii. What is Nepalese women's delivery services utilization practices according to demographic, social and economic variables?
- iv. What is Nepalese women's Post Natal Care (PNC) services utilization practices according to demographic, social and economic variables
- v. What is Nepalese women's overall safe motherhood services utilization practices according to demographic, social and economic variables

1.3 Objectives of the study

The main objective of the study is to analyze the effects of demographic, geographical and residential, social, and economic factors on safe motherhood services utilization by women in Nepal. The specific objectives are as follows:

1. To analyze Nepalese women's Antenatal Care (ANC) services utilization practices according to their demographic, social and economic variables;

2. To examine effects of demographic, social and economic variables on birth preparedness practices of Nepalese women;
3. To analyze Nepalese women's delivery services utilization practices according to demographic, social and economic variables;
4. To analyze Nepalese women's Post Natal Care (PNC) services utilization practices according to demographic, social and economic variables, and;
5. To analyze Nepalese women's overall safe motherhood services utilization practices according to demographic, social and economic variables.

1.4 Hypotheses

The review of literature on safe motherhood services utilization in Nepal and other countries (Chauhan, 2012; Deo et al., 2015; Tura, Afework & Yalew, 2014; Kaphle, Neupane, Kunwar, & Acharya, 2015; Mehari, 2013; Dahal, 2013; Yunus et al.; Dhakal, Chapman, Simkhada, Van, Stephens & Raja, 2007) has exhibited the effects of several demographic, social and economic factors in whether women utilize or do not utilize safe motherhood services. Many research studies did indicate demographic variables like woman's age, inter-birth intervals and CEB are predictor of use of ANC, one of the components of safe motherhood (IIPS, 2010), (Teferra, Alemu, & Woldeyohannes, 2012; Tura, Afework & Afework, 2014). Likewise, social variables like woman's education and place of residence was also found a strong predictor (Kaule-sabiti, Acheampong & Ngake, 2014; Rahman, 2009; Kulkarni & Nimbalkar, 2008; Baral, Lyons, Skinner, & VanTeijlingen, 2012).

Similarly among economic variables, household wealth was found to be a predictor of safe motherhood utilization (Yunus et al., 2013; Jat, Nag & Sebastian, 2011; Tura, Afework & Afework, 2014). Thus these findings indicate that use or nonuse of components of safe motherhood is influenced by demographic, social and economic background of women. Based on these findings following hypothesis are included in the study:

- i. Women from less than 30 year old age groups are more likely to utilize safe motherhood services than women who are from 30 or more year age groups
- ii. Women who have up to two CEB are more likely to utilize safe motherhood services than women who have 3 or higher CEB
- iii. There is no differences in the likelihood of safe motherhood services utilization among women from different caste/ethnic groups
- iv. Women living in urban areas are more likely to utilize safe motherhood services than women who live in rural areas
- v. Women who have attained at least 5 years of formal school are more likely to utilize safe motherhood services than women who have not attained formal school
- vi. Women who belong to richer wealth quintile households are more likely to utilize safe motherhood services than women who belong to poorer households

1.5 Rational of the study

Nepal's MMR has been declining in recent years and this decline is attributed to improvements in the provision of maternal health care services especially ANC, delivery and postnatal care in public health facilities. It should however be noted that a high percent of women are still not utilizing the services. The NDHS 2011 shows that about 4 in every 10 women did not take the ANC services from a skilled provider (a doctor, nurse, or midwife) for their most recent birth. Fifteen percent of women received no antenatal care for their most recent birth. The survey also showed that only 5 in 10 pregnant women made four or more antenatal care visits during their entire pregnancy. Only thirty-five percent of births took place in the health facilities. Same survey also shows that a large majority of women who did not deliver in a health facility believed that it was not necessary (62 percent). Forty percent of these births were attended by a relative or some other person, while 3 percent of births took place without any type of assistance. Similarly, only 45 percent of women received postnatal care for their last birth within the critical first two days following delivery. Women who do not take ANC care from trained health personnel,

those who deliver at home and the women who do not take PNC care are more vulnerable towards maternal morbidity and mortality.

Various factors may have been associated with non-utilization of health care services and among them demographic, social, and economic factors are considered as the determining factors for utilization or non-utilization of maternal health services in Nepal. There has been no comprehensive study conducted so far in Nepal for in-depth analysis of the interrelationships of these factors with each component of safe motherhood services utilization in Nepal. Thus, this study is expected to contribute in: a) fulfilling the current information gaps on the effects of demographic, social and economic variables on use of safe motherhood services; b) providing inputs to planners and policy makers and; c) shed light on areas for further research.

1.6 Delimitation of the study

Following are the delimitation of this study:

- a) The study analyzes individual level factors affecting utilization of safe motherhood services representing only demand side factors. The study does not look at the supply side factors.
- b) The study does not include time series data in the analysis but includes data only from a single point of time, i.e., NDHS 2011.
- c) The study has utilized only those safe motherhood/maternal health related variable that have been included in NDHS 2011. Thus the study has analyzed only the available data sets concerned with demographic and socio-economic statuses of respondents.
- d) The study has focused only on analysis of quantitative data so qualitative information has not been used in making inferences.
- e) The study has used bivariate logistic regression method in data analysis so only the 'gross effects' have been estimated

Chapter 2

LITERATURE REVIEW

This chapter presents review of literature on safe motherhood practices in the world with a focus on developing countries. The chapter also presents relevant literature related to safe motherhood practices in Nepal including the government policy and the strategies.

2.1 Overview of maternal health and mortality in developing countries

Developing countries account for 99% (284000) of the global maternal deaths, the majority of which are in sub-Saharan Africa (162000) and Southern Asia (83000). These two regions accounted for 85% of global burden, with sub-Saharan Africa alone accounting for 56%. The MMR in developing regions (240) was 15 times higher than in developed regions (16). Sub-Saharan Africa had the highest MMR at 500 maternal deaths per 100000 live births, while Eastern Asia had the lowest among MDG developing regions at 37 maternal deaths per 100 000 live births. The MMR of the remaining MDG developing regions in descending order are Southern Asia (220), Oceania (200), South-eastern Asia (150), Latin America and the Caribbean (80), Northern Africa (78), Western Asia (71), and Caucasus and Central Asia (46). The adult lifetime risk of maternal mortality in women from sub-Saharan Africa was the highest at 1 in 39, in contrast to 1 in 130 in Oceania, 1 in 160 in Southern Asia, One in 290 in South-eastern Asia and 1 in 3800 among women in developed countries. At the country level, two countries account for one third of global maternal deaths: India at 19% (56000) of all global maternal deaths, followed by Nigeria at 14% (40 000). Additionally, the following seven countries account for 3% to 5% of global maternal deaths each: Democratic Republic of the Congo (15 000), Pakistan (12 000), Sudan (10 000), Indonesia (9600), Ethiopia (9000), United Republic of Tanzania (8500) and Bangladesh (7200). Together with Afghanistan (6400), these 10 countries comprised 60% of the global maternal deaths reported in 2010 (WHO, 2012).

MMR is considered to be high if it is ≥ 300 maternal deaths per 100 000 live births and extremely high if it is ≥ 1000 maternal deaths per 100 000 live births. Forty countries had

high MMR in 2010. Of these countries, only Chad and Somalia had extremely high MMRs at 1100 and 1000, respectively. The other eight highest MMR countries were: Central African Republic (890), Sierra Leone (890), Burundi (800), Guinea-Bissau (790), Liberia (770), Sudan (730), Cameroon (690) and Nigeria (630) (WHO, 2012).

Although most sub-Saharan African countries had high MMR, Mauritius (60), Sao Tome and Principe (70) and Cape Verde (79) had low MMR (defined as 20–99 maternal deaths per 100 000 live births), while Botswana (160), Djibouti (200), Namibia (200), Gabon (230), Equatorial Guinea (240), Eritrea (240) and Madagascar (240) had moderate MMR (defined as 100–299 maternal deaths per 100 000 live births). Only four countries outside the sub-Saharan African region had high MMR: Lao People's Democratic Republic (470), Afghanistan (460), Haiti (350), and Timor-Leste (300) (WHO, 2012).

Globally, the total number of maternal deaths decreased from 543 in 1990 to 287 in 2010. Likewise, global MMR declined from 400 maternal deaths per 100 000 live births in 1990 to 210 in 2010. The latter represents an average annual decline of 3.1 percent. All MDG regions experienced a decline in MMR between 1990 and 2010, with the highest reduction in the 20-year period in Eastern Asia (69%) followed by Northern Africa (66%), Southern Asia (64%), Sub-Saharan Africa (41%), Latin America and the Caribbean (41%), Oceania (38%) and finally Caucasus and Central Asia (35%). Although the latter region experienced the lowest decline, its already low MMR of 71 maternal deaths per 100 000 live births in 1990 made it more challenging to achieve the same decline as another region with a higher 1990 MMR value. When interpreting change in MMR, one should take into consideration that it is easier to reduce MMR when levels are high than when they are low. Despite an initial increase in maternal mortality in regions highly affected by HIV (Southern Africa) between 1990 and 2005, there is evidence of declines between 2005 and 2010 (WHO, 2012).

Several factors could account for global, regional and country decline in maternal mortality between 1990 and 2010. In addition to improvement in health systems, other factors outside the health sector such as increased female education and increased physical accessibility

to health facilities could be contributory factors. Given different country contexts, it is not possible to fully explain why some countries had steeper declines than others, or why some made no progress. *The Millennium Development Goals report* of 2011 indicates that the other MDG 5 indicators have also shown some improvement in the past two decades. The proportion of deliveries attended by skilled health personnel in developing regions rose from 55 percent in 1990 to 65% in 2009. Similarly, the proportion of women who were attended to by skilled health care personnel at least once during pregnancy increased from 64 percent to 81 percent, while the proportion of women aged 15–49 years who use any method of contraception also increased from 52 percent to 61 percent. More recently, the rapid roll-out of antiretroviral therapy in sub-Saharan Africa to HIV-positive women, from <10 percent in 2000 to percent in 2010, improves the chances of surviving the additional demands of pregnancy in immune compromised health (WHO, 2012).

Improvement in the coverage of these health-care interventions over the past two decades may have contributed to improved outcomes. However, disparities exist, within and across regions. For example, Eastern Asia, which experienced the greatest MMR decline, has a contraceptive prevalence rate of 84 percent as opposed to only 22% in sub-Saharan Africa, the region with one of the lowest MMR declines. Efforts to improve maternal health and reduce maternal deaths should be focused on addressing inequalities across and within countries (WHO, 2012).

Research into the causes of maternal mortality has shown that while the direct causes are medical, either directly related to pregnancy or incidental, the underlying and basic causes are often social. A maternal death often marks the end of a lifetime of neglect and discrimination. From infancy, girls are given less care, less food and education. Women lack information and freedom of movement; they have limited decision-making power but fear disrespect for their wishes at health facilities. Other predisposing factors are teenage pregnancies, usually due to child marriages, son-preference and gender-based violence.

Estimating maternal mortality is difficult, as records of the cause of death do not always mention the pregnancy. So current estimates are likely to be on the lower side compared to

the actual figure. However, deaths are relatively easy to estimate. Further, for every woman who dies, an estimated 30-100 women suffer complications that result in debilitating conditions. This means that while approximately 155,000 women die, between 4.6 million and 15.5 million women suffer permanent disabilities each year in South Asia alone. The tragedy is that most of these deaths and disabilities are avoidable with appropriate treatment. The likelihood of maternal death varies between rich and poor countries: a lifetime risk of 1 in 8,700 for Canadian women compares with 1 in 42 for women in Bangladesh or 1 in 30 in Bhutan. Within any given country it also varies greatly between rich and poor women.

The failure to address preventable maternal disability and death represents one of the greatest social injustices of our times. A human rights approach shows that women's maternal mortality and morbidity result not simply from their disadvantages but frequently from cumulative denials of their human rights; that is, failure to address their preventable death and sickness is a result of injustices that women experience (UNICEF, 2003).

While early declines in maternal and neonatal mortality were achieved in most countries in Western Europe and North America in the first half of the 20th century, a similar downward trend in maternal and neonatal mortality did not occur in countries of the developing world. It was not until the late 20th century that maternal mortality started to be recognized as a public-health concern. The International Safe Motherhood Initiative, launched in 1987, gave a huge impetus to program, interventions and advocacy aimed at reducing maternal mortality worldwide. However, 10 years later, little or no progress had been made towards such a reduction. During the same period, international feminism gathered force and, together with the human rights movements, contributed to a growing global awareness that women's health needed to be understood and addressed within the economic, social and cultural context of individual women's lives. Women's lack of autonomy to make decisions about their lives, including whether to bear children – their inability to enjoy their human rights in fact – was a central focus of these efforts which in turn inspired the direction of the Cairo and Beijing international consensus documents (Gruskin et al., 2008).

Becoming pregnant for some women in the world today is a cause not for joy but for fear, not a celebration of new life but an acceptance that death in childbirth is a very real possibility. There are over half a million maternal deaths per year, 99 percent of them in developing countries (86% in sub-Saharan Africa and Asia) and for each of these deaths, an estimated further 30 women will become disabled, injured or ill owing to pregnancy. Maternal health can be viewed as a barometer of a nation's development. Women's experiences of pregnancy and childbirth exert influences far beyond their own health, crucial as this is, to affect their status and empowerment, their children and wider family's health, education and wealth and, indeed, their nation's society and economy. Children without mothers have lost the parent who makes the biggest difference to their well-being and are much more likely to live in poverty, drop out of school, and be malnourished. A recent article in *The Lancet* argued that maternal health is not only central to women's potential, but also has telescopic, ripple effects for broader development concerns facing the world today (Gill, Pandey & Malhotra, 2007).

2.2 Theoretical literature

2.2.1 Definition and concept of safe motherhood, maternal health, morbidity and mortality

Safe motherhood as the care and services a woman needs to take that ensure they remain safe and healthy throughout pregnancy, childbirth and after childbirth periods. It encompasses a series of initiatives, practices, protocols and service delivery guidelines designed to ensure that women receive high-quality gynecological, family planning, prenatal, delivery and postpartum care, in order to achieve optimal health for the mother, fetus and infant during pregnancy, childbirth and postpartum. Safe motherhood decreases maternal and infant mortality and morbidity. Although, most maternal and infant deaths can be prevented through safe motherhood practices, millions of women worldwide are affected by maternal mortality and morbidity from preventable causes. Unsafe motherhood consists in maternal mortality or morbidity due to preventable pregnancy and childbirth-

related causes (USAID, no date). Worldwide, safe motherhood services includes 4 main components of care: antenatal care (ANC), birth preparations (BP), use of a skilled birth attendant (SBA) and postpartum care (PNC).

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. While motherhood is often a positive and fulfilling experience, for too many women it is associated with suffering, ill-health and even death. The major direct causes of maternal morbidity and mortality include hemorrhage, infection, high blood pressure, unsafe abortion, and obstructed labor (WHO, 2015).

Maternal, or obstetric morbidity, defined by WHO as morbidity in a woman who has been pregnant (regardless of the site or duration of the pregnancy), from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes, is a subset of reproductive morbidity. Morbidity can be physical or psychological and can result from direct or indirect causes. Maternal mortality, while a rare event, has a clear definition and can be measured. Maternal morbidity is complex, with multiple causes, duration ranging from acute to chronic, severity ranging from transient to permanent and with a range of diagnosis and treatment options.

The WHO Maternal Morbidity Working Group recently defined maternal morbidity as ‘any condition that is attributed to or aggravated by pregnancy and childbirth that has a negative impact on the woman’s wellbeing’. This definition provides a framework for identifying and measuring maternal morbidity in a more systematic way, using scientifically sound principles and methods. Defining, identifying and measuring maternal morbidity is important as it provides a useful additional measure of effectiveness of interventions designed to improve maternal and newborn health (Adaji, no date).

The causes of maternal morbidity are many and complex. They vary in duration and severity and cover a broad range of diagnoses requiring a wide variety of treatments. Maternal morbidity can be conceptualized as a spectrum ranging, at its most severe, from a “maternal near miss” – defined by the World Health Organization (WHO) as the near

death of a woman who has survived a complication occurring during pregnancy or childbirth or within 42 days of the termination of pregnancy – to non-life-threatening morbidity, which is more common by far. In 2011, WHO published guidelines for defining and identifying a maternal near miss on the basis of clinical criteria, laboratory markers and management proxies? However, varying definitions of non-severe or non-life threatening maternal morbidity continue to exist (Tabassum et al., 2013).

Maternal mortality according to WHO is: “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes” (WHO, 2007).

This definition allows identification of maternal deaths, based on their causes as either direct or indirect. Direct obstetric deaths are those resulting from obstetric complications of the pregnant state (pregnancy, delivery, and postpartum), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above. Deaths due to, for example, hemorrhage, pre- eclampsia/eclampsia or those due to complications of anesthesia or caesarean section are classified as direct obstetric deaths. Indirect obstetric deaths are those resulting from previous existing disease, or diseases that developed during pregnancy, and which were not due to direct obstetric causes but aggravated by physiological effects of pregnancy. For example, deaths due to aggravation of an existing cardiac or renal disease are indirect obstetric deaths (WHO, 2007).

In this context there are other frequently used terminologies which need to be understood. They are (UNICEF, 2003):

Maternal death refers to the death of a woman while pregnant or within 42 days of the termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or incidental causes.

Late Maternal Death is defined as the death of a woman from direct or indirect obstetric causes occurring more than 42 days but less than one year after the termination of pregnancy.

Maternal Mortality Ratio: the number of maternal deaths per 100,000 live births. This measure indicates the risk of maternal death among pregnant and recently pregnant women.

Maternal Mortality Rate: the number of maternal deaths per 100,000 women aged 15 – 49 per year. This measure reflects both the risk of death among pregnant and recently pregnant women and the proportion of women who become pregnant in a given year

Worldwide maternal health is a significant health concern, as many women give birth at least once during their lifetimes. In developing nations, complications during, pregnancy, labor and delivery, and postpartum period can be among the leading causes of death due to limited access to health care. International organizations concerned with health use a variety of methods for combating maternal mortality rates, including providing education, increasing the number of health care providers, and improving sanitation. In pregnancy, maternal health includes a number of concerns.

One of the most important is keeping the mother healthy so the fetus experiences normal development. Pregnant women have unique dietary needs and must be careful about environmental exposures to toxins that might hurt their babies. In the case of women with preexisting disabilities or diseases, some care may need to be taken in pregnancy to protect their health while they carry the baby to term; women with mental illnesses who cannot take medications during pregnancy, for example, may need counseling and other support. While motherhood is often a positive and fulfilling experience, for too many women especially those in developing nations it is associated with suffering, ill-health and even death (UNICEF, 2003). In many developing countries, selected groups of women start their suffering from conception through delivery and after delivery or postpartum periods. In this process many die before delivering the child or immediately after delivery – during postpartum.

2.2.2 Determinants of maternal morbidity, mortality and safe motherhood services utilization

Conceptualization of the determinants of maternal morbidity and mortality is in the initial stages of development. Studies have tended to focus on biomedical determinants, variously classified as genetic or constitutional, environmental, and behavioral risk factors. Not all determinants are known and it is impossible to describe ways of measuring all of them. However, some common determinants are briefly discussed below following the three tiers; pathogenic causes of mortality, biologically causal risk factors, and risk indicators (Campbell & Graham, 2006).

Pathogenic causes of maternal mortality include all fatal conditions aggravating or aggravated by pregnancy. The complications of pregnancy, childbirth and the puerperium listed in the ICD- 9 include 40 major three-digit divisions. The most common direct causes of death however are hemorrhage, sepsis, obstructed labor, hypertensive diseases of pregnancy and complications of illegally induced abortion, while common indirect causes include malaria, and hepatitis.

Reproductive factors, including the woman's constitution, her age, parity, and general health status are the most commonly considered factors as they can be measured relatively easily in facility-based studies. Reproductive factors are thought to play a biologically causal role although some, such as age and parity may influence women's confidence and use of services. Often however, studies merely demonstrate an association with age and parity and recommend targeting of high risk women for special care without exploring the mechanisms for the association.

Another major category of determinants are health service factors. Here it is helpful to distinguish between curative and preventative interventions, although once again the conditionality of the three stages means that an intervention which cures morbidity prevents death. It is common to distinguish between interventions by modern and

traditional health practitioners as well as those carried out by women themselves. As regards risk factors, this is perhaps less useful than distinguishing between iatrogenic or harmful practices and helpful or beneficial ones. These can be generally grouped under the quality of care. The accessibility and availability of preventative and curative health services also belong in the health service category. Thaddeus and Maine (1990) have reviewed the literature on maternal health care utilization and proposed a useful framework examining three phases of delay: (1) delay in deciding to seek care on the part of the individual, the family or both; (2) delay in reaching an adequate health facility; and (3) delay in receiving adequate care at the facility.

The final category, socio-economic factors, is extremely broad and often includes urban/rural residence, education, income, status, and cultural factors as risk indicators. Because such influences are not necessarily causal, it is important to elaborate on the expected direction of an association and possible reasons behind it while recognizing the potential for confounding.

It is strongly argued that health is not just a medical issue based on biological factors and medical interventions. Health is also a social issue, and where we live, what we do, who we interact with, and the nature of these interactions and relationships, all affect our health. Health is thus a product of the interaction between our biology, and the physical, socio-economic, cultural and political environment in which we live and act i. e, it is socially determined. Thus differences in people's health status arise from biological differences and from differentials in socio-economic status. Social class, race and ethnicity, gender and a range of other social determinants may influence many dimensions of health, ranging from risk and vulnerability, to health seeking behavior, access to health services and long terms health and social consequences (Ravindran ed., 2001). Social determinants of health play a large role in women's ability to achieve maternal and reproductive health. It is therefore important to consider the role of social, cultural, health system and economic factors that impact on maternal health, and ultimately maternal mortality. A women's decision to seek health care could be affected by the influence of her partner or other family members; social norms; her education; her status in society; the distance she lives from the clinic, how sick

she is; her previous experiences with the health system and how she expects to be treated by health care providers, her level of decision making power in the household, her access to credit, land and income (Lule, Ramana, Oomman, Epp, Huntington, & Rosen, 2005).

2.2.3 The three delays model

The three delays model proposed by Maine stresses upon the importance of delays leading to maternal deaths. The three delays are delay in seeking care, delay in reaching care and delay in receiving care (Maine, 1991):

- i. Delay in Seeking Care: The first of the three delays is in making the decision to seek care. This delay may be divided into two elements: the delay in recognizing the need for medical care and the delay in deciding to seek care. Maternal death is “most likely in cultures where maternal illness, suffering and death are viewed as natural, inevitable and part of what it means to be a woman. The decision to seek care is also influenced by the expected outcome. Women’s utilization of health services, for emergency obstetric care or for treatment of injuries resulting from violence, is highly influenced by the manner in which their dignity is respected.

Confidentiality is a major issue. Women sometimes refuse to seek health services because they believe that their medical confidentiality will not be respected, especially in relation to complications of unsafe abortion, which is a leading cause of maternal death. This may be due to social stigma or prevailing laws. A further barrier to women seeking care is the need for authorization. In some cultures women requesting health services must obtain their husbands’ authorization or adolescent girls seeking health services must obtain parental authorization.

Delay in seeking care can be caused by a variety of factors. Lack of knowledge about problem identification, lack of recognition of the seriousness of the symptoms, lack of confidence in the medical system, concern about the distance to be traveled, cost of the services, traditional beliefs and poverty/low socio-economic condition all contribute to

delays in seeking care. Failure to recognize the danger signs is also a contributory factor for the delay.

ii. Delay in Reaching Care: The time taken to reach a facility is related to the availability, accessibility and quality of the services. Maternal death is “more likely in nations that give little priority to health services for women – including maternal care.” Health regulations and policies may demand unnecessarily high qualifications for health service providers of routine obstetric care. This may obstruct access and availability because of limits of facilities, personnel or women’s financial means.

Due to geographical distances, islands, difficult terrain and an under-developed road and transport system, it is not uncommon to have delays with transport. In developing country’s settings, this is further aggravated during the rainy season because of swollen rivers making crossing difficult and by long distances to the road head. Lack of finances, lack of reliable transport system, and delay in decision making by husbands are recurrent themes in most cases of maternal deaths. Overall, lack of birth preparedness contributing to poor organization leads to delays in reaching care.

iii. Delay in Receiving Care: In developing countries it is common to find the health facilities with inadequate financial resources, physical facilities and supplies. Unavailability of trained health personnel with lifesaving skills is also an important factor. These factors coupled with de-motivation of health personnel due to a variety of reasons also contributes to poor services in the facilities. All these factors lead to poor quality of services that contributes to maternal deaths even when the family manages to get the expecting mothers in the health facility (Maine, 1991).

The third delay in receiving adequate, appropriate treatment at the facility also depends on the functioning of the facility. To save women’s lives, quality EOC must be available 24 hours a day, 365 days a year. It depends on the management of the internal systems and processes of the facility to ensure (Maine, 1991):

- Availability and willingness of competent staff
- Availability of necessary equipment, supplies and infrastructure
- Technical competence, and,
- An environment where women feel comfortable with the way they are treated.

However, the situation in South Asia is in stark contrast to the requirements. Delays in the facility are related to lack of appropriate management resulting in low staff morale, insufficient teamwork, a lack of adequate services, and negative interactions between women and health personnel. The quality of care given by a particular facility is spread by word of mouth. A study in Bangladesh found that decisions on whether to use a facility or not were often based on hearsay, but then there was a good functioning team, the use of the facility increased five-fold. However, “suspicion and fear of improper practices may persist long after they have been eradicated.” Lack of supportive national policies contributes to delays in decision making, in reaching the facility and in receiving adequate, appropriate care. Beyond the medical causes of maternal deaths, health systems, laws and policies affect availability, accessibility and quality of reproductive health services. (UNICEF, 2003).

Social determinants of maternal health thus operate at various levels including (Ravindran ed., 2001):

- Individual level (age, birth order, parity, marital status, sexual practices, health status, e. g, nutrition, malaria, HIV/AIDS, education, employment, decision-making power).
- Household level (the social and economic status of the household within the community, the household’s access to resources; distribution of power within the household).
- Community level (level of development, urban or rural, stratified or homogenous, having health resources or not, cultural and gender norms, inheritance norms, norms of place of residence after marriage).

- National level (size of the country, population, level of development, type of governance, structure of the health system, extent to which dependent on the global market, nature of health policies and content of health sector reform packages).
- International (global economic scenario and dominant economic ideologies, balance of power between various geo-political forces, health sector reforms, international human rights regime).

2.3 Empirical literature

Some studies have noted the relation between maternal mortality and socio economic factors, such as income per capita, gross domestic product and educational level. However, less effort has been spent researching the influence of culture and political conditions on health - although it has been shown that political factors, such as democracy, have a positive effect on health indicators including maternal mortality.

2.3.1 Social-cultural, political and economic factors and maternal health and mortality

i. Human rights and maternal health and mortality

In South Asia at every three minutes one woman dies from complications of pregnancy and childbirth. Those who survive, live with complications that range from discomfort to situations of indignity. For three out of four of the babies whose mother dies, her death is the beginning of their death. Without breast milk, they waste away on a diet of flour and water or very much diluted milk and die of pneumonia or diarrhea.

For every woman who dies, estimated 30-100 women suffer complications that result in debilitating conditions. This means that while approximately 155,000 women die, between 4.6 million and 15.5 million women suffer permanent disabilities each year in South Asia alone.

The likelihood of maternal death varies between rich and poor countries: a lifetime risk of 1 in 8,700 for Canadian women compares with 1 in 42 for women in Bangladesh or 1 in 30 in Bhutan. Within any given country, it also varies greatly between rich and poor women. The failure to address preventable maternal disability and death represents one of the greatest social injustices of our times. A human rights approach shows those women's maternal mortality and morbidity result not simply from their disadvantages but frequently from cumulative denials of their human rights; that is, failure to address their preventable death and sickness is a result of injustices that women experience (UNICEF, 2003).

“The movement for human rights has focused more on the right to survival against oppression than to the quality of life, to which health is central. Maternal death has been accepted as part of the natural order, rather than as an avoidable consequence of women's ill health resulting from unjust disadvantage.” This change in focus leads to an examination of the human rights instruments to reveal the social injustices which contribute to avoidable maternal deaths. “Once an issue is recognized as a human right, there is a legal obligation to take steps that are ‘deliberate, concrete and targeted toward realization of the right’” (Freedman, 2001).

Reduction of maternal mortality is a threshold objective in a comprehensive strategy to ensure a woman's right to a life-enhancing pregnancy and childbirth. “The right to survival is founded on the inherent value of every woman - as a human being - not only as a mother, daughter or wife.”²⁶ WHO has produced a treatise “Advancing Safe Motherhood through Human Rights” on the articles in the various international and regional treaties which underpin this right. Clarification of the obligations and implications of the treaties has been made by the committees which monitor the observance of the various treaties. The obligations have been grouped under:

- Rights relating to life, survival and security;
- Rights relating to maternity and health;
- Rights relating to non-discrimination and due respect for difference; and,
- Rights relating to information and education.

The Women's Right to Life and Health Initiative has adopted five human rights principles as core values for the initiative. These values are human dignity, nondiscrimination, right to life and development, participation and accountability. It is important to emphasize that every pregnant woman is at risk of a complication. A review conducted by WHO found that the strategy of risk assessment has not been effective in preventing maternal deaths. Some women identified as being at risk have no complication, whereas women identified as being low risk are ignorant of what needs to be done in the event of a complication. The problem is that low-risk women do develop complications and there are so many of these women in the population.

Demand-side barriers that prevent women from articulating their rights to and needs for maternal health and care include: poor educational opportunities, gender inequalities and violence (as discussed above), plus: poverty; social and cultural norms (for instance, beliefs that male health staff should not provide care to female patients); geographical constraints especially in remote rural areas; transport to health facilities; the presence of conflict; and the direct and indirect costs of accessing health care. Developing policies and providing resources to address these barriers has contributed to improved maternal health in countries such as Sri Lanka, Burundi, Zambia and Uganda (Ronsmans & Graham, 2006).

Preventing maternal death and illness is an issue of social justice and women's human rights. Making motherhood safer requires women's human rights to be guaranteed and respected. These include their rights to good quality services and information during and after pregnancy and childbirth; their right to make their own decisions about their health freely, without coercion or violence, and with full information; and the removal of barriers legal, political, and health that contribute to maternal mortality.

Governments have an obligation to address the causes of poor maternal health through their political, health and legal systems. International treaties and national constitutions that address basic human rights must be applied to safe motherhood issues in order to guarantee all women the right to make free and informed decisions about their health, and access to quality services before, during, and after pregnancy and childbirth.

ii. Gender and maternal health and mortality

Deeply entrenched gender inequalities exist in many low-income countries where maternal deaths are high and health service utilization is low. Poverty is an important component of gender inequality, but the effects of unequal gender norms, like those of race, religion and ethnicity in some contexts, go beyond class differences. This is because gender inequality is defined and perpetuated by social norms and culture, and reflects differences in power between men and women both within the household and in the wider society. The effects include relatively higher rates of poverty and lower levels of education among women than men, women's lack of autonomy and mobility, intimate partner violence and, overall, lower social status and disempowerment of women relative to men. Gender inequality and women's low social status and disempowerment relative to men significantly impact women's health, the health of mothers and overall demand for maternal healthcare services (Shen & Williamson, 1999).

Gender also interacts with age to make young women particularly vulnerable to the ill effects of gender-inequitable norms on maternal healthcare access and utilization. These norms may dictate early marriage for girls. Globally, around 17 million young women are married before the age of 20, and a majority of these marriages takes place in low-income countries. Early marriage often leads to early childbearing and high total fertility, both of which are linked to higher risk of maternal mortality and morbidity. In fact, it is estimated that between 25 percent and 50 percent of all young women in low-income countries give birth before they turn 18 years of age (Grown, Gupta & Kes, 2005)

Both poverty and gender bias feature into healthcare provider negative attitudes toward women and can create disincentives among them to seek maternal health care. Gender attitudes and roles are particularly important determinants of health seeking behavior. Raising access to maternal, reproductive and child health interventions is a major challenge within societies that restrict the public lives of women. Again, the social is not completely divorced from the economic. There is evidence from Indonesia that the utilization of

prenatal care increases with the control a woman exercises over household finances. Causality is a moot point. In Africa, women make more use of public health care than men in the highest income group but the gender bias is the opposite in the lowest income groups (O'Donnell, 2007).

Maternal deaths are rooted in women's powerlessness and their unequal access to employment, finances, education, basic health care, and other resources. These realities set the stage for poor maternal health even before a woman becomes pregnant, and can worsen her health when pregnancy and childbearing begin. Legal reform and community mobilization are essential for empowering women to understand and articulate their health needs, and seek services with confidence and without delay.

iii. Education and maternal health and mortality

The evidence on the importance of maternal education has led to several exchanges. Hospital studies often find that illiterate women have higher maternal mortality ratios than more educated women, leading some to argue that female education will reduce maternal mortality. Others counter that such an assumption assumes a causal relationship which is not adequately demonstrated by such studies. Indeed much of the effect of education may be due to selection bias, as in many countries illiterate women normally deliver at home and only use hospitals for complicated deliveries, arriving late and often moribund. If access to health services is controlled for by only considering women booked into the health system, further insight into the effects of education can be gained. In Zaria, Nigeria between 1976-9, women with lower educational levels had better survival than more highly educated women (110 versus 250 maternal deaths per 100,000 live births respectively (Rosenfield & Maine, 1985). By contrast, a hospital study in Port Harcourt in 1987-9 showed women with less than secondary school education experienced almost five times the maternal mortality of booked women with secondary or higher education (640 versus 130 maternal deaths per 100,000 live births respectively). Some differences may be due to underlying health status but it is also likely that ability to pay for health services and staff attitudes play an important role. Further exploration of the reasons for such differentials

may lead to remedies well within the means of hospital staff and available resources (Campbell and Graham, 2006).

Many studies show that women's education increases the use of maternal health services independent of a number of other factors. Educated women are more likely than uneducated women to use antenatal, delivery and postnatal care. In 49 out of 62 countries with data, the difference between the deliveries attended by skilled health personnel for women with the highest and the lowest education levels was 30 percentage points or higher. Improvements in secondary education for girls may be even more effective than primary education, and is especially important in countries where girls face greater discrimination and where son preference prevails. Educated women are not only more likely to benefit from maternal health services, but they have greater autonomy, confidence and decision-making ability and power. Furthermore, studies in countries as diverse as Zimbabwe and Pakistan show a strong association between education and contraceptive use.

Women's ability to exercise their right to reproductive health and to negotiate their access to health services is directly affected by the gender, social, cultural and economic inequities they face. We heard evidence from a number of witnesses highlighting that reductions in maternal mortality are directly linked to improving girls' and women's educational opportunities. Other socio-cultural norms strongly affect women's experiences of pregnancy and childbirth. Female genital cutting substantially increases the risk of delivery complications for women. Gender-based violence has a powerful impact on women's health, and contributes to unplanned pregnancies, abortions and the spread of sexually transmitted infections, including HIV and syphilis, which lead to a higher risk of neonatal and maternal deaths. Studies from Rwanda, Tanzania and South Africa indicate a threefold increase in the risk of HIV amongst women who have experienced violence compared to those who have not. In turn, HIV-positive women have been found in some populations to be about four times more likely to die in pregnancy or childbirth than a woman without HIV (WHO, 2006)

iv. Economic status and maternal health and mortality

There is emerging evidence of the link between poverty and maternal deaths in low- and middle income countries. In Peru, for example, there is a six fold difference between the MMR among the richest and poorest income quintiles (130/100,000 vs. 800/100,000) (Ronsmans & Graham, 2006).

In Indonesia, the risk of maternal death is around three to four times greater in the poorest than the richest groups. An analysis across 10 developing countries reveals that the proportion of women dying of maternal causes increases consistently with increasing poverty. There are also significant disparities in the use of maternal healthcare services across socio economic groups. A 55-country analysis of the Demographic and Health Survey in the mid-1990s found that women in the richest quintile were 5.2 times more likely to give birth with a doctor, nurse or midwife in attendance than the poorest quintile. Data from the World Bank reveal similar disparities. In all regions except Europe and Central Asia, less than 50 percent of women in the lowest wealth quintile deliver with support from a medically trained person. Meanwhile, with the exception of South Asia, 80 percent or more of women in the highest wealth quintiles have their deliveries attended by trained personnel. On average, just about 22 percent of women in South Asia and less than half in Sub-Saharan Africa deliver with medically trained staff and in the lowest income quintiles just 7 percent in South Asia and a quarter in Sub-Saharan Africa do (Paruzzolo, Mehra, Kes & Ashbaugh, 2010).

If women are employed they can control the income they earn and are able to accumulate assets, they are less dependent on spouses and other members of their households and are better able to make their own health care decisions. For example, a recent study found women's employment has a positive effect on maternal health and is associated with reduced maternal mortality and morbidity. Unemployed women in the same study were more than four times as likely to die from causes related to pregnancy and childbirth than those who were employed. In a review study Simkhada found women's paid employment to be a statistically significant factor in use of antenatal care in seven of 28 studies they

reviewed. Studies in Nigeria and Philippines show that women working as civil servants or white collar workers use antenatal care services more than housewives and the unemployed. However, much less research has been done on the links between employment and maternal health than on the links with education, and this knowledge gap needs to be filled (Simkhada, Teijlingen, Porter & Simkhada, 2008).

v. Safe motherhood and maternal health and mortality

Safe motherhood is a vital economic and social investment thus all national development plans and policies should include safe motherhood programs, in recognition of the enormous cost of a woman's death and disability to health systems, the labor force, communities and families. Additional resources should be allocated for safe motherhood, and should be invested in the most cost-effective interventions (in developing countries, basic maternal and newborn care can cost as little as US\$3 per person, per year) (FCI, 2010).

Delay marriage and first birth is a must since pregnancy and childbearing during adolescence can carry considerable risks. To delay first births, reproductive health information and services for married and unmarried adolescents need to be legally available, widely accessible, and based on a true understanding of young people's lives. Community education must encourage families and individuals to delay marriage and first births until women are physically, emotionally, and economically prepared to become mothers (FCI, 2010).

Every pregnancy faces risks because during pregnancy, 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 high quality obstetric care throughout their pregnancies, but especially during and immediately after childbirth when most emergency complications arise. Antenatal care programs should not spend scarce resources on screening mechanisms that attempt to predict a woman's risk of developing complications (FCI, 2010).

Ensure skilled attendance at delivery because the single most critical intervention for safe motherhood is to ensure that a health worker with midwifery skills is present at every birth, and transportation to a health facility is available in case of an emergency. A sufficient number of health workers must be trained and provided with essential supplies and equipment, especially in poor and rural communities (FCI, 2010).

Improve access to quality reproductive health services because large number of women in developing countries do not have access to maternal health services. Many of them cannot get to, or afford, high-quality care. Cultural customs and beliefs can also prevent women from understanding the importance of health services, and from seeking them. In addition to legal reform and efforts to build support within communities, health systems must work to address a range of clinical, interpersonal, and logistical problems that affect the quality, sensitivity, and accessibility of the services they provide (FCI, 2010).

Prevent unwanted pregnancy and address unsafe abortion because the evidence shows that each year, an estimated 75 million unwanted pregnancies occur around the world. Many women without access to safe services for termination of pregnancy resort to unsafe abortion which often results in death or disability. Unsafe abortion is the most neglected and most easily preventable cause of maternal death. These deaths can be significantly reduced by ensuring that safe motherhood programs include client-centered family planning services to prevent unwanted pregnancy, contraceptive counseling for women who have had an induced abortion, the use of appropriate technologies for women who experience abortion complications, and, where not against the law, safe services for pregnancy termination (FCI, 2010).

2.3.2 Safe motherhood services utilization and maternal morbidity and mortality

A large body of evidence confirms that many people in the developing world go without health care from which they could benefit greatly. The poor in developing countries are even less likely than the better off to receive effective health care. Concern for the level

and distribution of health in the developing world demand that measures be taken to redress both facts. What are these measures? What policies can increase the utilization of effective health care, particularly by the poor in developing countries? There are two sides to the access problem: on the supply side, good quality, effective health care may not be offered; on the demand side, individuals may not utilize services from which they could benefit. The two are obviously related. Poor quality care will arouse little interest from the public. A high level of demand, made effective by purchasing power, will induce the provision of quality care. Solving the access problem requires tackling both demand and supply side issues. Worldwide, maternal health care or safe motherhood programs focus on four components of health care utilization by women. These components are: utilization of ANC services, birth preparedness, skilled birth attendance in delivery or institutional delivery, and utilization of PNC services. The utilization of all four components of maternal health care ensures safe motherhood of every pregnant woman.

i. Antenatal Care (ANC)

Antenatal care is a key strategy for reducing maternal mortality and morbidity, but millions of women in developing countries do not receive it. ANC is an important determinant of safe delivery (Bloom et al. 1999). ANC is a pivotal factor for safe motherhood. The primary aim of ANC is to achieve healthy mother and a healthy baby at the end of a pregnancy. Mothers who had not received good quality ANC were found to be more at risk of having low birth weight babies and there is clear association between infant mortality rate and lack of or poor quality ANC. Moreover, substantial reduction in pre-natal mortality takes place even if the initial antenatal check-up is availed by women as late as the third trimester. Antenatal visits may raise awareness about the need for care during delivery or give women and their families a familiarity with health facilities that enable their families a familiarity with health facilities that enables them to seek help more efficiently during a crisis. The number of ANC visits and the timing of the first visit are important for the health of the mother and the outcome of the pregnancy.

Research conducted in different parts of the developing world shows that demographic and socio-economic background of women has direct bearing on utilization of ANC services.

The results of a study conducted in Uganda shows that the background variables of women like household wealth, educational status and place of residence has strong effect on ANC service utilization using the 2006 Uganda Demographic Health Survey data. The aim of the study was to investigate the effect of demographic and socio-economic factors on the utilization of maternal health care services. The study found that the odds of urban women visiting antenatal care clinics are 1.40 times higher than the odds of rural women visiting antenatal care clinics. Moreover, the odds of urban women receiving tetanus toxoid injection are 1.43 times higher than those of rural women. Formal education impacts positively on women's utilization of maternal care services in Uganda. For example, women without any formal education are less likely than their counterparts with primary education to visit antenatal care clinics and to deliver in a health facility. The odds of women with primary education visiting an antenatal clinic are 2.05 higher than those of women with no education, while the odds of women with primary school education. The study thus concludes that that variation in the utilization of maternal health care services among women of childbearing age in Uganda is associated with urban/rural residence, educational attainment, births order and wealth index. In terms of residence, the study found that women resident in urban areas are more likely than their rural counterparts to use antenatal care services, receive tetanus toxoid injection and deliver their babies in public health facilities. The same positive association is observed between a woman's educational attainment and visit to antenatal care clinic, place of delivery and tetanus toxoid injection. Finally, wealth index is positively associated with both antenatal care and place of delivery in that women in the richest categories of wealth are more likely to have the injection and deliver their babies at health facilities than their counterparts in the poor and poorest categories of wealth. Women with secondary or higher education are much more likely than their counterparts with no education to utilize maternal care services. For instance, the odds of women with secondary or higher education visiting an antenatal care clinic and receiving tetanus toxoid injection are 2.56 times higher than those of women with no education (Kaule-sabiti, Acheampong & Ngake, 2014).

A study conducted in Rajasthan, India reveals that a little more than one-fourth (27.6%) of the mothers received the minimum number of antenatal visit (three or more visits) which

is recommended by WHO to achieve the essential level of ANC. More than forty per cent (43.4%) of the mothers did not receive any kind of ANC during their pregnancy period. Nearly 45.1% and more than eighty per cent (87.0%) of the mothers not received TT injection and IFA tablets during their pregnancy period respectively. As a whole, it is very clear from the above analysis that the care received at each and every stage of the pregnancy period is significantly far from the national averages. Utilization of reproductive health services is related to their availability and socio-economic, demographic and cultural factors such as women's age, education, employment, caste and autonomy. These studies have shown that education of the mother is an important social variable that has a positive effect on the utilization of maternal and child health services. Some studies have shown a strong association between spouse's education and utilization of reproductive health services. In the present study, education of women has been identified as prime determinant of use of ANC services. Educational attainment of the husband also showed its positive impact on ANC. As access to and availability of health care services is greater in the urban areas, the study finds higher use among women in urban areas than among those in rural areas. The results show that religion is not a differentiating factor for the use of antenatal services. Documented evidence exhibits a strong association of the caste system with utilization of maternal care services. The study results further shows that caste was an important factor for the use of ANC services. Women belonging to scheduled castes and tribes were less likely to use ANC services than other caste women. In the rural areas, scheduled caste and scheduled tribe groups are usually living in a separate habitation, which is away from the main settlement. Also, in the urban areas, significant proportions of scheduled castes and scheduled tribes are living in slums. The health facilities are usually in close proximity to the main settlement area. The spatial disadvantage combined with social and economic seclusion of these groups, could be the reason for the relative under-utilization of maternal health care services among the members of scheduled caste and scheduled tribe communities. Studies from developing countries relate income as important determinants of utilization of ANC. The economic status of the household also determines the utilization of ANC and delivery care services. This study too exhibited positive relation between wealth index of the household and use of ANC services (Chauhan, 2012).

A study conducted in North Goa District, India among 250 women who had delivered child during past 3 years on the date of survey showed a high use of antenatal care (78.8%) i.e. out of 250 women studied, 197 women were registered for antenatal care before 12 weeks of gestation and received 5 or more visits. Among the study respondents the use of ANC increased with education level of women, the use of antenatal care was 31.6 percent for illiterate women, 66.7 percent for women with education level up to secondary school and 90.8 percent for women who studied up to S.S.C. and above. A chi-square test revealed that this was a statistically significant difference, suggesting significant association between education level of women and the use of antenatal care ($P < 0.01$). By religion, the use of antenatal care was significantly higher ($P < 0.01$) for Christian women (92.7 percent) compared to Hindu women (78.8 percent) and Muslim women (48.0 percent).

The use of antenatal care was significantly associated with exposure to communication variables such as television, radio and newspaper ($P < 0.01$). The women who were exposed to television about messages on prenatal care were 3.35 times more likely to use antenatal care than women who were not exposed to the message on television. The women who heard messages on radio about prenatal care were 2.38 times more likely to use antenatal care than women not exposed to radio, while women exposed to newspaper who read messages about prenatal care were 4.37 times more likely to use antenatal care than women not read messages about prenatal care in the newspaper. Overall, the analysis of logistic regression reveals women's education, religion, quality of care, exposure to radio, and parity of women were emerged as independent and most significant factors influencing the use of ANC (Kulkarni & Nimbalkar, 2008).

A study was conducted in Madhya Pradesh, India for which a total of 15,782 ever-married women aged 15-49 years who delivered a child during the three years preceding the survey was drawn from the DLHS-3 data. The study examined the effects of socio demographic and economic factors on the utilization of maternal health services. The results of this study showed that 61.7 percent of the respondents used antenatal services at least once during their most recent pregnancy. Moreover, univariate logistic regression indicated that women

delivering at younger age were more likely to use antenatal care, receive skilled attendance at delivery and use postnatal care. The findings further showed that the mothers used more antenatal care during the second order birth in comparison with the first order birth but the use of antenatal care decreased with birth order more than two.

The levels of skilled attendance at delivery and postnatal care decreased steadily with increased birth order. The three indicators of the use of maternal health services increased sharply with increased levels of education of mother. This analysis also indicated that women from families living below poverty line were less likely to use maternal health services in comparison with women living in families above poverty line. Women from schedule tribes population and Hindu religion were least likely to be users of the three dimensions of maternal health services. The women who were farmers, agricultural workers and laborers were less likely to use maternal health services in comparison with professional women and unemployed. Similarly, women living in urban areas tended to use the maternal health care services more than those living in rural areas. Levels of the utilization of maternal health services were low in the districts with high percentage of tribal population. All other variables used in this study were significantly associated with the use of the three maternal health services. Household socio-economic status was the strongest factor associated with the use of the three maternal health service indicators. Mother's level of education was the second most influential factor for the use of maternal health services (IIPS, 2010).

A comparative study was carried out in 2011 which utilized Demographic and Health Surveys (DHS) data from 1990 to 2009 in 38 countries of four regions: 21 countries in sub-Saharan Africa; 4 countries in North Africa/West Asia/Europe; 8 countries in South/Southeast Asia; and 5 countries in Latin America and the Caribbean. This comparative report analyzed levels and trends in use of maternal health services: antenatal care, skilled birth attendance and postnatal care for the mother. The study found that despite progress in extending antenatal care coverage, many countries, particularly in sub-Saharan Africa and South/Southeast Asia, still have unsatisfactory levels of the WHO-recommended four or more antenatal care visits. However, it is encouraging that the data on trends in having at least four antenatal care visits show improvements since 1990 in

most countries. This trend could be the result of program efforts based on better understanding of antenatal care in improving health outcomes for women and children. Steady increases were found in Latin America and the Caribbean, North Africa/West Asia/Europe and South/Southeast Asia, while the former two regions already had relatively high levels of use in the 1990s. Sub-Saharan Africa presents a mixed picture, with increases more evident in Western and Central Africa than elsewhere in the region (Wang, Alva, Wang & Fort, 2011).

WHO recommends that pregnant women start antenatal care in the first trimester to have enough time for diagnosis and treatment of problems and diseases. The majority of women surveyed in Latin America and the Caribbean and in North Africa/West Asia/Europe have the first antenatal care visit in their first trimester of pregnancy. In contrast, women in sub-Saharan Africa tend to start antenatal care only in the second trimester, and even as late as the third trimester. Socioeconomic disparities in use of antenatal care are profound. In developing countries as a whole, women are more likely to report four or more antenatal care visits if they reside in urban rather than rural areas, have a higher education level or live in a richer household. These differentials are smaller in countries with overall high levels of antenatal care. Having only one antenatal visit may not be enough to ensure that women prepare for and receive sufficient care for childbirth, and WHO recommends a minimum of four antenatal visits. Overall, most women who receive any antenatal care have at least four antenatal visits, but there is substantial variation among countries. In half the countries included in this analysis, more than 50 percent of all pregnant women surveyed reported four or more antenatal visits. Having four visits is most prevalent in Latin America and the Caribbean. With the exception of Haiti (54 percent), all other countries in the region have more than two-thirds of women reporting four or more antenatal care visits, and as many as 95 percent in the Dominican Republic (Wang, Alva, Wang & Fort, 2011).

In three of the four countries in the North Africa/West Asia/Europe region, at least two-thirds of women make four or more antenatal care visits. Levels are lower in the South/Southeast Asian region, except in Indonesia and the Philippines, where sizable

proportions of women reported four or more antenatal visits. For example, only 21 percent of Bangladeshi women and 27 percent of Cambodian 10 women reported four or more visits. Although 87 percent of Vietnamese women reported having some antenatal care, only 30 percent had four or more visits. In sub-Saharan Africa, the proportion of women making four or more antenatal care visits ranges from 12 percent in Ethiopia to 78 percent in Ghana. Some countries with high antenatal coverage also show a high level of four or more visits - Ghana, Zimbabwe and Namibia, for example. In a few other countries - for example, Chad, Ethiopia and Niger - only a minority of women had any antenatal care at all, and very few made as many as four antenatal care visits. Even where antenatal coverage is high, the percentage reporting as many as four visits may be low. In Rwanda, for example, 96 percent of women reported at least one antenatal care visit, but only 24 percent reported four or more visits (Wang, Alva, Wang & Fort, 2011).

The value of antenatal care in reducing maternal mortality and morbidity has been questioned, by arguing that most life-threatening complications cannot be predicted or prevented by screening during pregnancy and occur most commonly in pregnancies that are considered low-risk. The efficacy of ANC packages may have limited potential to affect maternal mortality ratios. However, it has also been argued that antenatal care offers a unique opportunity to educate pregnant women and their partners on healthy behaviors, danger signs, who to contact and where to go in case of problems and other topics related to pregnancy, childbirth, puerperium and childcare, and to help plan for a safer delivery. In addition, antenatal care may allow for the development of a relationship between pregnant women and the public health system, especially the midwife. In this context, the skilled birth attendant has a major role to play in providing screening and preventive services during the stages of pregnancy while also identifying risk signs (pre-eclampsia, anemia) that will render the women vulnerable to serious complications and even death. Unfortunately, the poor quality of ANC services in terms of preventing, diagnosing and treating complications has been observed but this has not deterred women from accessing antenatal services. Coverage of ANC first visit was reported to average 68% in poor countries, which is indicative of multiple entry points (PHC and outreach services provide ANC) for relatively low cost healthcare according to the health practitioners. The ANC

attendance rates however tend to fall off in successive visits with women rarely receiving the requisite four ANC visits during pregnancy (Canavan, 2009).

ii. Birth preparedness (BP)

Birth Preparedness and Complication Readiness (BPCR) interventions are widely promoted by governments and international agencies to reduce maternal and neonatal health risks in developing countries. It is a comprehensive strategy to improve the use of skilled providers at birth and the key intervention to decrease maternal mortality. Birth preparedness and complication readiness (BP/CR) is the process of planning for normal birth and anticipating actions needed in case of emergency. It encourages women, households, and communities to make arrangements such as identifying or establishing available transport, setting aside money to pay for service fees and transport, and identifying blood donor in order to facilitate swift decision-making and reduce delays in reaching care once a problem arises. Responsibilities for BP/CR must be shared among all safe motherhood stakeholders, since coordinated effort is needed to reduce the delays that contribute to maternal and newborn deaths (Jhpiego, 2004)

The entry point for birth preparedness is routinely through the ante natal services where the woman is expected to attend for comprehensive screening, prevention and care ideally at least four visits during the trimesters of pregnancy, ANC is usually provided at primary healthcare level as part of basic package of maternal healthcare.

In most developing countries the birth preparedness practices are low. A study conducted in 2012 in Robe Woreda of Ethiopia revealed that proportion of birth preparedness and complication readiness was 16.5% which indicated that birth preparedness was less prevalent in the study area. The study mainly tried to identify about arrangements made during pregnancy by the mothers for birth and its complication and the result showed that less number of respondents had made arrangement in a comprehensive way prior to the last childbirth commonly by identified a means of transportation, identified skilled provider, saving money and identified place of delivery (Kaso & Addisse, 2014).

In a study conducted in Sukma district of Chhattisgarh, India which is one of the most backward and left wing extremist affected districts assessed knowledge of birth preparedness among pregnant and recently delivered mothers. This study looked into the following birth preparedness elements: receiving routine antenatal care; identifying skilled attendant; identifying place of birth; preparation of essential items- clean cloth, blade for delivery at home; knowledge of danger sign; knowledge of expected date of delivery; saving money for emergency; arrangement for transportation and identification of blood donor. This study found that more than three fourth of the respondents had knowledge of expected date of delivery. This increases the probability to reach the health facility on time or prepare for home deliveries. About one fourth of the respondents had knowledge about saving money for emergency care. The study further found that only 6% of those respondents who had past history of child death had practiced birth preparedness compared to 24% of those who had no such history ($p=0.073$). Almost 43% of those respondents who had health facility as primary contact for health services had practiced birth preparedness compared to 18% of those having traditional healer as primary contact for health services ($p=0.012$). Only 2% of those respondents who stated distance of PHC from house more than 10 km, have practiced birth preparedness compared to 35% of those who stated distance of PHC within 10 km range from their house ($p=0.000$). About 32% of those respondents who had knowledge of place of birth had practiced birth preparedness compared to 9% of those who had no knowledge about it ($p=0.001$) (Mutreja & Kumar, 2015).

In 2014, a cross-sectional survey was conducted in Chamwino district of Central Tanzania. The survey included a sample of 428 women who delivered within two years prior to data collection regardless of newborn outcome. A multi-stage cluster sampling technique was used in the survey. The survey assessed the practice and determinants BPCR among recently delivered women. The study treated BPCR as dependent variable and marital status, education, maternal occupation, spouse's occupation, monthly income, parity, booking at ANC, knowledge on danger signs, counseling on BPCR as independent variables. The final multiple logistic regression model showed that, the odds of birth BPCR

were two times greater among women who received at least primary education when compared to those with no education (AOR = 2.26, 95 % CI; 1.39, 3.67). Occupation of the spouse was found to be significant determinant of BPCR, the odds of BPCR were two times greater among women whose spouse were employed, compared to women whose spouses were not employed at the time of the survey (AOR = 2.18, 95 % CI; 1.46, 3.25). Also, the odds of BPCR were two times greater among women who booked for ANC during the first trimester compared to those who booked after first trimester (AOR = 2.03, 95 % CI; 1.11, 3.72). Furthermore, the odds of BPCR were two times greater among women who attended at least four ANC visits compared to those with less than four visits (AOR = 1.94, 95 % CI; 1.17, 3.21) and finally, the odds of BPCR were four times greater among women who had knowledge of key danger signs than those who not had knowledge on key danger signs (AOR = 4.16, 95 % CI; 2.32, 7.45) After adjustment for other variables, odds of utilizing health facility for delivery was four times higher for women who had BPCR than for those who not had BPCR (AOR = 3.91, 95 % CI; 2.44,6.27). In the study significant predictors for BPCR were found to be; education level, gestational age at booking for ANC, number of ANC visits, spouse employment status and knowledge of key obstetric danger signs (Bintabara, Mohamed, Mghamba, Wasswa, & Mpembeni, (2015).

A study was conducted in New Delhi, India in 2012 to assess the status of BPCR among pregnant women and to study the socio-demographic factors affecting BPCR practices. The study included a total of 417 pregnant women who attended antenatal clinic of Primary Health Care Clinic of Palam area. While examining the relationship between independent variables and BPCR practices the study found that age and education of women were highly statistically significantly associated with their knowledge of danger signs of pregnancy (P = 0.000). Education of women (P = 0.001) and parity (P = 0.000) were also statistically significantly associated with their knowledge about early registration of pregnancy. Similarly, the study also found that Education of women (P = 0.00) and her husband (P = 0.02), parity (P = 0.01), and type of family (P = 0.02) were also statistically significantly associated with their awareness about TT immunizations in pregnancy. Further, education of women (P = 0.001), type of family (joint) (P = 0.01) and Socio-

economic Status (SES) ($P = 0.01$) were statistically significantly associated with their awareness about transportation provided by JSY scheme. Education of women ($P = 0.000$) and their husbands ($P = 0.000$), occupation of husband ($P = 0.000$), and type of family (0.03) were also statistically significantly associated with the women who had made arrangements for transport before delivery. Overall, the study showed that parity, younger age, education, joint family system, and husband's education and occupation were associated with having a birth plan (Kaphle, Neupane, Kunwar, & Acharya, 2015).

A systematic review study was conducted on the effectiveness of BPCR in improving maternal and neonatal health in developing countries by Soubeiga et al (2014). The review included India, Nepal, Bangladesh, Ghana, Malawi, Pakistan and four Latin American cities (Rosario in Argentina, Pelotas in Brazil, Havana in Cuba, and Mexico City in Mexico). Meta-analyses showed that exposure to BPCR interventions was associated with a statistically significant reduction of 18 percent in neonatal mortality risk (twelve studies, $RR = 0.82$; 95% CI: 0.74, 0.91) and a non-significant reduction of 28 percent in maternal mortality risk (seven studies, $RR = 0.72$; 95% CI: 0.46, 1.13). Results were highly heterogeneous ($I^2 = 76\%$, $p < 0.001$ and $I^2 = 72\%$, $p = 0.002$ for neonatal and maternal results, respectively). Subgroup analyses of studies in which at least 30 percent of targeted women participated in interventions showed a 24 percent significant reduction of neonatal mortality risk (nine studies, $RR = 0.76$; 95% CI: 0.69, 0.85) and a 53 percent significant reduction in maternal mortality risk (four studies, $RR = 0.47$; 95% CI: 0.26, 0.87). Pooled results revealed that BPCR interventions were also associated with increased likelihood of use of care in the event of newborn illness, clean cutting of the umbilical cord and initiation of breastfeeding in the first hour of life.

The study found evidence to support implementation of BPCR interventions to improve maternal and neonatal health in developing countries. Neonatal and maternal risks can be significantly reduced if home visits and/or women's group sessions reach a high proportion of pregnant women. Decision-makers could support these approaches in settings where healthcare facilities are inadequate, where healthcare utilization is low, and where the burden of neonatal mortality is high. Sufficient resources should be mobilized for

widespread implementation of these interventions and to ensure their quality, through ongoing training of educators/facilitators, provision of practice guidelines, and regular field supervision. The study thus concluded that with adequate population coverage, BPCR interventions are effective in reducing maternal and neonatal mortality in low-resources settings (Soubeiga, Gauvin, Hatem, & Johri, 2014).

Various studies conducted across several developing countries shows that the background variables of women like education, place of residence, distance to health facility etc have strong effect in birth preparation practices. A study was conducted among 3612 pregnant women in 2012 with the objective to identify the status of BPCR and affecting factors at different levels in the study area for policy and program implications. The study found that place of residence and access to health center were found to have statistically significant association with BPCR practice. Women from urban residence (OR = 6.01; 95% CI: 2.56, 14.08) and women who were from clusters (Kebeles) found within 2 hours travel on foot from health center on the average (OR = 2.93; 95% CI: 1.43, 6.02) were more likely to be prepared for birth and its complications. Among the socio-demographic and economic characteristics considered as level-1, educational status, husband's occupation and wealth quintiles were found to have statistically significant association with BPCR practice. Women who attended primary (OR=1.55; 95% CI: 1.24, 1.94), secondary (OR=3.13; 95% CI: 2.00, 4.91) or tertiary (OR=8.04; 95% CI: 2.14, 30.24) were more likely to be prepared as compared to women who didn't attend any formal education.

Women having employed (OR= 1.77; 95% CI: 1.14, 2.74) or merchant husbands (OR=2.04; 95% CI: 1.40, 2.96) were more likely to be prepared as compared to women having farmer husband. Women in the third (OR=1.46; 95% CI: 1.06, 2.00), fourth (OR=1.24; 95% CI: 1.06, 1.72) or fifth (OR=1.56; 95% CI: 1.12, 2.19) wealth quintiles were more likely to be prepared as compared to women in the lowest quintiles (poorest). Among the obstetric related factors considered at individual level, knowledge of key danger signs, attitude and frequency of ANC visits had significant association with BP and CR practice. Women who knew all the four key danger signs during labor and delivery were more likely to be prepared for birth and its complications (OR=2.04; 95% CI: 1.22,

3.39). Similarly, having favorable attitude towards BPCR was found to increase the likelihood of preparation significantly (OR = 1.73; 95% CI: 1.37, 2.18). ANC visit was also among the strong predictors of BPCR. Having 1-3 visits (OR = 2.12; 95% CI: 1.67, 2.69) and greater or equal to 4 visits (OR=2.87; 95% CI: 1.98, 4.18) were found to increase the likelihood of preparation as compared to those who didn't attend ANC visit at all. The study therefore concludes that Improving ANC, giving special emphasis to knowledge of key danger signs and BPCR during health education and ANC should be taken as short term intervention. The study recommends women education, job and income generating activities to raise the socio-economic status of the women as long term interventions (Debelew, Afework & Yalew, 2014).

A community based cross-sectional study was conducted among a sample of 110 recently delivered women to assess the status of BPCR among women who gave birth in the last year in a rural area of Darjeeling, West Bengal, India. In the study BPCR status was not found to be significantly associated with maternal age, literacy, number of family members, monthly income of the family, or with any obstetric factors (e.g., parity, history of stillbirths, ANC). However, the preparedness (well-prepared or less-prepared) was significantly associated with their awareness regarding at least 3 key danger signs during pregnancy ($p = 0.009$), delivery/childbirth ($p = 0.036$), and in the newborn period ($p = 0.007$). It is also evident that 82.1% of women were well-prepared who were advised about relevant BPCR practices during pregnancy as compared to only 3.1% of women who were not advised accordingly. This difference was also found to be significant ($p < 0.001$). The study further found that women who had more knowledge about the key danger signs during pregnancy, labor, and in the newborn period were more likely to be well-prepared (Mandal, Biswas, Bhattacharya & Das, 2015).

Many countries in the developing world have implemented programs that is aimed at enhancing utilization of maternal health services and increasing access to skilled care during childbirth, particularly for women with obstetric complications by improved knowledge of obstetric danger signs, birth preparedness practices, and readiness for emergency complications among the expecting mothers. But many scholars have

questioned this notion and are somehow skeptic about whether merely enhancing the knowledge would lead to better care and birth preparations. Against this background one study was carried out in Uganda among expectant women patients visiting Makerere University Hospital. The objective of the study was to assess the association between knowledge of danger signs and birth preparedness among women admitted with pregnancy complications. The study result showed that only about 1 in every 4 women mentioned the need to identify means of transport, while only about 1 in 8 women mentioned the need to identify a blood donor. With these findings, only 36.5% of the respondents were regarded as knowledgeable on BPCR. While nearly 1 in every 3 women mentioned at least three components of BPCR, about 1 in every 4 women could not mention any of the five components (money, transport, blood donor, place of birth, accompanying person to the place of birth). While looking at the associated variables, the study revealed that there was a statistically significant association between not being in formal employment and lack of knowledge on BPCR (adjusted odds ratio, 0.4; 95% CI, 0.2 – 0.8). There was a significant association, however, between knowledge of danger signs (during pregnancy, labor and postpartum period) and BPCR (adjusted odds ratio, 3.9; 95% CI, 2.0 – 7.5).

The study showed low levels of knowledge of obstetric danger signs and low levels of birth preparedness among women with pregnancy complications during the ante-partum period. Only about 1 in 3 women were able to mention at least two of the five basic components of BPCR, and could be regarded as ‘knowledgeable for BPCR’. Women who were knowledgeable on danger signs were four times more likely to be knowledgeable on BPCR as compared to those who were not knowledgeable. Knowledge of at least three danger signs was independently associated with knowledge about BPCR.

The BPCR concept is based on the assumption that knowledge of danger signs leads to greater anticipation and preparation to mitigate effects of pregnancy and childbirth complications by reducing the first two delays and the third delay if health facilities are prepared to address obstetric complications. Recognition of obstetric danger signs is the key factor in seeking health care for obstetric emergencies and seeking preventive care or health promotion during pregnancy and childbirth. Therefore, a lack of awareness of

obstetric danger signs is associated with a lack of preparedness for normal birth or complication readiness in case of obstetric complications that require emergency healthcare.

The study shows low awareness of danger signs and birth preparedness among pregnant women admitted with pregnancy complications, which indicates a missed opportunity for health education. This makes informed decision-making problematic for pregnant women and healthcare providers. However, women who were knowledgeable about danger signs were more knowledgeable about BPCR. The study thus concludes that new strategies are needed to inform pregnant women about BPCR so as to improve decision-making in pregnancy and childbirth. This calls for urgent need to utilize all available opportunities to raise awareness of obstetric danger signs and to strengthen health education and counseling on BPCR (Mbalinda, Nakimuli, Othman, Osinde, Kakande & Kaye, 2014).

A cross sectional community based study was conducted in October 2012 and February 2013 among women who gave birth in the last 12 months preceding the study in Lekhnath municipality of western Nepal. Regarding knowledge on BPACR; maximum 98.0% women had knowledge on arrangement of fund and minimum 52.3% women had knowledge on identifying blood donor. Only one-third (103, 33.2%) women had knowledge on all five components of birth preparedness and complication readiness. Similarly only about one-third (106, 34.2%) women were prepared for all five components of birth preparedness and complication readiness. And very few (26, 8.4%) women utilized all five prepaid items of birth preparedness and complication readiness. Of the five birth preparedness practices, our study found 84.7% identified place of delivery; 94.4% arranged fund, 93.6% arranged transportation, 57.4% identified skill provider and 86.4% identified blood donor (Kaphle, Neupane, Kunwar & Acharya, 2015).

iii. Skilled delivery or institutional delivery practices

According to WHO safe delivery service is one of the most important maternity care issues for women who are pregnant. Delivery is performed by someone with midwifery skills

who is able to manage a normal delivery and who can recognize and manage obstetric complications and can refer in a timely manner.

Most obstetric complications occur around the time of delivery and cannot be predicted. Therefore it is important that all pregnant women have access to a skilled attendant, i.e. someone with midwifery skills, who is able to manage a normal delivery and who can recognize and manage obstetric complications, or refer in time if needed. Skilled attendance at delivery is advocated as the "single most important factor in preventing maternal deaths" and the "proportion of births attended by skilled health personnel" is one of the indicators for Millennium Development Goal 5. Access to skilled delivery care is also crucial to prevent stillbirths and to improve newborn survival. Skilled attendants can perform deliveries either at home, in health centers or in hospitals, but it is argued that the most efficient strategy for lower income countries is to place them in health centers with referral capacity. In practice, skilled attendance in most countries is synonymous with facility delivery.

Safe delivery practices and antenatal care are among the most effective health interventions for preventing maternal morbidity and mortality particularly in places where general health status of the women is poor. The antenatal period presents an important opportunity for identifying threats to the mother and unborn baby's health status, as well as for counseling on birth preparedness, delivery care and family planning options after the birth. Globally, 211 million pregnancies and 136 million births occur every year. Pregnancy and child birth process put every woman at risk of complications but 99% of the maternal complication/deaths that occur in developing countries are avoidable or preventable (Yegezu & Kitila, 2014).

In Ethiopia, the proportion of births that occur at home remains high, and skilled health professionals attend very few births. Considering these facts, this study examined factors determining institutional delivery care service utilization in Ethiopia, using data from two rounds of the Demographic and Health Surveys (DHS) in Ethiopia (2000 and 2005). Using the binomial logistic regression model, the study showed that women residing in urban

areas, women with secondary and higher education, and women from the wealthiest households were most likely to utilize delivery care services. In addition, the study found that four or more antenatal visits and birth order of children were significant predictors of institutional delivery. Further, the study showed that delivery service utilization did not change significantly between the two survey years. Based on these findings, it can be recommended that there should be progress toward a health education program that enables more women to utilize maternal health care services, including delivery care. To meet the goal, this program should target specific groups, including rural and uneducated women, through appropriate media. It should also target mothers with higher birth orders and should encourage more use of antenatal care during pregnancy. Finally, improvement in the socioeconomic status of women is crucial to enabling more women to seek care during pregnancy and delivery (Mehari, 2013).

Kaule-sabiti and colleagues in their analysis of Uganda DHS 2006 data found that like antenatal care visits and tetanus toxoid injection, urban residence is positively associated with place of delivery in Uganda. For instance, the odds of urban women giving birth in health facilities are almost three times (2.99) higher than those of their rural counterparts, controlling for birth order, educational attainment and wealth index. On the whole, women with lower birth order are more likely than their counterparts with higher birth order to receive tetanus toxoid injection and also to give birth in a health facility. For example, the odds of women with first birth order receiving tetanus toxoid injection and giving birth in a health facility are 1.95 and 2.37 times higher than their counterparts with 6+ birth order. And the odds of women with second and third birth orders receiving tetanus toxoid injection and giving birth in a health facility are 1.82 and 1.30 times higher than those with 6+ birth order. Women without any formal education are less likely than their counterparts with primary education to visit antenatal care clinics and to deliver in a health facility. The odds of women with primary school education delivering in a health facility are 1.47 times higher than those with no education. Likewise, the odds of women with secondary or higher education delivering in a health facility are 3.69 times higher than those of their counterparts with primary education. The odds of women in lower categories of wealth delivering in a public or private health facility are much lower than those of women in the

richest category of wealth (58%, 39%, 35% and 29% respectively) (Kaule-sabiti, Acheampong & Ngake, 2014).

A cross-sectional community based study using quantitative and qualitative methods was conducted in Ethiopia in 2006. A total of 1089 women who had at least one birth one year prior to the study were involved in the study from nine rural and four urban areas of four districts. In this study, concerning the predictors of safe delivery service utilization, multivariate logistic regression analysis was carried out to determine the most important variables predicting the utilization of safe deliver services among the study participants, showed that women who live in urban areas were eight times more likely to use the service than their counter parts OR=8.5, 95% CI; (5.2, 13.9). The other predictor was maternal education, women whose educational status was secondary and above secondary were 2.5 and 4.6 times more likely to utilize the service than women who were illiterate {OR (95% CI): 2.5(1.2,5.0) 4.6, (1.7, 12.8), respectively. But there was no significant difference in utilization between those illiterate and who attend primary education. Religion had significant association with utilization of safe delivery services. Orthodox Christians and Muslims were less likely to utilize the service than others Christians (protestant, Catholic, Jehovah witness) OR (95% CI):.36, (0.17, 0.79) and 0.31, (0.13, 0.73)}, respectively. Husbands' attitude towards institutional delivery was also associated with utilization of safe delivery service. Women whose husbands' attitudes were negative were less likely to utilize the service OR= 0.11, 95% CI; (0.02, 0.58). Women's decision making power has a significant association with the utilization of service in that those women who were decision maker in their house utilized the service 8 times more likely than the others OR= 7.8, 95% CI; (2.3, 26.5). Respondents' overall attitudes towards danger health problem related to pregnancy and childbirth and safe delivery utilization has significant association with service utilization. Those women who have favorable attitude utilized the service three times more than those who have unfavorable attitude (OR=2.8, 95% CI=1.6 - 4.7)

In the study, age at first pregnancy showed statistical association with place of delivery. Those who were pregnant before the age of 20 years were less likely to utilize the service than those who were pregnant after the age of 20years {OR (95% CI): .60, (.38, .95)}.

Order of pregnancy has also showed a statistical association with the utilization of safe delivery. Those women who have five and more children were less likely to utilize the service than those who have one child {OR (95% CI): .18, (.08, .42)}. The other strong predictor of safe delivery service utilization was prenatal visit; women who had at least one registered prenatal visit were 4.5 times more likely to utilize the service than those who did not {OR (95% CI): 4.5, (2.2, 8.9) }. The study concluded that factors such as, urban residence, maternal education, antenatal care utilization, respondent's and husband's attitude towards institutional delivery and women's decision making power were found to be important predictors of safe delivery service utilization by women in Ethiopia (Abera, Mariam, & Belachew, 2011).

A study conducted in Ethiopia found that age of the mother, occupational status of the mother, educational status of the mother, distance from the nearby health center, residence, media of communication, monthly income, number of ANC visits at last pregnancy, gravidity, parity, knowledge and attitude of the mother, ANC visit during last pregnancy, husband's educational status, husband's occupational status and obtaining information about delivery place during ANC visit were the factors found to be significantly associated with institutional delivery service utilization.

The study further revealed that mothers who were urban residents were about 5 times more likely to give birth in health facilities than rural mothers. Mothers with age group of 15–24 years were 4 times more likely to deliver in health institutions than mothers with age group 35 and above. Mothers with educational level of secondary and above were about 12 times more likely to give birth in health facilities than those with primary education and below. ANC visit during last pregnancy was also found to be a strong predictor of institutional delivery service utilization. Mothers who had ANC visit during pregnancy were 4 times more likely to deliver in health facilities than those who did not have ANC visit during last pregnancy. Mothers who were knowledgeable on ANC and delivery services were about 3 times more likely to deliver in health institutions than mothers who were not knowledgeable. Very low (12.1%) institutional delivery service utilization was observed in the study area though 66.8% of the mothers attended ANC services during their last

pregnancy. A large proportion (87.9%) of mothers gave birth at home without a skilled attendant. The majority (80.0%) of mothers who gave birth at home were assisted by family members and relatives. Closer attention and care from family members and relatives, delivering at home is usual experience, having much freedom at home during delivery, influence from the husband and other family members, disliking the services provided at the health facilities, lack of sufficient knowledge about the services, labor was unexpected/short and absence of problem were the main reasons given by mothers not attending health care delivery. Factors such as - being urban resident, age at interview, ANC visit during the last pregnancy, educational status of the mother and knowledge of the mothers on pregnancy and delivery services were significantly associated with skilled delivery service utilization (Teferra, Alemu & Woldeyohannes, 2012).

iv. Postnatal care practices (PNC)

An estimated 60% of maternal deaths in the developing world occur during the six-week period after childbirth. Based on the most recent global estimates, that translates to 172,000 postnatal maternal deaths per year. The vast majority of these fatalities are preventable, caused by sepsis, hemorrhage, hypertensive disorders, anemia and other treatable conditions. What is more, for every maternal death there are an estimated 20 women who suffer from serious injury or infection. While antenatal care is crucial for ensuring women's health needs are met, risk factors for maternal morbidity and mortality are often difficult to identify before complications arise - emphasizing the importance of care during labor, delivery and postpartum, when problems are more likely to present themselves. Further, care during these periods can reduce the mortality risk for neonates as well (WHO, 2012).

There are several reasons as to the need of focusing on PNC care. Every year, four million infants die within their first month of life, representing nearly 40 percent of all deaths of children under age 5. Almost all newborn deaths are in developing countries, with the highest number in South Asia and the highest rates in sub-Saharan Africa. Most newborn deaths occur at home, regardless of whether delivery was in the home or in a health care facility, and regardless of whether a skilled attendant was present at birth. More than half

a million women die each year as a result of complications from pregnancy and childbirth. Most of these deaths occur in sub-Saharan Africa and South Asia. More than 60 million women deliver at home each year without the benefit of skilled care. As with newborn deaths, nearly all maternal deaths occur in developing countries. Both mothers and their newborns are vulnerable during the postnatal period, especially during the first 24 hours following the birth. More than two thirds of newborn deaths will have occurred by the end of the first week after delivery, with up to one-half of all newborn deaths occurring in the first 24 hours. Similarly, approximately two-thirds of all maternal deaths occur in the postnatal period.

Evidence from Bangladesh indicates the majority of maternal deaths occur between the third trimester and the end of the first week after pregnancy. The time of highest risk of death is the same for mothers and for newborns on the day of delivery and over the next few days after delivery. These data offer compelling evidence that integrated maternal and newborn postnatal care (PNC) during the first few days after delivery should be provided to all newborns and their mothers as a concerted strategy to improve survival of both.

Yet, despite the benefits of PNC, most newborns and mothers do not receive postnatal care services from a skilled health care provider during the critical first few days after delivery. The large gap in PNC coverage is evident in a recent analysis of Demographic and Health Surveys in 23 African countries. Approximately one-third of women in sub-Saharan Africa give birth in facilities, and no more than 13 percent receive a postnatal care visit within two days of delivery. In fact, whether women deliver at home or in a facility, postnatal care services are often absent. Moreover, PNC services, where available, often lack essential elements of care required for the optimum health of the mother and her newborn (Sines, Syed, Wall & Worly, 2007).

A study was conducted in Odisha, one of the socio economically disadvantaged states of India. The study analyzed maternal health care services utilization based on the 7792 ever married women aged 15–49 years included in District Level Household and Facility Survey (DLHS), third round conducted in the year 2007-08. The study aimed at assessing the level

and pattern of maternal healthcare services utilization among different sub groups of women with a special focus on the regional, economic, and educational inequality. The study examined the relationship between demographic, social and economic variables and utilization of PNC services. In the economic front the study found that more than half of the women from the richest group (55 percent) had PNC while the corresponding figure was only 19 percent among those from the poorest group. Similarly on social aspect education of women and their husbands was linearly related to maternal health care services utilization. The higher proportions of educated women have used maternal health care services than women without any formal education. The Study showed that among women with 10 or more years of schooling, 48 percent had received full ANC, 88 percent had safe delivery, and 54 percent had PNC. The corresponding figures among the illiterate women were 13 percent, 28 percent, and 18 percent respectively. Utilization of all selected maternal healthcare services was higher among the urban women compared to the rural women. Only 21 percent of women from the rural area had full ANC as compared to 37 percent of urban women. Among religious groups, Muslim women had higher utilization of all three maternal healthcare services than the Hindus and women from other religious groups. Around 69 percent of Muslim women had safe delivery against 51 percent of the Hindus and only 28 percent of women from the other religions. A lower proportion of the scheduled tribe women had full ANC, safe delivery, and PNC compared to women from other social groups in the state. Higher proportion of younger women (15–24 years) had gone for safe delivery and PNC compared to their elder counterpart. Number of children ever born was inversely associated with maternal healthcare services utilization. Rural women have considerably lower maternal healthcare services utilization than the urban women. The result of multivariate analysis confirmed that rural women are less likely to use maternal health care services than urban women after adjusting for different socio economic and demographic characteristics. Among the covariates included in the decomposition analysis, education of women was found as the main contributor while utilizing maternal healthcare services. The poor utilization among illiterate women may probably be due to ignorance of benefits of health care utilization. The study found that the utilization of maternal health care services is considerably low in Odisha along with wide variation by region, economic standard, and literacy level. The disparity is substantial when

compared with other developed states like Kerala and Tamil Nadu in India, where utilization of maternal healthcare services is nearly universal. The variations are primarily due to the divergent socio economic and demographic characteristics of women.

The study also revealed “region” as an important covariate affecting the utilization of maternal health services in the state. Poor economic condition of women was found as another significant predictor for low utilization of maternal health care services. Apart from region and economic condition of women, place of residence and educational level of women remained as the other important covariates for the utilization of maternal healthcare services. Rural women have considerably lower maternal health care services utilization than the urban women. The result of multivariate analysis confirmed that rural women are less likely to use maternal health care services than urban women after adjusting for different socio economic and demographic characteristics. The study concludes that utilization of maternal health care services which is the key to combat the maternal morbidities or death is low and unevenly distributed among different subgroups in Odisha. This is more noticeable in the disadvantaged regions among the poor and illiterates (Prusty, Gouda & Pradhan, 2015).

2.4 The evolution of maternal and newborn health programs

The evolution of maternal and newborn health programming has led to a series of guidelines and protocols that have been developed to guide practitioners on best practice and ultimately lead to providing a comprehensive package of maternal and newborn healthcare. Linked directly with access to skilled health providers, UNFPA has defined priority actions that are imperative for safe motherhood including the following key practices;

- all women receive or have access to information on reproductive health, counseling and services for prevention of unwanted pregnancies
- all pregnant women have access to skilled medical care during and after pregnancy, and care for the newborn

- geographic, socio-cultural, economic, legal and regulatory barriers that impede access to skilled health care are addressed
- the capacity of the health system at all levels is strengthened for efficient and effective delivery of reproductive services

The continuum for maternal, newborn and child care is now the recommended model using a health systems approach as advocated by the PMNCH and the international community. A range of definitions exist to address the various levels with varying priorities. It promotes access by families and communities, by outpatient and outreach services and by clinical services, attending the full life cycle approach. It advocates for high coverage and quality of integrated service delivery packages with functional linkages between the levels of care, so the care can contribute to the effectiveness of all the linked packages (Canavan, 2009).

2.4.1 Maternal Health Policy and Programs

Improving maternal health and reducing maternal mortality have been key concerns of several international summits and conferences since the late 1980s. In 1987, when the Safe Motherhood Conference was held in Nairobi, Kenya, the scope and dimensions of maternal health were not well known or understood. There was little evidence available concerning the technical and programmatic interventions most effective for improving maternal health. For the first time ever, the international development community focused on the plight of women dying during pregnancy and childbirth, and issued a specific goal for maternal mortality reduction: to reduce maternal mortality by 50 percent by the year 2000. From here on, “safe motherhood” was coined as the “catch phrase” for maternal health. Following the Nairobi conference, a series of regional and national meetings was held in Africa, the Arab region, Asia, and Latin America in an effort to generate recognition of poor maternal health and stimulate commitment to address this public health problem among national decision makers, health providers, and NGOs. In 1989, world leaders, joined by the heads of UN agencies and senior representatives of the international development community, gathered in New York to attend the World Summit for Children.

The conference reviewed key areas related to the survival, protection, and development of children and issued a plan of action for the next ten years.

Maternal mortality was identified as critical to the health and survival of children, and as one of the major goals of the Summit, which specifically called for a reduction of maternal mortality by half between 1990 and 2000. Maternal health was framed largely as a means to ensure childhood survival, rather than an end in itself. The International Conference on Population and Development (ICPD), held in Cairo, Egypt, was a watershed event for women's health and rights. Reframing population and development from a focus on meeting demographic goals to securing the reproductive health and rights of men and women of all ages, the ICPD put forward a far-reaching plan for achieving progress in health and development. Maternal health was situated within the context of the comprehensive approach to reproductive health. Specifically, the ICPD PoA called for maternal health services, based on the concept of informed choice, [which] should include education on safe motherhood, prenatal care that is focused and effective, maternal nutrition programs, adequate delivery assistance that avoids excessive recourse to Caesarian sections and provides for obstetric emergencies; referral services for pregnancy, childbirth and abortion complications; post-natal care and family planning (UNFPA, 2004).

Governments agreed to cut the number of maternal deaths by half by the year 2000, and in half again by 2015. In 1995, the Fourth World Conference on Women (FWCW) in Beijing gave substantial attention to maternal mortality and reiterated the commitments made at the ICPD. The ICPD and Beijing commitments also reinforced the position that maternal deaths and disability are violations of women's human rights, and are strongly tied to women's status in society and economic dependency. At a fundamental level, women have a right to health services that promote their health and survival during pregnancy and childbirth.

To commemorate the tenth anniversary of the safe motherhood initiative, the members of the Safe Motherhood Inter-Agency Group executed a wide-ranging program with the following objectives:

- Invigorate national and international commitment and action for safe motherhood among a range of audiences, including policymakers, donors, and health providers; and
- Bring together existing knowledge and research on the most effective interventions into a set of clear technical messages for guiding programs and policies on the ground.

The Safe Motherhood Tenth Anniversary program consisted of a comprehensive set of activities, including a technical consultation held in Colombo, Sri Lanka in October 1997 to forge consensus on the most cost-effective strategies for safe motherhood; a World Health Day media event in April 1998 to generate high-level attention to the problem of maternal mortality among developing country policymakers and donors; and a far reaching media strategy and communications campaign to widely disseminate the findings and messages to interested parties all over the world. The Tenth Anniversary program has been by far the single largest effort to advance safe motherhood within the international and national arenas. Selected products and outcomes included:

- Increased media attention on the dimensions and consequences of maternal mortality.
- A set of ten priority action messages reflecting consensus on the key policy and program strategies for improving maternal health (see Annex III for a summary of the ten action messages for safe motherhood).
- A range of communications tools and resources, including a Web site, fact sheets, public service announcements, a brochure, and a pocket card.

The ten priority action messages profoundly transformed the conception, design, and implementation of safe motherhood programs and policies. Two program interventions that

the Initiative itself had advocated ten years earlier at the Nairobi conference (training of traditional birth attendants and risk screening for pregnant women to identify those most likely to develop obstetric complications) were deemed to be ineffective for reducing maternal mortality, and not to be promoted as priority strategies. Instead, the ten action messages emphasize the need to address the broad social, economic, and political context that contributes to women's risks of dying during pregnancy and childbirth, and promote access to essential obstetric care to prevent or treat serious obstetric complications (UNFPA, 2004).

In 2000, at the UN Millennium General Assembly in New York, 189 countries from around the world adopted specific international development goals with the aim of reducing poverty and promoting human development. Building upon the agreements and commitments made at the series of world conferences held in the 1990s, the Millennium Development Goals (MDGs) offer a blueprint for reducing poverty and hunger, and addressing poor health, gender inequality, lack of education, lack of access to clean water, and environmental degradation. Millennium Development Goal 5 called for an improvement in maternal health and a reduction in maternal mortality by 75% by 2015 from 1990 levels. The identification of maternal health as one of the eight MDGs firmly situated it as central to poverty reduction and overall development efforts. Its inclusion resulted in increased international attention to maternal mortality, and provided a mechanism for monitoring progress on maternal health and improving access to skilled attendants at deliveries (the key indicator for measuring progress for Goal 5). With the MDGs widely accepted as the framework for assessing progress on overall health and development at the national and international levels, safe motherhood figured more prominently in country programs and in development agencies' priorities.

In September 2005, a partnership bringing together three existing global health coalitions on maternal, newborn, and child health (the Partnership for Safe Motherhood and Newborn Health, which itself evolved from the Safe Motherhood Inter-Agency Group; the Healthy Newborn Partnership; and the Partnership for Child Survival) was launched. The Partnership for Maternal, Newborn, and Child Health (PMNCH) aims to strengthen global

advocacy and leadership in an effort to raise the profile and visibility of maternal, newborn, and child health; develop and promote a continuum of care for mothers and children; and coordinate country-level support and action. It builds on the expertise, experience, lessons learned, and membership of the predecessor partnerships, with a major focus on working effectively at the country level to achieve improvements in maternal, newborn, and child health (FCI, 2007).

2.5 Maternal Health Policy in Nepal

2.5.1 Safe Motherhood Policy, 1998

Nepal Safe Motherhood Policy (SMHP) 1998 is one of the several new post - ICPD national policies developed and adopted after the government endorsed Cairo ICPD Programme of Action. The Family Health Division of the MoH is the lead agency responsible for the implementation and collaboration of all maternal health related activities under the SMNH Programme. The general objective of the safe motherhood policy is to reduce mortality and morbidity among women during pregnancy, childbirth and the postnatal period through adoption of a combination of health and health related measures. The specific objectives are to (MoHP, 1998):

- Increase the accessibility, availability and utilization of maternal health care facilities; strengthen the technical capacity of maternal health care providers at all levels of the health care system;
- Strengthen referral services for maternity care, particularly at the district level and with specific emphasis on appropriate referral of high-risk cases;
- Increase the availability and use of contraceptives for child spacing and family planning purposes;
- Raise public awareness about the importance of the health care of women and in particular, maternal health care and safe motherhood; and,
- Improve the legal and socio-economic status of women.

Thus the goal of Nepal's National Safe Motherhood Programme is to reduce maternal and neonatal mortalities especially of the poor and excluded by addressing factors related to various morbidities, death and disability caused by complications of pregnancy and childbirth.

Experience shows that three key delays are of critical importance to the outcomes of an obstetric emergency: delay in seeking care, delay in reaching care and delay in receiving care. To reduce the risks associated with pregnancy and childbirth and address these delays, three major strategies have been adopted in Nepal (Acharya, 2011):

- Promoting birth preparedness and complication readiness including awareness raising and improving the availability of funds, transport and blood supplies.
- Promoting the use of skilled birth attendants at every birth, either at home or in a health facility Provision of 24-hour emergency obstetric care services (basic and comprehensive) at selected public health facilities in every district In order to operationalize the strategy, government has implemented awareness raising campaign on birth preparedness (preparation of finance, transport, blood, safe delivery kit, identification of a health facility for institutional delivery or identification of a skilled birth attendant if the child is planned to be delivered at home).
- In order to encourage women for institutional delivery, the government is paying cash to mothers (Rs. 500, 1000, and 1500 respectively to women from Tarai, Hill and Mountain regions) as transportation cost for institutional delivery. Child delivery is also free of cost at government health institutions and also at designated private and teaching hospitals.

2.5.2 National Safe Motherhood Plan (2002-2017)

Safe motherhood has been an issue of growing importance in Nepal over the past decade. Following the conference in Nairobi, HMG/N formulated the National Health Policy in 1991, which identified safe motherhood as a priority program and institutionalized safe

motherhood as a primary health care. Similarly the establishment of Safe Motherhood Task Force and the development of the National Safe Motherhood Plan of Action (1994-97) were steps towards improving maternal health status in Nepal. In 1998, HMG/MoH published the Reproductive Health Strategy, which includes safe motherhood in the integrated RH care package. This was followed by a safe motherhood Policy document that re-iterated the issues already contained in the Plan of Action 1994-97 and also gave high priority to improving the maternal and neonatal health status of the nation.

The overall mission statement of the long term plan is to facilitate creation of an enabling environment where a woman's right to safe pregnancy, delivery and post-partum care is achieved. The goal is to maternal and neonatal health status improved and the purpose of the plan is to sustain increase in utilization of quality maternal health services (MoHP, 2002).

2.5.3 National Policy on Skilled Birth Attendance, 2006

Safe Motherhood was identified as a priority programme for the government in the National Health Policy of 1991; which was followed in 1994 by the formulation of a national Safe Motherhood Policy that placed emphasis on:

- Strengthening maternity care, including family planning services, at all levels of health service delivery including the community. The National Safe Motherhood Plan 2002-17 developed a long term vision to scale up the coverage of maternal and newborn health care at all levels of health care delivery system.
- Strengthening the technical capacity of maternal health care providers at all levels of the health care system through training. The National Safe Motherhood Training Strategy, 2002 focused on strengthening pre-service and in-service training institutions to ensure that all health providers have appropriate skills according to the national RH clinical standard 1998.

- Deploying and providing appropriate support and personnel for each level of maternity services was an identified objective. The importance of appropriate human resource as an essential component for ensuring quality maternal health services was reiterated in the Nepal Strategic Plan for Human Resources for Health 2003-2017.

The Skilled Birth Attendant (SBA) Policy addresses the gaps identified by the above national Policy and Plan documents. The SBA policy is linked to other national policies and strategies. The National Information, Education and Communication (NIEC) Strategy for Safe Motherhood developed in 2003 by the DoHS will be referred to for developing partnerships with communities, which are vital for implementation of the SBA policy. The main thrust of MoHP towards reducing maternal and neonatal mortality in Nepal is through the Safe Motherhood Programme, including Newborn Care, by improving maternal and neonatal health services at all levels of the health care delivery system and ensuring skilled care at every birth. The general objective of the policy is to reduce maternal and neonatal morbidity and mortality by ensuring availability, access and utilization of skilled care at every birth (MoHP, 2006).

2.5.4 Health Service Delivery System in Nepal

Nepal's health services delivery system operates at 4 levels: national, regional, district and community level. At the national level the health services are provided by national hospitals that are also equipped with specialized services. At the regional levels, regional hospitals provide both general and specialized health services. These hospitals however provide limited variety of specialized health services. At the district level district hospitals provide general and only a limited variety of specialized health services. The district hospitals refer most of the complicated cases either to regional or national hospitals. Safe motherhood services including delivery services (both normal and complicated cases) are provided by all hospitals at different levels.

Three types of health facilities are found at the community level: Primary Health Care Centre (PHCC), Health Post (HP) and Sub-health Post (SHP). PHCC is established at Illaka

level in each district and most of these facilities provide general health services and safe motherhood services including child delivery. It is however noted that not all PHCCs may handle complicated delivery cases mainly due to unavailability of skilled service provider or the required equipment. HP and SHPs operate at VDC levels. Either one of these three types of health facilities operate at each VDCs. These facilities do provide selected types of safe motherhood services especially ANC and PNC services. But not all HPs or SHPs have the adequate facilities to provide delivery services.

The goal of the National Safe Motherhood Program is to reduce maternal and neonatal mortality and morbidities by addressing avoidable factors that are caused by complications of pregnancy and childbirth. Global evidence shows that all pregnancies are at risk. Moreover, complications during pregnancy, delivery and the postnatal period are difficult to predict. Evidence has suggested that three delays are of critical importance to the outcomes of an obstetric emergency in Nepal's context (delay in seeking care, delay in reaching care, and delay in receiving care. To reduce the risks associated with pregnancy and childbirth and address factors associated with mortality and morbidity following three strategies has been adopted by the safe motherhood program:

- Promoting birth preparedness and complication readiness including awareness raising and improving the availability of funds, transport and blood supplies.
- Encouraging for institutional delivery.
- Expansion of 24-hour emergency obstetric care services (basic and comprehensive) at selected public health facilities in every district.

2.5.5 The Safe Motherhood Program

The safe motherhood program provides 3 types of services, ANC, delivery and PNC through the health facilities at national to community levels.

a. Antenatal Care

Antenatal care services include:

- At least four antenatal check-ups: first at 4th month, second at 6th month, third at 8th month and fourth at 9th month of pregnancy;
- Monitor blood pressure, weight and fetal heart rate;
- Provide information, education and communication (IEC) and behavior change communication (BCC) for danger signs and care during pregnancy and timely referral to the appropriate health facilities;
- Birth preparedness and complication readiness (BPCR) for both normal and obstetric emergencies (delivery by skilled birth attendants, money, transportation and blood);
- Early detection and management of complications;
- Provision of tetanus toxoid (TT) immunization, iron and de-worming tablets to all pregnant women and malaria prophylaxis where necessary.

b. Delivery Care

Delivery care services include:

- Skilled birth attendants at deliveries (either home-based or facility-based);
- Early detection of complicated cases and management or referral after providing obstetric first aid by health worker to appropriate health facility where 24 hours emergency obstetric services are available;
- Obstetric first aid at home and/or HP/SHP if complications occur, using Emergency Obstetric Care Kit (EOC kit);
- Identification and management of complications during delivery and referral to appropriate health facility as and when needed;
- Registration of births and maternal and neonatal deaths.

c. Postnatal Care

Postnatal care services include:

- Three postnatal visits: First visit within 24 hours of delivery, second visit on the third day and third visit on seventh day after delivery;

- Identification and management of mother's and newborn in complications of postnatal period and referral to appropriate health facility as and when needed;
- Promotion of exclusive breastfeeding;
- Personal hygiene and nutrition education, post-natal vitamin A and iron supplementation for the mother;
- Immunization of newborns; and
- Post-natal family planning counseling and services.

2.5.6 The Aama Program

This is a national priority programme that aims to reduce maternal and neonatal mortality and morbidity through demand and supply side incentives and free delivery care. Aama is an innovative, evidence-based financing scheme designed to mitigate the high costs of giving birth by providing free institutional delivery care and incentivizing deliveries through cash payments to women to compensate for transport (and other indirect) costs. Its main goal is to reduce maternal mortality in line with the Government of Nepal's (GoN's) National Safe Motherhood and Newborn Health - Long Term Plan 2006 - 2017. More broadly, it contributes to poverty reduction by reducing the likelihood of catastrophic expenditure. It has been envisaged that through the programme the financial burden of delivery on household finance will be reduced, especially in the poorest quintile of the population, thereby increasing service utilization. Similarly, conditional cash transfers on completion of four ANC visits are provided to women to encourage take up of this service. The Aama Programme provides funds to participating institutions and covers the following (Upreti et al., 2012):

- **Incentives to Women:** Cash payments are made to women immediately following institutional delivery. These are: NRs. 1,500 in the mountains, NRs. 1,000 in the hills and NRs. 500 in the Tarai.
- **Free Institutional Delivery Services:** Payments are made to health facilities for the provision of free care. For a normal delivery, health facilities with less than 25 beds receive NRs. 1,000; health facilities with 25 or more beds receive NRs. 1,500. For

complicated deliveries health facilities receive NRs. 3,000; for caesarean sections (CS) NRs. 7,000.

- Incentives to Health Workers for Home Deliveries: These are in the process of being phased out in order both to emphasize the importance of institutional delivery and because this incentive is difficult to implement and monitor.
- Incentive payments to health workers for home deliveries have been reduced to NRs 100 from NRs. 200.
- 4 ANC: A sum of NRs. 400 is provided to women on completion of four ANC visits in the fourth, sixth, eighth and ninth months of pregnancy.

Overall, the activities carried out and policy and strategies implemented for improvement of maternal health and promoting safe motherhood in Nepal are:

- Establishment of Safe Motherhood Sub-committee
- Establishment of Reproductive Health Steering Committee
- Establishment of Reproductive Health Coordinating Committee
- Formulation of National Reproductive Health Strategy (1998)
- Development of reproductive health (including maternal, and neonatal) clinical protocol for paramedics, nurses and medical officers
- Formulation of long term Safe Motherhood Plan (2002-2017)
- Development of Health Sector Strategy: An Agenda for Reform
- Development of Health Sector Program: Implementation Plan, 2004-2009
- Development of National Neonatal Strategy (2004)
- National Policy on Safe Abortion Care

2.6 Conceptual Framework of the Study

Maternal health is the health of women during their pregnancies, deliveries, and postpartum periods. Worldwide, it is a significant health concern, as many women give birth at least once during their lifetimes. In developing nations, complications during, pregnancy, labor and delivery, and postpartum period can be among the leading causes of death due to limited access to health care.

Health is a product of the interaction between biology, and the physical, socio-economic, cultural and political environment in which we live and act i. e, it is socially determined. Thus differences in people’s health status arise from biological differences and from differentials in socio-economic status. Social class, race and ethnicity, gender and a range of other social determinants may influence many dimensions of health, ranging from risk and vulnerability, to health seeking behavior, access to health services and long terms health and social consequences (Ravindran, ed., 2001).

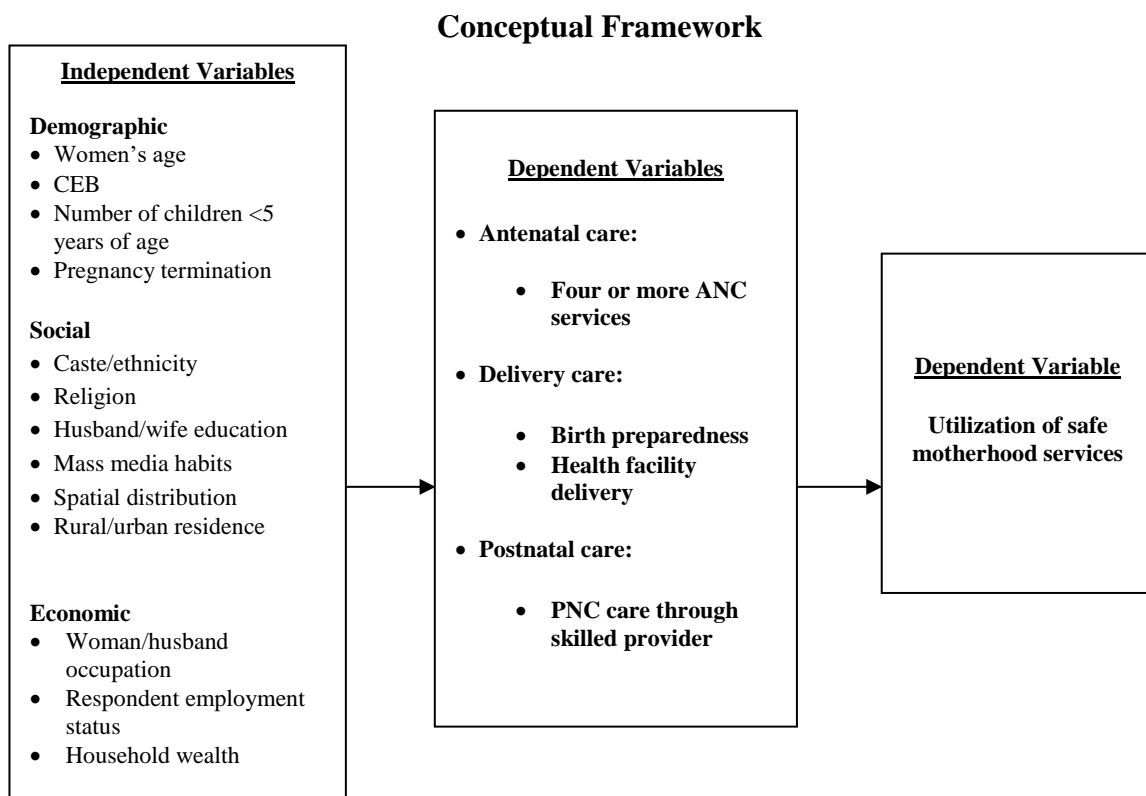


Figure 2: Conceptual Framework of the Study

It is important to consider the role of social, cultural, health system and economic factors that impact on maternal health, and ultimately maternal mortality. A women’s decision to seek health care could be affected by the influence of her partner or other family members; social norms; her education; her status in society; the distance she lives from the clinic, how sick she is; her previous experiences with the health system and how she expects be

treated by health care providers, her level of decision making power in the household, her access to credit, land and income (Lule, Ramana, Oomman, Epp, Huntington, & Rosen, 2005).

In this context therefore it is important to identify the demographic, social and economic factors that influence the decision making process of a woman in Nepal regarding whether to seek or not to seek safe motherhood services during her pregnancy through delivery and post-partum periods. This knowledge can be expected to contribute in the reduction of maternal morbidity and mortality by devising appropriate health interventions in Nepal. Based on the literature review the conceptual framework adopted for the study is presented in figure 1.

Research conducted in several developing countries shows that women who are younger, who have low parity, have pregnancy termination history and those who have attended at least 1 ANC visit are more likely to utilize safe motherhood services. Likewise, social characteristics of women such as caste/ethnicity, religion, educational attainment, place of residence and access to media has strong influence in service utilization. Similarly, economic factors like occupational and employment status, income and household wealth does also show effects on safe motherhood utilization.

This study conceptualizes that the utilization of each component of safe motherhood services depends on 3 sets of independent variables namely: demographic (age, CEB, no. of children <5 years, pregnancy termination status, at least 1 ANC visit); social (caste/ethnicity, religion, husband/wife education, mass media habits, spatial distribution, regional distribution, rural/urban residence); and economic (husband/wife education, women's employment status, household wealth). The study thus has examined the effects of these variables on the utilization of each component of safe motherhood services in Nepal (Figure 1).

2.7. Operational Definition of Dependent and Independent Variables and Measurement Indicators

2.7.1 Dependent Variables

Table 2.1 provides a list of the selected dependent variables, their DHS variable name and the name of the newly generated variable after it has been renamed and recoded from the initial DHS variable.

Table 2.1: Study variables, DHS 2011 data file codes and recoded names for data analysis

DEPENDENT VARIABLES		DHS Names	Recoded Names
Safe motherhood utilization			
1.	ANC 4 or More	m14_1	ANC4 or More
2.	Birth Preparedness	s414by_1	Preparedness
3.	Institutional Delivery	m15_1	Institutional
4.	Postnatal Care	m50_1	PNC
5.	Safe Motherhood utilization_rev	Preparedness, ANC 4 or More, Institutional delivery and PNC	SM_Utilization_rev

a) Antenatal care (ANC)

Antenatal care is a type of preventive health care with the goal of providing regular check-ups that allow doctors or midwives to treat and prevent potential health problems throughout the course of the pregnancy while promoting healthy lifestyles that benefit both mother and child. World Health Organization and the health care programs across the world including in Nepal recommends that all pregnant women should at least have a minimum of 4 ANC visits to a trained health personnel. The study thus includes all women who have made at least 4 ANC visits to trained medical personnel in their last pregnancy.

Thus, ANC = percent of women taking ANC services 4 or more times

Coding scheme:

Woman who had 4 or more ANC visits = 1

Woman who had no ANC or had less than 4 ANC visits = 0

b) Birth preparedness and complication readiness (BPCR)

Birth preparedness and complication readiness (BPCR) is one intervention that addresses three delays by encouraging pregnant women, their families, and communities to effectively plan for births and deal with emergencies, if they occur. It is a key component of globally accepted safe motherhood programs. In this study a woman is considered to have made BPCR if she has:

- Saved money for deliverya
- Arranged blood/blood donor in case it is required during or after delivery....b
- Arranged transport to the facility for delivery....c
- Identified a health institution for delivery.....d
- Arranged for safe delivery kit.....e

Thus, BPCR = Total percentage of women who made the above mentioned arrangements in their last delivery; or,

$$\text{BPCR} = a + b + c + d + e$$

Coding scheme:

Women who made all 5 preparations = 1

Women who made no preparation or made less than 5 preparations = 0

c) Institutional or health facility delivery

In this study all women who reported of delivering in a health facility or birthing centre is considered to have made institutional delivery of last pregnancy.

Thus, institutional or health facility delivery =

$$\frac{n}{N} \times 100$$

Where,

n = women who delivered in health facility

N = All women

Coding scheme:

Women who delivered at health facility = 1

Women who delivered at home or other places = 0

d) Postnatal care (PNC)

In this study all women who reported of having made postnatal checkups with a trained health personnel is considered to have done PNC care after delivery of last pregnancy.

Thus, PNC care =

$$\frac{n}{N} \times 100$$

Where,

n = women who had PNC after last delivery

N = All women

Coding scheme:

Woman who had PNC visits = 1

Woman who had no PNC visits = 0

e) Safe motherhood service utilization

In this study, a woman is considered to have ensured safe motherhood if she has: taken ANC services at least 4 or more times, made BPCR, delivered pregnancy in a health facility, and taken PNC services in last delivery.

Thus,

$$\text{Safe motherhood service utilization} = \frac{a+b+c+d}{N} \times 100$$

Where,

a = Taken ANC services at least 4 or more times

b = Made BPCR

c = Delivered pregnancy in a health facility
d = Taken PNC services
N= All women

Coding scheme:

Women who utilized all 4 components of safe motherhood = 1
Women who utilized none or less than 4 components of safe motherhood = 0

2.7.2 Independent variables

This section presents a list of the selected independent variables, their DHS variable name and the name of the newly generated variable after it has been renamed and recoded from the initial DHS variable.

a. Demographic Variables

Demographic variables used in this study are presented in Table 2.2.

Table 2.2: Demographic variables. DHS 2011 data file codes and recoded names for data analysis

DEMOGRAPHIC VARIABLES		DHS Names	Recoded Names
1.	Women's individual sample weight	v005	Weights
2.	Women's age (single year)	v012	age_singleyr
3.	Women's age (grouped year)	v013	age_grouped
4.	Children under 5 years of age	v137	child_5yrsUnder
5.	Births in the last five years	v208	Birth5years
6.	CEB	v201	CEB
7.	Age of women at first birth	v212	age_1Birth
8.	Ever had a pregnancy terminated	v228	Preg_termination

- Age of women

The study includes currently married women of reproductive age between 15 to 49 years who have given birth to a child in 5 years preceding the survey period has been included

in the analysis. The data file of NDHS 2011 provides age data by single age and also provides grouped data in 5 year age groups. The study thus has utilized age data grouped in 7 age categories with 5 years interval starting: 15-19, 20-2445-49 years.

- CEB

Children ever born (CEB) to women is the mean number of children ever born alive to women. The number of children ever born to a particular woman is a measure of her lifetime fertility experience up to the moment at which the data are collected. The NDHS 2011 data file provides data on CEB as: total CEB by women.

Coding scheme:

Pre-coded data used for women whose CEB was reported as 1, 2, 3, and 4

Recode has been applied for women who had 5 or more CEB and data generated as 5+ CEB

- No. of children < 5 years of age

Coding scheme:

Pre-coded data used for total number of living children who are less than 5 years old

- Pregnancy termination

Pregnancy termination refers to women who ever have had performed induced abortion.

Coding scheme:

Pre-coded data used for abortion/pregnancy termination:

Women ever undergone induced abortion procedure = 1

Women never undergone induced abortion procedure - 0

b. Social variables

Social variables used in this study are presented in Table 2.3.

- Caste/ethnicity

Caste/ethnicity has been regrouped into 6 categories. These are adapted from Health Management Information System (HMIS), published by DoHS/GoN. The regrouped categories are:

Brahmin/Chhetri & other castes: *Brahman (hill), Chhetri, Thakuri, Sanyasi, Brahman (Tarai), Rajput, Kayastha, Baniya, Marwadi, Jaine, Nuraang, Bengali*

Other Tarai castes: *Yadav, Teli, Kalwar, Sudhi, Sonar, Lohar, Koiri, Kurmi, Kanu, Haluwai, Hajam/Thakur, Badhe, Bahae, Rajba Kewat, Mallah, Nuniya, Kumhar, Kahar, Lodhar, Bing/Banda, Bhediyar, Mali, Kumar, Dhunia*

Dalit: *Kami, Damai, Sarkii, Gaine, Badi, Chamar, Mushar, Dhusah/Paswan, Tatma, Khatway, Bantar, Dom, Chidimar, Dhobi, Halkhor*

Newar: *Newar*

Hill & Tarai Janjati: *Thakali, Gurung, Magar, Tamang, Rai, Limbu, Sherpa, Bhote, Walung, Byansi, Hyolomo, Garrti/Bhujel, Kuumal, Sunsar, Baramu, Pahari, Yakkah, Chhantal, Jirel, Darai, Dura Majhi, Danuwar, Thami, Lepcha, Chepang, Bote, Raji, Hayu, Raute, Kusunda, Tharu, Dhanuk, Rajbansi, Tajpuriya, Gangai, Dhimarl, Meche, Kisan, Munda Santhal/Satar, Dhangad/Jhangad, Koche, Pattarkatta/Kusbadiay*

Muslim: *Muslim, Churaute*

Table 2.3: Social variables. DHS 2011 data file codes and recoded names for data analysis

A. SOCIAL		DHS Codes	Recoded Names
1.	Religion	v130	Religion- Hindu
2.	Newspaper frequency	v157	Newspaper
3.	Radio frequency	v158	Radio
4.	TV frequency	v159	TV
5.	Access to mass media	v157 v158 v159 combined	mass_media
6.	Respondents Education in single years	v133	Edu_CYSchooling
7.	Respondents Education (P_S_HS)	v106	Edu_P_S_HS
8.	Husbands education level	v701	Edu_Partner_P_S_HS
9.	Ethnicity	v131	Ethnicity
10.	Place of residence (ecological)	secoreg	Eco_Reg
11.	Place of residence (rural/urban)	v102	Rur_Urb
12.	Development region	sdevreg	Dev_Reg
13.	Eco-development region (Domain)	ssubreg	Domain

- Religion

In this study religion has been classified into 2 categories: Hindu and others.

Coding scheme:

Hindu = 1

All other religion/not specified = 0

- Husband/wife education

In this study education has been classified into 4 categories: No education, primary secondary, higher

Coding scheme:

No education: 0 = 0

Primary: grade 1 to 5 = 1

Secondary: grade 6 to 10 = 2

Higher: grade 11 and above = 3

- Mass media habits

In this study mass media habits refers to women who have or do not have the habit of reading newspapers, listening to radio, and watching TV.

Coding scheme:

women who reads newspaper at least once in a week or more; listens to radio at least once in a week or more and watches TV at least once in a week or more = 1

Women who reads newspaper less than once in a week or not at all; listens to radio less than once in a week or not at all; and watches TV less than once in a week or not at all = 0

- Rural/urban residence

Coding scheme:

Pre-coded data used for rural/urban residence

c. Economic variables

Economic variables used in this study are presented in Table 2.4.

- Husband/wife occupation

Occupation has been regrouped into 4 categories: Manual labor, agriculture, service/trade, not working

Table 2.4: Economic variables, DHS 2011 data file codes and recoded names for data analysis

Type of variable		DHS Names	Recoded Names
B. ECONOMIC		DHS Codes	Recoded Names
1.	Respondent currently employed	v714	Employ_Resp
2.	Respondent's occupation	v716	Occup_Resp
3.	Husband's occupation	v704	Occup_Partner
4.	Household wealth index	v190	Wealth_quintile
6.	PCA wealth factor scores	v191	Wealth_Status

Coding scheme:

Manual labor = 1
 Agriculture = 2
 Service/trade/industry = 3
 Not working = 4

- Wife's employment status

This study analyzed employment status on the basis of whether respondent was currently employed or not.

Coding scheme:

Currently employed = 1
 Currently not employed = 2

- Household wealth

The wealth index used in this survey is a measure that has been used in many DHS and other country level surveys to indicate inequalities in household characteristics, in the use

of health and other services, and in health outcomes. It serves as an indicator of level of wealth that is consistent with expenditure and income measures (Rutstein, & Johnson, 2004). The index was constructed using household asset data via a principal components analysis (MoHP, 2012).

In its current form, which takes better account of urban-rural differences in scores and indicators of wealth, the wealth index is created in three steps. In the first step, a subset of indicators common to urban and rural areas is used to create wealth scores for households in both areas. Categorical variables to be used are transformed into separate dichotomous (0-1) indicators. These indicators and those that are continuous are then examined using a principal components analysis to produce a common factor score for each household. In the second step, separate factor scores are produced for households in urban and rural areas using area-specific indicators. The third step combines the separate area-specific factor scores to produce a nationally applicable combined wealth index by adjusting area-specific scores through a regression on the common factor scores. This three-step procedure permits greater adaptability of the wealth index in both urban and rural areas. The resulting combined wealth index has a mean of zero and a standard deviation of one. Once the index is computed, national-level wealth quintiles (from lowest to highest) are obtained by assigning the household score to each *de jure* household member, ranking each person in the population by his or her score, and then dividing the ranking into five equal categories, each comprising 20 percent of the population (MoHP, 2012).

NDHS 2011 has provided pre-coded data for 5 five categories of wealth quintiles: Richest, rich, middle, poor, and poorest. In the study these 5 categories were regrouped using raw data file into 3 categories: rich, middle, and poor.

Coding scheme:

Rich = (richest + rich) 1

Middle = (middle) 2

Poor = (poor + poorest) 3

Chapter 3

METHODOLOGY

This chapter presents details of the research methodology adopted for the study. The chapter first discusses the ‘research paradigm’ of the study. Then the following sections present details of methodology that includes sources of data with details on study area, sample size and design, sampling procedure and data collection method and tools. The chapter then presents the information related to study variables, both dependent and independent and analytical procedures adopted in the study.

3.1 Research paradigm

A paradigm is “a set of beliefs, values and techniques which is shared by members of a scientific community, and which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them” (Kuhn, 1970). A research paradigm consists of the relationship between: ontology, epistemology, methodology and methods. People have different views/philosophies regarding how they view and address problems. For example positivists believe that there is a single reality, which can be measured and known, and therefore they are more likely to use quantitative methods to measure and this reality. Constructivists believe that there is no single reality or truth, and therefore reality needs to be interpreted, and therefore they are more likely to use qualitative methods to get those multiple realities. Pragmatists believe that reality is constantly renegotiated, debated, interpreted, and therefore the best method to use is the one that solves the problem.

Ontology and epistemology create a holistic view of how knowledge is viewed and people can see themselves in relation to this knowledge, and the methodological strategies that is used to un/discover it. Awareness of philosophical assumptions will increase quality of research and can contribute to the creativity of the researcher.

The paradigm of this research is summarized in Figure 1.

Research Paradigm

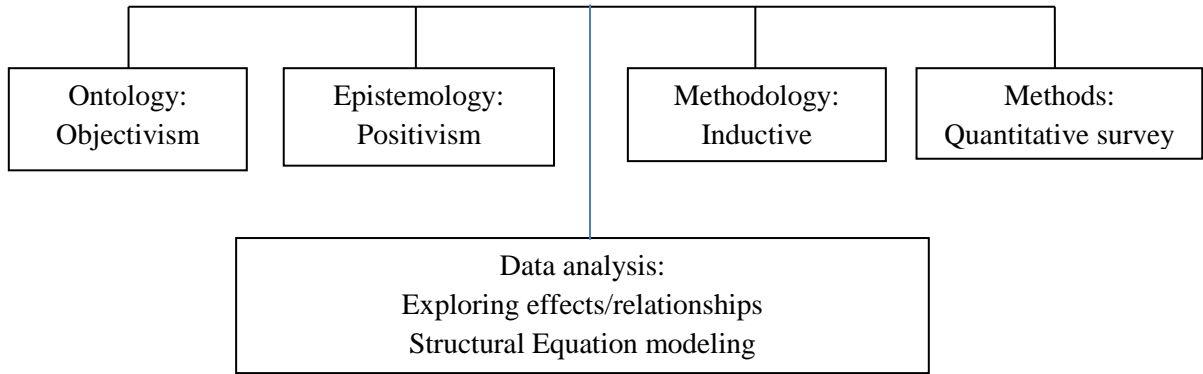


Figure 1: Paradigm of the study

In the following paragraphs each of these components is explained in the context of the effects of safe motherhood services utilization by women in Nepal.

Ontology

Ontology is the study of being. Ontological assumptions are concerned with what constitutes reality, in other words *what is*. Researchers need to take a position regarding their perceptions of how things really are and how things really work (Crotty, 1998).

It is scientifically proven that women in their pregnancy, delivery and post-partum periods need to take special care of their health in order to prevent complications and possible death of both themselves and the fetus. In order to insure safe motherhood for every woman WHO recommends every women to undertake certain precautionary measures from pregnancy through delivery and postpartum periods so that maternal complication that may lead to maternal morbidity and mortality could be prevented. There are 4 precautionary measures recommended by WHO for every pregnant woman especially those from developing countries to ensure safe motherhood: i) take antenatal care (ANC) at least four times during pregnancy, ii) make necessary preparations for delivery (arrange for money, blood, transport, identify institution or a place for safe delivery, arrange to have safe delivery kit), iii) deliver in a health institution or ensure to have delivery by a skilled birth

attendant (SBA), and iv) go for postnatal checkups (PNC). The safe motherhood policy and programs of Nepal government also follows the WHO guideline. Thus every woman who follows this recommendation will insure safe motherhood for each pregnancy.

Women's behavior towards adopting these guidelines are objective behavior and can be measured in terms of number of ANC visits they made during pregnancy, types of preparations they made, place where they delivered pregnancy and whether they did go for PNC checkup. Explorations of these facts do not need any description and different researchers can get same findings/results, and the perception of researchers does not affect the reality as it is. This study does not aim to explore meaning of safe motherhood services to women's life, life experience of women with safe motherhood services, or their changing behavior through collection of perceptual information. Instead, this study assumes that factors that determine women's behavior towards utilization of safe motherhood services can be measured in objective way through statistical procedure.

This study aims to explore a number of demographic, social and economic variables which are independent (and objective in nature) that influences a woman's behavior towards whether she follows each of the four precautionary measures for safe motherhood or not. The independent variables are: i) demographic (age, CEB, number of children <5 years of age, pregnancy termination) ii) Social (caste/ethnicity, religion, husband/wife education, mass media habits, spatial distribution, rural/urban residence) and, iii) economic (husband/wife occupation, woman's employment status, household wealth).

Epistemology

Epistemology is concerned with the "process of knowledge", nature and forms of knowledge (Cohen et al., 2007). Thus it is concerned with how we come about the process of knowledge or how we come to know the reality. In the context of utilization of safe motherhood services in Nepal various surveys conducted in recent years (NDHS 2006 and 2011, NMICS 2014) have shown that not all women in Nepal do take the recommended services during their pregnancy through delivery and postpartum period in order to ensure safe motherhood. The findings of these surveys indicate that so far only about half of the pregnant woman take ANC services at least 4 times, less than half of these women do not

make recommended preparations for delivery, only about 4 in every 10 women deliver at a health facility and small percentage of these women visit a hospital or a health clinic for PNC services. The surveys also indicate various factors that have contributed to low utilization of these services. The prevailing high maternal mortality in Nepal is mainly attributed to non-utilization or partial utilization of the recommended safe motherhood services by women in Nepal. It is thus imperative to scientifically search for the answers as to why Nepali women behave as they do in the context of ensuring safe motherhood. We believe that a law-like regularity exists between safe motherhood practices and its constituents (determinants). Such regularities are tried to explore through testing of a number of hypotheses derived from existing theoretical and empirical studies. In this sense, this study is theory-testing, which is inherent feature of positivist epistemology. Since the study assumes objective reality the epistemological position is Positivist.

Methodology

A positivist research demands deductive methodology (Lindsay, 2010). Therefore, this study, as noted above, is conducted with deductive methodology with the primary aim of testing hypotheses. Hypotheses are formulated based on existing theories and conclusions of empirical studies. The hypotheses testing procedure is devoted to estimating effect of each independent variables on safe motherhood practices of women, and confirmation/refutation of the hypotheses with standard statistical procedure called logistic regression. Then, conclusions are drawn about the applicability of the existing theories of safe motherhood behavior of women in Nepal.

Methods

Deductive methods demands use of quantitative technique and therefore this study is conducted with quantitative method. Data is collected through large scale nationwide survey with structured questionnaire. Data analysis technique applied in the study is statistical methods.

Since the ontological position of this study is objectivism and the epistemological position is based on positivism the study aims to instrumentally predict or describe reality based on quantitative data gathered through a survey and measurements.

Axiology

As the study is quantitative where the researcher is independent from what is being studied, it is believed that there should be no question about axiology in the study.

3.2 Source of data

The study has utilized secondary source of data from Nepal Demographic and Health Survey 2011. This is a nationally representative survey and it was carried out using systematic sampling with probability proportional to size (PPS). Apart from these surveys reference materials for the study have been collected from a variety of sources including Nepal government policy documents, publications of UN and other bilateral and multi-lateral agencies and research papers published in various national and international journals.

3.2.1 Sampling frame of NDHS 2011

The primary focus of the 2011 NDHS was to provide estimates of key population and health indicators, including fertility and mortality rates for the country as a whole and for urban and rural areas separately. In addition, the sample was designed to provide estimates of most key variables for the 13 eco-development regions. Nepal is divided into 75 districts, which are further divided into smaller VDCs and municipalities. The VDCs and municipalities, in turn, are further divided into wards. The larger wards in the urban areas are divided into sub-wards. An enumeration area (EA) is defined as a ward in rural areas and a sub-ward in urban areas. Each EA is classified as urban or rural. The 2011 NDHS used the list of EAs with population and household information developed by the Central Bureau of Statistics for the 2001 Population Census. The long gap between the 2001 census and the fielding of the 2011 NDHS necessitated an updating of the 2001 sampling frame to take into account not only population growth but also the mass internal and external migration due to the 10-year political conflict in the country. To obtain an updated list, a partial updating of the 2001 census frame was carried out by conducting a quick count of dwelling units in EAs five times more than the sample required for each of the 13 domains.

The results of the quick count survey served as the actual frame for the 2011 NDHS sample design.

The country is broadly divided into three horizontal ecological zones, namely mountain, hill, and Tarai. Vertically, the country is divided into five development regions. The cross section of these zones and regions results in 15 eco-development regions, which are referred to in the 2011 NDHS as sub regions or domains. Due to the small population size in the mountain region, the Western, Mid-western, and Far-western mountain regions are combined into one domain, yielding a total of 13 domains. In order to provide an adequate sample to calculate most of the key indicators at an acceptable level of precision, each domain had a minimum of about 600 households.

Stratification was achieved by separating each of the 13 domains into urban and rural areas. The 2011 NDHS used the same urban-rural stratification as in the 2001 census frame. In total, 25 sampling strata were created.

3.2.2 Sample Selection

Samples were selected independently in each stratum through a two-stage selection process. In the first stage, EAs were selected using a probability-proportional-to-size strategy. In order to achieve the target sample size in each domain, the ratio of urban EAs to rural EAs in each domain was roughly 1 to 2, resulting in 95 urban and 194 rural EAs (a total of 289 EAs).

Complete household listing and mapping was carried out in all selected EAs (clusters). In the second stage, 35 households in each urban EA and 40 households in each rural EA were randomly selected. Due to the non-proportional allocation of the sample to the different domains and to oversampling of urban areas in each domain, sampling weights are required for any analysis using the 2011 NDHS data to ensure the actual representativeness of the sample at the national level as well as at the domain levels. Since the 2011 NDHS sample is a two-stage stratified cluster sample, sampling weights were calculated based on

sampling probabilities separately for each sampling stage, taking into account non proportionality in the allocation process for domains and urban-rural strata.

3.2.3 Sample size

In 2011 NDHS, a household is defined as a person or group of related and unrelated persons who usually live together in the same dwelling unit(s) or in connected premises, who acknowledge one adult member as the head of the household, and who have common cooking and eating arrangements. Information was collected from all usual residents of a selected household (*de jure* population) as well as persons who had stayed in the selected household the night before the interview (*de facto* population). The total household included in the survey was 10,826 with 9,280 from rural areas and 1,546 from urban areas. From these households a total of 12,674 women and 4,121 men were included as respondents in the survey.

As the current study aims to analyze safe motherhood service seeking behavior and practices of women in Nepal the study does not include all the samples included in the NDHS 2011. Rather this study includes only the currently married women aged 15 to 49 years who have given birth to a child within the last 5 years preceding the survey date. Thus the sample size of this study is a total of 4079 married women of reproductive age who have given birth to a child within the last 5 years preceding the survey date. After applying the sampling weights the total sample population is derived at 4148 married women of reproductive age.

3.2.4 Sampling weights

Sampling weights are adjustment factors applied to adjust for differences in the probability of selection and interview between cases in a sample, either due to design or happen stance. In the 2011 NDHS the sample is selected with unequal probability to expand the number of cases available (and hence reduce sampling variability) for certain areas or subgroups for which statistics are needed. Thus two main sampling weights were used in the 2011

NDHS: household weights and individual weights. The household weight for a particular household is the inverse of its household selection probability multiplied by the inverse of the household response rate of its household response rate group. The individual weight of a respondent's case is the household weight multiplied by the inverse of the individual response rate of their individual response rate group.

3.2.5 Data collection method and tools

In NDHS 2011, 3 sets of questionnaire were utilized to collect the data. At the household level all the information was collected through household questionnaire. At the individual level one set of questionnaire was utilized to collect information from married women aged 15 to 49 years and another set was utilized to collect information from men aged 15 to 49 years.

3.2.6 Response rates

In 2011 NDHS a total of 11,353 households were selected, out of which 10,888 were found to be occupied during data collection. Interviews were completed for 10,826 of these existing households, yielding a response rate of 99 percent. In the selected households, 12,918 women were identified as eligible for the individual interview. Interviews were completed for 12,674 women, resulting in a response rate of 98 percent. Of the 4,323 eligible men identified in the selected subsample of households, 4,121 were successfully interviewed, yielding a 95 percent response rate. Response rates were higher in rural than urban areas, especially for eligible men.

3.3 Study methods

As indicated above the objective of the study is to analyze the effects of demographic, social and economic factors on the utilization of safe motherhood services in Nepal. Thus the data utilized in this study belongs to a total sample of 4,079 currently married women between the ages of 15 to 49 years who had given birth to a child in the last 5 years

preceding the survey date. After applying weightage the sample size is derived at 4,148 women.

3.3.1 Study variables

The study has defined two sets of variables which are respectively categorized as dependent and independent. Once a woman is pregnant she is recommended to follow certain health checkups and other procedures through her pregnancy, delivery and postpartum period (up to 42 days after delivery). If she utilizes all the recommended procedures including health checkups then it will ensure a safe motherhood status for her and the new born. These procedures are regarded as dependent variables. Whether a woman follows all the recommended procedures and ensures safe motherhood practices depends on a number of demographic, social and economic variables concerning the woman and her family members, especially her husband. These variables influence the safe motherhood behavior and practices of an individual woman. Thus these variables are regarded as independent variables in the study. The details of each category of variables are described below:

Dependent variables

- i. **Utilization of ANC** services 4 or more times from pregnancy conception to the time of delivery
- ii. **Preparation for delivery** by the pregnant woman or the family by arranging of money, transport, blood (or identification of blood donor), identification of a health facility for delivery, and arranged for or bought a safe delivery kit.
- iii. **Health institution or facility** delivery
- iv. **Postnatal services** from a skilled health worker after delivery
- v. **Safe motherhood:** Takes all the recommended health checkups and procedures that ensure safe motherhood. In other words a woman could said to have gained safe motherhood status if she takes at least 4 ANC services, makes birth preparations, delivers at a health institution, and takes PNC services.

Independent variables

The independent variables in the study have been grouped into following 3 categories:

i. Demographic variables

- Woman's current age
- Woman's age at 1st birth
- Children ever born
- Number of children <5 years of age
- Pregnancy termination (induced abortion)

ii. Social variables

- Caste/ethnicity
- Religion
- Woman's education
- Husband's education
- Mass media habits
- Spatial distribution
- Regional distribution
- Rural/urban residence

iii. Economic variables

- Woman's occupation
- Husband's occupation
- Woman's employment status
- Household wealth

3.3.2 Wealth index

Wealth is the value of all natural, physical and financial assets owned by a household, reduced by its liabilities. It is a composite measure of a household's cumulative living standard composed of key asset ownership variables; it is used as a proxy indicator of household level wealth. Usually these indicators are grouped in four categories: productive assets (farm equipment, livestock), non-productive assets (radio, TV, vehicles), households amenities (toilets, floor-wall-roof materials), and other assets (Persons per sleeping room, number of rooms, land ownership). The wealth index varies from country to country based

on the choice of the variables to include. To create the Wealth index the Principal Component Analysis (PCA) is used (WFP, no date).

For tabular analysis with the DHS wealth index, quintiles are used. These quintiles are based on the distribution of the household population rather than on the distribution of households. The distribution is population based because it is thought that most analysis is concerned with poor people rather than poor households (Oscar & Johnson. 2004).

It is common in DHS analysis to find wealth index presented in 5 groups: Lowest, second, middle, fourth, highest. Lowest group represents the poorest quintile while the highest represents richest quintile. In this study however the wealth quintiles have been re-grouped into three categories: rich, middle and poor groups by combining lowest and second into 1st group, middle into 2nd group and fourth and highest into 3rd group representing poorest, middle and richest group. The regrouping was done by using NDHS 2011 data file.

3.4 Data analysis

Data utilized in this study has been analyzed using NDHS data files. The dependent and independent variables have been re-categorized to make a meaningful analysis. Data has been analyzed by using STATA v. 12 and SPSS v. 20. As a first step data has been analyzed on the basis of frequency and cross tabulations. The frequency tables and cross tabulations have been used to analyze the background characteristics of women and utilization of different components of safe motherhood services by them. The cross tabulations has been done on the basis of dependent and independent variables of the study. The main purpose of the cross tabulated data is to analyze the demographic, social and economic differentials in utilization of safe motherhood services in Nepal. In the second step, binary logistic regression has been done to analyze the effects of each independent variable on the utilization of safe motherhood services by married women of reproductive age in Nepal.

3.4.1 Logistic regression analysis

Bivariate logistic regression is a form of regression which is used when the dependent is a dichotomy and the independents are of any type. The central mathematical concept that

underlies logistic regression is the logit - the natural logarithm of an odds Ratio. Generally, logistic regression is well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables. In the simplest case of linear regression for one continuous predictor X and one dichotomous outcome variable Y the plot of such data results in two parallel lines, each corresponding to a value of the dichotomous outcome.

In essence, the logistic model predicts the logit of Y from X . As stated earlier, the logit is the natural logarithm (\ln) of odds of Y , and odds are ratios of probabilities (π) of Y happening (i.e., a student is recommended for remedial reading instruction) to probabilities ($1 - \pi$) of Y not happening (Chao-Ying and Peng and Lee and Ingersoll, 2002). The study will use bivariate logistic model to test study hypotheses.

The bivariate logistic model has the form:

$$\text{logit}[\theta(x)] = \log \left[\frac{\theta(x)}{1 - \theta(x)} \right] = \alpha + \beta_i x_i$$

Where, $\text{logit}[\theta(x)] = \text{logit of dependent variable}$;

α = Constant of the equation; and

β = Coefficient of the predictor/independent variables

x_1, x_2, \dots, x_n = Independent/predictor variables

The value of the coefficient β determines the direction of the relationship between X and the logit of Y . When β is greater than zero, larger (or smaller) X values are associated with larger (or smaller) logits of Y . Conversely, if β is less than zero, larger (or smaller) X values are associated with smaller (or larger) logits of Y . Within the framework of inferential statistics, the null hypothesis states that β equals zero, or there is no linear relationship in the population. Rejecting such a null hypothesis implies that a linear relationship exists between X and the logit of Y . If a predictor is binary, as in the Table 1 example, then the odds ratio is equal to e , the natural logarithm base, raised to the exponent of the slope β ($e\beta$).

Logistic regression can be used to predict a categorical dependent variable on the basis of continuous and/or categorical independents and to determine the effect size of the independent variables on the dependent. The impact of predictor variables is usually explained in terms of odds ratios. Logistic regression applies maximum likelihood estimation after transforming the dependent into a logit variable. A logit is the natural log of the odds of the dependent equaling a certain value or not (usually 1 in binary logistic models, the highest value in multinomial models). In this way, logistic regression estimates the odds of a certain event (value) occurring (Czepiel, no date).

In this study the binary logistic regression has been used to predict the likelihood of utilization of different components of safe motherhood services. The study has identified a number of independent variables that are grouped under 3 categories: demographic, social and economic variables. Likewise a total of 4 components of safe motherhood are identified as dependent variables. In addition the study has also included one more variable namely, full utilization of safe motherhood services. This variable includes the women who have taken all 4 components of safe motherhood in their last pregnancy. In this way the study attempts to analyze the effects of demographic, social and economic variables on the utilization of full safe motherhood services by married women of reproductive age in Nepal. Moreover, after generating and analyzing the regression results the study has also utilized stepwise logistic regression method to further analyze relative importance of the selected variables.

Chapter 4

BACKGROUND CHARACTERISTICS OF WOMEN

This chapter presents background characteristics of women aged 15-49 years who had live birth five years preceding 2011 NDHS survey date. The chapter begins with a brief description of Nepal's population characteristics. This is followed by presentation of description of age, marital status, caste, ethnicity and religion, urban and rural residence, and ecological distribution of women respondents. Similarly, the chapter presents demographic, social and economic characteristics of women. The chapter also includes media habits of the respondents in terms of listening to radio, watching TV and reading newspaper and magazines.

4.1 Population and social characteristics of Nepal

Nepal is a land-locked country nestled in the foothills of the Himalayas. It occupies an area from 26° 22' to 30° 27' north latitudes and 80° 4' to 88 ° 12' east longitudes with elevation ranging from 90 meters to 8,848 meters. The country is sandwiched between the two most populous countries of the world, India to the east, south, and west and China to the north. Nepal is rectangular in shape and stretches 885 kilometers in length (east to west) and 193 kilometers in width (north to south). The total land area of the country is 147,181 square kilometers.

Topographically, Nepal is divided into three distinct ecological zones: Mountain, Hill, and the Tarai (or plains). The Mountain region, accounts for 35 percent of the total land area, ranges in altitude from 4,877 meters to 8,848 meters above sea level and covers a land area of 51,817 square kilometers. Hill ecological region ranges in altitude from 610 meters to 4,876 meters above sea level covers an area of 61,345 square kilometers and occupies 42 percent of the total area. This zone includes the Kathmandu Valley, the country's most fertile and urbanized area. Unlike the Mountain and Hill, the Tarai zone in the southern part of the country can be regarded as an extension of the relatively flat Gangetic plains of

alluvial soil. The Tarai consists of dense forest area, national parks, wildlife reserves, and conservation areas. This zone covers 34,019 square kilometers and is the most fertile part of the country. Tarai zone constitutes only 23 percent of the total land area in Nepal (CBS, 2012),

According to the 2011 Census, the population of Nepal is about 26.5 million. The country's population was growing at the rate of 1.35 percent per year between the periods 2001-2011. Of the total population, 52 percent are females and 48 percent males with a sex ratio of 94.2 in 2011 which indicate lower number of male per 100 females in the country. The population is found unevenly distributed across the three ecological zones. Among the zones, only 6.7 percent of the total population lives in Mountains because of the harsh terrain and limited transport and communication facilities in this zone. About 43 percent of the total population lives in the Hill zone and slightly more than half of the population (50.3%) live in the Tarai zone (CBS, 2012). By rural urban residence, only about 17 percent of the population is residing in urban areas while the great majority of population (83%) resides in rural areas.

By religion majorities of Nepali population (81.4%) are Hindu. Nine percent are Buddhist and about 4 percent and another 3 percent respectively are Muslim and Kirant. Slightly more than 1 percent (1.4%) of the population is Christian. The 2001 census listed 103 diverse ethnic/caste groups, each with its own distinct language and culture (Central Bureau of Statistics, 2003). The major groups are as follows: Chhetri, Brahmins, Magar, Tharu, Tamang, and Newar. The 2001 census also identified about 92 mother tongues. Most of these languages originated from two major groups: the Indo-Europeans, who constitute about 79 percent of the population, and the Sino-Tibetans, who constitute about 18 percent of the population. Nepali is the official language of the country and is the mother tongue of about half of the population. However, it is used and understood by most people in the country. The other two major languages are Maithili and Bhojpuri, spoken by about 12 percent and 8 percent of the population respectively (MoHP, 2012).

4.2 Demographic characteristics of respondents

4.2.1 Current age and age at marriage

A total sample of 4079 women of reproductive age who had a live birth in the last five years preceding the survey date were included in 2011 Nepal Demographic and Health Survey (NDHS). The age distribution of the women shows that 8 percent of the respondents were in 15-19 age groups. The highest proportions (80%) of women were concentrated within the ages of 20 to 34 years. Nearly 8 percent respondents are in 35-39 age group. Less than 5 percent of the respondents were in the age group of 40-44 and 45-49 age groups (Table 4.1).

Description	Number	Percent
Age Group		
15-19	333	8.0
20-24	1329	32.0
25-29	1310	31.6
30-34	670	16.1
35-39	317	7.6
40-44	140	3.4
45-49	50	1.2
Total	4148	100.0
Source: Calculated from NDHS 2011 data file Weights are applied		

The NDHS 2011 results shows that Marriage occurs relatively early in Nepal; among women age 45-49, nearly 59 percent were married by age 18, and about 77 percent were married by age 20. The proportion of women married by age 15 declines from 24 percent among those currently aged 45-49 to 5 percent among those currently aged 15-19 years. The median age at marriage is also rising – from 16.1 years for women currently aged 45-49 years to median age at marriage of 16.8 years for women currently aged 20-24 years. This is a clear evidence of rising age at first marriage of women in Nepal (Table 4.2).

Current Age	Exact age at marriage					Number of respondents	Median age at marriage
	15	18	20	22	25		
15-19	5.0	na	na	na	na	2,753	na
20-24	10.1	40.7	59.8	na	na	2,297	16.8
25-29	15.3	50.9	69.2	80.4	89.7	2,101	16.9
30-34	16.6	55.1	73.5	84.7	93.0	1,734	16.7
35-39	18.7	56.5	74.4	86.4	95.4	1,557	16.6
40-44	19.5	59.4	78.1	87.4	95.5	1,285	16.4
45-49	23.5	58.7	76.7	87.2	95.0	947	16.1

Source: MOHP, 2012
na: not applicable

4.2.2 Pregnancy and child bearing

Child bearing in Nepal starts at very early age. In 2011 NDHS, over half of the respondents reported their ages between 10-14 years when they delivered their first child. Similarly, nearly 40 percent respondent had their first child when they were in 15-19 year age group. In this way about 90 percent of women had their first child in their teens. About 10 percent respondents had their first child at the age of 20 years or above (Table 4.3).

Description	Number	Percent
Age at First Birth		
10-14	2126	51.2
15-19	1645	39.6
20-24	264	6.4
25-29	48	1.2
30+	66	1.6
Children Ever Born		
1	1302	31.4
2	1161	28.0
3	733	17.7
4	397	9.6
5+	555	13.3
Total	4148	100.0

Source: Calculated from NDHS 2011 data file
Totals may not add up to 100.0 due to rounding off of cases

The NDHS 2011 shows that nearly 6 in 10 women in Nepal had 1 to 2 children ever born to them. About 18 percent respondents had 3 CEB and another 10 percent respondents had 4 CEB. About 13 percent had 5 or more CEB (Table 4.3).

Data further shows that 6 percent of the respondents had no child less than 5 years of age. Over half of the respondents (52.6%) had only one child less than 5 years old and nearly one-third (32.2%) of the respondents had 2 children who were less than 5 years of age. Similarly, 7 percent respondents had 3 children and about 2 percent respondents had 4 or more children who were less than 5 years of age. The 2011 NDHS results further shows that about 2 in every 5 respondents had a history of pregnancy termination (induced abortion) in the past years (Table 4.4).

Table 4.4: Distribution of respondents by children under 5 years and pregnancy termination history, 2011		
Description	Number	Percent
Children < 5 Years of Age		
None	247	6.0
1	2181	52.6
2	1335	32.2
3	299	7.2
4+	86	2.1
Pregnancy Termination		
Had pregnancy terminated	796	19.2
No pregnancy termination	3352	80.8
Total	4148	100.0
Source: Calculated from NDHS 2011 data file		
Totals may not add up to 100.0 due to rounding off of cases		

4.3 Social characteristics

4.3.1 Spatial Distribution and Rural Urban Residence

In Nepal majority of the population live in Tarai and Hill regions. Small percentages of population live in the Mountain region. The same trend is observed in the representation of respondents in the NDHS as well. In 2011 NDHS about 41 percent of respondents were from Tarai region and nearly the same percentage (40.6%) were from the Hills. About 18 percent respondents were represented from Mountain region (Table 4.5).

Similarly by development region almost one-quarter (24.1%) and nearly one-third (31.2%) of respondents respectively were from eastern and central development regions. About one-fifth (20.9%) were from Central regions. Likewise, 20 percent of respondents were from western region. The lowest percentages of women were from Western (14.4%) and far-western (10.6%) development regions. By eco-development sub-region, the highest percentages of respondents were from Central (19.7%) and Eastern (14.2%) Tarai. The percentage of respondents from Western Hill (11.8%) was also relatively high (Table 4.5).

Table 4.5: Spatial, regional, and rural – urban distribution of respondents, 2011		
Description	Number	Percent
Ecological Regions		
Mountain	306	7.4
Hill	1669	40.2
Tarai	2174	52.4
Development Regions		
Eastern	999	24.1
Central	1293	31.2
Western	818	19.7
Mid-west	598	14.4
Far-west	440	10.6
Eco-development Sub-regions		
Eastern Mountain	78	1.9
Central Mountain	73	1.8
Western Mountain	154	3.7
Eastern Hill	332	8.0
Central Hill	403	9.7
Western Hill	488	11.8
Mid-western Hill	275	6.6
Far-western Hill	171	4.1
Eastern Tarai	589	14.2
Central Tarai	817	19.7
Western Tarai	329	7.9
Mid-western Tarai	238	5.7
Far-western Tarai	200	4.8
Rural and Urban Residence		
Rural	3730	89.9
Urban	418	10.1
Total	4148	100.0
Source: Calculated from NDHS 2011 data file		
Totals may not add up to 100.0 due to rounding off of cases		

Nepal is predominantly a rural country in that according to most recent population and housing census great majority of total population (83%) in Nepal was residing in rural areas in 2011. Only 17 percent of the population was designated as urban dwellers in 2011

census. Following this trend 22 percent of women were represented from urban areas while great majorities (78%) were from rural areas in NDHS 2011 (Table 4.5).

4.3.2 Religion and caste/ethnicity

By religion great majority of Nepal's population have remained the followers of Hindu religion. Over 80 percent of Nepal's population was enumerated as followers of Hindu religion in 2011 census. Great majority of women (85.3%) in NDHS 2011 represented this religious group. Among the rest, less than 10 percent of the women (8.2%) were followers of Buddhist religion. Nearly 7 percent of women belonged to Muslim, Christian and other religious groups (Table 4.6).

Table 4.6: Distribution of respondents by religion and caste/ethnicity, 2011		
Description	Number	Percent
Religion		
Hindu	3444	83.0
Buddhist	360	8.7
Muslim	235	5.7
Kirant	58	1.4
Christian	51	1.2
Caste/ethnicity		
Hill and Tarai Janajati	1396	33.6
Brahmin/Chhetri and other caste groups	1283	30.9
Dalit	683	16.5
Other Tarai Caste	414	10.0
Muslim	236	5.7
Newar	127	3.1
Total	4148	100.0
Source: Calculated from NDHS 2011 data files		
Note: 10 weighted cases are missing		
Totals may not add up to 100.0 due to rounding off of cases		
*List of caste/ethnic groupings is attached as Annex 1		

Nepal is well known for its caste/ethnic and cultural diversity. In 2001 census for example a total of 103 ethnic groups were recorded in Nepal. For the purpose of this study all the caste/ethnic groups represented in NDHS 2011 have been re-classified into 6 broad categories. Thus the re-classified distribution of caste/ethnicity shows that the highest percentages of respondents (33.6%) were from Hill and Tarai Janjati followed by

Brahmin/Chhetri and other caste groups (30.9%). Among the rest about 17 percent and another 10 percent respectively were Dalit and other Tarai caste/groups. Less than 10 percent respondents were from Muslim (5.7%) and Newar (3.1%) caste/ethnic groups (Table 4.6).

4.3.3 Education and media habits

A high percentage of respondents (43.9%) had no formal education. The highest percentage (29.6%) of respondents who had attended formal education had completed secondary level and another 20 percent had attained primary level of education. Only about 6 percent of the respondents had attained higher secondary and/or university level education (Table 4.7).

The overall results of NDHS 2011 shows that majority of respondents (74%) do not read newspaper at all. This is more likely scenario since only 57 percent women were recorded as literate in 2011. So, most respondents could not be expected to read newspapers even if they have access to this media channel. Similarly, nearly 1 in 5 respondents (18.7%) read newspapers less than once in a week. Only 7 percent respondents read newspapers at least once in a week. The data further shows that more respondents use radio more frequently than newspaper. Overall, about 37 percent and another 39 percent respondents respectively listen to radio at least once in a week and less than once in a week. About one-quarter of the respondents (24%) reported that they do not use radio at all (Table 4.7).

TV appears to be the preferred media among the respondents as more than one-third (37.6%) reported that they watch TV at least once in a week. Similarly, about 28 percent watch TV less than once in a week. Slightly over one-third (34.8%) of the respondents however reported that they do not watch TV at all. Overall, a very low percentage of respondents (3.9%) reported of utilizing all three mass media channels at least once in a week or less than once in a week (Table 4.7).

Table 4.7: Distribution of respondents by educational attainment and mass media habits, 2011		
Description	Number	Percent
Respondent Education		
Higher	263	6.3
Secondary	1229	29.6
Primary	835	20.1
No education	1822	43.9
Media Habits		
Newspaper		
At least once a week	300	7.2
Less than once a week	777	18.7
Not at all	3071	74.0
Total	4148	100.0
Radio		
At least once a week	1535	37.0
Less than once a week	1617	39.0
Not at all	997	24.0
Television		
At least once a week	1561	37.6
Less than once a week	1145	27.6
Not at all	1443	34.8
Mass Media Habits		
Yes	162	3.9
No	3987	96.1
Total	4149	100.0
Source: Calculated from NDHS 2011 data file		
Totals may not add up to 100.0 due to rounding off of cases		

4.4 Economic Characteristics

The occupational status of the respondents is presented in Table 4.8. The overall results shows that over one-half of the respondents (58.2%) who reported as currently working in NDHS 2011 period reported agriculture as their main occupation. About 10 percent of respondents had reported their occupation in service/trade sector and less than 5 percent reported their occupation in manual labor sector. About 28 percent reported themselves as not working hence occupation was not specified for them. The data further shows that over one-half of the respondents (56.1%) reported that they were currently employed at the time of the survey (Table 4.8).

Table 4.8: Distribution of respondents by occupation and employment status, 2011		
Description	Number	Percent
Occupation		
Agriculture	2416	58.2
Service/trade	399	9.6
Manual	182	4.4
Not working	1150	27.7
Employment Status		
Employed	2329	56.1
Not employed	1820	43.9
Total	4148	100.0
Source: Calculated from NDHS 2011 data files		
Note: 3 weighted cases are missing		
Totals may not add up to 100.0 due to rounding off of cases		

Worldwide, it is customary to find presentation of household level wealth status data in five categories in Demographic and Health Surveys. The same 5 categories of household index have been presented in this chapter as well. The overall information shows that about one-third of the respondents (15.7% richest and 18% richer) fall in rich category in terms of their household wealth. Similarly, about one-fifth of respondents (21%) fall into middle category. Nearly one-half of the respondents (45.3%) fall in poor category (poorest 23.6% and poorer 21.7%) (Table 4.).

Table 4.9: Distribution of respondents by household wealth status, 2011		
Description	Number	Percent
Wealth quintiles		
Richest	649	15.7
Richer	748	18.0
Middle	873	21.0
Poorest	979	23.6
Poorer	899	21.7
Total	4148	100.0
Source: Calculated from NDHS 2011 data files		
Totals may not add up to 100.0 due to rounding off of cases		
Weights are applied		

4.5 Safe motherhood characteristics

In normal pregnancy WHO recommends that every woman must take ANC services at least 4 times immediately after conception to the time of delivery. In Nepal, slightly over

one-half (52.7%) of the respondents had utilized at least 4 ANC in their last pregnancy. The rest of the 47 percent either took ANC services less than 4 times or did not take at all. It is regarded that ANC visits to a health facility or a health worker is the entry point for a pregnant woman for birth preparations. In 2011 only 39% respondents reported of making some kind of preparations for in their pregnancy. The percentage of women making birth preparations is less than the women who had taken at least 4 ANC services (Table 4.10).

Table 4.10: Distribution of respondents by utilization of components of safe motherhood services		
Description	Number	Percent
Four or more ANC visits		
Yes	2078	52.7
No	2071	47.3
Birth preparedness		
Yes	1621	39.1
No	2526	60.9
Institutional delivery*		
Yes	1598	39.2
No	2480	60.8
Total		
PNC services		
Yes	1790	43.2
No	2358	56.8
Utilization of safe motherhood services		
Yes	682	16.4
No	3468	83.6
Total	4148	100.0
Source: Calculated from NDHS 2011 data files		
Note: *70 weighted cases are missing		
Totals may not add up to 100.0 due to rounding off of cases		

Similarly, the institutional delivery practice in Nepal is also low. In 2011, only 39 percent of the respondents had delivered their last pregnancy in a health facility. The rest of the respondents had delivered their last pregnancy at home. Postpartum period is the most crucial period for a woman who has just delivered their pregnancy because the most of the complications arise during this period and these complications lead to high incidence of maternal morbidity and mortality in Nepal. In PNC visits the health of the new born is also undergoes checkups and immunized thus this visit is important for the good health of the

new born as well. It is however observed that less than half of the respondents (43.2%) had taken PNC services in 2011 (Table 4.10).

The uptake of these provisions and services ensures safe motherhood status for every pregnant woman. It is however noted that the percentage of women taking all the services and making necessary provisions for delivery and postpartum periods and thus ensuring safe motherhood is very low. Data analysis result from 2011 NDHS shows that only 16 percent of women had taken all components of maternal health care and thus ensured safe motherhood for themselves (Table 4.10).

Chapter 5

UTILIZATION OF ANTENATAL CARE SERVICES

This chapter presents the effects of socio-economic and demographic variables of respondents and utilization or non-utilization of ANC services at least 4 times by using logistic regression. The chapter first presents the demographic variables (age, CEB, age at first birth, children under 5 years of age and pregnancy termination) and their relationship with use and nonuse of ANC services 4 times. This is followed by selected social variables (caste/ethnicity, religion, place of residence, spatial distribution, development regions, respondent's education, partner's education, and media habits). Likewise the effects of economic variables (respondent's occupation, partner's occupation, respondent's employment status and household wealth) is also presented in this chapter.

5.1 Antenatal care practices

Maternal and child healthcare is one of the eight basic components of primary healthcare in the Declaration of Alma-Ata (WHO, 1978). Globally, awareness of the issue of maternal mortality began in 1987 at the Safe Motherhood Conference in Nairobi, which drew the attention of the world and developed countries in particular to this issue and the commitment to strive for reducing the mortality and morbidity related to pregnancy and childbirth was obtained. This commitment was reinforced in the ICPD conference held in Cairo in 1994 where in addition to the call to reduce maternal mortality and morbidity by at least 50 percent by the turn of the century, Safe Motherhood was recognized as one of the key components of reproductive health (MoHP, 2002).

Antenatal care (ANC) is a pivotal factor for the safe motherhood. The primary aim of ANC is to achieve healthy mother and a healthy baby at the end of a pregnancy. Mothers who had not received good quality ANC were found to be more at risk of having low birth weight babies and there is clear association between infant mortality rate and lack of or poor quality ANC. Moreover, substantial reduction in perinatal mortality takes place even

if the initial antenatal check-up is availed by women as late as the third trimester. Antenatal visits may raise awareness about the need for care during delivery or give women and their families a familiarity with health facilities that enable women to seek care (Chauhan, 2012). It often presents the first contact opportunities for a pregnant woman to connect with health services, thus offering an entry point for integrated care, promoting healthy home practices, influencing care-seeking behaviors and linking women with pregnancy complications to a referral system; thus impacting positively on maternal and fetal health (Bulato & Ross, 2000).

There are potential benefits to be had from some of the elements of antenatal care, and these benefits may be most significant in developing countries where morbidity and mortality levels among reproductive-age women are high. The antenatal period clearly presents opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and that of their infants. For example, if the antenatal period is used to inform women and families about danger signs and symptoms and about the risks of labor and delivery, it may provide the route for ensuring that pregnant women do, in practice, deliver with the assistance of a skilled health care provider. The antenatal period provides an opportunity to supply information on birth spacing, which is recognized as an important factor in improving infant survival. The World Summit for Children in 1990 adopted antenatal care as a specific goal, namely “Access by all pregnant women to prenatal care, trained attendants during childbirth and referral facilities for high-risk pregnancies and obstetric emergencies”. Similar aims have been voiced in other major international conferences, including the International Conference on Population and Development in 1994, the Fourth World Conference on Women in 1995, their five-year follow-up evaluations of progress, and the United Nations General Assembly Special Session on Children in 2002.

The new WHO model of antenatal care separates pregnant women into two groups: those likely to need only routine antenatal care (some 75% of the total population of pregnant women), and those with specific health conditions or risk factors that necessitate special care (25% of pregnant women). For the first group, a standard programme of four antenatal

visits is recommended (with additional visits should conditions emerge which require special care). The WHO guidelines are also specific as regards the timing and content of antenatal care visits according to gestational age. The guidelines stipulate that “only examinations and tests that serve an immediate purpose and that have been proven to be beneficial should be performed”. These examinations include measurement of blood pressure, testing of urine for bacteriuria and proteinuria, and blood tests to detect syphilis and severe anemia (WHO, 2003).

The Millennium Development Goal aims at reducing the maternal mortality ratio by three quarters during 1990-2015. In order to achieve this goal, all women need access to high quality of antenatal care. However antenatal care services are available in developing countries but utilization of these existing services is poor.

5.2 Effects of demographic, social and economic factors on ANC use

The number of ANC visits and the timing of the first visit are important for the health of mother and the outcome of the pregnancy. It is one of the most effective health intervention for preventing maternal morbidity and mortality. Antenatal period is an important opportunity for identifying pregnancy related threats to the mother and unborn baby's health. It supports to apply the possible preventive and curative measures to manage the complications in time by through various services viz. counseling on nutrition, birth preparedness, delivery care, post-partum care and family planning options after delivery.

Data for the late 1990s and for 2000-2001 show that just over 70% of women worldwide have at least one antenatal visit with a skilled provider during pregnancy. In the industrialized countries coverage is extremely high, with 98% of women having at least one visit. In the developing world, antenatal care use is around 68% (excluding China), but this indicates considerable success for programs aimed at making antenatal care available. The region of the world with the lowest levels of use is South Asia, where only 54% of pregnant women have at least one antenatal care visit. In the developing world as a whole, the majority of women presenting for any antenatal care have at least four visits. In 33 of the 45 countries, at least 50% of women reported four or more visits, There are, of course,

some notable exceptions; countries with relatively high percentages of women who received only one antenatal care visit include Bangladesh, Ethiopia, Morocco, Nepal and Yemen. The South Asian countries are distinguished by their overall low level of ANC use. In Nepal, for example, 38% of women reported at least one visit but only 9% reported four or more visits, with most women having two or three antenatal visits (WHO, 2003).

Since the late 1990s the ANC care seeking behavior has improved, more women are seeking the services now than ever. Still a relatively high percentage of women do not seek even a single ANC care and the percentage of women who seek 4 or more ANC care from a skilled service provider is still low in developing countries. In Nepal in 2011 for example, 15 percent women had not sought ANC care in their last pregnancy, nearly 8 percent had the care only once and only about one-half (52.7%) had sought 4 or more ANC care (calculated from NDHS 2011 data files). Research in developing countries including Nepal shows that various demographic, social and economic factors determine the ANC care and the number of times the care is sought by pregnant women.

The analysis of data from DLHS (District Level Household and Facility Survey) conducted in 2007-08 in Rajasthan, India among 12458 among currently married women showed that about 43 percent of the respondents had no ANC visits and only about 15 percent had 4 or more ANC visits during their pregnancy. To determine the contribution of selected variables with full ANC coverage, logistic regression was applied in the study. The study found that age at marriage, education and wealth index were found to be highly significant factors for getting full ANC service among women in having full coverage of ANC. The study further found that women with 11 or more years of schooling had a ten times more likelihood for getting full ANC coverage as compared to illiterate women. Similarly, women who got married above age 21 had 4.57 times more likelihood to utilize full package of ANC as compared to women who got married below age 18. The mothers living with richest wealth index had 9.54 times more likelihood to receive full ANC coverage as compared to poorest counterparts (Chauhan, 2012),

A community-based cross-sectional survey was carried out in Tigray region of Ethiopia among 1113 rural women aged 15–49 years in 2009. The objective of the study was to

determine the prevalence of maternal health care utilization and explore its determinants among rural women aged 15–49 years. The study found that several factors were found to be significant predictors for ANC utilization (Table 2). Married (OR=2.57, 95% CI: 1.44-4.58) and divorced (OR=2.78, 95% CI: 1.31-5.89) women had a higher probability of visiting ANC services than single and widowed women. With regard to education, mothers with 5 - 12 years of education (OR=3.18, 95% CI: 1.85-5.47) were more likely to attend ANC than non-educated and grade 1– 4 mothers. Proximity of the health facility in the village (OR=1.83, 95% CI: 1.41-2.38) and having husbands with a non-farming occupation (OR=2.26, 95% CI: 1.43-3.58) were also associated with a greater use of ANC (Tsegay, Tesfay, Goicolea, Edin, Lemma & Sebastian, 2013).

In a study carried out in Lao PDR in 2008 among 310 married women of reproductive age who had at least one child and had delivered the last child within two years from the period of data collection, it was found that about 53 percent of the women had not taken any ANC care while only about 36 percent had taken 4 or more ANC care in their last pregnancy. Among women who visited an ANC, the highest number of respondents, 92 (64.3%), had visited less than four times during their previous pregnancies, whereas only 51 (35.7%) had visited four times or more. The study showed that several demographic, social and economic factors had determining effects on the use of ANC services. Among several such factors, education, income, knowledge, attitude, distance to the ANC service, availability of public transportation, the costs of transportation, as well as the cost of service were revealed to be positive and significant predictors of ANC service with a < 0.05 p-value. The study further showed that the levels of education and knowledge were the most important predictors of ANC utilization in the Kham District. Educated women were 6.8 times (95% CI = 2.7–16.8) more likely to receive ANC services than those who had no education, and women who were highly knowledgeable were 6.5 times (95% CI = 2.4–17.6) more likely to do so than those who were deficient in knowledge. Moreover, family income proved to be one of the most significant predictors of ANC service utilization. Women who had high incomes were 2.6 times (95% CI = 1.2–5.7) more likely to have obtained ANC services than women with low incomes (Yang, Yoshida, Or-Rashid & Sakamoto, 2010).

Likewise, a study carried out in Ghana based on data from Ghana Demographic and Health Survey (GDHS) in 2008 showed that wealth, education, number of living children, problems with transportation, ownership of health insurance, age of woman and residence (rural/urban) are important predictors of the use of ANC in Ghana. The results also show regional variations in the use of ANC and differential use between the rural and urban dwellers. Thus, these variables together do influence the use of ANC and other maternal health services in Ghana. The results suggest that wealth still has a positive and significant influence on the use of ANC; women in higher wealth quintiles are more likely to make more ANC visits than women in the lowest wealth quintile. The study was based on univariate analysis involving chi square to test the significance of association between ANC use and each of the predictors in the study (Arthur, 2012).

Dahiru *et al.* utilizing 2013 Nigeria Demographic and Health Survey (NDHS) data carried out further analysis in order to examine the potential factors related to use/non-use of antenatal care, institutional delivery and postnatal care among women aged 15-49 years in Nigeria. The study showed that Rural location confers some disadvantage in use of ANC where they have odds of only 0.47 (95%CI: 0.45-0.49) of utilizing ANC compared to their urban counterparts. Both maternal and husband's levels of education showed increased odds of utilization with increasing educational attainments. Household wealth level has a similar pattern of increasing utilization by increasing household wealth level, rich household are 3.42 times the odds to utilize ANC than the poor households (95%CI: 3.25-3.61). Other covariates that independently increased the odds of ANC utilization are: female-headed households (OR=1.15, 95%CI: 1.08-1.23), status of pregnancy wantedness, health insurance coverage (OR=1.92, 95%CI: 1.66-2.22) and the status of the decision maker in the household. Those covariates that reduced the odds of ANC utilization were being employed (OR=0.91, 95%CI: 0.87-0.96) and a high parity of two and more (OR=0.16, 95%CI: 0.15-0.17). In terms of place of delivery, covariates that had independent significant influence on utilization of health facility for birthing included age of mother, maternal as well as husband's level of education, maternal employment status, household wealth level, sex of household head, pregnancy wantedness, use of at least four

ANC visits, health insurance coverage and person deciding on utilizing of health care. In most developing countries including Nigeria, this finding is not unexpected since there is inequity in the distribution and location of health care facilities in favor of urban areas and therefore women in those urban areas have increased accessibility compared to their rural counterparts. This study further revealed that education of the mother and that of her husband are significant predictors of ANC use. Both factors showed a dose-response relation between level of education and likelihood of use of ANC; women with tertiary education were more than four times more likely to use ANC than those with no formal education likewise women whose husbands possessed tertiary level education were about 4.13 times more likely to use ANC than women of husbands with no formal education. Education influences use of health care services synergistically with other covariates such as urban location, employment, health insurance and awareness of benefits of utilization of health services. The more the education, the more likely for the women to live in urban areas where health services are available and education increases the affordability of health services as well as increasing the awareness and knowledge of benefits to be derived from its use which motivate use. Additionally, women who are educated are more likely to have paid employment and to contribute to the household expenditure and consumption and that means more power in decision-making process in household issues including utilization of health services. Household wealth status significantly predicts the use of ANC; women living in rich households are three times more likely to receive adequate ANC than those in the lowest quintile. This is also in conformity with findings from previous studies; household economic status improves both financial and geographic access to health services. The role of religion appears to be similar between Christianity and Islam. Being either a Christian or Muslim increases the likelihood of attending ANC by similar amount. But belonging to traditional or other forms of religious beliefs significantly decreased the probability of adequate use of ANC (Dahiru & Oche, 2015).

In a cross-sectional quantitative study conducted in Sunsari district of Nepal in 2012 a total of 372 randomly selected women who delivered in the last year preceding the survey were interviewed using a semi-structured questionnaire. Bivariate and multivariate logistic regression analysis was carried out to identify barriers associated with 4 ANC visits. The

study revealed that women exposed to media had higher chance of receiving four or more ANC visits with an adjusted odds ratio (aOR = 3.5, 95% CI: 1.2–10.1) in comparison to women who did not. Women from an advantaged ethnic group had more chance of having 4 ANC visits than respondents from a disadvantaged ethnic group (aOR = 2.4, 95% CI: 2.1–6.9). Similarly, women having a higher level of autonomy were nearly three times more likely (aOR = 2.9, 95% CI: 1.5–5.6) and richer women were twice (aOR = 2.3, 95% CI: 1.1–5.3) as likely to have at least 4 ANC visits. The study concludes that being from disadvantaged ethnicity, lower women’s autonomy, poor knowledge of maternal health service and incentive upon completion of ANC, less media exposure related to maternal health service, and lower wealth rank were found significantly associated with fewer than the recommended 4 ANC visits. Thus, maternal health programs need to address such socio-cultural barriers for effective health care utilization (Deo et al., 2015).

5.2.1 Demographic variables and utilization of 4 or more ANC services in Nepal

ANC use in Nepal has been increasing in recent years. During the late 1990s and early 2000/1 about 38% of women had reported at least one ANC visit but only 9% reported four or more visits, with most women having two or three antenatal visits (WHO, 2003). In 2011 for example, 15 percent women had not sought ANC care in their last pregnancy, nearly 6 percent had the care only 1 time, about one-third (33.2%) had up to 3 times and only about one-half (52.7%) had sought ANC visits 4 or more times (Table 5.1).

Table 5.1: Distribution of respondents by ANC service utilization, 2011		
Description	Number	Percent
No ANC services	611	15.0
Use of ANC service 1 time	234	5.7
Use of ANC services 2 times	426	10.4
Use of ANC services 3 times	657	16.1
Use of ANC services 4 or more times	2151	52.7
Total	4079	100.0
Source: Calculated from NDHS 2011 data files		

Data from NDHS 2011 shows high variation in the use of 4 time ANC visits according to demographic and socio-economic background of women. By age, over one-half of the

women (54%) in the age groups of 15-19, 20-24 and 25-29 years had 4 or more ANC visits in their last pregnancy. Similarly over half of the women who were in their twenties at the time of their first birth (20-24 and 25-29 years) had four ANC visits compared to the women who delivered their first child below 20 years of age.

By age of women at their first birth, comparatively low percentage of women whose age at first birth was below 20 years (10-14 and 15-19 year age groups) had taken four or more ANC visits than the women whose age at first birth was above 20 years. The highest percentage of women (68.2%) taking ANC services 4 or more times were from those whose age was between 25-29 years. Similarly, nearly 6 in every 10 women (58.3%) who were at 30 years and higher ages at their first birth had also taken ANC services 4 or more times. This findings indicates that women in higher ages (>30 years) tend more to follow the ANC guidelines than those who have their first in younger ages (Table 5.2).

By parity, high percentage of women (>50%) who had only 1-2 children had visited for the recommended number of at least 4 ANC visits. Lower percentage of women having 3 or more children reported of taking ANC services four or more times during their last pregnancy. Overall, the data indicates that women who have higher number of children ever born to them tends to have recommended number of ANC visits than the women who have lower number of children ever born to them (Table 5.2).

The 2011 data shows that high percentage of women who had few (1-2) number of young sibling (<5 years of age) had at least 4 ANC visits in their last pregnancy compared to women who had 3 or more young siblings. About 56 percent of women who had 1 child had taken 4 or more times of ANC services. About 4 in every 10 women having 2 children had taken ANC services 4 or more times. Only slightly more than one-third of the women who had 3, 4 or more children had taken ANC services 4 or more times in their last pregnancy. The NDHS 2011 results also shows that about half of the women (49.6%) who have had induced abortion (pregnancy termination) earlier than the last birth also had at least 4 ANC visits in their last pregnancy (Table 5.2).

Table 5.2: Use of 4 or more ANC services in Nepal according to demographic characteristics of women						
Description	Use of 4 or more ANC		Use of no or less than 4 ANC		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Age Group						
15-19	181	54.4	152	45.6	333	100.0
20-24	736	55.4	592	44.6	1328	100.0
25-29	712	54.4	598	45.6	1310	100.0
30-34	311	46.4	359	53.6	670	100.0
35-39	105	33.1	212	66.9	317	100.0
40-44	27	19.1	114	80.9	141	100.0
45-49	6	12.0	44	88.0	50	100.0
Total	2078	50.1	2071	49.9	4149	100.0
Age at First Birth						
10-14	16	24.2	50	75.8	66	100.0
15-19	953	44.8	1173	55.2	2126	100.0
20-24	901	54.8	744	45.2	1645	100.0
25-29	180	68.2	84	31.8	264	100.0
30+	28	58.3	20	41.7	48	100.0
	2078	50.1	2071	49.9	4149	100.0
Children Ever Born						
1	869	66.7	433	33.3	1302	100.0
2	658	56.7	503	43.3	1161	100.0
3	307	41.9	426	58.1	733	100.0
4	139	35.0	258	65.0	397	100.0
5+	105	18.9	450	81.1	555	100.0
	2078	50.1	2070	49.9	4148	100.0
Child < 5 Years						
0	138	55.9	109	44.1	247	100.0
1	1235	56.6	946	43.4	2181	100.0
2	568	42.5	767	57.5	1335	100.0
3	107	35.8	192	64.2	299	100.0
4+	31	36.0	55	64.0	86	100.0
	2079	50.1	2069	49.9	4148	100.0
Pregnancy Termination						
Yes	395	49.6	401	50.4	796	100.0
No	1683	50.2	1669	49.8	3352	100.0
Total	2078	50.1	2070	49.9	4148	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Totals may not equal 100.0 due to rounding off of cases						

Logistic regression has been used in this study to examine the effects of selected demographic variables on the use of at least 4 ANC visits by women during their pregnancy. The variables used for examining effects are: current age, age of women at first birth of their child, parity (CEB), number of children under 5 years of age, and women's history of pregnancy termination (induced abortion). The result shows that young age, age

at 1st birth, parity and number of children less than 5 years of age has strong effects on use or nonuse of 4 or more ANC visits. The logistic regression results shows that young women who are up to the age of 29 years are more than 8 times likely to have at least 4 ANC visits than the women whose current age is 30 years or above (Table 5.3).

Table 5.3: Effects of selected demographic variables on utilization of ANC 4 or more times in Nepal using logistic regression			
Description	Odds ratio (OR)	95% Confidence interval (CI)	P value
Age Group			
15-19	8.879	2.456 - 32.097	0.001
20-24	9.290	2.627 - 32.851	0.001
25-29	8.902	2.518 - 31.469	0.001
30-34	6.491	1.825 - 23.096	0.004
35-39	3.709	1.024 - 13.437	0.046
40-44	1.757	.455 - 6.782	0.414
45-49	Ref.	--	--
Age at First Birth			
10-14	.392	.211- .724	0.003
15-19	Ref.	--	--
20-24	1.492	1.274 -.748	0.000
25-29	2.657	1.904 - .708	0.000
30+	1.721	.836 - 3.541	0.140
Children Ever Born			
1	8.594	6.395 -11.548	0.000
2	5.609	4.180 - 7.526	0.000
3	3.094	2.259 - 4.237	0.000
4	2.299	1.623 - 3.257	0.000
5+	Ref.	--	--
Number of Child < 5 Years			
0	2.276	1.212 - 4.273	0.011
1	2.355	1.352 - 4.102	0.002
2	1.337	.763 - 2.343	0.310
3	1.003	.5403 - 1.861	0.993
4+	Ref.	--	--
Pregnancy Termination			
Yes	.976	.812 - 1.173	0.795
No	Ref.	--	--
Source: Calculated from NDHS 2011 data files Weights are applied Ref.: Reference category			

Similarly, women who are at the age of 20-29 are 2.6 times likely to have at least 4 ANC visits than the woman who are at younger ages (below 24 years) or women at higher ages (above 30 years). Women who have low parity (only 1 and 2 child respectively) are 8.5 times and 5.6 times likely to take at least 4 ANC visits than women with higher (3 or more)

parity. Likewise, women who have 1 or 2 children who are <5 years of age are more than two times likely to get at least 4 ANC visits than the women with 3 or more <5 children. The result is significant at 5 level (Table 5.3).

5.2.2 Social variables and utilization of 4 or more ANC

NDHS 2011 shows that regarding social characteristics, a very high percentage (82.7%) of respondents from Newar group had 4 or more ANC visits in their last pregnancy. Similarly high percentage (63.5%) of respondents that belonged to relatively advantaged caste groups (Brahmin, Chhetri, Gurung, Thakali and others) reported of having at least 4 ANC visits in 2011. Among other caste groups, relatively high percentage (46.4%) of women respondents from Janjati groups of Hill and Tarai region also had 4 or more ANC visits in their last pregnancy. By religion, over half of Hindu women (51.9%) had 4 or more ANC visits compared to only about 41 percent women who belonged to other religious groups. Likewise higher percentages of women living in urban areas (71.8%) and over one-half of the women from Tarai and Hill regions had at least 4 ANC visits (Table 5.3).

By development region, percentage of women from mid-west and far-west regions who had at least 4 ANC visits in their last pregnancy was comparatively low. Similarly, among those who had utilized at least 4 ANC visits in their last pregnancy the highest percentage of women were from Eastern (15.3%) and Central Tarai (14.7%). These women are followed by women from Central and Western Hills where about 11 percent of women had utilized at least 4 ANC visits in their last pregnancy (Appendix II).

Table 5.4: Use of 4 or more ANC services in Nepal according to social characteristics						
Description	Use of ANC4 or more times		Use of no ANC or used less than 4 times		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Caste/ethnicity						
Brahmin/Chhetri & other castes*	814	63.5	468	36.5	1282	100.0
Other Tarai Caste	148	35.8	265	64.2	413	100.0
Dalit	272	39.9	410	60.1	682	100.0
Newar	105	82.7	22	17.3	127	100.0
Hill and Tarai Janajati	648	46.4	748	53.6	1396	100.0
Muslim	82	34.7	154	65.3	236	100.0
Religion						
Hindu	1787	51.9	1658	48.1	3445	100.0
Non Hindu	291	41.3	413	58.7	704	100.0
Residence						
Rural	1778	47.7	1952	52.3	3730	100.0
Urban	300	71.8	118	28.2	418	100.0
Ecological Region						
Mountain	840	42.6	829	57.4	305	100.0
Hill	1108	50.3	1067	49.7	1669	100.0
Tarai	2078	50.9	2071	49.1	2175	100.0
Respondent Education						
Higher	243	92.4	20	7.6	263	100.0
Secondary	881	71.7	348	28.3	1229	100.0
Primary	431	51.6	404	48.4	835	100.0
No education	523	28.7	1299	71.3	1822	100.0
Husband's Education*						
Higher	368	79.7	94	20.3	462	100.0
Secondary	1104	61.1	704	38.9	1808	100.0
Primary	396	40.2	588	59.8	984	100.0
No education	200	22.9	672	77.1	872	100.0
Media Habits						
Newspaper						
At least once a week	264	88.0	36	12.0	300	100.0
Less than once a week	563	72.5	214	27.5	777	100.0
Not at all	1251	40.7	1820	59.3	3071	100.0
Radio						
At least once a week	896	58.4	639	41.6	1535	100.0
Less than once a week	777	48.1	840	51.9	1617	100.0
Not at all	405	40.6	592	59.4	997	100.0
Total	2078	50.1	2071	49.9	4149	100.0
Television						
At least once a week	1090	69.8	471	30.2	1561	100.0
Less than once a week	542	47.3	603	52.7	1145	100.0
Not at all	446	30.9	997	69.1	1443	100.0
Mass Media Habits						
Yes	138	85.2	2047	14.8	162	100.0
No	1940	48.7	2071	51.3	3987	100.0
Total	2078	50.1	2047	49.9	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
**22 weighted cases missing						
Totals may not equal 100.0 due to rounding off of cases						
*List of caste/ethnic groupings is attached as Annex 1						

By education, higher percentage of women (71.7%) with secondary education had at least 4 ANC visits than women who had attended primary level or had no education. Similar result is observed among women whose husband had secondary level of education (Table 5.4).

Among the total women having utilized at least 4 ANC visits in 2011, about 4 in 10 women who do not read newspaper at all had utilized ANC services 4 or more times. The percentage of women using ANC 4 or more times was high among those who read newspaper at least once a week or less than once a week. Similarly women who listen to Radio at least once a week (58.4%) and who use radio less than a week (48.1%) also reported of taking ANC services 4 or more times. Regarding TV, a high percentage of women (69.8%) who watch TV at least once a week reported of taking ANC services 4 or more times. Comparatively the percentage of women who watch TV less than once a week and those who do not watch TV at all is low. Overall, a high percentage of women (85.2%) who have access to all three types of public media had utilized ANC services 4 or more times in their last pregnancy (Table 5.4).

The logistic regression analysis shows strong effect of selected social variable on the use of at least 4 ANC visits. Women's caste/ethnicity, religion, place of residence (rural, urban) and education has strong effects on the utilization of 4 or more ANC visits. Among the different caste/ethnic groups, Newar women are 9 times more likely (95% CI 4.655 - 17.464) and women from Brahmin/Chhetri and other caste groups are more than three times likely to use at least 4 ANC than women from Tarai, Janjati and Muslim groups. The analysis shows the effect significant at 5% level. Similarly Hindu women are 1.5 times more likely to take 4 or more ANC visits than women from non-Hindu groups (Table 5.4).

By ecological regions, the odds of taking at least 4 ANC visits is higher among women respondents living in Mountain region than those living in Hill and Tarai regions (Table 5.4). Not much variation are observed in uptake of at least 4 ANC visits among women living across 5 development regions. Similar results could be observed in taking at least 4 ANC visits among women residing across 13 eco-development sub-regions (Appendix III).

Table 5.5: Effects of selected social variables on utilization of ANC 4 or more times in Nepal using logistic regression			
Description	Odds ratio (OR)	95% Confidence interval (CI)	P value
Caste/ethnicity			
Brahmin/Chhetri & other castes*	3.263	2.174 - 4.897	0.000
Other Tarai Caste	1.050	.651 - 1.694	0.842
Dalit	1.244	.810 - 1.912	0.318
Newar	9.017	4.655 - 17.464	0.000
Hill and Tarai Janajati	1.626	1.080 - 2.446	0.020
Muslim	Ref.		
Religion			
Hindu	1.526	1.238 - 1.882	0.000
Non Hindu	Ref.	--	
Residence			
Rural	Ref.	--	
Urban	2.792	2.322 - 3.357	0.000
Ecological Region			
Mountain	.717	.594-.865	0.001
Hill	.977	.835-1.142	0.767
Tarai	Ref.	--	
Respondents, Education			
Higher	30.856	16.97 - 56.103	0.000
Secondary	6.280	5.157 - 7.648	0.000
Primary	2.646	2.154 - 3.250	0.000
No education	Ref.	--	
Husbands, Education			
Higher	.399	.298 - .536	0.000
Secondary	.171	.126 - .234	0.000
Primary	.076	.054 - .106	0.000
No education	Ref.		
Media Habits			
Newspaper			
At least once a week	10.647	7.463 - 15.192	0.000
Less than once a week	3.829	3.221 - 4.553	0.000
Not at all	Ref.		
Radio			
At least once a week	2.051	1.744 - 2.412	0.000
Less than once a week	1.353	1.153 - 1.587	0.000
Not at all	Ref.		
Television			
At least once a week	5.170	4.426 - 6.039	0.000
Less than once a week	2.008	1.710 - 2.359	0.000
Not at all	Ref.		
Mass Media Habits			
Yes	6.147	3.482 - 10.852	0.000
No	Ref.	--	--
Source: Calculated from NDHS 2011 data files			
Weights are applied			
Totals may not equal 100.0 due to rounding off of cases			
Ref. Reference category			
*List of caste/ethnic groupings is attached as Annex 1			

Place of residence however has significant effect as women residing in urban areas are 2.79 times more likely (95% CI (2.322 - 3.357)) to utilize at least 4 ANC visits than women residing in rural areas. Similarly, the analysis result shows highly significant effect of women's education on ANC use. Women with higher level of education are 30.85 times more likely (95% CI 16.97 - 56.103) to utilize at least 4 ANC than women with no education. The analysis result shows significant effect of education and ANC at secondary (OR 6.28; 95% CI 5.157 - 7.648) and primary (OR 2.64; 95% CI 2.154 - 3.250). It is however surprising to observe that husband education does not have much effect on the use of ANC (Table 5.5).

Access to media shows strong effect on the utilization of ANC services. Women who read newspaper at least once a week are 10 times more likely to utilized ANC 4 services than those who have less access or no access to newspapers. The likelihood of taking ANC 4 services 2 times more and 5 times more respectively for women who listen to radio at least once a week (OR 2.051; 95% CI 1.744 - 2.412) and the women who watch TV at least once a week (OR 5.170; 95% CI 4.426 - 6.039). Overall, the likelihood of ANC 4 service utilization is 6 times more among women who have access to all three medial channels than the women who have no access to these media channels. The result is significant at $p < 0.001$ (Table 5.5).

5.2.3 Economic variables and utilization of 4 or more ANC

In 2011 about one-half (50.1%) of the women had reported of taking at least 4 ANC visits during their last pregnancy. Of these, a high percentage of women (76.1%) reported of taking ANC services 4 or more times in their last pregnancy. Higher percentages of women whose occupation was manual labor (57.7%) and those who were not working (56.7%) had utilized ANC services 4 or more times. Less than half of women (42.1%) whose occupation was agriculture had taken ANC services 4 or more times. On the contrary, a high percentage (65.1%) of women whose husband's occupation was service/trade had taken at least 4 ANC visits. By employment status, percentage of currently employed women taking 4 or more visits is lower (48.3%) than the women who were currently unemployed.

Likewise by household wealth status, a high percentage of women who are from rich category (74.2%) and relatively high percentage of women who belonged to middle category (45.2%) had taken at least 4 ANC visits while only about one-third (30.9%) of women from poor category had taken at least 4 ANC visits in their last pregnancy (Table 5.6).

Table 5.6: Use of 4 or more ANC services in Nepal according to economic characteristics, 2011						
Description	Use of ANC 4 or more times		Use of no ANC or used less than 4 times		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Respondent's Occupation						
Manual	105	57.7	77	42.3	182	100.0
Service/trade	303	76.1	95	23.9	398	100.0
Agriculture	1016	42.1	1400	57.9	2416	100.0
Not working*	652	56.7	498	43.3	1150	100.0
Total	2077	50.1	2071	49.9	4148	100.0
Husband's Occupation						
Manual	579	44.0	736	56.0	1315	100.0
Service/trade	1099	65.1	589	34.9	1688	100.0
Agriculture	334	33.2	671	66.8	1005	100.0
Total	2079	50.1	2070	49.9	4149	100.0
Respondent's Employment						
Yes	1126	48.3	1203	51.7	2329	100.0
No	952	52.3	868	47.7	1820	100.0
Total	2078	50.1	2071	49.9	4149	100.0
Household Wealth Status+						
Rich	1026	74.2	356	25.8	1382	100.0
Middle	624	45.2	758	54.8	1382	100.0
Poor	427	30.9	956	69.1	1383	100.0
Total	2077	50.1	2070	49.9	4147	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
+ Household wealth have been regrouped into following 3 categories by combining:						
Richer and Richest = Rich; Middle = Middle; Poorer and Poorest = Poor						
*141 cases not included in the analysis						
Totals may not equal 100.0 due to rounding off of cases						

A total of four categories of economic variables have been included in logistic regression analysis to assess the effects of these variables on 4 or more ANC service utilization by women in Nepal. The variables included were: respondent's and husband occupation,

women's current employment status and household wealth. The analyses result shows that women who are in service or trade related occupation are 2.43 times more likely (95% CI 1.761 - 3.368) to use ANC services 4 or more times than women those who are not working. Similarly women's husband whose occupation is agriculture and trade/business is 2.43 times and 1.04 times respectively are more likely to utilize ANC 4 or more times than those whose husbands are not working.

Table 5.7: Effects of selected economic variables on utilization of ANC 4 or more times in Nepal using logistic regression			
Variable name	Odds ratio (OR)	Confidence interval (CI)	P value
Respondent's Occupation			
Manual	1.048	.703 - 1.560	0.819
Service/trade	2.436	1.761 - 3.368	0.000
Agriculture	.554	.462 - .665	0.000
Not working	Ref.	--	--
Husband's Occupation			
Service/trade	1.578	1.285 - 1.938	0.000
Agriculture	3.747	3.067 - 4.578	0.000
Not working	Ref.	--	--
Respondent's Employment			
Yes	.854	.733 - 996	0.044
No	Ref.		
Household wealth Status			
Rich	6.445	5.291 - 7.852	0.000
Middle	1.845	1.535 - 2.217	0.000
Poor	Ref.	--	--
Calculated from NDHS 2011 data files Weights are applied Ref: Reference category			

Likewise, women from rich categories are 6.44 times more likely (95% CI 5.291 - 7.852) to utilize ANC 4 or more times than the women from poor category. Women from middle category are also 1.8 times more likely (95% CI 1.535 - 2.217) to utilize ANC services 4 or more times than poor category women (Table 5.7).

Chapter 6

BIRTH PREPAREDNESS PRACTICES

This chapter presents the effects of socio-economic and demographic variables of women and birth preparedness (BP) practices in Nepal. The chapter first presents the demographic variables (age, CEB, age at first birth, children under 5 years of age and pregnancy termination) and their relationship with birth preparations by women during their pregnancy and before delivery. This is followed by the effects of selected social variables (caste/ethnicity, religion, place of residence, spatial distribution, development regions, respondent's education, partner's education, and media habits) on birth preparations. Likewise the effects of economic variables (respondent's occupation, husband occupation, respondent's employment status and household wealth on birth preparations is also presented in the last section of this chapter.

6.1 Birth preparedness practices

Women and newborns need timely access to skilled care during pregnancy, childbirth, and the postpartum/newborn period. Too often, however, their access to care is impeded by delays: delays in deciding to seek care, delays in reaching care, and delays in receiving care. Delays in deciding to seek care may be caused by failure to recognize signs of complications, failure to perceive the severity of illness, cost considerations, previous negative experiences with the healthcare system, and transportation difficulties. Delays in reaching care may be created by the distance from a woman's home to a facility or provider, the condition of roads, and a lack of emergency transportation. Delays in receiving care may result from unprofessional attitudes of providers, shortages of supplies and basic equipment, a lack of healthcare personnel, and poor skills of healthcare providers (Jhpiego, 2004).

Birth Preparedness and Complication Readiness (BPCR) is the process of planning for normal birth and anticipating the actions needed in case of an emergency. Responsibility for BPCR must be shared among all safe motherhood stakeholders - policymakers, facility managers, providers, communities, families, and women because a coordinated effort is needed to reduce the delays that contribute to maternal and newborn deaths. Each stakeholder has an important role to play— from creating appropriate policies to strengthening facilities and providers to implementing effective community systems to adopting informed practices at home. Together, stakeholders can plan for the care that women and newborns need during pregnancy, childbirth, and the postpartum/newborn period, prepare to take action in emergencies, and build an enabling environment for maternal and newborn survival (Jhpiego, 2004).

Developing countries have recently invested in behavior change and community mobilization interventions to reduce maternal and neonatal risks following the concept of “Birth Preparedness and Complication Readiness” (BPCR), which comprises elements of antenatal, intra-partum, postpartum care and neonatal care. BPCR programs generally include counseling for women and their families to (Soubeiga, Gauvin, Hatem, & Johri, 2014):

- encourage them to take decisions before the onset of labour and potential occurrence of obstetric complications;
- inform them about the signs of complications so they will know and be able to react promptly if needed;
- inform them about the locations of emergency services to make the care-seeking process more efficient; and;
- encourage them to save the money needed to pay for services and to plan their transportation to a health facility during labour and in case of emergency.

Key elements of birth preparedness include: attending antenatal care at least four times during pregnancy; identifying a skilled provider and making a plan for reaching the facility during labor; setting aside personal funds to cover the costs of travelling to and delivering

with a skilled provider and any required supplies; recognizing signs of complications; knowing what community resources emergency transport, funds, communications, etc. are available in case of emergencies; having a plan for emergencies i.e. knowing what transport can be used to get to the hospital, setting aside funds; identifying person(s) to accompany to the hospital and/or to stay at home with family; and identifying a blood donor.

Because life-threatening complications can occur during the early postpartum period, birth preparedness also includes preparing/planning for accessing postpartum care during the first week after delivery and at six weeks after delivery. Birth preparedness involves not only the pregnant woman, but also her family, community and available health staff. The support and involvement of these persons can be critical in ensuring that a woman can adequately prepare for delivery and carry out a birth plan (FCI, 2007).

The three delays model developed in the 1990s and was adapted in various country contexts through a series of operational research studies led by Columbia University, to strengthen the coverage and quality of maternal health services at community and health facility levels. Based on the three-delay framework, as developed and implemented by the Prevention of Maternal Mortality network states three major factors that contribute to maternal death including:

- Delay in recognizing complications and deciding to seek care;
- Delay in reaching a treatment facility; and
- Delay in receiving adequate care and treatment at the facility.

This model can be further elaborated to explore the factors that contribute to the delays at each of the three stages. Examples of major gaps and systemic weaknesses that exacerbate already high rates of maternal morbidity and mortality include:

- Shortage of and thus inadequate access to skilled care;
- Poor health infrastructure at all levels (including supplies, equipment);
- Lack of transportation for emergency referral; and,
- Low quality of Obstetric care.

The three delays model has subsequently been used to inform a comprehensive approach to birth preparedness with prevention and management as integral components of the plan. *The elements of Birth preparedness have been promoted by WHO, UNFPA and other international agencies as part of maternal health strategies. With the shift from TBA training and risk screening towards access to skilled attendance, including emergency obstetric care as a means of decreasing maternal mortality this approach has been adopted widely by NGOs and government services (WHO, 1999). Maine (2007) critiques this approach however, suggesting that it has been promoted heavily in the absence of evidence that it actually works. Birth preparedness as a conceptual framework provides an opportunity to address the three delays but is contingent on other external factors such as existence of functioning referral services. Birth Preparedness process provides (pregnant) women and their family members with key messages associated with pregnancy and childbirth in order to ensure a healthy outcome for both mother and newborn. The messages are about (Canavan, 2009):*

- Having a skilled provider attend each birth;
- Knowing the signs of complications before, during and after delivery;
- Being prepared for a clean delivery;
- Having some cash available for emergencies;
- Having identified transportation for emergencies; and,
- Having identified a person to accompany the women to the hospital in emergencies.
- Knowing where to go if an emergency occurs

6.2 Effects of demographic, social and economic factors on birth preparedness practices

A study was carried out in Nigeria with the aim of assessing the awareness and intention of women to use BPCR/maternity services. This was a multi-centric study involving 800 women. The study found that although awareness of the concept of birth preparedness was high (70.6%) among the women, knowledge of specific key danger signs was poor.

Logistic regression analysis showed that of the four variables, age, educational status, marital status, and parity, educational status was the best predictor of awareness of the concept of birth preparedness ($P = 0.5477$; 0.0029 ; 0.6455 ; 0.4433). The place of residence, urban or rural, was not a good predictor of awareness of birth preparedness ($\chi^2 = 0.3316$; $P = 0.5646$). Parity was a better predictor of knowledge of severe vaginal bleeding as a key danger sign during pregnancy than educational level ($P = 0.0009$ and $P = 0.3849$). Intention and behavior as regards plan to use maternity services during pregnancy and access to skilled attendance in childbirth was generally positive (ranging from 69.5% to 83.5%). However, log regression analysis showed that educational level, marital status and parity were not good predictors of intention and behavior, especially regarding plan to attend at least four antenatal clinic (ANC) visits with a skilled provider ($P = 0.449$; 0.1286 and 0.9765 , resp.). Those who were aware of birth preparedness were more likely to plan to identify mode of transport to the place of childbirth than those who were not aware. This difference was not statistically significant ($\chi^2 = 0.3255$; $P = 0.5683$). When planning to save money for childbirth was regressed on marital status, educational level, awareness of birth preparedness, and parity, it was observed that parity was a highly significant predictor ($P = 0.0089$) of planning to save money followed by awareness of birth preparedness ($P = 0.0101$). Marital status and level of education were not good predictors of planning to save money for childbirth ($P = 0.2394$, 0.2013). Women who planned to save money for child birth were more aware of community financial support system than those who did not plan to save money. This difference was not statistically significant ($\chi^2 = 0.8602$; $P = 0.3536$) (Ekabua, Kufre, Odusolu, Agan, Iklaki, & Etokidem, 2011).

In order to assess knowledge and practices towards birth preparedness and complication readiness and associated factors among women of reproductive age groups (15–49) a study was carried out in Ethiopia in 2012 among 581 women who gave birth in the last 12 months preceding the survey. In bivariate analysis the study found that maternal education was significantly associated with birth preparedness and complication readiness. Mothers whose educational status was secondary, high school and above were about 10 times more likely to prepare for birth and its complication than women with other levels of education (OR = 10.06, 95% CI: 2.85, 35.42). This study also found that women with higher income

and women with knowledge of danger sign of obstetric complications were also significantly associated with birth preparedness and complication readiness. Women who had history of antenatal visit and mothers who had given birth at health facility before their last delivery were more likely to prepare for birth and its complication were more likely to prepare for birth and its complication. Similarly in multiple logistic regression analysis several socio demographic variables (women's education monthly income, parity, ANC visit, knowledge of the danger signs of obstetric complications, presence of history of still birth, history of delivery at health facility before last delivery more likely to prepare for birth and its complications than mothers didn't know the presence of complications (Kaso & Addise, 2014).

Another study was carried out in Ethiopia in 2013 among 3472 pregnant women to determine the effect of birth preparedness and complication readiness on skilled care use in Southwest Ethiopia. The study utilized bivariate and multivariate techniques in data analysis. This study also confirms that maternal education, husband's occupation, wealth quintiles, inter-birth interval, and knowledge of key danger signs during labor, ANC visit and BP & CR were found to have statistically significant association with skilled care use. Having primary, secondary or tertiary educations by women were found to increase the likelihood of skilled care use significantly as compared to not having formal education. Similarly, women whose husbands were employed or merchants were more likely to use skilled care as compared to those whose husbands were farmers. Women in the 3rd wealth quintiles and 4th quintiles were more likely to use skilled care as compared to those in the lowest quintile (Tura, Afework & Yalew, 2014).

In 2013 a community based cross sectional study was conducted using quantitative methods among all pregnant women (n=578) who were residing in Duguna Fango district in Ethiopia. The study found that only one tenth (10.7%) of pregnant women identified skilled provider. Two hundred forty eight (43.6%) identified health facility for delivery and/or for obstetric emergencies. More than half (54.1%) of families saved money for incurred costs of delivery and emergency, if needed for delivery of the last child. About 103 (18.1%) arranged transportation to health facility. Preparedness for compatible blood

donor was found to be very low (3%). The birth preparedness score was computed from key elements of birth preparedness such as; arrangement for transportation, saving money for delivery, identified skilled attendant to assist at birth, identifying a health facility for emergency and identifying blood donor in case of emergency. Taking at least three steps was considered being well prepared. Accordingly less than one fifth 18.3% of pregnant women on this study were considered as well prepared for birth and complications.

The study showed some important findings. Availing antenatal care, being pregnant for the first time, history of past obstetric complications and having knowledge of at least two danger signs during pregnancy were predictors of birth preparedness and complication readiness. The study further found that women who attended antenatal care service were well prepared than those who did not attend. The finding is similar to other studies conducted in Adigrate Ethiopia, India and Aleta Wondo. This signifies that antenatal care services visits are an opportunity to inform pregnant women and help to plan for the important components of birth preparedness and complication readiness. The study found that women who have knowledge of at least two key danger signs during pregnancy were more likely to be well prepared, which is consistent with study done in Uganda. This could be that knowledge of danger signs of obstetric complications is essential for women to seek skilled birth attendants. The study revealed that women with history of obstetric complication were more likely to be well prepared than their counterparts. This finding is similar with a study done in Adigrat, Ethiopia. This could be the reason that women perceive serious problems based on previous experiences (Gebre, Gebremariam & Abebe, 2015).

Similar study conducted in Ethiopia in 2014 among 580 women who gave birth in the last 12 months regardless of their birth outcome was included in the study. The study aimed to assess birth preparedness and complication readiness among women of child bearing age group in Oromia region. The study revealed that, only a small proportion of the respondents were prepared for birth and its complication in their last pregnancy. The most commonly mentioned practice in the study were identifying place of delivery, saving money. Regarding some of the factors affecting birth preparedness and complication readiness, the

study found educational status of the women and ANC follow up significant statistical association with birth preparedness and complication readiness. Likewise place of residence and knowledge of key danger signs during pregnancy as well as postpartum period were also found independent predictors of birth preparedness and complication readiness (Markos & Bogale, 2014).

Various studies conducted in Nepal also show strong relationship between selected demographic, social and economic factors and birth preparedness practices. Karkee conducted community-based prospective cohort study 2012 in Kaski district of Western Nepal among 701 women who had delivered 11 months prior to the study date. In this study birth preparedness was measured by five indicators: identification of delivery place, identification of transport, identification of blood donor, money saving, and ANC check-up. These arrangements also are the government designated preparedness for safe delivery in Nepal. The study found that the great majority of women had reported check-up at antenatal care clinic (97%) and said they saved money (93%). About 65% of women were prepared for at least 4 activities, with the exception of identification of a potential blood donor. The overall mean percentage of women who actually prepared for the five activities (BP/CR index) was 72.4%. Only two women reported no preparation for these activities. The study also found that the more arrangements made, the more likely were the women to have skilled attendance at birth (OR 1.52, $p < 0.001$). For those pregnant women who had or intended to save money, identified a delivery place or identified a potential blood donor, their likelihood of actual delivery at a health facility increased by two to three folds. However, making arrangements for transportation or antenatal care visit were not significantly associated with skilled attendance at birth. The study concludes that birth preparedness is positively associated with skilled attendance at birth. Birth preparedness packages, if able to change the intention, are likely to change the behavior as well and increase the proportion of skilled attendance at birth (Karkee, Lee & Binns, 2013).

A Community based survey was conducted among 310 women who gave birth in the last 12 months preceding the study in Lekhnath municipality, Nepal. The aim of this study was to assess knowledge and practices of women on birth preparedness in the study area. The

study found that women with secondary and higher level of education were about thirty eight and half times more likely to be prepared than women with primary and below level of education ($p < 0.001$, Crude OR 38.65, 95% CI 9.26 - 160.68). The study reported women were about fifteen times more likely to be prepared in later pregnancies than first one ($p < 0.001$, Crude OR 15.0, 95% CI 6.64 - 33.86). In the study women who had attended 4 or greater times antenatal care were more well prepared than women who had attended less than 4 times antenatal care ($p < 0.003$, Crude OR 11.47, 95% CI 1.51 - 86.73). The study concluded that there was low level of knowledge, preparedness and utilization of all essential components of BPACR. The study however indicated that there was positive influence of women's education on antenatal care service utilization and awareness on obstetric danger signs in BPACR (Kaphle, Neupane, Kunwar, & Acharya, 2015)

6.2.1 Demographic variables and birth preparedness practices in Nepal

The entry point for birth preparedness is through the antenatal services when the pregnant woman is expected to attend for comprehensive screening, prevention of complications and routine. It is recommended by WHO and health care personnel that ideally at least four ANC visits during pregnancy (WHO, 1999). In most developing countries ANC is usually provided at primary healthcare level as part of a basic package of maternal healthcare.

Comparatively birth preparedness by pregnant women is low in Nepal. In 2003 more than one in three women (37%) saved money for delivery, 9 percent bought a home delivery kit, 4 percent contacted a health worker, and about 26 percent arranged for food and clothing for the newborn. Nearly one in two mothers reported of no birth preparations in the last pregnancy. Men's responses differed somewhat from women's responses. Fifty-four percent of men mentioned that they saved money for the birth, 10 percent of men said they bought a home delivery kit, 9 percent contacted a health worker, and 6 percent arranged for transport. About 29 percent of men said they did not make any preparations for the birth of their youngest child (MOHP, 2007).

In 2011 more than 1 in 3 (36%) saved money for delivery. Five percent bought a home delivery kit and 2 percent contacted a health worker, which are lower in comparison to similar data in the 2006 NDHS. More than half of women (56 percent) arranged for food and clothing for the newborn in 2011, in comparison to 26 percent in 2006. Arrangements of transportation however slightly increased from 1 percent in 2006 to 3 percent in 2011. Nearly one-third (35.4%) of women said they had not made any preparations at all for the birth of their last child (MOHP, 2012).

In this study following 5 components of birth preparations have been included in data analysis: *saving of money, arrangement of transport, arrangement of blood or a blood donor, identification of a skilled health worker or health institution for delivery, and arrangement of clean delivery kit.* Arrangement of food and clothes and other preparations have been excluded from the analysis. There are two reasons for the exclusion of these components: the first reason is that the 5 components of birth preparations mentioned above are recommended internationally; secondly, a very high percentage of respondents (55.7%) in 2011 reported of preparing food and clothing – this inflates the total percentage of birth preparations to about 64 percent of women.

Overall, the data analysis result showed that nearly 4 in every 10 women (39.1%) reported of making at least 1 component of birth preparations in their last pregnancy. By current age about 40 percent of women each in the age groups of 15-19, 20-24 and 25-29 years had made birth preparations in their last pregnancy. The percentage reporting of BP was found low among women in the older age groups. BP practice was much lower among women who are who were in the age groups of 40-44 and 45-49 years (Table 6.1).

Likewise, BP practice was highest among women whose age at first birth was 20-24 (42.9%) and 25-29 (48.9%) years. By parity, BP practice was high (47.2% - 45.8%) among women who had 1 or 2 child. Birth preparation among women who ever had pregnancy termination (induced abortion) was also found slightly high. By 4 or more ANC use, over half of the women (54.1%) who had utilized ANC services 4 or more times had also made birth preparations. Comparatively only 24 percent of women who had not utilized ANC

services 4 or more times had made birth preparations for delivery of last pregnancy (Table 6.1).

Description	Birth preparation		No birth preparation		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Age Group						
15-19	144	43.2	189	56.8	333	100.0
20-24	554	41.7	774	58.3	1328	100.0
25-29	560	42.7	750	57.3	1310	100.0
30-34	239	35.7	431	64.3	670	100.0
35-39	88	27.8	228	72.2	316	100.0
40-44	30	21.4	110	78.6	140	100.0
45-49	6	12.0	44	88.0	50	100.0
Age at First Birth						
10-14	19	28.8	47	71.2	66	100.0
15-19	752	35.4	1374	64.6	2126	100.0
20-24	705	42.9	940	57.1	1645	100.0
25-29	129	48.9	135	51.1	264	100.0
30+	129	48.9	135	51.1	264	100.0
	1623	39.1	2526	60.9	4149	100.0
Children Ever Born						
1	615	47.2	687	52.8	1302	100.0
2	532	45.8	630	54.2	1162	100.0
3	273	37.2	460	62.8	733	100.0
4	93	23.4	304	76.6	397	100.0
5+	108	19.5	447	80.5	555	100.0
Child < 5 Years						
None	103	41.7	144	58.3	247	100.0
1	944	43.3	1237	56.7	2181	100.0
2	461	34.5	874	65.5	1335	100.0
3	83	27.8	216	72.2	299	100.0
4+	31	34.7	55	65.3	86	100.0
Pregnancy Termination						
Yes	320	40.2	476	59.8	796	100.0
No	1302	38.8	2050	61.2	3352	100.0
Utilization of ANC 4 or More						
Yes	1125	54.1	953	45.9	2078	100.0
No	498	24.0	1573	76.0	2071	100.0
Total	1623	39.1	2526	60.9	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						

The logistic regression analysis on the effects of selected demographic variables on the likelihood of birth preparation practices among Nepalese women is presented in Table 6.2.

Table 6.2: Effects of selected demographic variables on birth preparation practices in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Age Group			
15-19	Ref.		
20-24	.937	.692 - 1.269	0.674
25-29	.977	.722 - 1.321	0.878
30-34	.727	.522 - 1.013	0.060
35-39	.506	.339 - .754	0.001
40-44	.359	.201 - .642	0.001
45-49	.164	.055 - .492	0.001
Children Ever Born			
1	3.651	2.736 - 4.872	0.000
2	3.445	2.574 - 4.610	0.000
3	2.424	1.769 - 3.322	0.000
4	1.240	.861 - 1.785	0.249
5+	Ref.		
Age at First Birth			
10-14	.673	.248 - 1.829	0.438
15-19	.938	.457 - 1.925	0.861
20-24	1.284	.624 - 2.641	0.497
25-29	1.625	.753 - 3.506	0.216
30+	Ref.		
Child < 5 Years			
0	1.259	.674 - 2.354	0.470
1	1.345	.776 - 2.331	0.291
2	.931	.533 - 1.626	0.802
3	.675	.361 - 1.261	0.218
4+	Ref.		
Pregnancy Termination			
Yes	1.058	.878 - 1.273	0.554
No	Ref.		
Utilization of ANC 4 or More			
Yes	3.729	3.265 - 4.257	0.000
No	Ref.		
Calculated from NDHS 2011 data files Weights are applied Ref: Reference category			

The overall result shows that women's age does not have strong positive effect on birth preparations. But women who have one CEB are 3.65 times more likely (95% CI, 2.736 - 4.872; $p < 0.005$) and women with 2 CEB are 3.44 times more likely (95% CI 2.574 - 4.610) to practice birth preparations. Similarly, women with 3 CEB are 2.42 times more likely to practice birth preparations. Utilization of ANC services has strong effects on birth preparations in Nepal. The regression analysis results show that women who have utilized

ANC services 4 or more times are strongly likely (OR 3.729; CI 3.265 - 4.257; $p < 0.005$) to make birth preparations than the women who did not take ANC services or took the services less than 4 times. The other demographic variables do not show any effect on birth preparation practices in Nepal (Table 6.2).

6.2.2 Social variables and birth preparedness practices in Nepal

According to caste or ethnicity, the analysis result shows that the BP practices were high among Newar (48.8%) and Brahmin/Chhetri (46.8%) caste/ethnic groups. Similarly, BP practice was also relatively high among Hill and Tarai Janjati (38.3%) and Dalit (36.2%) ethnic groups. The lowest BP practice was among other Tarai ethnic (24.2%) groups. By religion, the BP practice among Hindu and other religious groups of women was found nearly the same (39.6% - 36.8%). Similarly, over one-half (56%) of women in urban areas had practiced BP in their last pregnancy while only about 37 percent women had practiced BP in rural areas. By ecological regions the practice was highest in Tarai (41.5%) followed by Hills (37.4%) and the lowest was in Mountains (30.4%) (Table 6.3).

By development region, the BP practice was highest in Far-western (52.7%) and Eastern (48%) regions. By eco-development sub-region, a high percentage of women in Far-western Tarai (69.2%) Eastern Tarai (52.5%) and Central Hill (45.5%) regions had made birth preparations. The lowest percentage of women making BP in their last pregnancy were from Western mountain (22.6%) and Mid-western Hill (29.8%) regions (Appendix IV).

High percentage of women high level of education had made BP in their last pregnancy than those who had low or no education. For example, about 67 percent with high level of educational attainment (higher secondary or above) and about 52% of women with secondary level of education had made birth preparations (Table 6.3).

It is also noted that BP use was highest (60%) among women whose husband had attended higher level of education. By media habits, overall BP practice was found high among women (63%) who had habits of using media channels such as newspaper, radio, and TV (Table 6.3).

Table 6.3: Birth preparation practices in Nepal according to social characteristics of women						
Description	Birth preparation		No birth preparation		Total respondents	
Caste/ethnicity	Number	Percent	Number	Percent	Number	Percent
Brahmin/Chhetri & other castes*+	601	46.8	682	53.2	1283	100.0
Other Tarai Caste	100	24.2	314	75.8	414	100.0
Dalit	247	36.2	436	63.8	683	100.0
Newar	62	48.8	65	51.2	127	100.0
Hill and Tarai Janajati	534	38.3	862	61.7	1396	100.0
Muslim	70	29.8	165	70.2	235	100.0
Religion						
Hindu	1363	39.6	2081	60.4	3444	100.0
Others	259	36.8	445	63.2	704	100.0
Residence						
Rural	1388	37.2	2342	62.8	3730	100.0
Urban	234	56.0	184	44.0	418	100.0
Ecological Region						
Mountain	94	30.8	211	69.2	305	100.0
Hill	625	37.4	1044	62.6	1669	100.0
Tarai	903	41.5	1271	58.5	2174	100.0
Respondent Education						
Higher	178	67.7	85	32.3	263	100.0
Secondary	637	51.8	593	48.2	1230	100.0
Primary	334	40.0	500	60.0	834	100.0
No education	473	26.0	1349	74.0	1822	100.0
Husband education**						
Higher	278	60.3	183	39.7	461	100.0
Secondary	838	46.3	971	53.7	1809	100.0
Primary	299	30.4	685	69.6	984	100.0
No education	199	22.8	673	77.2	872	100.0
Media Habits						
Newspaper						
At least once a week	195	65.2	104	34.8	299	100.0
Less than once a week	430	55.3	347	44.7	777	100.0
Not at all	996	32.4	2075	67.6	3071	100.0
Radio						
At least once a week	715	46.6	820	53.4	1535	100.0
Less than once a week	605	37.4	1012	62.6	1617	100.0
Not at all	302	30.3	694	69.7	996	100.0
Television						
At least once a week	821	52.6	740	47.4	1561	100.0
Less than once a week	460	40.2	684	59.8	1144	100.0
Not at all	340	23.6	1102	76.4	1442	100.0
Mass Media Habits						
Yes	102	63.0	60	37.0	162	100.0
No	1520	38.1	2467	61.9	3987	100.0
Total	1622	39.1	2527	60.9	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
*11 cases missing						
**22 cases missing						
Totals may not equal 100.0 due to rounding off of cases						
+List of caste/ethnic groupings is attached as Annex 1						

Table 6.4: Effects of selected social variables on birth preparation practices in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Caste/ethnicity			
Brahmin/Chhetri & other castes*	2.070	1.352 - 3.169	0.001
Other Tarai Caste	.748	.449 - 1.246	0.265
Dalit	1.333	.848 - 2.0949	0.213
Newar	2.244	1.255 - 4.012**	0.006
Hill and Tarai Janajati	1.454	.946 - 2.234	0.087
Muslim	Ref.		
Religion			
Hindu	1.128	.912 - 1.395	0.267
Non Hindu	Ref.		
Residence			
Rural	Ref.		
Urban	2.140	1.792 - 2.556	0.000
Ecological Region			
Mountain	.628	.517 - .763	0.000
Hill	.842		0.033
Tarai	Ref.	Ref.	
Respondent Education			
Higher	.167	.119 - .233	0.000
Secondary	.318	.224 - .451	0.000
Primary	.510	.365 - .715	0.000
No education	Ref.		
Husband's Education			
Higher	.194	.143 - .263	0.000
Secondary	.287	.218 - .377	0.000
Primary	.566	.442 - .725	0.000
No education	Ref.		
Media Habits			
Newspaper			
At least once a week	.257	.191 - .346	0.000
Less than once a week	.663	.477 - .921	0.014
Not at all	Ref.		
Radio			
At least once a week	.498	.404 - .615	0.000
Less than once a week	.686	.579 - .812	0.000
Not at all	Ref.		
Television			
At least once a week	.278	.230 - .338	0.000
Less than once a week	.607	.504 - .732	0.000
Not at all	Ref.		
Mass Media Habits			
Yes	2.781	1.866 - 4.144	0.000
No	Ref.		
Source: Calculated from NDHS 2011 data files			
Weights are applied			
Totals may not equal 100.0 due to rounding off of cases			
*List of caste/ethnic groupings is attached as Annex 1			
Ref. Reference category			

On social variables, the logistic regression analysis results shows a strong likelihood of birth preparedness among Brahmin/Chhetri (OR 2.070; 95% CI 1.352 - 3.169; $p < 0.001$) and Newar (OR 2.244; 95% CI .946 - 2.234) caste/ethnic groups of women. Similarly Women residing in urban areas are 2.14 times more likely to practice BP than those living in rural areas. Similarly, women who use different media channels like newspaper, radio and TV are more likely to practice BP. Overall, women who have the habits of using the above three media channels are 2.7 times more likely (95% CI 1.866 - 4.144; $p < 0.001$) to practice BP than those who do not have the habits of using these media channels. Women's and their husband's education also has some effect as women or their husband with some education are more likely to practice BP than the women or their husband who have no education. The logistic regression analysis does not show much effect of other social variables like religion and ecological region (Table 6.4). The analysis also does not show much effect by development region and eco-development sub-regions (Appendix V).

6.2.3 Economic variables and birth preparedness practices in Nepal

Table 6.5 presents data on BP practices among women based on their economic characteristics. The result shows that the practice of BP was highest among women whose occupation was service/trade (55.3%) and those in manual labor (48.4%). BP among women who were not working was also relatively high (43.4%). The lowest percentages of women reporting of making BP were from agriculture (33.7%) sector. It is also noted that BP practice was highest among women whose husband's occupation was service/trade (48.5%) followed by those involved in manual labor (37.2%). By employment status BP practice was high among women who were not currently employed (41.9%). By household wealth status BP practice was highest among women who belonged to rich (53.4%) followed by those who belonged to middle (38.6%) wealth quintiles (Table 6.5).

The logistic regression result shows some likelihood effects of economic variables on the practice of birth preparations. Women whose occupation is service/trade are more likely to practice BP (OR .54; 95% CI .373 - .786) than women whose occupation is manual or agriculture. Similarly women whose husband's occupation is service/trade is 1.59 times

more likely (95% CI 1.333 - 1.908; $p < 0.001$) to practice BP than the women whose husband's occupation is manual or agriculture.

Description	Birth preparation		No birth preparation		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Respondent's Occupation+						
Manual	88	48.4	94	51.6	182	100.0
Service/trade	220	55.3	178	44.7	398	100.0
Agriculture	813	33.7	1602	66.3	2415	100.0
Not working	499	43.4	651	56.6	1150	100.0
Husband's Occupation++						
Manual	489	37.2	826	62.8	1315	100.0
Service/trade	819	48.5	869	51.5	1688	100.0
Agriculture	279	27.7	727	72.3	1006	100.0
Respondent Employment						
Yes	861	37.0	1468	63.0	2329	100.0
No	762	41.9	1058	58.1	1820	100.0
Household wealth						
Rich	738	53.4	645	46.6	1383	100.0
Middle	534	38.6	849	61.4	1383	100.0
Poor	351	25.4	1033	74.6	1384	100.0
Total	1623	39.1	2527	60.9	4150	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Totals may not equal 100.0 due to rounding off of cases						
+2 missing cases						
++ 140 missing cases						

Household wealth also does have some effect on BP practice as women who belong to rich or middle wealth quintiles are more likely to practice BP than women who belong to poor quintile (Table 6.6).

Table 6.6: Effects of selected economic variables on birth preparation practices in Nepal using logistic regression

Variable name	Odds ratio (OR)	Confidence interval (CI)	P value
Respondent's Occupation			
Manual	.818	.554 - 1.209	0.314
Service/trade	.542	.373 - .786	0.001
Agriculture	1.320	.860 - 2.028	0.204
Not working	Ref.		
Husband's Occupation			
Manual	.648	.523 - .804	0.000
Service/trade	1.595	1.333 - 1.908	0.000
Agriculture	Ref.		
Total			
Household wealth			
Rich	.297	.246 - .358	0.000
Middle	.550	.454 - .665	0.000
Poor	Ref.		
Respondent's Employment Status			
Yes	.814	.698 - .950	0.009
No	Ref.		

Source: Calculated from NDHS 2011 data files

Weights are applied

Ref: Reference category

Chapter 7

INSTITUTIONAL DELIVERY PRACTICES

This chapter presents the effects of socio-economic and demographic variables of respondents and utilization of health institutions or facilities at the time of child delivery. The chapter first presents the institutional delivery practices in other countries specially the developing countries. This is followed by descriptive presentation of institutional delivery practices in Nepal based on data from NDHS 2011. Finally the chapter presents the effects of selected demographic, social and economic variables on utilization of health institutions in child delivery in Nepal.

7.1 Institutional delivery practices

Every year, more than 500,000 maternal deaths occur worldwide, 4 million newborns die and another 3 million babies are stillborn. Nearly all these deaths take place in low- and middle-income countries and most could be prevented with current medical care (WHO, 2012).

Most obstetric complications occur around the time of delivery and cannot be predicted. Therefore it is important that all pregnant women have access to a skilled attendant, i.e. someone with midwifery skills, who is able to manage a normal delivery and who can recognize and manage obstetric complications, or refer in time if needed. Skilled attendance at delivery is advocated as the "single most important factor in preventing maternal deaths" and the "proportion of births attended by skilled health personnel" is one of the indicators for Millennium Development Goal 5. Access to skilled delivery care is also crucial to prevent stillbirths and to improve newborn survival.

“Skilled attendance” has only recently been defined explicitly as “the process by which a woman is provided with adequate care during labour, delivery and the early postpartum

period”. This definition emphasize that the process requires a skilled attendant and an enabling environment which includes adequate supplies, equipment and infrastructure as well as efficient and effective systems of communication and referral. The “environment” can, however, also be viewed more broadly to include the political and policy context in which skilled attendance must operate, the socio-cultural influences, as well more proximate factors such as pre- and in-service training, supervision and deployment and health systems financing. This constellation of factors can be conceived as the conceptual framework for skilled attendance (SMIAG, 2000b).

Countries that have succeeded in reducing maternal mortality have emphasized the role of the professional midwife or doctor working in health facilities, usually hospitals. Over the last five or six decades, maternal death decreased in Malaysia and Sri Lanka in response to improved access to health care in rural areas and the introduction of professional midwifery. More recently, China, Costa Rica, Egypt, Indonesia, Jamaica, Jordan, Mexico and Thailand have reduced maternal mortality by increasing the availability of skilled attendants and improving the referral system for emergencies. In China, the expansion of government services offering professional medical care to rural areas between the 1960s and 1980s contributed to a dramatic reduction in maternal deaths. Similarly, in Malaysia, the health-care system’s improvements in rural areas resulted in skilled, salaried midwives at more births. Since the 1980s, Malaysia’s highly supervised referral system, along with free transportation, has shifted the preponderance of births to health institutions and significantly reduced maternal mortality. In Sri Lanka, midwives were deployed throughout the country and health-care services were expanded in rural communities in the early decades of the twentieth century. By 1996, over 94 per cent of births took place in hospitals. Cuba, Egypt, Jamaica and Thailand also reduced maternal mortality following coordinated transitions from home-based to facility-based delivery, offering skilled care at birth as well as the capability to perform Caesarean sections and blood transfusions.

The inverse relationship between maternal mortality and the proportion of deliveries attended by health professionals provides further indication of the importance of skilled attendants. In general, higher the proportion of deliveries by a health professional the lower

the maternal mortality ratio is. In almost all countries where health professionals attend more than 80 per cent of deliveries, maternal mortality ratios are below 200 per 100,000.

A woman's location, socio-economic status and education all may affect the adequacy of the care she receives during her delivery. Cultural and religious beliefs often influence where a woman chooses to give birth. Her own decision-making power within the family, and her past experiences in childbearing, may affect the care she receives as well. The importance of these factors may differ from setting to setting, but a recent study of trends across six developing countries – Bangladesh, Bolivia, Ghana, Indonesia, Malawi and the Philippines – found these correlations (UNFPA, 2004):

- Urban-rural residence – The percentage of women receiving professional delivery care is consistently higher in urban than in rural areas.
- Poverty – The richest women are most likely to receive skilled care at delivery. The poorest women are least likely to receive care.
- Maternal education – The more education a woman has received the more likely she is to deliver with a professional.
- Antenatal care – The more antenatal visits she makes, the more likely a pregnant woman is to receive professional delivery care.
- Birth order – The higher the birth order of a delivery, the less likely the mother is to receive professional delivery care. In other words, women in their first or second pregnancy are more likely to deliver with a skilled birth attendant than women who have already had several children.

The study also found that delivery with health professionals has increased over the last decade in all six countries, with the largest increases in Bolivia and Indonesia and the smallest in Malawi. However, while rates of professional delivery care appear to be increasing in some countries, national trends provided by large-scale surveys can mask substantial variations among different groups of women, especially the inequities between rich and poor (UNFPA, 2004).

Recent research also demonstrates that delivery by a skilled birth attendant (SBA) serves as an indicator of progress towards maternal mortality worldwide whereby estimates between 13% - 33% of maternal deaths could be averted by the presence of a skilled birth attendant. This is amply demonstrated by the association between absence of skilled attendance and maternal mortality. Analysis of DHS survey data from 44 countries (1999-2004) showed that the proportion of deliveries assisted by TBAs is extremely variable within and across countries, being highest in rural areas. The proportion assisted by SBAs is actually comparable to the number of deliveries assisted by family members and no persons combined. Traditionally, the main provider of such services was the untrained birth attendant which continues to be the practice among the poorest communities in developing countries (WHO, 2005).

7.2 Effects of demographic, social and economic factors on institutional delivery practices

Various studies conducted in different countries shows that skilled birthing service, be it a individual SBA or health institution, seeking behavior is strongly influenced by various factors including education, occupation employment, place of residence, income of both of the women and her husband. A Community-based cross-sectional study was conducted in Ethiopia in 2010 among 371 mothers who had given birth in the last 12 months prior to the survey data. The study used both bivariate and multivariate analysis to examine the relationship between institutional delivery and background variables of the respondents. On bivariate analysis the study found that, age of the mother, occupation, education, distance from the nearby health center, residence, media of communication, monthly income, number of ANC visits at last pregnancy, husband's education, husband's occupation and obtaining information about delivery place during ANC visit were the factors found to be significantly associated with institutional delivery service utilization in the study area. In the multivariate logistic regression analysis the study found only residence of the mother, age at interview, educational status, and ANC visit during last pregnancy and knowledge of the mother were found to be significantly associated with the institutional delivery service. Similarly, mothers who were urban residents were about 5

times more likely to give birth in health facilities than rural mothers; mothers with age group of 15–24 years were 4 times more likely to deliver in health institutions than mothers with age group 35 and above; mothers with educational level of secondary and above were about 12 times more likely to give birth in health facilities than those with primary education and below and mothers who had ANC visit during pregnancy were 4 times more likely to deliver in health facilities than those who did not have ANC visit during last pregnancy. Factors such as being urban resident, age at interview, ANC visit during the last pregnancy, educational status of the mother and knowledge of the mothers on pregnancy and delivery services were significantly associated with skilled delivery service utilization (Teferra, Alemu & Woldeyohannes, 2012).

Women's background variables such as age, education, parity, husband education has strong influence in institutional delivery practices. A community-based cross-sectional survey was carried out in Tigray region of Ethiopia among 1113 rural women aged 15–49 years in 2009. The objective of the study was to determine the prevalence of maternal health care utilization and explore its determinants among rural women aged 15–49 years. The study showed that institutional delivery service utilization was very low in the study areas. Of all the survey participants, only 46 women (4.1%) gave birth at a health facility, 41 of them (3.6%) at a health center and five (0.5%) at a health post. The most frequently mentioned reasons for delivering at a health facility were “saves mother's life”, “health facility is clean”, “bleeding will not occur”, “problem of retained placenta is not encountered if delivered at health facility”, and “health facility supports labour”. Women in the younger age group had the highest proportion of institutional delivery use (54%) followed by the middle age group, 30 – 39 years (39%). Moreover, women with 5 – 12 years of education were more likely to use institutional delivery than non-educated mothers (OR=2.56, 95% CI: 1.1-6.0). Parity was another important determinant. Women with 8 - 11 (OR=0.40, 95% CI: 0.11-1.48) and 5 – 7 children (OR=0.39, 95% CI: 0.17- 0.93) were less likely to use institutional delivery than women with less parity. Receiving health information about ANC during the pregnancy check-up (OR=3.08, 95% CI: 1.21-7.84), history of difficult/prolonged labour (OR=10.0, 95% CI: 4.87-20.6) and husband's

occupations classified as other than farming (OR=3.84, 95% CI: 1.78-8.29) were also strongly associated with the use of institutional delivery.

The analysis highlighted the effect of women's education. Having five or more years of education was found to be a significant predictor for both ANC use and institutional delivery. Proximity to the health facility is another one of the main factors involved in improving access to maternal health services [42]. The results of this study confirm the advantages of proximity for using ANC services, but not for institutional delivery. In contrast to the findings of our study, studies from Ethiopia have indicated proximity as a determinant predictor for both ANC and institutional delivery utilization, although mainly for urban residents. Husbands' occupation was associated with both ANC use and institutional delivery. Women who classified their husbands' occupation as "other than farming" were more likely to use ANC services and institutional delivery than farmers' wives. This finding was comparable to the results of other studies where women with husbands in non-farming occupations were more likely to use ANC and institutional delivery (Tsegay, Tesfay, Goicolea, Edin, Lemma & Sebastian, 2013).

Another community based cross sectional study was conducted in Bahir Dar City administration of Ethiopia in 2012 among 484 women who gave birth 12 months before the study period. In this study binary and multivariable logistic regression analyses were carried out to identify factors associated with institutional delivery service use. The study found that among the socio-demographic variables, age, marital status, occupation and educational status of mothers were statistically associated with institutional delivery service use. Similarly, occupation and educational status of husbands showed statistically significant association with institutional delivery service utilization. Likewise, the binary logistic analysis showed that age at first marriage, number of pregnancies, type of pregnancy (planned vs. unplanned), gestational age at first ANC visit and number of live births showed statistically significant association with institutional delivery service use (Abeje, Azage & Setegn, 2014).

A number of other studies in various regions of the world have found important socio-demographic characteristics which influence the likelihood of using professional health

care at birth. One such study was conducted to examine the relationship of antenatal care utilization with the use of safe delivery care among poor to middle income women in an urban area of Uttar Pradesh (UP), India. The study covered 336 poor to middle income women who had given birth to a child up to 3 years prior to survey date. The study concluded that the use of care during pregnancy among lower to middle income women in Varanasi positively influences the likelihood of using trained assistance at the birth be it a health institution or a SBA. Women who obtained higher levels of antenatal care were more likely to use safe delivery care than those with lower antenatal care levels, in both contexts measured. This effect persists at various levels of economic status, education and parity, and whether or not they experienced problems at delivery or had previously used safe delivery care. The results provide further support for the argument that antenatal care is an integral part of maternal health care including safe delivery care (Bloom & Lippeveld, 1999)

Similarly, a cross-sectional study conducted in the state of Andhra Pradesh, India using data from 'Young Lives', a longitudinal study on childhood poverty. The study population was a cohort of 1419 rural, economically deprived women. The data were from round-1 of Young Lives younger cohort recruited in 2002 and followed until 2015. The prevalence of institutional delivery by SBA in the study sample was 36.8%. An examination of the determinants of skilled institutional delivery showed that those pregnant women who had primary and secondary levels of education, desired to be pregnant and had received adequate prenatal care were most likely to utilize these services. The probability of utilizing skilled institutional delivery decreased after the first child and was lower for women who belonged to a schedule caste or schedule tribe. However, age at parity and education of their husbands had no significant effect on skilled institutional delivery. Pregnant women from the poorest households were least likely to undergo skilled institutional delivery. Educated women, particularly women with secondary education were more likely to utilize SBA and health institutions for delivery. The results of this study showed that caste/ethnicity has strong influence in institutional delivery care as the study indicated that women belonging to schedule caste/schedule tribe group were significantly less likely to

have skilled institutional delivery even after controlling for all other determinants, (Nair, Ariana & Webster, 2012).

A study conducted in Ethiopia analyzing data from the 2000 and 2005 Demographic and Health Surveys reveal a gross effect of several background and intermediate variables that influence women's decision to give birth in health facilities. The study verifies that health facility delivery care utilization is highly influenced by women's place of residence. Women residing in urban areas are more likely to utilize institutional delivery care services than women in rural areas. The study also found that Educational status of women was the most significant factor influencing place of delivery. Women with secondary or higher level of education are more likely to utilize health facility delivery care services. In most traditional societies a higher level of female education may indicate greater female autonomy, so that women develop the confidence to utilize health facility services (Mekonnen & Mekonnen, 2002). This study found that low socioeconomic status of the mother is an important predictor of home delivery. This finding can be possibly explained by the fact that poor mothers are unlikely to afford the cost of transport and other medical costs. Media exposure that is, frequency of watching television is another important factor identified in this study is influencing utilization of delivery care services (Mehari, 2013).

The association between individual, community and district level factors and the utilization of maternal health services covering three aspects of maternal health care use of antenatal care, skilled attendance at delivery and postnatal care were examined in this study. This study was designed as a cross sectional study. Data from 15,782 ever married women aged 15-49 years residing in Madhya Pradesh of India who participated in the District Level Household and Facility Survey (DLHS-3) 2007-08 were used for this study. Multilevel logistic regression analysis was performed accounting for individual, community and district level factors associated with the use of maternal health care services. The results of this study indicated that mother's level of education, use of ANC and household socioeconomic status were the strongest factors associated with of the use of skilled attendance at delivery. The results of full model showed that women with higher secondary and above education were 2.35 times more likely to receive skilled attendance at delivery in

comparison with illiterate women. Women having received at least one ANC during pregnancy had 3.52 times higher odds of receiving skilled attendance at delivery than women who did not receive any ANC. Women from the richest quintile of the society were also more likely to receive skilled attendance at delivery than women from the poorest quintile. Older women, women having more than 3 children, belonging to schedule tribes, to be Hindu and to be married to a low educated husband were associated with lower use of skilled attendance at delivery. At community level, urban residence was found to be positively associated with receiving skilled attendance at birth. (Jat & Sebastian, 2011).

A study was conducted during 2007-08 using data drawn from the District Level Household and Facility Survey (DLHS-3) of rural India on reproductive and child health. The study found that socio-economic status of a women and accessibility to health facilities play important role for the utilization of maternal health care services. Among many influencing factors, education, particularly, women's education, household's economic status and accessibility to health facility are found to be effective to influence utilization. However, household wealth and education are found to be relatively more important than the proximity to health center. This evidence stands stronger when other confounding factors of maternal health care utilization are controlled. This finding strengthens the existing knowledge from previous studies that 'socio-economic status of an individual is relatively more important than the proximity to health center as far as utilization of maternal health care services in India is concerned. Cost of health care appears to be another important hurdle for accessing maternal health care services. About 23-24 percent of women gave the high cost as a reason for not using ANC and having 'institutional delivery (Dhak, 2013).

One study was carried to analyze the effects of socio-economic and demographic variables in rural areas of Chitwan district of Nepal. The study included 673 women aged 15-49 years. The study used univariate and multivariable logistic regression analysis to carryout data analysis. The study found effect of caste/ethnicity to be statistically significant in the multivariable analysis. The analysis results show that socio-demographic, socio-cultural, and health service related factors interact in determining the uptake of birthing facilities by

pregnant women and their families. One finding worth highlighting is the critical role that husband's support plays in the decision for institutional delivery. Gender roles limiting women's involvement in decision-making, young women having no access to material resources and higher illiteracy rates make women dependent on their husbands and other family members in having access to maternal health services, including delivery at a health facility (Shah, Rehfuess, Maskey, Fischer, Bhandari & Delius, 2015).

A study conducted by Dahal in Shanischare of Jhapa district, Nepal among 252 recently delivered women (women delivering within last 12 months) found a significant differences in place of delivery related to ethnicity, ($P < 0.001$), types of family ($P = 0.002$), education ($P < 0.001$), age at birth ($P = 0.006$), parity ($P < 0.001$) and number of ANC visits ($P < 0.001$). Place of delivery varied by mother's characteristics in study setting. The mothers who were of Brahmin/Chhetri ethnicity, completed primary level of education and aged less than 20 years had higher rates of undergoing delivery at health facility. Despite the comparatively higher proportion of mothers undergoing delivery at health facility, still plenty of mothers from Dalit/Janajati (44.9%), nuclear family (41.7%), aged 20 or more (36.2%) were delivering baby at home. In this study ethnicity, parity and ANC visits were significant contributor in the model. Women from Brahmin/Chhetri ethnicity were more likely to deliver in a health facility compared to those with Dalit/Janajati (OR = 2.59, 95% CI = 1.28-5.27, $P < 0.01$). Women with primiparous were 3.19 times (95% CI of OR= 1.48-6.87) more likely to give birth in a health facility compared to the multiparous mothers ($P < 0.01$). Women who had fewer ANC visits than those having four or more ANC visits were less likely to deliver in health facility (OR=0.42, 95% CI=0.21-0.86, $P < 0.05$) (Dahal, 2013).

In a study conducted in Kenya it was found that expectant women with secondary school level of education and above are 6 times more likely to deliver in a medical facility assisted by a SBA compared to these with primary level of education and below (OR 6.19) (95% CI=3.982 - 9.616). The study established that the probability of an expectant woman to deliver in a medical facility reduced with increase of her age. The probability of an expectant women aged 26 years and above to deliver using a SBA reduces by 69%

compared to women aged 25 years and below (OR 0.310) (95% CI=0.155-0.623). Expectant women from households earning more than 1 US dollar in a day as well as these coming from households earning more than the GoK recommended minimum wage monthly were 7 times more likely to deliver assisted by a SBA compared to these from households earning less than 1 US dollar a day and these earning equal or below the minimum wage, the Odds Ratios are (OR 7.17) (95% CI 4.204 - 12.221), (OR 7.09) (95% CI 2.681 - 18.757) respectively. Women in employment and these operating small scale businesses were found to be 6 times more likely to deliver assisted by a SBA as compared to expectant women who were peasants (OR 5.93) (95% CI 3.885-9.065). This study also established that the number of children a woman had influenced whether she was to deliver her child in a medical facility assisted by a SBA or not. The probability of an expectant women with 3 children or more to deliver assisted by a SBA reduced by 68% compared to these with 2 children or less (OR 0.319) (95% CI 0.154 - 0.660). This probability reduced much further (by 74%) for women with 4 children or more compared to these with 3 children or less (OR 0.260) 95% CI 0.129 - 0.527) (Nziokil, Onyango & Ombaka, 2015).

Similar effect of demographic and socio-economic variables of women in utilization of institutional delivery care was found in Nigeria. The study utilized Nigeria Demographic and Health Survey 2015 data sets to carry out the further analysis. An important finding of this study was that relationship between obtaining at least four ANC visits and subsequent facility delivery was profound in that ANC utilization increased the odds of facility delivery by more than four times (OR=4.61, 95%CI: 4.34-4.88). geopolitical zone of residence, place of residence (rural/urban), maternal education, husband's level of education, household wealth, parity, use of ANC, health insurance coverage and type of decision maker about woman's health spending. Maternal education appears to be most powerful predictor of facility delivery, it is significant in our two models and it also shows a typical dose-response characteristics of with increasing level of education there is corresponding increased chance of facility delivery to the point that women with tertiary level of education are more than two-and-half times more likely to deliver at health facility. Related to maternal education is the influence of husband's level of education which also plays a similar role; increasing level of husband's education increases the use health facility

by the woman for delivery. Educated husband are more likely to provide support to their wives to utilized formal health services such as facility delivery. Household wealth, parity, enrolment into insurance scheme appeared to be common factors responsible for both use of ANC and facility delivery; and that use of ANC positively predicts use facility delivery (Dahiru & Oche, 2015).

7.2.1 Effects of demographic variables on utilization of institutional delivery services in Nepal

In Nepal the trend of child delivery at a hospital or other health facilities where skilled birth attendants are available is still low. In 2011 only about 35 percent of births took place in a health facility: 26 percent were delivered in a public-sector health facility, 2 percent in a nongovernment facility, and 7 percent in private facility. Still two-thirds of births (63 percent) are taking place at home (MoHP, 2012).

The NDHS results shows that by age majority of the young women especially those in age groups of 15-19 (54.4%), 20-24 (42.1%) and 25-29 (40.2%) had delivered at a health facility. Similarly, higher percentage of women whose age at first birth was in the age group of 25-29 (58.7%) and 20-24 (43.3%) were the ones who delivered at a health facility. Similarly comparatively higher percentage of women who had low parity 1 (60.1%) and 2 (39.7%) had delivered at a health facility than the women who had 3 or more children. Comparatively low percentage of women with high parity (3, 4, 5 or more number of children) had delivered their last child at a health facility.

Similarly women who had fewer number of under 5 year aged children at the time of the survey had delivered at a health facility than the women with higher number of under 5 children. About 42 percent of women who had a history of pregnancy termination had also made institutional delivery of their last child. Institutional delivery practice was also found high among women (58%) who had made ANC visits 4 or more times in the last pregnancy (Table 7.1).

Table 7.1: Institutional delivery practices in Nepal according to demographic characteristics of women						
Description	Institutional delivery		Delivery at home or other places		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Age group						
15-19	181	54.4	148	44.4	333	100.0
20-24	559	42.1	744	56.0	1328	100.0
25-29	526	40.2	767	58.5	1310	100.0
30-34	226	33.7	433	64.6	670	100.0
35-39	76	24.0	235	74.1	317	100.0
40-44	29	20.7	108	77.1	140	100.0
45-49	1	2.0	45	90.0	50	100.0
Total	1598	38.5	2480	59.8	4148	100.0
Age at first birth*						
10-14	14	21.5	51	78.5	65	100.0
15-19	688	32.4	1407	66.2	2125	100.0
20-24	712	43.3	902	54.8	1645	100.0
25-29	155	58.7	100	37.9	264	100.0
30+	29	60.4	19	39.6	48	100.0
Total	1598	38.5	2479	59.8	4147	100.0
Children ever born*						
1	782	60.1	500	38.4	1302	100.0
2	461	39.7	682	58.7	1162	100.0
3	197	26.9	523	71.4	733	100.0
4	93	23.4	296	74.6	397	100.0
5+	65	11.7	479	86.2	556	100.0
Total	1598	38.5	2480	59.8	4150	100.0
Child < 5 years*						
None	120	48.8	117	47.6	246	100.0
1	976	44.8	1172	53.7	2181	100.0
2	412	30.9	902	67.6	1335	100.0
3	65	21.7	228	76.0	300	100.0
4+	25	29.1	60	69.8	86	100.0
Pregnancy Termination*						
Yes	331	41.5	451	56.6	797	100.0
No	1267	37.8	2029	60.5	3352	100.0
Utilization of ANC 4 or more						
Yes	1205	58.0	841	40.5	2079	100.0
No	393	19.0	1639	79.1	2071	100.0
Total	1598	38.5	2480	59.8	4150	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
*71 weighted cases are missing						

The overall logistic regression result derived from NDHS 2011 data shows that women of younger ages are highly likely to opt for institutional delivery than older women. Women who are aged 15-19 and 20-24 years respectively are 64 times (95% CI 14.523-282.970)

and 39 times (95% CI 9.087-170.440) more likely to have institutional delivery than women at 30 years or higher ages. The results are significant at (p<0.001) level (Table 7.2).

Table 7.2: Effects of selected demographic variables on utilization of institutional delivery services in Nepal using logistic regression			
Variable name	Odds ratio (OR)	Confidence interval (CI)	P value
Age group			
15-19	64.105	14.523-282.970	0.000
20-24	39.355	9.087-170.440	0.000
25-29	35.953	8.304-155.682	0.000
30-34	27.413	6.288-119.517	0.000
35-39	16.921	3.802-75.315	0.000
40-44	13.869	2.926-65.739	0.001
45-49	Ref.		
Children Ever Born			
1	11.580	8.136-16.482	0.000
2	4.992	3.501 - 7.118	0.000
3	2.787	1.902 - 4.084	0.000
4	2.313	1.508 - 3.548	0.000
5+	Ref.		
Age at first birth			
10-14	.5542	.251 - 1.223	0.144
15-19	Ref.		
20-24	1.612	1.370 - 1.898	0.000
25-29	3.168	2.295 - 4.371	0.000
30+	3.076	1.470 - 6.436	0.003
Child < 5 years			
0	2.468	1.272 - 4.786	0.008
1	2.005	1.112 - 3.618	0.021
2	1.099	.605 - 1.999	0.756
3	.684	.351 - 1.335	0.266
4+	Ref.		
Pregnancy termination			
Yes	1.177	.974 - 1.421	0.091
No	Ref.		
Utilization of ANC 4 or more			
Yes	5.975	5.189 - 6.880	0.000
No	Ref.		
Source: Calculated from NDHS 2011 data files Weights are applied Ref: Reference category			

The analysis results further show that low parity women, those who have 1 child and women who have 2 children respectively are 11 times (95% CI 8.136-16.482) and 4 times (95% CI 3.501=7.118) more likely to deliver their pregnancy at a health institution.

Similarly, women who have first birth in their twenties (20-24 and 25-29 age groups) are highly likely to deliver in a health institution than those who have first birth at 19 years or at lower ages. Similarly, the logistic regression analysis results further shows that women who have 1-2 children under five years of age are also twice as likely ($p < 0.01$) to have institutional delivery than women with 3 or more under 5 children. (Table 7.2).

Women who have a history of pregnancy termination (induced abortion) are also more likely have institutional delivery. The study result further showed that the odds of women who have taken ANC services 4 or more times of having institutional delivery is nearly 6 times more than women who had taken ANC services less than 4 times (95% CI 5.189 - 6.880; $p < 0.001$) (Table 7.2).

7.2.2 Effects of social variables on utilization of institutional delivery services in Nepal

The 2011 NDHS results show that a high percentage of women (71.1%) from Newar groups had delivered at a health institution. Similarly, relatively high percentage of women (48%) from Brahmin/Chhetri caste groups, women from 'Other caste groups' (38.4%) and women from Muslim groups (37.3%) had delivered in a health institution compared to women from other caste/ethnic groups. The percentage of women from Hill and Tarai Janjati groups (31.1%) and Dalit groups (29.7%) was slightly lower who had delivered their last pregnancy at a health institution (Table 7.3).

By religion, higher percentage of women following Hinduism (39.8%) had their last pregnancy delivered at a health institution. Comparatively lower percentage of women following other religions (such as Buddhism, Islam, Kirat, Christianity and others) had delivered their last child at a health facility or health institution. The 2011 NDHS data also reveals some variation in institutional delivery practices of women by their current place of residence. For example, a high percentage of woman (74.4%) residing in urban areas had opted for institutional delivery of last their pregnancy. Comparatively a low percentage of women i.e., 35 percent (about one-third of all women) had delivered their last child in a health facility (Table 7.3).

Table 7.3: Institutional delivery practices in Nepal according to social characteristics of women						
Description	Institutional delivery		Delivery at home or other places		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Caste/ethnicity+						
Brahmin/Chhetri & other castes	616	48.0	649	50.6	1283	100.0
Other Tarai Caste	159	38.4	250	60.4	414	100.0
Dalit	203	29.7	470	68.8	683	100.0
Newar	91	71.1	35	27.3	128	100.0
Hill and Tarai Janajati	434	31.1	926	66.3	1396	100.0
Muslim	88	37.3	148	62.7	236	100.0
Religion*						
Hindu	1370	39.8	2009	58.3	3445	100.0
Others	227	32.3	471	67.0	703	100.0
Residence*						
Rural	1286	34.5	2377	63.7	3730	100.0
Urban	311	74.4	103	24.6	418	100.0
Ecological Region*						
Mountain	64	20.9	236	77.1	64	100.0
Hill	580	34.8	1047	62.8	580	100.0
Tarai	953	43.8	1197	55.1	953	100.0
Respondent's Education*						
Higher	216	82.1	41	15.6	263	100.0
Secondary	719	58.5	490	39.9	1229	100.0
Primary	285	34.2	531	63.7	834	100.0
No education	377	20.7	1418	77.8	1822	100.0
Husband's Education*						
Higher	335	72.7	118	25.6	461	100.0
Secondary	829	45.9	953	52.7	1808	100.0
Primary	268	27.2	698	70.9	984	100.0
No education	162	18.6	691	79.3	871	100.0
Media Habits						
Newspaper						
At least once a week	247	82.6	48	16.1	299	100.0
Less than once a week	448	57.6	317	40.7	778	100.0
Not at all	902	29.4	2115	68.9	3071	100.0
Radio*						
At least once a week	695	45.2	818	53.3	1536	100.0
Less than once a week	565	34.9	1020	63.1	1617	100.0
Not at all	338	33.9	642	64.5	996	100.0
Television*						
At least once a week	969	62.1	573	36.7	1561	100.0
Less than once a week	354	30.9	767	67.0	1144	100.0
Not at all	274	19.0	1140	79.1	1442	100.0
Mass Media Habits*						
Yes	130	80.2	30	18.5	162	100.0
No	1467	36.8	2450	61.5	3986	100.0
Total	1597	38.5	2480	59.8	4148	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Totals may not equal 100.0 due to rounding off of cases						
+List of caste/ethnic groupings is attached as Annex 1						
*71 weighted cases are missing						

By spatial distribution, highest percentage of institutional delivery was found in Tarai (43.8%) followed by women living in Hill (34.8%) areas. The lowest percentages of women having institutional delivery were from the Mountain (20.9%) areas (Table 7.3).

By development region the highest percentage of women (42.9%) opting for institutional delivery was from the Western (40.3%) and Central (38.9%) regions. Nearly one-third each of the women from mid-western region (32.6%) and the Far-west region (31.8%) had institutional delivery of their last pregnancy. Similarly, by eco-development sub-region, the highest percentage of women delivering their last child at health were from Eastern Tarai (54.5%) Western Tarai (51.7%) and Central Hill (51.4%) regions. About 40 percent each of women from Mid-western and Far-western sub-regions had also delivered their last pregnancy at a health institution (Appendix VI).

By education, more than 8 in every 10 women (82.1%; n=216) with higher level of education (higher secondary and university) had their last pregnancy at a health institution. Similarly more than one-half of women with secondary level of education (58.5%) had institutional delivery of last pregnancy. Slightly over one-third of women (34.2%) with primary level of education also had institutional delivery of last child. Similarly, a high percentage of women (72.7%) whose husband had attained higher level of education had also delivered last child at health institution. The NDHS results further shows that about 80 percent of women who have access to mass media have had their last child delivered at a health institution (Table 7.3).

Studies conducted in Nepal and other developing countries have clearly exhibited the influence of social variables on use or non-use of health institutions for child delivery (Nzioki, et.al, 2015; Dahal, 2013; Shah et al., 2015; and Dhak, 2013). Social characteristics like women's education and employment status, husband education, ethnicity, place of residence are shown to have determining effect in institutional delivery practices. The effect of social variables on institutional delivery practices of Nepalese women is presented in Table 7.4. By caste ethnicity, the analysis results show that among the different caste/ethnic groups in Nepal Newar women are more than two times likely to have

institutional delivery (OR 2.73; 95% CI 1.663-4.496) than women from other caste/ethnic groups. Similarly, Hindu women (OR 1.41; 95% CI 1.132-1.763) are also more likely to have institutional delivery than non-Hindu women. By place of residence women living in urban areas are more than 5 times likely (OR 5.56; 95% CI 4.633-6.768) to have institutional delivery than women living in rural areas (Table 7.4).

Women from Eastern development region are also significantly likely to opt for institutional delivery than women from other development regions. By eco-development sub-regions women from Central Hill, Eastern Tarai, and Western Tarai are more likely to utilize institutional delivery services than the women from other eco-development sub-regions (Appendix VII).

Research conducted in Nepal and elsewhere shows that educational attainment of women has strong effect on health services seeking behavior. The analysis of NDHS 2011 data also confirms this finding. Women who have attained higher education are strongly likely (OR 20.05; 95% CI 12.777-31.464) to have institutional delivery than the women who have no education or have only primary or secondary level of education. Husband education however does not show much effect on the decision to have institutional delivery (Table 7.4).

Regarding access to media channels the analysis results show that access to newspaper has much higher likelihood effect on institutional delivery practices than access to other media channels like Radio and TV. Women with access to newspaper at least once a week have 11 times more likelihood of institutional delivery (95% CI 8.360 - 15.488; $p < .001$) than women who have access less than once a week or no access. Access to radio also has some likelihood effect of institutional delivery as women with access to radio at least once a week are 1.06 times likely (95% CI 1.363 - 1.897; $p < .001$) than the women who have limited or no access to radio. Access to TV also has profound effect on the likelihood of institutional delivery as women who watch TV at least once a week are 6.97 times more likely (95% CI 5.903 - 8.236; $p < .001$) to opt for institutional delivery than the women who watch TV less than once a week or do not watch TV at all (Table 7.4).

Table 7.4: Effects of selected social variables on utilization of institutional delivery services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (95 CI)	P value
Caste/ethnicity*			
Brahmin/Chhetri & other castes	Ref.		
Other Tarai Caste	.668	.493 - .903	0.009
Dalit	.454	.360 - .574	0.000
Newar	2.734	1.663 - 4.496	0.000
Hill and Tarai Janajati	.494	.411 - .593	0.000
Muslim	.623	.416 - .933	0.022
Religion			
Hindu	1.412	1.132 - 1.763	0.002
Others	Ref.		
Residence			
Rural	Ref.		
Urban	5.560	4.633 - 6.768	0.000
Ecological Region			
Mountain	.340302	.275 - .422	0.000
Hill	.6956638	.592 - .817	0.000
Tarai	Ref.		
Respondent's Education			
Higher	20.050	12.777 - 31.464	0.000
Secondary	5.519	4.516 - 6.745	0.000
Primary	2.020	1.612 - 2.532	0.000
No education	Ref.		
Husband's Education			
Higher	.305	.234 - .399	0.000
Secondary	.135	.100 - .181	0.000
Primary	.082	.059 - .115	0.000
No education	Ref.		
Media Habits			
Newspaper			
At least once a week	11.379	8.360 - 15.488	0.000
Less than once a week	3.263	2.775 - 3.837	0.000
Not at all	Ref.		
Radio			
At least once a week	1.608	1.363 - 1.897	0.000
Less than once a week	1.046	.885 - 1.235	.599
Not at all	Ref.		
Television			
At least once a week	6.973	5.903 - 8.236	0.000
Less than once a week	1.905	1.588 - 2.284	0.000
Not at all	Ref.		
Mass Media Habits			
Yes	7.293	4.334 - 12.273	0.000
No	Ref.		
Source: Calculated from NDHS 2011 data files			
Weights are applied			
*List of caste/ethnic groupings is attached as Annex 1			
Ref. Reference category			

Overall, the analysis results confirm that media habits in terms of frequency of reading Newspaper, listening to radio and watching TV individually does show significant effect on institutional delivery practices. In addition, women who have habits of using all three types of communication media are 7 times more likely (95% CI 4.334-12.273) to have institutional delivery than those who do not have the access to different media channels (Table 7.4).

7.2.3 Effects of economic variables on utilization of institutional delivery services in Nepal

Regarding economic characteristics a high percentage of women who were working service/trade sector (65.4%) had their last delivery at a health institution. The second highest percentage of women (56.3%) having institutional delivery were currently not working. Relatively high percentages of women working in manual labor sector (47.8%) had also delivered last pregnancy at health institution. Similarly, more than half of women (54.6%) whose husband was in service/trade sector also had institutional delivery. The second highest percentage of women (32.9%) having institutional delivery were those whose husband was manual worker. Likewise, nearly half of women (48.5%) who were not employed at the time of survey also had institutional delivery. By wealth index, two-third (66.3%) from rich and about one-third (33.9%) women from middle wealth groups had institutional delivery of their last child. Only 15 percent women from poor group had opted for institutional delivery of their last child (Table 7.5).

Economic variables such as family income/household wealth, occupation and employment of women, husband occupation and employment have shown strong effect in the utilization of safe motherhood services including institutional delivery services (Paudel et.al, 2013; Mehari, 2013; Shah et al., 2015).

In Nepal too social variables like women's education, husband's education and household wealth have exhibited strong effect in the use of institutional delivery services. The NDHS 2011 analysis result shows that women occupation, husband occupation and household

wealth have significant effect on the use of institutional delivery services. Women working in agriculture sector are more likely to opt for institutional delivery than women who are not working, nor have other occupation.

Table 7.5: Institutional delivery practices in Nepal according to economic characteristics of women						
Description	Use of ANC 4 or more times		Use of no ANC or used less than 4 times		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Respondent's Occupation*						
Manual	87	47.8	93	51.1	182	100.0
Service/trade	261	65.4	133	33.3	399	100.0
Agriculture	599	24.8	1775	73.5	2415	100.0
Not working	647	56.3	480	41.7	1150	100.0
Total	1597	38.5	2481	59.8	4149	100.0
Husband's Occupation*						
Manual	433	32.9	855	65.0	1315	100.0
Service/trade	922	54.6	749	44.4	1688	100.0
Agriculture	195	19.4	792	78.8	1005	100.0
Not working						
	1597	38.5	2481	59.8	4149	100.0
Respondent's Employment*						
Yes	715	30.7	1577	67.7	2329	100.0
No	883	48.5	903	49.6	1820	100.0
	1598	38.5	2480	59.8	4149	100.0
Household Wealth Status*						
Rich	916	66.3	449	32.5	1382	100.0
Middle	468	33.9	898	65.0	1382	100.0
Poor	213	15.4	1133	81.9	1383	100.0
Total	1597	38.5	2480	59.8	4147	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
*71 missing cases						
Ref: Reference category						

Likewise, husband occupation has significant effect on institutional delivery as the analysis result shows that women whose husband's occupation is in service/trade sector are 5 times more likely (95% CI 3.982-6.254) to opt for institutional delivery than those women whose husband's occupation is in other sectors. Similarly, Household wealth has significant effect on institutional delivery as the logistic regression analysis shows that women from rich household are more than 10 times likely (95% CI 8.746-13.474) and middle wealth

households more than twice likely (95% CI 2.232-3.439) to have institutional delivery than the women from poor households (Table 7.6).

Table 7.6: Effects of selected economic variables on utilization of institutional delivery services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Respondent's Occupation			
Not working	.697	.469 - 1.034	0.073
Agriculture	1.460	1.085 - 1.965	0.012
Service/trade	.250	.207 - .303	0.000
Manual	Ref.		
Husband's Occupation			
Manual	2.051	1.614 - 2.607	0.000
Service/trade	4.990	3.982 - 6.254	0.000
Agriculture	Ref.		
Household Wealth Status			
Rich	10.855	8.746 - 13.474	0.000
Middle	2.770	2.232 - 3.439	0.000
Poor	Ref.		
Respondent's employment			
Yes	.463	.395 - .543	0.000
No	Ref.		
Source: Calculated from NDHS 2011 data files			
Weights are applied			
Ref: Reference category			

Chapter 8

POSTNATAL CARE PRACTICES

This chapter presents the effects of socio-economic and demographic variables of women and utilization or non-utilization of Postnatal Care (PNC) services in Nepal. The chapter first presents the demographic variables (age, CEB, age at first birth, children under 5 years of age and pregnancy termination) and their relationship with use and nonuse of ANC 1 services. This is followed by the effects of selected social variables (caste/ethnicity, religion, place of residence, spatial distribution, development regions, respondent's education, partner's education, and media habits) on PNC service utilization. Likewise the effects of economic variables (respondent's occupation, husband occupation, respondent's employment status and household wealth on PNC service utilization is also presented in this chapter.

8.1 Postnatal care practices

The postnatal period which is first six weeks after birth is critical to the health and survival of a mother and her newborn. The most vulnerable time for both is during the hours and days after birth. Lack of care in this time period may result in death or disability as well as missed opportunities to promote healthy behaviors, affecting women, newborns, and children.

The health of mothers is mostly regarded as an indicator of the health of a society. Globally, more than half a million women die each year from complications of pregnancy and childbirth. A large proportion of maternal and neonatal complications occur during the first 48 hours after delivery. Thus, postnatal care (PNC) is important for both mother and the child for treating complications arising from the delivery, as well as to provide the mother with important information. Every year, four million infants die within their first month of life, representing nearly 40% of all deaths of children under the age of 5 years. Almost all

newborn deaths are in developing countries, with the highest number in South Asia and the highest rates in sub-Saharan Africa (Tesfahun, Worku, Mazengiya, & Kifle, 2014).

The leading cause of maternal mortality in Africa – accounting for 34 percent of deaths – is hemorrhage, the majority of which occurs postnatally. Sepsis and infection claim another 10 percent of maternal deaths, virtually all during the postnatal period. HIV-positive mothers are at greater risk of postnatal maternal death than HIV- negative women. Access to family planning in the early postnatal period is also important, and lack of effective PNC contributes to frequent, poorly spaced pregnancies (WHO, 2005).

Sub-Saharan Africa has the highest rates of neonatal mortality in the world and has shown the slowest progress in reducing newborn deaths, especially deaths in the first week of life. Each year, at least 1.16 million African babies die in the first 28 days of life – and 850,000 of these babies do not live past the week they are born.⁴ Asphyxia claims many babies during the first day, and the majority of deaths due to pre-term birth occur during the first week. Thirty eight percent of babies in sub-Saharan Africa die of infections, mainly after the first week of life. The majority of these deaths are low birth weight (LBW) babies, many of whom are pre-term. In addition, long term disability and poor development often originate from childbirth and the early postnatal period (WHO, 2005).

At least one in four child deaths occur during the first month of life. These deaths often take place before child health services begin to provide care, usually at six weeks for the first immunization visit. Low coverage of care in the postnatal period negatively influences other maternal, newborn, and child health (MNCH) programs along the continuum of care. For example, the lack of support for healthy home behaviors, such as breastfeeding, can have ongoing effects for the child in terms of under nutrition. Additionally, newborns and mothers are frequently lost to follow up during the postnatal period for prevention of mother-to-child transmission (PMTCT) of HIV (WHO, 2005). Thus postnatal care is essential in maintaining and promoting the health of the woman and the new-born baby, while providing an opportunity for health professionals to identify, monitor and manage

health conditions, that may develop in the mother and new-born during the postnatal period.

8.2 Effects of demographic, social and economic variables on PNC use

A study was carried out in Pakistan to explore the determinants of PNC utilization among 5,724 women aged 15-49 years who gave birth in the last 5 years preceding the survey using data from the Pakistan Demographic and Health Survey (PDHS) 2006-07. The study used bivariate and multivariate analysis to identify the socio-economic and demographic determinants of PNC utilization in Pakistan. The study found that ANC use, level of education (OR=2.238, CI=1.973–2.539) and family wealth (rich) (AOR=1.556 CI=1.339-1.808) had a strong influence in PNC services utilization. The study concluded that women live in developed provincial settings with higher education, living in urban and prosperous areas, having fewer children and have more access to health services were more likely to use PNC services. (Yunus et al., 2013).

Similar study was carried out in Madhya Pradesh, India using data from the District Level Household and Facility Survey 2007-08 (DLHS-3), a nationwide household survey conducted to obtain reproductive and child health outcome indicators. In the multilevel analysis, overall, only some of the individual level variables such as mother's level of education, birth order one and mother being from the richest quintile remained to be significant variables. The results showed that the stronger factor related to the use of PNC was skilled attendance at delivery (adjusted OR = 58.32; 95% CI 50.20-67.74). Further, women from the richest households had higher likelihood of using postnatal care than women from the poorest households. The odds of reporting the use of postnatal care among women who were higher secondary and above educated were about 1.39 times higher than among those who were illiterate. Likewise, association was found between the use of PNC and birth order and use of ANC during pregnancy. Unlike the first (ANC and delivery) two maternal health indicators, postnatal care was not much influenced by the place of residence, religion and caste of the women (Jat, Nag & Sebastian, 2011).

Another study conducted in Mandla, a tribal dominated district Madhya Pradesh, India among 210 postnatal mothers (who gave birth in the last one year period), also exhibited similar association between socio-economic and demographic variables and use of PNC services. The study found that education of mothers ($P= 0.003$) was important contributing factor with utilization of postnatal care (OR =2.545; 95% CI: 1.375-4.714), and mother, who were house wives, utilized PNC 2.980 times more (95%CI: 1.600-5.548) ($P=.000$). Mothers who belonged to general and other caste utilized PNC 2.076 times more (95%CI: 1.095-3.935) than other caste groups. The study also showed that husband's education was important in influencing in the use of PNC services. Women, who had some schooling, utilized PNC 3.421 times more. Similarly, women whose husband was in service or business had more than 3 times likelihood utilizing PNC than those from other occupation. The study also showed that place of delivery and person conducting delivery had a significant effect on PNC services utilization. The study however showed no significant association with variables like age of mother, type and size of family and family income (Sharma, Singh, Thakur, Kasar, Tiwari & Sharma, 2014).

A study was conducted in Bangladesh among 3300 women. The study considered non-utilization of PNC services as the dependent variable and examined the effects of selected socio-demographic factors and selected service related factors as independent variables. Both bivariate and multivariate analysis was used to identify factors associated with non-utilization of postnatal care services. In the multivariate technique, binary logistic regression was used to examine strength of the relationship between the dependent and independent variables in order to identify those variables that have a significant relationship with the dependent variable. In the logistic regression model, four independent variables (antenatal checkup, type of delivery, complication raised during delivery, and pregnancy intention) were identified as factors potentially associated with non-utilization of PNC. Like several other studies conducted in developing countries this study also exhibited significant association between completed secondary and higher education, exposure to mass media, family planning use before pregnancy and utilization of PNC services (Noor, 2012). Another study conducted in Bangladesh utilizing Bangladesh Demographic and Health Survey, 2004 data with 11,440 ever-married women's samples

to identify the significant factors affecting postnatal care of mothers in both urban and rural areas. This study also found strong association with mothers education (higher level), urban mothers, who have primary and secondary level educational qualification, receive more PNC from medically trained providers as compared to their rural counterparts. The study also found that women from rich and middle wealth quintiles are more likely to use PNC though the association was not found significant (Rahman, no date).

A study was conducted in Ethiopia among 16,515 currently married women in the age groups of 15-49 years using data from Ethiopian Demographic and Health Survey, 2011. The study used logistic regression analysis for examining the effects of mother's age at birth, mother education, husband/partner education, birth order, religion, wealth index, region of residence and mother's employment status in the utilization of PNC services. The study found that household wealth was a very strong determinant of health services utilization including PNC services. Similarly, birth order(s) had significant associations with use of ANC, delivery care and PNC services. Religion was found to be significantly related with the use of DC and PNC services. Married to partners having primary or higher education used all three services more than those mothers who had partners/husbands with no education husbands/partners (Mehari & Wencheke, 2013).

Another study conducted in Ethiopia consisting of a sample population of 836 mothers from 15 to 49 years who gave birth in the last year preceding the survey date. The study also found that the independent variables associated with women like place of residence (urban/rural, distance from health institution, antenatal follow-up, previous visit by community health agents, and the ability to make decisions were significant factors that strongly influenced in the utilization of postnatal services (Tesfahun, Worku, Mazengiya, & Kifle, 2014).

In Nepal the Ministry of Health and Population recommends at least three postnatal visits at specific times: within 24 hours of birth, on the third day of the newborn's life, and on the seventh day of life. Postnatal care in Nepal is historically uncommon, and most mothers and newborns make their first postnatal contact with health services at the time of the

baby's first immunization at 6 weeks postpartum. The period following delivery represents a source of significant mortality for women and their babies. Postpartum hemorrhage is in fact the most common overall cause of maternal death in Nepal, and although under-five mortality has been declining between 2006 and 2011, neonatal mortality has remained constant (Onda, Caglia, Tunçalp & Langer, 2014).

Similar effect of demographic and socio-economic variables of women in utilization of institutional delivery care was found in a study conducted in Nigeria. The study utilized Nigeria Demographic and Health Survey 2015 data sets to carry out the further analysis. The study found that age of mother, geopolitical zone, place of residence, maternal and husband levels of education, wealth level, parity, pregnancy wantedness, ANC attendance, health facility delivery and the position of the decision maker are the uniform predictors of postnatal care. Social advantage as reflected in high wealth index, high maternal and husband's levels of education and urban location are significantly associated with utilization of postnatal care. These social advantages, as pointed out earlier act synergistic to make it easier for the mothers to use postnatal care for their newborns. For instance, woman with tertiary education is more likely exposed to benefits of postnatal care, more likely to have had ANC and delivered in health facility and therefore these might propel her further to access postnatal care. Living in urban towns/cities made her more exposed to facilities providing postnatal care and that she or her husband might be gainfully employed that makes health services affordable in their places of residences. One important finding of this study was the relationship between postnatal care and parity: the higher the parity the less likely to receive postnatal care. It is possibly related to maternal experience of child birth to extend that those high parity women do not consider postnatal care worthwhile from experience they gather from previous child birth. This might also explain the reason why higher parity women use facility for delivery as well as ANC less than lower parity as seen in this study (Dahiru & Oche, 2015).

The PNC service utilization in Nepal shows that only 33 percent of mothers received PNC in 2006. Of these women, one in five received post-natal care within four hours of delivery, more than one in four (27%) received PNC within the first 24 hours and 4% received PNC

within 1-2 days. Like other maternal health services, utilization of PNC in Nepal differs according to women's socio-economic and demographic characteristics. Women aged less than 20 years, women in first birth order, those living in urban areas, women in the highest wealth quintile, and highly educated were found more likely to utilize PNC within the first 24 hours than other groups of women. By geographical region, women living in the Tarai zone, those living in the central region, and women from the central Tarai and central Hill sub-regions were found more likely to have received postnatal care within the first 24 hours after delivery than mothers living in other regions (MoHP, 2007).

The strongest predictor of receiving a postnatal check-up in Nepal is having delivered in a health facility. Other factors that make women more likely to receive PNC include living in urban settings, residing in a Tarai rather than Hill or mountain areas, higher socioeconomic status and higher level of education. Several factors have been shown to affect uptake and utilization of primary care in Nepal. Barriers to care include lack of awareness of the need for PNC, increased distance to a health facility, lack of transport or adequate roads, absence of skilled health workers in the community, financial barriers, and low women's empowerment and decision-making ability, particularly regarding mobility or spending. Mothers-in-law often have decision-making power regarding whether women receive antenatal care, which in turn affects utilization of PNC; women who receive ANC are substantially more likely (OR = 24.6, 95% CI 3.39 to 500.92) to return for postnatal care. Type of delivery care provider also plays a factor; women who gave birth with a midwife as the primary provider were more likely to receive postnatal care at a hospital clinic than those women attended by a physician (OR = 1.3, 95% CI 1.18–1.51). Furthermore, cultural beliefs and some socio cultural practices like maternal seclusion for two to four weeks post-delivery represent additional barriers to seeking and accessing care (Dhakal, Chapman, Simkhada, Van, Stephens & Raja, 2007).

NDHS 2011 data showed some increase in PNC utilization by women in Nepal. In 2011 45 percent of women reported of receiving postnatal care for their last birth within the critical first two days following delivery while more than one in two (54%) women did not receive a PNC checkup within the recommended time. Likewise one in three women

received postnatal care within four hours of delivery, 7 percent received care within 4-23 hours, and 4 percent were received PNC within 1-2 days following delivery. The data also showed differences in PNC utilization by mother's age, birth order, and place of residence, wealth quintile, and level of education.

The skill level of the provider who performs the first postnatal checkup also has important implications for maternal and neonatal health. Table 9.11 shows that 23 percent of women received postnatal care from a nurse or midwife and 16 percent from a doctor. Six percent of women received postnatal care from a health assistant, AHW, MCHW, VHW, or FCHV. Mothers of first-order births, those who delivered in a health facility, those with an SLC and higher education, those from the wealthiest households, and those in urban areas were more likely to have received postnatal care from an SBA than other mothers. Postnatal care from an SBA was highest in the Tarai, in the Eastern region, and in the Eastern Tarai sub region (MoHP, 2012).

8.2.1 Effects of demographic variables on PNC utilization

By age of women, slightly more than half (51.7%) in 15-19 year age group had utilized PNC services in Nepal in 2011. Relatively high percentage of women in the age groups of 20-24 (45.3%) and 25-29 (46.8%) had utilized PNC services after delivery of their last pregnancy. Nearly 40 percent of women in 30-34 year age group also had utilized PNC services. The percentage of women utilizing PNC services after last delivery gradually declined after 34 years of age. PNC utilization was high among women whose age at first birth was high. For example about 71 percent and another 63 percent women whose age at first birth respectively was 30 years or above and 25-29 years had utilized PNC services. The percentage of women with young age at first birth utilizing PNC services was relatively low (Table 8.1).

Variation in PNC services is also observed on the basis of other demographic characteristics of women. Other factors like also Utilization of PNC care also appears to be influenced by number of living children a woman has and pregnancy termination.

Table 8.1: Use of PNC services in Nepal according to demographic characteristics of women						
Description	Use of PNC		Non-use of PNC		Total respondents	
Age Group	Number	Percent	Number	Percent	Number	Percent
15-19	172	51.7	161	48.3	333	100.0
20-24	601	45.3	727	54.7	1328	100.0
25-29	613	46.8	698	53.2	1311	100.0
30-34	267	39.9	402	60.1	669	100.0
35-39	96	30.3	221	69.7	317	100.0
40-44	35	25.0	105	75.0	140	100.0
45-49	6	12.0	44	88.0	50	100.0
	1790	43.2	2358	56.8	4148	100.0
Age at First Birth						
10-14	21	32.3	44	67.7	65	100.0
15-19	778	36.6	1348	63.4	2126	100.0
20-24	790	48.0	855	52.0	1645	100.0
25-29	167	63.3	97	36.7	264	100.0
30+	34	70.8	14	29.2	48	100.0
	1790	43.2	2358	56.8	4148	100.0
Children Ever Born						
1	805	61.8	497	38.2	1302	100.0
2	541	46.6	621	53.4	1162	100.0
3	240	32.7	493	67.3	733	100.0
4	115	29.0	282	71.0	397	100.0
5+	90	16.2	464	83.8	554	100.0
Total	1791	43.2	2357	56.8	4148	100.0
Child < 5 Years						
None	137	55.5%	110	44.5%	247	100.0
1	1089	49.9%	1092	50.1%	2181	100.0
2	464	34.8%	871	65.2%	1335	100.0
3	68	22.7%	231	77.3%	299	100.0
4+	32	36.8%	55	63.2%	87	100.0
	1790	43.1	2359	56.9	4149	100.0
Pregnancy Termination						
Yes	360	45.2	436	54.8	796	100.0
No	1430	42.7	1922	57.3	3352	100.0
Total	1790	43.2	2358	56.8	4148	100.0
Utilization of ANC 4 or More						
Yes	1316	63.3	762	36.7	2078	100.0
No	474	22.9	1596	77.1	2070	100.0
Total	1790	43.2	2358	56.8	4148	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						

Similarly, high percentage of women having one (61.8%) and two children (46.6%) had utilized PNC services compared to the percentage of women who had CEB of more than 3 or more. It is also observed that in case of women who have only 1 or 2 living child(ren)

who are below 5 years of age, i.e., lower the number of <5 children higher the utilization of PNC services. Slightly higher percentage of women (45.2%) having a pregnancy termination history had utilized PNC services after last delivery. The analysis result further shows that majorities of women (63.3%; n=1316) who had taken ANC services 4 or more times also had utilized PNC services after their last delivery (Table 8.1).

The logistic regression analysis of the same variables shows that women whose current age is under 30 years are 6 to 7 times more likely to use PNC services than those whose current age is more than 30 years. The results are significant at $p < 0.0001$. Parity also has strong effect in the utilization of PNC as women who have 1 CEB are more than 8 times likely (95% CI 6.052 - 11.332) and women having 2 CEB are more than 4 times likely (95% CI 3.260 - 6.115) than women having 3 or more CEB to have utilized PNC services. Women whose age at first birth is 20 or more years and women who have 1 under 5 children are highly likely to use PNC services in Nepal (Table 8.2).

Utilization of ANC services as per the recommendation of WHO (a minimum of 4 times during pregnancy) leads to utilization of other components of safe motherhood services as well. In the present analysis the results of logistic regression shows that women who have taken ANC services 4 or more times are 5.8 times more likely (95% CI 5.075 - 6.659; < 0.001) to utilize PNC services than the women who had taken ANC services less than 4 times in their last pregnancy (Table 8.2).

Table 8.2: Effects of selected demographic variables on utilization of PNC services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Age Group			
15-19	7.890	2.288 - 27.207	0.001
20-24	6.124	1.816 - 20.650	0.003
25-29	6.507	1.930 - 21.933	0.003
30-34	4.922	1.450 - 16.711	0.011
35-39	3.215	.928 - 11.142	0.066
40-44	2.499	.679 - 9.199	0.0168
45-49	Ref.		
Children Ever Born			
1	8.281	6.052 - 11.332	0.000
2	4.464	3.260 - 6.115	0.000
3	2.485	1.768 - 3.493	0.000
4	2.077	1.416 - 3.047	0.000
5 +	Ref.		
Age at First Birth			
10-14	.841	.422 - 1.676	0.622
15-19	Ref.		
20-24	1.601	1.365 - 1.878	0.000
25-29	2.969	2.156 - 4.088	0.000
30+	4.346	1.959 - 9.642	0.000
Child < 5 Years			
0	2.166	1.147 - 4.090	0.017
1	1.723	.983 - 3.021	0.057
2	.922	.522 - 1.628	0.778
3	.512	.270 - .970	0.040
4+	Ref.		
Pregnancy Termination			
Yes	1.109	.922 - 1.335	0.272
No	Ref.		
Utilization of ANC 4 or More			
Yes	5.813	5.075 - 6.659	0.000
No	Ref.		
Source: Calculated from NDHS 2011 data files Weights are applied Ref: Reference category			

8.2.2 Effects of social variables on PNC utilization

Considerable variation is observed in PNC service utilization based on the social background of women in Nepal. The NDHS 2011 data shows that higher percentages of Newar (74%) and Brahmin/Chhetri (52%) had utilized PNC services. The percentage of

women from other caste/ethnic groups who had utilized PNC services in their last pregnancy was relatively low.

By religious groups, the percentage of women utilizing PNC services after last delivery was higher (44.9%) than women from other (34.8%) religious groups. Similarly, a great majority of women residing in urban areas (71.8%) had utilized PNC services than those residing in rural areas (39.9%). A higher percentage of Hindu (44.9%) women compared to non-Hindu women (34.8%) had utilized PNC services. About 7 in 10 women (71.8%) in urban areas compared to about 40 percent women in rural areas had utilized PNC care in their last delivery. By ecological region the highest percentage of women utilizing PNC services were from Tarai (49.8%) followed by Hills (37.6%) and the lowest use (26.8%) was by women from Mountain region (Table 8.3).

Not much variation is observed in the utilization of PNC services by development regions. The percentage of women utilizing PNC services from Eastern, Central, Western and Far-western regions ranged between 42% - 46%. About 39 percent of women from Mid-western region had utilized PNC services after delivery of last child. Similarly by eco-development sub-regions, the highest users of PNC care were from Western Tarai (57.3%), Eastern Tarai (50.1%) and Far-western Tarai (57%). The percentage of women utilizing PNC services after their last delivery was also comparatively high in Central Hill (49.5%) and Mid-western Tarai (47.1%) sub-regions (Appendix VIII).

By education, the highest percentage (85.6%) of PNC users were those having attained higher level of education. The second highest percentage of PNC service users (61%) were those having attained secondary level of education. Similarly about 40 percent of women with primary education had utilized PNC services while only about 27 percent women had utilized this service after their last pregnancy. Similar trend is observed in case of husband education, i.e., higher the level of husband's education higher is the percentages of women who have utilized PNC services (Table 8.3).

Table 8.3: Use of PNC services in Nepal according to Social characteristics of women						
Description	Use of PNC		Non-use of PNC		Total	
	Number	Percent	Number	Percent	Number	Percent
Caste/ethnicity						
Brahmin/Chhetri & other castes*	667	52.0	615	48.0	1282	100.0
Other Tarai Caste	176	42.5	238	57.5	414	100.0
Dalit	236	34.6	447	65.4	683	100.0
Newar	94	74.0	33	26.0	127	100.0
Hill and Tarai Janajati	517	37.1	878	62.9	1395	100.0
Muslim	93	39.6	142	60.4	235	100.0
	1790	43.2	2356	56.8	4146	100.0
Religion						
Hindu	1546	44.9	1899	55.1	3445	100.0
Others	245	34.8	459	65.2	704	100.0
Residence						
Rural	1490	39.9	2240	60.1	3730	100.0
Urban	300	71.8	118	28.2	418	100.0
Ecological Region						
Mountain	82	26.8	224	73.2	306	100.0
Hill	627	37.6	1042	62.4	1669	100.0
Tarai	1082	49.8	1092	50.2	2174	100.0
Respondent's Education						
Higher	225	85.6	38	14.4	263	100.0
Secondary	750	61.0	480	39.0	1230	100.0
Primary	332	39.8	503	60.2	835	100.0
No education	484	26.6	1338	73.4	1822	100.0
Husband's Education						
Higher	344	74.6	117	25.4	461	100.0
Secondary	912	50.4	896	49.6	1808	100.0
Primary	318	32.3	666	67.7	984	100.0
No education						
Media Habits						
Newspaper						
At least once a week	250	83.3	50	16.7	300	100.0
Less than once a week	481	61.8	297	38.2	778	100.0
Not at all	1060	34.5	2011	65.5	3071	100.0
Radio						
At least once a week	738	48.1	797	51.9	1535	100.0
Less than once a week	660	40.8	957	59.2	1617	100.0
Not at all	392	39.4	604	60.6	996	100.0
Television						
At least once a week	1021	65.4	540	34.6	1561	100.0
Less than once a week	412	36.0	732	64.0	1144	100.0
Not at all	357	24.8	1085	75.2	1442	100.0
Mass Media Habits						
Yes	133	82.1	29	17.9	162	100.0
No	1658	41.6	2329	58.4	3987	100.0
Total	1791	43.2	2358	56.8	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Totals may not equal 100.0 due to rounding off of cases						
*List of caste/ethnic groupings is attached as Annex 1						

Among the three types of mass media channels, it is observed that more than 8 in 10 women (83.3%) utilizing PNC services also read newspapers at least once a week. Lower percentage of women had utilized PNC services that read newspapers less than once a week or did not read at all. Similar trend is observed in case of other media channels, i.e., higher the frequency of using these media channels higher is the utilization of PNC services. The analysis results further shows that very high percentage of women (82.1%) who use all three media channels had also utilized PNC service (Table 8.3).

The logistic regression analysis using NDHS 2011 data shows significant effect of selected social variables on the utilization of PNC services in Nepal. Among various caste/ethnic groups in Nepal women from Newar ethnic group are more than 4 times (95% CI 2.372 - 8.051) Brahmin/Chhetri groups are nearly twice likely to utilize PNC services than women from other caste/ethnic groups. Similarly Hindu women are more likely to utilize PNC services than non-Hindu women, the logistic regression result is significant at $p < 0.001$ level (OR 1.52 95% CI 1.227 - 1.895). Likewise, urban women are nearly 4 times more likely (95% CI 3.184 - 4.619; $p < 0.001$) to utilize PNC services than rural women. By ecological region the odds of PNC services utilization by women from Mountain and Hill regions is more than the women residing in Tarai region (Table 8.4).

The logistic regression analysis does not show significant difference in PNC services utilization by development regions. Similarly, by eco-development sub-regions, the odds of PNC service utilization is found more by women in Mountain and Hill sub-regions than those from Tarai sub-regions (Appendix IX).

The logistic regression results further showed that education has also significant effect on PNC service utilization in Nepal. Women with higher education and secondary level of education respectively are 16 times and 4 times more likely to utilize PNC care with significance at $p < 0.001$ than the women with primary or no education. Similarly, good access to mass media channels especially newspaper and TV significantly increases the likelihood of PNC utilization in Nepal (Table 8.4).

Table 8.4: Effects of selected social variables on utilization of PNC services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Caste/ethnicity			
Brahmin/Chhetri & other castes*	1.659	1.112 - 2.475	0.013
Other Tarai Caste	1.128	.704 - 1.807	0.616
Dalit	.8058	.525 - 1.236	0.322
Newar	4.370	2.372 - 8.051	0.000
Hill and Tarai Janajati	.901	.601-1.350	0.614
Muslim	Ref.		
Religion			
Hindu	1.525	1.227 -1.895	0.000
Others	Ref.		
Residence			
Rural	Ref.		
Urban	3.835	3.184 - 4.619	0.000
Ecological Region			
Mountain	.369	.301 = .451	0.000
Hill	.607	.518 - .712	0.000
Tarai	Ref.		
Respondent's Education			
Higher	16.247	10.343 - 25.522	0.000
Secondary	4.3204	3.566 - 5.234	0.000
Primary	1.827	1.476 - 2.260	0.000
No education	Ref.		
Husband's Education			
Higher	Ref.		
Secondary	.346	.264 - .452	0.000
Primary	.162	.121 - .217	0.000
No education	.110	.080 - .151	0.000
Media Habits			
Newspaper			
At least once a week	9.553	6.983 - 13.069	0.000
Less than once a week	3.071	2.610 - 3.614	0.000
Not at all	Ref.		
Radio			
At least once a week	1.427	1.214 - 1.678	0.000
Less than once a week	1.063	.905 - 1.249	0.458
Not at all	Ref.		
Television			
At least once a week	5.738	4.896 - 6.724	0.000
Less than once a week	1.708	1.441 - 2.024	0.000
Not at all	Ref.		
Mass Media Habits			
Yes	6.399	3.835 - 10.677	0.000
No			
Source: Calculated from NDHS 2011 data files Weights are applied Totals may not equal 100.0 due to rounding off of cases *List of caste/ethnic groupings is attached as Annex 1 Ref. Reference category			

Women who read newspapers at least once a week are 9.55 times more likely (95% CI 6.983 - 13.069; $p < .001$) and women who watch TV at least once a week are 5.73 times more likely (95% CI, 4.896 - 6.724; $p < .001$) to utilize PNC services than women who read newspapers or watch TV less frequently. Women with access to all three media channels (newspaper, radio and TV) are 6 times more likely (95% CI 3.835 - 10.677; $p < 0.001$) to use PNC services than those with no access to these media channels (Table 8.4).

8.2.3 Effects of economic variables on PNC use

The NDHS 2011 results showed high percentage (68.3%) of women in service/trade occupation had utilized PNC services last time. Utilization of PNC services among women who were not working (59.5%) was also high (Table 8.5).

Description	Variable name		Use of PNC		Non-use of PNC	
	Number	Percent	Number	Percent	Number	Percent
Respondent's Occupation						
Manual	84	46.2	98	53.8	182	100.0
Service/trade	272	68.3	126	31.7	398	100.0
Agriculture	748	31.0	1667	69.0	2415	100.0
Not working	684	59.5	466	40.5	1150	100.0
Husband's Occupation						
Manual	489	37.2	826	62.8	1315	100.0
Service/trade	985	58.4	703	41.6	1688	100.0
Agriculture	261	26.0	744	74.0	1005	100.0
Not working						
Respondent's Employment						
Yes	825	35.4	1504	64.6	2329	100.0
No	966	53.1	854	46.9	1820	100.0
Household wealth Status						
Rich	956	69.1	427	30.9	1383	100.0
Middle	552	39.9	831	60.1	1383	100.0
Poor	283	20.5	1100	79.5	1383	100.0
Total	1791	43.2	2358	56.8	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Totals may not equal 100.0 due to rounding off of cases						

By husband occupation, more than one-half of women (58.4%) whose husband's occupation was service/trade had also utilized PNC services after delivery of last pregnancy. By current employment status, only about one-third (35.4%) of currently employed women had utilized PNC services. PNC utilization was high among currently unemployed women (53.1%). By household wealth status, a high percentage of women from rich (69.1%) wealth quintile had utilized PNC services in Nepal (Table 8.5).

The logistic regression analysis results shows that women working in service/trade sectors (OR 1.46; 95% CI 1.090 - 1.975) are significantly likely to utilize PNC services than those working as manual worker, working in agriculture sector or who were not working. The result further shows a stronger influence of husband education on PNC use. Women whose husbands are working in service trade sectors are nearly 4 times more likely (95% CI 3.237 - 4.918) and those working as manual worker are 1.6 times likely to utilize PNC services than those working in agriculture sector. Both the results are significant at $p < 0.001$. Household wealth also shows strong likelihood of utilization of PNC care as women from rich wealth quintiles are 8.6 times likely (95% CI 7.093-10.655) and women from middle wealth quintiles are 2.5 times likely (95% CI 2.112-3.150) to have utilized PNC services. Both results are significant at $p < 0.001$ (Table 8.6).

Table 8.6: Effects of selected economic variables on utilization of PNC services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Respondent's Occupation			
Manual	.583	.394 - .627	0.007
Service/trade	1.467	1.090 - 1.975	0.011
Agriculture	.306	.254-.369	0.000
Not working	Ref.		
Husband's Occupation			
Manual	1.688	1.353-2.104	0.000
Service/trade	3.990	3.237- 4.918	0.000
Agriculture	Ref.		
Respondent's Employment			
Yes	.484	.415-.566	0.000
No	Ref.		
Household Wealth Status			
Poor	Ref.		
Middle	2.580	2.112-3.150	0.000
Rich	8.693	7.093-10.655	0.000
Source: Calculated from NDHS 2011 data files Weights are applied Ref. Reference category			

Chapter 9

UTILIZATION OF SAFE MOTHERHOOD SERVICES

This chapter presents the utilization of safe motherhood services in Nepal. The analysis presented in this chapter includes only currently married women aged between 15-49 years who have given birth in the last five years and who have utilized following components of safe motherhood services in their last pregnancy through delivery periods: had at least 4 ANC visits, had made birth preparations, had institutional delivery, and had utilized PNC services. The chapter thus presents the effects of demographic, social and economic factors on utilization of safe motherhood services in Nepal.

9.1 Safe motherhood practices

Improving maternal health is one of the eight Millennium Development Goals. It is widely accepted that the use of maternal health services helps in reducing maternal morbidity and mortality. However, the utilization of maternal health services is a complex phenomenon influenced by many factors. Various studies conducted worldwide (Sarin, 1997; Magadi, Madise, & Rodrigues, 2008); (Kesterton, Cleland, Slogett & Ronsmans, 2010; Stephenson, & Tsui, 2002) have recognized socio-economic factors and service delivery environment as important determinants for the use of maternal health services. A study on influence of community-level characteristics on the use of maternal and reproductive health services conducted in Uttar Pradesh state of India reported strong community-level influences on service use. This study further highlighted a need for looking beyond individual factors when examining health-care seeking behavior. Positive relationship between level of maternal education and use of maternal health care services has been indicated by previous studies in India. A study on the use of antenatal care services in Madhya Pradesh recorded significant association between the use of antenatal care and factors such as women's education, household's standard of living, cast and religion. There is a need of clear understanding of the socio-cultural and service delivery related factors at different levels affecting the use of maternal health services (Jat, Nag & Sebastian, 2011).

A study based on secondary data from the Bangladesh Maternal Mortality Survey (BMMS) was carried out in 2001 among 41,549 women in Bangladesh to identify more influential factors that are affecting maternal health care services and treatment seeking behavior. The study examined the factors associated with the utilization of 3 components of maternal health care: ANC, delivery and PNC services. The study found mother's age at birth, education, access to media channels and place of residence are important factor to determine the utilization of maternal health services (Rahman, 2009).

A review was conducted based on Nepal demographic and health surveys 2001 and 2006 and literature reviewed from across the globe and related to the Nepalese context. The review attempted to explore the range and pattern of maternal health services i.e., antenatal care (ANC), postnatal care (PNC), delivery care, skilled birth attendance (SBA) and family planning (FP) services utilization in Nepal over the mid-1990s and early 2000. The study found a significant difference in utilization of maternal health services according to the socio-economic status of women and geographical location. Several factors affected the uptake of maternal health services, including woman's age, her level of education, employment and income, wealth, location (e.g. rural/urban, ecological and development region), and number of living children in the family. The review found that educated women, those who live in urban areas and central and western regions of Nepal, who are from the better-off households, are more likely to use maternal health services than others. Similarly, women who have more than three living children are less likely to use maternal health services (except for family planning services) than others (Baral, Lyons, Skinner, & VanTeijlingen, 2012).

A study conducted in Ethiopia examined the factors that influence the use of maternal healthcare services and particularly assessed the use of antenatal and delivery-care services. Data for the study were drawn from the 2000 Ethiopia Demographic and Health Survey. The study analyzed responses from 7,978 women, who had at least one child who were aged less than five years at the time of the survey. Multivariate logistic regression analysis was employed to explore the relative importance of a number of demographic and socio cultural variables in the likelihood of using these services. The analysis for the urban

area identified a number of variables, including the place of residence, marital status and education of women, parity, and year of birth of the child as significant and independent predictors for the uptake of antenatal care services in urban Ethiopia. Women residing in Addis Ababa were 2.5 times more likely to use antenatal care compared to women from other urban areas. The odd of using such services in urban areas was also nearly two and a half times higher among currently married women than unmarried women. Education continued to exert a strong and independent impact on the use of antenatal care services in urban Ethiopia. Compared to women with no education, those with primary education were nearly two times more likely to use the service. Interestingly, the corresponding odd of using the service was about four times higher if these women attained at least secondary education. With regard to parity, the present study revealed that urban women with 2-4 children ever born were two times more likely to use antenatal care compared to women with only one child.

Although the use of professionally-assisted delivery service was low in Ethiopia, there was a substantial variation in the uptake of professionally-assisted delivery by residence, parity, education, religion, and marital status. Results of multivariate analysis for the overall sample showed that place of residence, education of women, parity, and numbers of children aged less than five years were independent predictors of use of delivery services in Ethiopia. Women residing in Addis Ababa were about 40 times more likely to receive assistance during delivery compared to their rural counterparts. The corresponding figure for women from other urban areas of the country was about nine times. Education of women positively and independently predicted the use of delivery-care services. The corresponding odds ratio for women with primary and at least secondary education compared to women with no education was about three and a half times and eight times respectively.

Education of women was also an independent predictor of use of delivery services in urban Ethiopia, with the highest odds of use documented among women with at least secondary education (7 times higher), followed by women with primary education (2 times higher) compared to women with no education. The number of children aged less than five years

was one of the most important predictors of use of delivery care in urban Ethiopia. The present analysis showed that women with two or more children aged less than five years were 60% less likely to use the service compared to women with only one child aged less than five years at the time of the survey (Mekonnen & Mekonnen, 2003).

Several studies have reported that transportation and distance to the health facilities, staff attitudes towards service users, inadequate numbers of SBAs, Service delivery systems and poor physical infrastructure in the health facilities, women's age, parity and education, perceptions of safe pregnancy, place of residence (rural/ urban), gender inequality, cultural and religious beliefs, decision making power, socio economic status of women and geographical barriers including poor communication and road links are associated factors that affect the uptake of SBAs in Nepal. Studies not only indicate economic, geographic, cultural and religious factors but also salient institutional problems like limited availability of services, minimal staff support and training, lack of medicine and equipment and deficiency in the referral systems as barriers for maternal health services utilization. It has also been suggested that political instability and weak governance often change policy and planning that all contributing in use of existing health services. Younger women aged between 15 to 19 and those over 35 years, are at greater risk during childbirth. Available literature shows that women of 35 years and over who have more than three children are less likely to use SBAs during pregnancies. Different studies from Nepal have shown that the mother's education being lower than primary level and not having had antenatal care is also associated with a high prevalence of home delivery without help of SBAs. Low female literacy and women aged between 30-39 years were associated with the lower use of SBAs when compared to younger and literate women.

Maternal health care varies within and between developing countries around the world. A systematic review of inequalities in the use of maternal health care in developing countries reported that within countries, urban or wealthier women were more likely to deliver with the help of SBAs than rural and poor women were. In rural areas of Nepal, the proportion of institutional deliveries is as low as five times than in urban areas. Though, in urban areas like Kathmandu a significant proportion of women still deliver at home. So, even easy

access to institutional maternity services may not be enough to ensure the use of SBAs. There may still be access problems related to cost, attitude and beliefs of people. Studies from two rural districts of Nepal showed that a very large proportion of deliveries took place at home; only 6% of those deliveries were attended by SBAs (Baral, Lyons, Skinner, & vanTeijlingen, 2010).

This chapter therefore also analyses whether the set hypotheses are proved to be true or prove false.

9.2 Hypotheses testing

Research studies done in Nepal and elsewhere did indicate demographic variables like woman's age, inter-birth intervals and CEB are predictor of use of ANC, one of the components of safe motherhood (IIPS, 2010), (Teferra et al., 2012) and (Tura et al., 2014). Likewise, social variables like woman's education, caste/ethnicity and place of residence was also found a strong predictor (Kalule-Sabiti, 2014), (Rahman, 2009) and (Kulkarni et al, 2008). Similarly among economic variables, household wealth was found to be a predictor of safe motherhood utilization (Yunus et al., 2013), (Jat et al., 2011) and (Tura et al., 2014). Thus these findings indicated that use or nonuse of components of safe motherhood is influenced by demographic, social and economic background of women. Based on these findings following hypothesis are included in the study:

- i. Women from less than 30 year old age groups are more likely to utilize safe motherhood services than women who are from 30 or more year age groups
- ii. Women have up to two CEB are more likely to utilize safe motherhood services than women who have 3 or higher CEB
- iii. There is no differences in the likelihood of safe motherhood services utilization among women from different caste/ethnic groups
- iv. Women living in urban areas are more likely to utilize safe motherhood services than women who live in rural areas

- v. Women who have attained at least 5 years of formal school are more likely to utilize safe motherhood services than women who have not attained formal school
- vi. Women who belong to richer wealth quintile households are more likely to utilize safe motherhood services than women who belong to poorer households

Based on data analysis results using logistic regression this section also examines whether the set hypotheses proves to be true or false.

9.3 Effects of demographic, social and economic variables on utilization of safe motherhood

The maternal mortality ratio (MMR) in Nepal decreased substantially between 1996 and 2006, from 539 to 281 deaths per 100,000 live births (MoHP, 2012). Improvements in maternal health services have been one of the key reasons that the country's MMR has fallen dramatically. Antenatal care is considered one of the most important components of maternal health care; the aim of this care is to detect, manage, and refer potential complications during pregnancy.

Delivery care plays a significant role in the welfare of both mothers and babies. Specifically, it is important that babies are delivered by skilled providers with adequate medical supervision, proper medical attention, and hygienic conditions during delivery, whether in hospital or at home. Increasing the percentage of births delivered in health facilities or in the presence of an SBA reduces deaths from complications of pregnancy. Nationally, the percentage of women who delivered with assistance from a SBA is low in Nepal at 36 percent in 2011. For both the mother and her newborn, the highest risk of death occurs at the time of childbirth and in the period immediately after delivery. More than two-thirds of newborn deaths occur within seven days after birth and, of these, most deaths occur within two days of birth. Maternal death rates are also most frequent in this period. Thus, ensuring appropriate postnatal care (PNC) is crucial. The GoN recommends PNC check-ups for mothers and neonates to identify, manage, and prevent complications that may occur within this critical period. The 2011 NDHS shows that in Nepal, for women's

last births occurring in the period two years preceding the survey, 45 percent of women and 30 percent of neonates received a first PNC check-up within two days of delivery (Pandey, Dhakal, Karki, Poudel & Pradhan, 2013).

Safe motherhood is the combination of 4 components of maternal health services: ANC services at least 4 times, make necessary arrangements for birth (birth preparation), deliver pregnancy at health institution, and have postnatal check-ups immediately after delivery. Women who take all the recommended services and make necessary preparations during pregnancy through delivery and after delivery periods are considered to have ensured safe motherhood. Among these services ANC is regarded as the first step towards ensuring safe motherhood because when women visit health facility for first checkup they get counseling from the trained health personnel on issues such as how to care during pregnancy, foods to be taken, use of vitamins, iron tablets and other supplements, required vaccine doses and so on. During the ANC visits, the women are also counseled on the danger signs that may appear during pregnancy, what preparations are required be done before delivery, where to go for delivery and to get after delivery services. So with these procedure followed by ANC service providers it is expected that majority of women who go for ANC services will also follow other recommended steps like birth preparations, delivery at health institutions and taking PNC services to ensure safe motherhood.

Table 9.1 presents analysis based on NDHS 2011 data of women who used different components of safe motherhood among the women who utilized or did not utilized ANC services 4 or more times in their last pregnancy.

Table 9.1: Distribution of women who used different components of safe motherhood among the women who used or did not used ANC services 4 or more times in their last pregnancy, 2011.							
Safe motherhood components	Users of ANC services 4 or more times		Non users of ANC services 4 or more times		Total Users		Total respondents
	Number	Percent	Number	Percent	Number	Percent	Number
Utilized 4 or more ANC service	2077	50.1	--	--	--	--	4148
Made birth preparations	1125	54.1	498	24.0	1623	39.1	4148
Had institutional delivery	1205	58.0	393	19.0	1598	38.5	4148
Had postnatal care	1316	63.3	474	22.9	1790	43.2	4148
Calculated from NDHS 2011 data files Weights have been applied na – not applicable							

The analysis result shows that not all women who utilized ANC services 4 or more times did utilize other services as well. In 2011, about one-half (50.1%) of the surveyed women had utilized ANC services 4 or more times in the last pregnancy. Similarly, nearly 4 in every 10 women (39.1%) had made birth preparations and slightly less percentage of women (38.5%) had institutional delivery. Slightly more than 4 in every 10 women (43.2%) had taken postnatal checkup. It is noted that of the total women who had taken ANC services 4 or more times only slightly more than half (54.1%) had made birth preparations, 58 percent had delivered at a health institution and 63 percent had postnatal care (Table 9.1).

Data analysis result further showed that a sizeable percentage of women among those who did not utilize ANC services 4 or more times but had utilized other components of safe motherhood services. Of these women, nearly one-quarter (24%) had made birth preparations, nearly 20 percent had institutional delivery and about 23 percent had utilized PNC services in their last pregnancy (Table 9.1).

9.3.1 Effects of demographic variables on utilization of safe motherhood services in Nepal

As indicated earlier, the data analysis in this chapter includes only the women who have taken the following components of safe motherhood during their pregnancy through delivery and postpartum periods in their last pregnancy: women who have taken at least 4 ANC services, had made birth preparations, had institutional delivery, and had utilized PNC services.

Thus, safe motherhood is the outcome of utilization of all these 4 components of maternal health services. If a woman does not take one of the components or does not comply with the safe motherhood guideline while taking these services (for example a woman takes ANC services 4 times, makes birth preparations, delivers the child at an health institution but does not take PNC services) all then that woman cannot be regarded as having utilized safe motherhood.

Description	Utilization of SM services		Non utilization of SM services		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Age Group						
15-19	59	17.7	274	82.3	333	100.0
20-24	239	18.0	1090	82.0	1329	100.0
25-29	248	18.9	1063	81.1	1311	100.0
30-34	94	14.0	576	86.0	670	100.0
35-39	30	9.5	287	90.5	317	100.0
40-44	11	7.9	129	92.1	140	100.0
45-49	1	2.0	49	98.0	50	100.0
Age at First Birth						
10-14	1	1.5	65	98.5	66	100.0
15-19	247	11.6	1878	88.4	2125	100.0
20-24	348	21.2	1297	78.8	1645	100.0
25-29	71	26.9	193	73.1	264	100.0
30+	15	31.3	33	68.8	48	100.0
Children Ever Born						
1	339	26.0	963	74.0	1302	100.0
2	230	19.8	932	80.2	1162	100.0
3	68	9.3	665	90.7	733	100.0
4	24	6.1	372	93.9	396	100.0
5+	20	3.6	536	96.4	556	100.0
Child < 5 Years						
None	50	20.2	197	79.8	247	100.0
1	452	20.7	1729	79.3	2181	100.0
2	159	11.9	1176	88.1	1335	100.0
3	13	4.3	286	95.7	299	100.0
4+	7	16.4	79	91.9	86	100.0
Pregnancy Termination						
Yes	130	16.3	666	83.7	796	100.0
No	552	16.5	2801	83.5	3353	100.0
Total	682	16.4	3467	83.6	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Totals may not equal 100.0 due to rounding off of cases						
Weights are applied						

The data analysis result shows that in 2011 only about 16 percent of women (n=682) had practiced all components of safe motherhood as recommended by health personnel. The analysis result shows variations in safe motherhood services utilization according to demographic characteristics of women. For example, by current age of women, higher percentage of women (17.7% - 18.9%) in 15-19 to 25-29 year age groups had utilized safe motherhood services. The percentage of women utilizing safe motherhood declines among women of older age groups. By age at first birth, more women at higher age at first birth had utilized the services compared to women who had first birth at younger ages especially among women who had the first birth at 10-14 (1.5%) and 15-19 (11.6%) years. Likewise,

comparatively high percentage of women who had 1 CEB (26%) and 2 CEB (19.8%) had utilized safe motherhood services. The percentage of women utilizing the safe motherhood services sharply declines among those who have 3 or more CEB. Similar pattern is observed among women who did not have or have only 1 or 2 children who are aged below 5 years of age. The analysis result shows no variation in utilization of safe motherhood services based on their pregnancy termination history (induced abortion) (Table 9.2).

The effects of selected demographic variables of women such as current age, age at first birth, CEB on the utilization of safe motherhood services have also been analyzed by employing logistic regression analysis technique. The analysis by current age of women shows that the likelihood of safe motherhood utilization among women aged between 15-25 years is more than 12 times high. Similarly, the likelihood of utilizing safe motherhood services by women aged 25-29 is more than 13 times high (OR 13.42; 95% CI 3.102 - 58.065; $p < 0.001$) than those in 30-34 years or higher age groups. *Thus the hypotheses that young women from less than 30 year old age groups are more likely to utilize safe motherhood services than women who are from 30 or more year age groups is true (hypothesis i).*

Similarly the odds of safe motherhood utilization by women who have low CEB (1 and 2 CEB; $p < 0.001$) is more than 9 times and more than 6 times (95% CI 5.470 - 15.772) and (95% CI 3.805 - 11.124; $p < 0.001$) higher than women who have 5 or more CEB. *Thus the hypotheses that women who are with up to 2 CEB are more likely to utilize safe motherhood services than women who are with 3 or more CEB is true (hypotheses ii).*

Likewise women whose age at first birth is more than 25 years are 2 to 3 times more likely to use the services than the women who are aged 15-19 and 10-14 years ($p < 0.001$). The logistic regression analysis however does not show strong effects of other demographic variables like number of < 5 children and women who have a history of pregnancy termination (Table 9.3).

Table 9.3: Effects of selected demographic variables on utilization of safe motherhood services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Age Group			
15-19	12.502	2.814 - 55.545	0.001
20-24	12.603	2.911 - 54.546	0.001
25-29	13.422	3.102 - 58.065	0.001
30-34	9.393	2.144 - 41.145	0.003
35-39	5.936	1.298 - 27.139	0.022
40-44	5.134	.999 - 26.383	0.050
45-49	Ref.		
Children Ever Born			
1	9.288	5.470 - 15.772	0.000
2	6.506	3.805 - 11.124	0.000
3	2.694	1.501 - 4.836	0.001
4	1.730	.885 - 3.381	0.109
5+	Ref.		
Age at First Birth			
10-14	.099	.014 - .728	0.023
15-19	Ref.		
20-24	2.037	1.653 - 2.510	0.000
25-29	2.785	1.954 - 3.968	0.000
30+	3.374	1.622 - 7.019	0.001
Child < 5 years			
0	2.703	1.018 - 7.179	0.046
1	2.802	1.128 - 6.959	0.026
2	1.450	.577 - 3.642	0.429
3	.502	.170 - 1.485	0.213
4+	Ref.		
Pregnancy Termination			
Yes	1.058	.878 - 1.273	0.554
No	Ref.		
Source: Calculated from NDHS 2011 data files Weights are applied Totals may not equal 100.0 due to rounding off of cases			

9.3.2 Effects of social variables on utilization of safe motherhood services in Nepal

Information on safe motherhood practices according to social variables or characteristics are presented in Table 9.3. The analysis results show high variations in service utilization according to caste ethnicity of women. The highest percentage of women (34.6%) reporting of safe motherhood services belonged to Newar caste/ethnic groups followed by those belonging to Brahmin/Chhetri (26%) groups. Similarly, only about 12 percentage of women from Hill and Tarai Janjati groups followed by about 11 percent of Dalit women had utilized the services. Low percentage of women from other Tarai caste/ethnic groups

(8.5%) and Muslim (9.8%) groups had utilized the safe motherhood services during their last pregnancy. By religion more women from Hindu groups (17.5%) of women had utilized the services than those from other religious groups (11.1%). By place of residence, a high percentage of women living in urban areas (35.6%) than those in rural areas (14.3%) had utilized safe motherhood services. By ecological regions the higher use of safe motherhood services was among those living in Tarai (17.8%) and Hill region (15.8%) than those living in Mountain region (10.5%) (Table 9.4).

No specific pattern of service utilization was observed according to development regions. Overall results show that more women living in Western (18.5%), Eastern (17.9%) and Far-western (17.7%) regions had utilized the services than the women living in Central and mid-western regions. Moreover by eco-development sub-regions, comparatively high percentage of women from Western Tarai (26.1%), Central Hill (25.7%), Far-western Tarai (24.9%) and Eastern Tarai regions had utilized safe motherhood services than the women from other sub-regions (Appendix X).

By education attainment of women and their husband, the overall result shows that higher percentage of women who have attained higher level of education (54.4%) did utilize safe motherhood services during last pregnancy. The percentage of women with secondary level of education was also found relatively high (27.9%) compared to the percentage of those who had primary level education (11.9%) or had no education (5.4%). According to husband's education, a high percentage of women whose husbands have attained higher education (42.7%) and secondary level education (20.1%) had utilized safe motherhood services (Table 9.4).

On the basis of media habits of women, a higher percentage of women who have the habits of reading newspapers at least once a week (48.5%), who listen to radio at least once a week (20.1%) and those who watch TV at least once a week (30.4%) had utilized safe motherhood services during last pregnancy than the women who utilize these media channels less than once a week or do not use them at all. no habits of reading newspapers had utilized the services than compared to those women who read newspapers less than once a week (34.4%) or at least once a week (21.3%). Overall, a high percentage of women

Table 9.4: Use of safe motherhood services in Nepal according to social characteristics of women						
Description	Utilization of full SM services		Non utilization of full SM services		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Caste/ethnicity*						
Brahmin/Chhetri & other castes	333	26.0	950	74.0	1283	100.0
Other Tarai Caste	35	8.5	379	91.5	414	100.0
Dalit	73	10.7	610	89.3	683	100.0
Newar	44	34.6	83	65.4	127	100.0
Hill and Tarai Janajati	169	12.1	1227	87.9	1396	100.0
Muslim	23	9.8	212	90.2	235	100.0
Religion						
Hindu	604	17.5	2840	82.5	3444	100.0
Others	78	11.1	626	88.9	704	100.0
Residence						
Rural	533	14.3	3197	85.7	3730	100.0
Urban	149	35.6	269	64.4	418	100.0
Ecological Region						
Mountain	32	10.5	274	89.5	306	100.0
Hill	263	15.8	1405	84.2	1668	100.0
Tarai	387	17.8	1788	82.2	2175	100.0
	682	16.4	3467	83.6	4149	100.0
Respondent's Education						
Higher	143	54.4	120	45.6	263	100.0
Secondary	343	27.9	887	72.1	1230	100.0
Primary	99	11.9	736	88.1	835	100.0
No education	98	5.4	1724	94.6	1822	100.0
Husband's Education						
Higher	197	42.7	264	57.3	461	100.0
Secondary	363	20.1	1446	79.9	1809	100.0
Primary	86	8.7	898	91.3	984	100.0
No education	36	4.1	836	95.9	872	100.0
Media Habits						
Newspaper						
At least once a week	145	48.5	154	51.5	299	100.0
Less than once a week	234	30.1	544	69.9	778	100.0
Not at all	302	9.8	2769	90.2	3071	100.0
Radio						
At least once a week	308	20.1	1228	79.9	1536	100.0
Less than once a week	256	15.8	1361	84.2	1617	100.0
Not at all	118	11.8	878	88.2	996	100.0
Television						
At least once a week	475	30.4	1086	69.6	1561	100.0
Less than once a week	134	11.7	1010	88.3	1144	100.0
Not at all	73	5.1	1370	94.9	1443	100.0
Mass Media Habits						
Yes	71	43.8	91	56.2	162	100.0
No	611	15.3	3376	84.7	3987	100.0
Total	682	16.4	3467	83.6	4149	100.0
Source: Calculated from NDHS 2011 data files						
Weights are applied						
Missing cases: Caste/ethnicity-11; Partner education-22;						
Totals may not equal 100.0 due to rounding off of cases						
*List of caste/ethnic groupings is attached as Annex 1						

(43.8%) who had the habits of using all three media channels had also utilized safe motherhood services in during last pregnancy (Table 9.4).

The logistic regression result on the likelihood effects of selected social variables on the use of safe motherhood utilization is presented in Table 9.5. The analysis on caste/ethnicity of women shows that women who belong to Brahmin/Chhetri and Newar caste/ethnic groups respectively are 3.22 times more likely (95% CI 1.698 - 6.109; $p < 0.001$) and nearly 5 times more likely (95% CI 2.313 - 10.471; $p < 0.001$) than women who belong to other caste/ethnic groups (Table 9.5). *Thus the hypotheses that there is no differences in the likelihood of safe motherhood services utilization among women from different caste/ethnic groups is false (hypotheses iii).*

Apart from the caste/ethnic groups mentioned above the likelihood of utilizing safe motherhood services is also higher among Hill and Tarai Janjati groups. The women from these ethnic groups are 1.6 times more likely to utilize safe motherhood services than those from other Tarai caste groups of women. Similar result is observed in case of Dalit caste groups as well. (Table 9.5).

Similarly, women who belong to Hindu religion are 1.69 times more likely (95% CI 1.248 - 2.180; $p < 0.000$) to utilize safe motherhood services than the women from other religious groups. Place of residence also appears to be a determining factor in safe motherhood service utilization. The data analysis results show that women residing in urban areas are 3.31 times more likely (95% CI 2.710 - 4.054; $p < 0.001$) than the women who reside in rural areas. This finding shows that women living in urban areas are more likely to utilize safe motherhood services than women who live in rural areas. *Thus the hypothesis that women living in urban areas are more likely to utilize safe motherhood services than women who live in rural areas is true (hypotheses iv).*

By ecological regions, women from Mountain region are more likely to utilize safe motherhood services than those from Hill and Tarai regions (Table 9.5). The analysis results do not show much effect by development regions and eco-development sub-regions (Appendix XI).

Table 9.5: Effects of selected social variables on utilization of safe motherhood services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Caste/ethnicity			
Brahmin/Chhetri & other castes*	3.221	1.698 - 6.109	0.000
Other Tarai Caste	.844	.394 - 1.809	0.663
Dalit	1.097	.553 - 2.174	0.791
Newar	4.921	2.313 - 10.471	0.000
Hill and Tarai Janajati	1.261	.657 - 2.421	0.486
Religion			
Hindu	1.649	1.248 - 2.180	0.000
Others	Ref.		
Residence			
Rural	Ref.		
Urban	3.314	2.710 - 4.054	0.000
Ecological Region			
Mountain	.532	.403 - .701	0.000
Hill	.866	.708 - 1.059	0.162
Tarai	Ref.		
Respondent Education			
Higher	20.920	14.308 - 30.588	0.000
Secondary	6.824	5.115 - 9.104	0.000
Primary	2.375	1.673 - 3.371	0.000
No education	Ref.		
Husband's Education			
Higher	.337	.261 - .434	0.000
Secondary	.128	.092 - .180	0.000
Primary	.058	.036 - .093	0.000
No education	Ref.		
Media Habits			
Newspaper			
At least once a week	.116	.086 - .157	0.000
Less than once a week	.457	.332 - .629	0.000
Not at all	Ref.		
Radio			
At least once a week	.538	.408 - .710	0.000
Less than once a week	.750	.606 - .930	0.009
Not at all	Ref.		
Television			
At least once a week	.121	.089 - .166	0.000
Less than once a week	.303	.236 - .388	0.000
Not at all	Ref.		
Mass media habits			
Yes	4.328	2.951 - 6.348	0.000
No	Ref.		
Source: Calculated from NDHS 2011 data files Weights are applied Ref: Reference category			

The other social variable like women's education also has strong likelihood effect on use of safe motherhood services. Women who have attained higher level of education are 20.92 times more likely (95% CI 14.308 - 30.588; $p < 0.001$) to utilize the services than women with no education. Similarly, women who have attained secondary and primary education respectively are 6.82 (95% CI 5.115 - 9.104; $p < 0.001$) and 2.75 (95% CI 1.673 - 3.371; $p < 0.001$) times more likely to utilize the services than women with no education. *Thus the hypotheses that women who have attained at least 5 years of formal school are more likely to utilize safe motherhood services than women who have not attained formal school is true (hypotheses v).*

The analysis results further show that husband's education does not have strong likelihood effect on utilization of safe motherhood services. Regarding mass media habits, the analysis result shows some effect, though not strong, according to individual media channels like newspapers, radio and TV. But on overall mass media habits, women who utilize all media channels have strong likelihood (OR 4.32; 95% CI 2.951 - 6.348; $p < 0.001$) of utilizing safe motherhood services than the women who do not use these media channels (Table 9.5).

9.3.3 Effects of economic variables on utilization of safe motherhood services in Nepal

Information on the relationship of selected economic variables on safe motherhood utilization by women in Nepal is presented in Table 9.6.

Overall, the data analysis result shows that percentage of women and her husband whose occupation is in service/trade sector have utilized safe motherhood services compared to the women whose occupation is in other sectors. Women's employment status does not seem to have much effect on safe motherhood utilization. It is however noted that a high percentage of women (33.1%) who belong to rich wealth status have utilized safe motherhood services compared to those belonging to middle and poor wealth status (Table 9.6).

Table 9.6: Use of safe motherhood services in Nepal according to economic characteristics of women						
Description	Utilization of SM services		Non utilization of SM services		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Respondent's Occupation						
Manual	33	18.1	149	81.9	182	100.0
Service/trade	132	33.2	266	66.8	398	100.0
Agriculture	239	9.9	2177	90.1	2416	100.0
Not working	277	24.1	873	75.9	1150	100.0
Husband's Occupation						
Manual	167	12.7	1148	87.3	1315	100.0
Service/trade	436	25.8	1252	74.2	1688	100.0
Agriculture	69	6.9	936	93.1	1005	100.0
Respondent's Employment						
Yes	322	13.8	2007	86.2	2329	100.0
No	360	19.8	1459	80.2	1819	100.0
Household Wealth Status						
Rich	458	33.1	924	66.9	1382	100.0
Middle	160	11.6	1222	88.4	1382	100.0
Poor	64	4.6	1320	95.4	1384	100.0
Total	682	16.4	3466	83.6	4148	100.0
Source: Calculated from NDHS 2011 data files Weights are applied Missing cases: Respondent's occupation-2; Husband's occupation-141; Totals may not equal 100.0 due to rounding off of cases						

The logistic regression analysis on effects of selected economic variables on the utilization of safe motherhood services shows that women's occupation does have some likelihood effect especially those working in agriculture and manual labor occupation on safe motherhood service utilization. The analysis however shows strong likelihood effect of husband's occupation – those working in service/trade sector on safe motherhood service utilization (OR 2.39; 95% CI 1.893 - 3.039; $p < 0.001$). Women's employment status i.e., women who are employed are more likely to use the safe motherhood services than women who are not employed.

Household wealth does have strong likelihood effect on safe motherhood utilization. Women who belong to rich wealth quintile are 10.25 times more likely (95% CI 7.609 - 13.809; $p < 0.001$) and women belonging to middle wealth quintile are 2.7 times more likely

to utilize safe motherhood services than the women who belong to poor wealth quintile (Table 9.7). Thus the hypotheses that women who belong to richer wealth quintile households are more likely to utilize safe motherhood services than women who belong to poorer households is true (hypotheses vi).

Table 9.7: Effects of selected economic variables on utilization of safe motherhood services in Nepal using logistic regression			
Description	Odds ratio (OR)	Confidence interval (CI)	P value
Respondent's Occupation			
Manual	1.426	.878 - 2.317	0.152
Service/trade	.493	.305 - .798	0.004
Agriculture	2.229	1.333 - 3.728	0.002
Not working	Ref.		
Husband's Occupation			
Manual	.507	.360 - .715	0.000
Service/trade	2.399	1.893 - 3.039	0.000
Agriculture	Ref.		
Respondent's Employment			
Yes	.649	.534 - .789	0.000
No	Ref.		
Household Wealth			
Status			
Rich	10.251	7.609 - 13.809	0.000
Middle	2.701	1.946 - 3.748	0.000
Poor	Ref.		
Source: Calculated from NDHS 2011 data files Weights are applied Ref. Reference category			

9.4 Stepwise logistic regression analysis

As shown in previous sections logistic regression analysis of independent variables were separately done with dependent variables. Those independent variables that were found significant at $p < .01\%$, $p < .05\%$ and $p < .10\%$ were used to carry out analysis in the second level. As a second level of analysis the study applied stepwise logistic regression technique (both forward and backward) to look at the effect of selected sets of independent variables (Predictors) to the dependent variable (utilization of safe motherhood services) in Nepal. For this, three different sets of independent variables were identified depending on their significance levels. Thus the p-value threshold for an independent variable to enter the model or to remain in the model was determined at 3 levels: $p < .01\%$, $p < .05\%$ and $p < .10\%$.

The summary of stepwise logistic regression result at $p < .05\%$ level is presented in Table 9.8.

Table 9.8: Stepwise logistic regression (full model: forward) of selected sets of independent variables and the dependent variable at $p < .05$ level				
Independent Variables	Coefficient	Odds Ratio	P value	95% Confidence Interval (OR)
Demographic variables				
Respondent's age - 15-19	.4499222	1.568	0.008	.120 .780
Age at 1 st birth - 20-24 years	.208455	1.232	0.036	.0141 .403
Respondent's age at 1 st birth - 30+ years	.780396	2.18	0.043	.026 1.535
Social variables				
Respondent's caste/ethnicity - Brahmin/Chhetri & other castes	.3066192	1.359	0.003	.107 - .506
Respondent's caste/ethnicity - Newar	.5085657	1.663	0.023	.071 .946
Respondent reads newspaper - at least once in a week	-.3593587	0.698	0.001	-.581 - -.138
Respondent watch TV - at least once in a week	-.8119083	0.444	0.000	-1.133 -.491
Respondent watch TV - less than once in a week	-.3219449	0.725	0.008	-.559 -.085
Respondent's education level - no education	1.594377	4.925	0.000	1.199 1.990
Respondent's education level - secondary	.4681357	1.597	0.003	.163 .773
Husband's education level - Primary	1.021745	2.778	0.000	.731 1.313
Place of residence - urban	.2424435	1.274	0.022	.035 .450
Economic variables				
Household wealth status - rich	-.5034027	0.604	0.001	-.801 -.206
Respondent's occupation - service/trade	-.2890383	0.749	0.006	-.496 -.082
Husband's occupation - manual labor	-.3788705	0.685	0.007	-.653 -.105
constant	-1.688839	--	0.000	-2.046 - -1.333
Pseudo R2				0.1967
Total number of cases				3955

Data presented in Table 9.8 shows that regarding demographic variables woman's age at 1st birth at 20 to 24 years and 30 and above years were found significant predictors of safe motherhood utilization at $p < .05\%$ level. Regarding social variables, woman from 'Brahmin/Chhetri & other castes groups' and Newar caste groups, woman with no education and those with secondary level of education, woman whose husband's education attainment is at primary level, and women residing in urban areas were found significant

predictors of safe motherhood utilization at $p < .05\%$ level. Regarding economic variables the stepwise logistic regression analysis showed no economic variables as predictor of safe motherhood utilization at $p < .05\%$ level.

Table 9.9: Stepwise logistic regression (empty model: backward) of selected sets of independent variables and the dependent variable at $p < 0.05$ level				
Independent Variables	Coefficient	Odds Ratio	P value	
Demographic variables				
No. of children less than 5 years old - two children	.2047251	1.227	0.033	.0165 .393
Social variables				
Respondent's religion - Hindu	.420071	1.522	0.005	.129 .711
Respondent reads newspaper - at least once in a week	-.3628463	0.696	0.001	-.583 -.143
Respondent watch TV - at least once in a week	-.770235	0.463	0.000	-1.098 -.442
Respondent watch TV - less than once in a week	-.3041518	0.738	0.015	-.548 -.060
Husband's education level – no education	1.705488	5.504	0.000	1.320 2.091
Husband's education level – primary level	1.087449	2.967	0.000	.802 1.373
Husband's education level – secondary level	.5039823	1.655	0.001	.202 .806
Economic variables				
Household wealth status - rich	-.6721755	0.511	0.000	-1.021 -.323
Household wealth status - middle	-.1948052	0.823	0.121	-.441 .0516
Husband's occupation – manual labor	-.3275305	0.721	0.019	-.600 -.055
Respondent's occupation - service/trade	-.2982214	0.742	0.006	-.509 -.087
Constant	-1.776696	--	0.000	-2.200 -1.353
Pseudo R2				0.1935
Total number of cases				3955

The summary of Stepwise logistic regression results with empty model (backward model) at $p < .05\%$ level is presented in Table 9.9. The analysis of demographic variables based on this model indicates that women with 2 children less than 5 years old are predictor of safe motherhood utilization at $p < .05\%$ level. Among the social variables, women who belong to Hindu religious group, and women whose husband have attained secondary level of education are identified as significant predictor of safe motherhood utilization at $p < .05\%$ level. The analysis showed no economic variables as predictor of safe motherhood

utilization at $p < .05\%$ level (Table 9.9). Thus the overall results shows that the full model of stepwise logistic regression is the best fit model in the study.

Chapter 10

SUMMARY OF FINDINGS, CONCLUSIONS AND FURTHER RESEARCH

This chapter presents summary of findings of the study. The chapter first presents study objectives, methodology including study sample and data analysis methods. Then the chapter presents summary of key finding based on the data analysis. The chapter also presents conclusions and recommendations based on the study results.

10.1 Summary of findings

The main objective of the study was to analyze the effects of demographic, social, and economic variables on safe motherhood services utilization by women in Nepal. The study utilized secondary source of data from Nepal Demographic and Health Survey 2011. This is a nationally representative survey. The survey was carried out using systematic sampling with probability proportional to size (PPS). Apart from the survey reference materials for the study have been collected from a variety of sources including Nepal government policy documents, publications of UN and other bilateral and multi-lateral agencies and research papers published in various national and international journals.

The total household included in the survey was 10,826 with 9,280 from rural areas and 1,546 from urban areas. From these households a total of 12,674 women and 4,121 men were included as respondents in the survey. As the current study aimed to analyze safe motherhood service seeking behavior and practices of women, the study included only the currently married women aged 15 to 49 years who had given birth to a child within the last 5 years preceding the survey date. Thus the total sample size of his study was a total of 4079 married women of reproductive age who have given birth to a child within the last 5 years.

The study defined two sets of variables which are respectively categorized as dependent and independent. The components of safe motherhood were taken as dependent while a set of demographic, social and economic factors were taken as independent variables. Data utilized in this study was analyzed using NDHS data files. The dependent and independent variables were re-categorized to make a meaningful analysis. Data has been analyzed on the basis of frequency and cross tabulations. Binary logistic regression has been utilized to analyze the effects of each independent variable on dependent variables.

The highest proportions (80%) of respondents were concentrated within the ages of 20 to 34 years. Nearly 59 percent were married by age 18, and about 77 percent were married by age 20. The data on exact age at marriage gives a evidence of rising age at first marriage of women in Nepal. Over half of the respondents were between 10-14 years at the first birth. Nearly 40 percent had their first child in 15-19 year age group. Nearly 6 in 10 respondents had 1 to 2 children ever born to them. About 18 percent had 3 CEB and another 10 percent respondents had 4 CEB. Over half of the respondents (52.6%) had only one child less than 5 years old and nearly one-third (32.2%) had 2 children. Nearly 7 percent respondents had 3 children and about 2 percent respondents had 4 or more <5 children. About 2 in every 5 respondents had a history of pregnancy termination (induced abortion) in the past years.

The spatial distribution of respondents showed that about 41 percent of respondents resided in Tarai region and nearly the same percentage (40.6%) in the Hills. About 18 percent respondents were from Mountain region. Almost one-quarter (24.1%) and nearly one-third (31.2%) of respondents respectively were from eastern and central development regions. Twenty percent of respondents were from western region. The lowest percentages of women were from Western (14.4%) and far-western (10.6%) development regions. About 22 percent of women were represented from urban areas while great majorities (78%) were from rural areas. Great majority of respondents (85.3%) were Hindu. Less than 10 percent were Buddhist. Nearly 7 percent of women belonged to Muslim, Christian and other religious groups.

In this study all the caste/ethnic groups represented in NDHS 2011 were re-classified into 6 broad categories. The highest percentages of respondents (33.6%) were from Hill and Tarai Janjati followed by Brahmin/Chhetri and other caste groups (30.9%). About 17 percent and another 10 percent respectively were Dalit and other Tarai caste/groups. Less than 10 percent respondents were from Muslim (5.7%) and Newar (3.1%).

A high percentage of respondents (43.9%) had no formal education. The highest percentage (29.6%) of respondents had completed secondary level and another 20 percent had attained primary level of education. Only about 6 percent of the respondents had attained higher secondary and/or university level education. On media habits, majority of respondents (74%) do not read newspaper at all. About 37 percent and another 39 percent respondents respectively listen to radio at least once in a week and less than once in a week. About one-quarter of the respondents (24%) do not use radio at all. More than one-third (37.6%) respondents watch TV at least once in a week. About 28 percent watch TV less than once in a week. Slightly over one-third (34.8%) did not watch TV at all. In overall terms, a very low percentage of respondents (3.9%) utilized all three mass media channels at least once in a week or less than once in a week.

Over one-half of the respondent's (58.2%) occupation was agriculture and about 10 percent was occupied in service/trade sector. Less than 5 percent were in manual labor sector. About 28 percent respondents were not working. Of the working respondents over one-half (56.1%) were currently employed. About one-third of the respondents (15.7% richest and 18% richer) were in rich category in terms of their household wealth. One-fifth (21%) were middle category and nearly one-half of the respondents (45.3%) were in poor category (poorest 23.6% and poorer 21.7%).

Slightly over one-half (52.7%) of the respondents had utilized at least 4 ANC in their last pregnancy and the rest of (47%) percent either took ANC services less than 4 times or did not take at all. Only 39% respondents reported of making some kind of preparations for in their pregnancy. The percentage of women making birth preparations is less than the women who had taken at least 4 ANC services. Thirty-nine percent of the respondents had

delivered their last pregnancy in a health facility. The rest had delivered their last pregnancy at home. Less than half of the respondents (43.2%) had utilized PNC services. Sixteen percent of women had taken all components of maternal health care and thus ensured safe motherhood for themselves.

10.2 Key Findings

i. Utilization of antenatal care services 4 or more times

In 2011 about one-half (52.7%) of the women had sought 4 or more ANC visits, about one-third (33.2) had up to 3 visits, nearly 6 percent had the care only once. About 15 percent women had not sought ANC care in their last pregnancy. By age, about 7 in every 10 women (69.7%) in their 20s (20-29 years) had 4 or more ANC visits in their last pregnancy. A high percent of women who were younger at the time of their first birth (10-14 and 15-19 years) had four ANC visits than older women. High percentage of women who had only 1-2 children had few (1-2) young sibling (<5 years of age) had at least 4 ANC visits. A high percentage of women (81%) who have had induced abortion (pregnancy termination) earlier than the last birth also had at least 4 ANC visits.

The study found that young age, age at 1st birth, parity and number of children less than 5 years of age has strong effects on use of 4 or more ANC visits. Young women up to the age of 29 years, who have low parity are more likely to take at least 4 ANC visits. Women who have 1 or 2 children who are <5 years of age are more likely to get at least 4 ANC visits than the women with 3 or more <5 children. The result is significant at 5% level.

Women's caste/ethnicity, religion, place of residence (rural, urban) and education has strong effects on the utilization of 4 or more ANC visits. Among the different caste/ethnic groups, Newar and Brahmin/Chhetri and other caste groups are more likely to use at least 4 ANC than women from Tarai, Janjati and Muslim groups. Hindu women are 1.5 times more likely to take 4 or more ANC visits than women from non-Hindu groups. Place of residence also has significant effect as women residing in urban areas were more likely to

utilize at least 4 ANC visits. Women with higher level of education are more likely to utilize at least 4 ANC than women with no education. It was observed that husband education does not have much effect on the use of ANC. Access to media shows strong effect on the utilization of ANC services. Overall, the likelihood of ANC 4 service utilization is strong among women who have access to all three medial channels than the women who have no access to these media channels.

The study found that women who are in service or trade related occupation are more likely to use ANC services 4 or more times than women whose occupation is agriculture, manual work or who are not working. Women from rich categories are strongly likely to utilize ANC 4 or more times than the women from poor category. Women from middle category are also more likely to utilize ANC services 4 or more times than poor category women.

ii. Birth preparation practices

The analysis of the relationship between selected demographic variables on the birth preparation practices shows that women's age does not have strong positive effect on birth preparations. But women who have 1 and 2 CEB are more likely to practice birth preparations. Similarly, women with 3 CEB are 2.42 times more likely to practice birth preparations. Women who have utilized ANC services 4 or more times are more likely to practice birth preparations. The other demographic variables do not show any effect on birth preparation practices in Nepal.

The data analysis result shows a strong likelihood of birth preparations among Brahmin/Chhetri and Newar caste/ethnic groups of women. Women living in urban areas are also more likely to practice BP than those living in rural areas. The study also found that women who use different media channels like newspaper, radio and TV are more likely to practice birth preparations. Women's and their husband's education also has some positive effect on the practice of birth preparations than the women or their husband who have no education. The data analysis however does not show much effect of other social variables like religion, ecological region and development region of residence.

The study found some likelihood effects of economic variables on the practice of birth preparations. Women whose occupation is service/trade are more likely to practice birth preparations than women whose occupation is manual or agriculture. Husband's occupation in service/trade sector also was found to have positive effect in the birth preparation practices of women. Women who are from rich or middle wealth quintiles also are more likely to practice birth preparations.

iii. Institutional delivery practices

The study found that women of younger ages (15-19 and 20-24 years) are more likely to practice institutional delivery than older women. The analysis further shows that low parity women, those who have 1 child and women who have 2 children respectively are more likely to deliver their pregnancy at a health institution. Women who have first birth in their twenties (20-24 and 25-29 age groups) are also found highly likely to deliver in a health institution than those who have first birth at 19 years or at lower ages. The results further showed that women who have 1-2 children less than 5 years of age are also likely to have institutional delivery than women with 3 or more children less than 5 years old. Women who have utilized ANC services 4 or more times are more likely to have institutional delivery. Women who have a history of pregnancy termination (induced abortion) are also more likely have institutional delivery.

By caste ethnicity, the data analysis found that among the different caste/ethnic groups in Nepal Newar and Brahmin/Chhetri caste/ethnic groups are more likely to have institutional delivery than women from other caste/ethnic groups. Hindu women are also more likely to have institutional delivery than non-Hindu women. By place of residence women living in urban areas and those from Eastern development region were also found significantly likely to opt for institutional delivery. The study further found that women with the habits of reading newspaper have the highest likelihood of institutional delivery practices than access to other media channels like Radio and TV. Overall, the analysis results confirm that media habits in terms of frequency of reading Newspaper, listening to radio and

watching TV individually does show significant effect on institutional delivery practices. In addition, women who have habits of using all three types of communication media are more likely to practice institutional delivery.

The data analysis result shows that women occupation, husband occupation and household wealth have significant effect on the use of institutional delivery services. Women working in agriculture sector are more likely to opt for institutional delivery than women who are not working and/or have other occupation. Husband's occupation was found to have significant effect on institutional delivery practices. Household wealth has significant effect on institutional delivery practices as the women from rich and middle household were found more likely to have institutional delivery practices.

iv. Postnatal care practices

The study found that young women whose current age is below 30 years are more likely to use PNC services. The study also showed a strong effect in the utilization of PNC in that low parity has positive relationship with postnatal care. Women who have 1-2 CEB are found more likely to utilize PNC services. Women whose age at first birth is 20 or more years, women who have 1 under 5 children and women who have utilized ANC services 4 or more times are highly likely to use PNC services.

The study found significant effect of selected social variables on the utilization of PNC services in Nepal. Among various caste/ethnic groups women from Newar and Brahmin/Chhetri caste/ethnic groups are more likely to utilize PNC services. Hindu women are more likely to utilize PNC services than non-Hindu women. The study also found more likelihood of women in urban areas to utilize PNC services than rural women. Education has also significant effect on PNC service utilization in Nepal. Women with higher education and secondary level of education are more likely to utilize PNC than the women at primary level or women with no education. Good access to mass media channels especially newspaper and TV significantly increases the likelihood of PNC utilization. The

study also found more utilization of PNC services among women who use all three channels of mass media, i.e., newspaper, radio and TV.

Women working in service/trade sectors significantly likely to utilize PNC services. The study also found that husbands whose occupation is in service/trade sector are more likely to utilize PNC services. Women from rich and middle wealth status are highly likely to utilize PNC services.

v. Utilization of safe motherhood services

The study showed that young women have more likelihood of safe motherhood in Nepal. The study further found that women's low CEB status also results in safe motherhood service utilization. Moreover, women who have utilized ANC services 4 or more times are also more likely to practice safe motherhood. The study however does not show strong effects of other demographic variables like number of <5 children and women who have a history of pregnancy termination on safe motherhood services utilization.

The study shows that women from Brahmin/Chhetri and Newar caste/ethnic groups and women who belong to Hindu religion are more likely to use safe motherhood services. Urban residence, higher levels of educational attainment also was found to have strong positive effect of safe motherhood service utilization. The study however found not much association between husband's education and service utilization. The analysis result shows some effect of mass media utilization habits of women, though not strong.

The study found that women's occupation does have some likelihood positive effect especially those working in agriculture and manual labor occupation on safe motherhood service utilization. The study found strong likelihood effect of husband's occupation in service/trade sector on safe motherhood services utilization. Women's employment status i.e., women who are employed were more likely to use the services than women who are not employed. Household wealth does have strong likelihood effect on safe motherhood

utilization in that women belonging to rich and middle wealth household were more likely to utilize safe motherhood services than the women who belong to poor wealth households.

10.3 Conclusions

The analysis of dependent and independent variables of the study leads to the conclusion that demographic variables like age, parity, age at first birth, number of children less than 5 year old that a woman has and pregnancy termination history of women have strong influence in the utilization of different components of safe motherhood services. Similarly, women who utilize ANC services 4 or more times are also strongly likely to utilize all components of safe motherhood. Women who are currently 30 years or above and who have high parity are less likely to utilize ANC 4 or more times, make birth preparations, have institutional delivery, and use PNC services which means that these women have not ensured safe motherhood utilization. Women whose age at first birth is low and who have large number of children less than 5 years old also are less likely to use these services which put them more at risk of maternal morbidity and mortality.

Women from various Tarai caste/ethnic groups, Dalits and women from Muslim community are vulnerable to maternal morbidity and mortality since the safe motherhood practices among them is very low. Women from non-Hindu communities are vulnerable since the use of safe motherhood among them is low. Women's educational attainment has played significant role in ensuring safe motherhood. Women who have low levels of education or no education do not use all components of safe motherhood as recommended by health service provider. Women who reside in remote areas of mountain and Hill regions, live in rural areas, and have less exposure to mass media channels have not utilized the safe motherhood services during their pregnancy through delivery and post-partum periods to its fullest extent. Thus low levels or non-utilization of different components of safe motherhood services makes them more vulnerable to maternal morbidity and may eventually lead to mortality.

On the economic front, safe motherhood practices among women who are not working or who are occupied in agriculture sector is very low. Similarly, women who are not currently employed and who are from poor household wealth status have also not utilized the various components of safe motherhood. These women are therefore more vulnerable to maternal morbidity and mortality.

10.4 Recommendations and further research

Based on the findings of the study, following recommendations are made:

- i. This study made an attempt to analyze the safe motherhood practices in Nepal by women of various demographic, social and economic backgrounds. Further in-depth research, both qualitative and quantitative, that address the demographic, social and economic diversity are recommended to be implemented which could help in understanding people's knowledge, attitudes, and practices on safe motherhood. These researches need also to focus on the existing barriers in safe motherhood services utilization in Nepal especially among the women who are disadvantaged and marginalized.

APPENDIX I: List of CASTE/ETHNIC GROUPINGS

S. No	Caste/ethnic groupings	Individual ethnicity/castes
1.	Dalits	
	Hill	Kami, Damai, Sarkii, Gaine, Badi
	Tarai	Chamar, Mushar, Dhusah/Paswan, Tatma, Khatway, Bantar, Dom, Chidimar, Dhobi, Halkhor
2.	Janajatis	
	Hill	Thakali, Gurung, Magar, Tamang, Rai, Limbu, Sherpa, Bhote, Walung, Byansi, Hyolomo, Garrti/Bhujel, Kuumal, Sunsar, Baramu, Pahari, Yakkah, Chhantal, Jirel, Darai, Dura Majhi, Danuwar, Thami, Lepcha, Chepang, Bote, Raji, Hayu, Raute, Kusunda,
	Tarai	Tharu, Dhanuk, Rajbansi, Tajpuriya, Gangai, Dhimarl, Meche, Kisan, Munda, Santhal/Satar, Dhangad/Jhangad, Koche, Pattarkatta/Kusbadiay
3.	Other Tarai castes	Yadav, Teli, Kalwar, Sudhi, Sonar, Lohar, Koiri, Kurmi, Kanu, Haluwai, Hajam/Thakur, Badhe, Bahae, Rajba Kewat, Mallah, Nuniya, Kumhar, Kahar, Lodhar, Bing/Banda, Bhediyar, Mali, Kumar, Dhunia
4.	Muslim	Muslim, Churaute
5.	Newar	Newar
6.	Brahmin/Chhetri & other castes	Brahman (Hill), Chhetri, Thakuri, Sanyasi, Brahman (Tarai), Rajput, Kayastha, Baniya, Marwadi, Jaine, Nuraang, Bengali
Source: Adapted from Health Management Information System (HMIS), DoHS, 2012.		

APPENDIX II: Use of 4 or more ANC services in Nepal according to social characteristics

Description	Use of ANC4 or more times		Use of no ANC or used less than 4 times		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Development Region						
Eastern	513	51.4	708	48.6	999	100.0
Central	585	45.2	378	54.8	1293	100.0
Western	440	53.8	323	46.2	818	100.0
Mid-western	275	46.0	175	54.0	598	100.0
Far-western	265	60.2	2070	39.8	440	100.0
Eco-development Sub-region						
Eastern Mountain	41	52.6	37	47.4	78	100.0
Central Mountain	33	45.2	40	54.8	73	100.0
Western Mountain	56	36.4	98	63.6	154	100.0
Eastern Hill	155	46.7	177	53.3	332	100.0
Central Hill	246	61.0	157	39.0	403	100.0
Western Hill	234	48.0	254	52.0	488	100.0
Mid-western Hill	111	40.4	164	59.6	275	100.0
Far-western Hill	94	55.0	77	45.0	171	100.0
Eastern Tarai	317	53.8	272	46.2	589	100.0
Central Tarai	306	37.5	511	62.5	817	100.0
Western Tarai	205	62.3	124	37.7	329	100.0
Mid-western Tarai	133	55.9	105	44.1	238	100.0
Far-western Tarai	146	73.0	54	27.0	200	100.0
Total	2077	50.1	2070	49.9	4147	100.0

APPENDIX III: Effects of selected social variables on utilization of ANC 4 or more times in Nepal using logistic regression

Description	Odds ratio (OR)	95% Confidence interval (CI)	P value
Development Region			
Eastern	.698	.555-.877	0.002
Central	.546	.435-.684	0.000
Western	.768	.606-.975	0.030
Mid-western	.563	.454-.699	0.000
Far-western	Ref.	--	
Eco-development sub-region			
Eastern Mountain	.411	.273 - .618	0.000
Central Mountain	.308	.200 - .475	0.000
Western Mountain	.215	.145 - .318	0.000
Eastern Hill	.327	.223 - .479	0.000
Central Hill	.584	.391 - .871	0.008
Western Hill	.344	.232 - .512	0.000
Mid-western Hill	.254	.173 - .372	0.000
Far-western Hill	.454	.308 - .670	0.000
Eastern Tarai	.435	.293 - .647	0.000
Central Tarai	.223	.152 - .328	0.000
Western Tarai	.617	.415 - .918	0.017
Mid-western Tarai	.473	.320 - .697	0.000
Far-western Tarai	Ref.		--

APPENDIX IV: Birth preparation practices in Nepal according to social characteristics of women

Description	Birth preparation		No birth preparation		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Development Region						
Eastern	480	48.0	519	52.0	999	100.0
Central	426	32.9	867	67.1	1293	100.0
Western	285	34.8	533	65.2	818	100.0
Mid-western	200	33.4	398	66.6	598	100.0
Far-western	232	52.7	208	47.3	440	100.0
Eco-development Sub-region						
Eastern mountain	33	42.3	45	57.7	78	100.0
Central Mountain	26	36.1	46	63.9	72	100.0
Western Mountain	35	22.6	120	77.4	155	100.0
Eastern Hill	137	41.4	194	58.6	331	100.0
Central Hill	184	45.5	220	54.5	404	100.0
Western Hill	152	31.1	336	68.9	488	100.0
Mid-western Hill	82	29.8	193	70.2	275	100.0
Far-western Hill	70	40.9	101	59.1	171	100.0
Eastern Tarai	309	52.5	280	47.5	589	100.0
Central Tarai	216	26.4	601	73.6	817	100.0
Western Tarai	132	40.1	197	59.9	329	100.0
Mid-western Tarai	106	44.7	131	55.3	237	100.0
Far-western Tarai	139	69.2	62	30.8	201	100.0
Total	1621	39.1	2526	60.9	4147	100.0

APPENDIX V: Effects of selected social variables on birth preparation practices in Nepal using logistic regression

Description	Odds ratio (OR)	Confidence interval (CI)	P value
Development Region			
Eastern	.830	.661 - 1.042	0.109
Central	.442	.351 - .556	0.000
Western	.480	.377 - .610	0.000
Mid-western	.450	.361 - .562	0.000
Far-western	Ref.	Ref.	
Eco-development Sub-region			
Eastern Mountain	.632	.373 - 1.069	0.087
Central Mountain	.453	.265 - .774	0.004
Western Mountain	.242	.150 - .390	0.000
Eastern Hill	.429	.265 - .696	0.001
Central Hill	.488	.296 - .805	0.005
Western Hill	.277	.170 - .451	0.000
Mid-western Hill	.313	.195 - .502	0.000
Far-western Hill	.258	.160 - .416	0.000
Eastern Tarai	.382	.233 - .624	0.000
Central Tarai	.146	.091 - .234	0.000
Western Tarai	.262	.162 - .425	0.000
Mid-western Tarai	.319	.197 - .517	0.000
Far-western Tarai	Ref.	--	--

APPENDIX VI: Institutional delivery practices in Nepal according to social characteristics of women

Description	Institutional delivery		Delivery at home or other places		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Development Region*						
Eastern	429	42.9	562	56.3	999	100.0
Central	504	38.9	769	59.4	1294	100.0
Western	330	40.3	468	57.2	818	100.0
Mid-western	195	32.6	392	65.6	598	100.0
Far-western	140	31.8	289	65.7	440	100.0
Eco-development Sub-region						
Eastern Mountain	17	21.8	61	78.2	78	100.0
Central Mountain	19	26.4	52	72.2	72	100.0
Western Mountain	28	18.1	123	79.4	155	100.0
Eastern Hill	91	27.5	235	71.0	331	100.0
Central Hill	207	51.4	189	46.9	403	100.0
Western Hill	160	32.7	313	64.0	489	100.0
Mid-western Hill	77	28.0	190	69.1	275	100.0
Far-western Hill	46	26.9	120	70.2	171	100.0
Eastern Tarai	321	54.5	266	45.2	589	100.0
Central Tarai	278	34.0	527	64.4	818	100.0
Western Tarai	170	51.7	155	47.1	329	100.0
Mid-western Tarai	103	43.3	135	56.7	238	100.0
Far-western Tarai	81	40.5	113	56.5	200	100.0
Total	1598	38.5	2479	59.8	4148	100.0

APPENDIX VII: Effects of selected social variables on utilization of institutional delivery services in Nepal using logistic regression

Description	Odds ratio (OR)	Confidence interval (95 CI)	P value
Development Region			
Eastern	1.571	1.234 - 1.999	0.000
Central	1.349	1.063 - 1.711	0.014
Western	1.450	1.131 - 1.858	0.003
Mid-western	1.021	.809 - 1.288	0.860
Far-western	Ref.		
Eco-development Sub-region			
Eastern Mountain	.382	.250 - .583	0.000
Central Mountain	.512	.329 - .797	0.003
Western Mountain	.318	.210 - .480	0.000
Eastern Hill	.539	.370 - .787	0.001
Central Hill	1.520	1.043 - 2.217	0.029
Western Hill	.710	.483 - 1.044	0.081
Mid-western Hill	.566	.390 - .823	0.003
Far-western Hill	.527	.359 - .774	0.001
Eastern Tarai	1.682	1.154 - 2.450	0.007
Central Tarai	.733	.508 - 1.058	0.097
Western Tarai	1.524	1.049 - 2.212	0.027
Mid-western Tarai	1.059	.733 - 1.531	0.759
Far-western Tarai	Ref.	--	

APPENDIX VIII: Use of PNC services in Nepal according to Social characteristics of women

Description	Variable name		Use of PNC		Non-use of PNC	
	Number	Percent	Number	Percent	Number	Percent
Development Region						
Eastern	459	45.9	540	54.1	999	100.0
Central	552	42.7	741	57.3	1293	100.0
Western	363	44.4	455	55.6	818	100.0
Mid-western	230	38.5	368	61.5	598	100.0
Far-western	187	42.4	254	57.6	441	100.0
Eastern	459	45.9	540	54.1	999	100.0
Eco-development Sub-region						
Eastern Mountain	22	27.8	57	72.2	79	100.0
Central Mountain	22	30.6	50	69.4	72	100.0
Western Mountain	38	24.5	117	75.5	155	100.0
Eastern Hill	101	30.4	231	69.6	332	100.0
Central Hill	200	49.5	204	50.5	404	100.0
Western Hill	174	35.7	314	64.3	488	100.0
Mid-western Hill	97	35.3	178	64.7	275	100.0
Far-western Hill	55	32.4	115	67.6	170	100.0
Eastern Tarai	337	57.1	253	42.9	590	100.0
Central Tarai	330	40.4	487	59.6	817	100.0
Western Tarai	189	57.3	141	42.7	330	100.0
Mid-western Tarai	112	47.1	126	52.9	238	100.0
Far-western Tarai	114	57.0	86	43.0	200	100.0
Total	1791	43.2	2359	56.8	4150	100.0

APPENDIX IX: Effects of selected social variables on utilization of PNC services in Nepal using logistic regression

Description	Odds ratio (OR)	Confidence interval (CI)	P value
Development Region			
Eastern	1.157	.917 - 1.459	0.218
Central	1.013	.807 - 1.274	0.912
Western	1.084	.854 - 1.378	0.507
Mid-western	.850	.682 - 1.060	0.149
Far-western	Ref.		
Eco-development Sub-region			
Eastern Mountain	.292	.195 - .437	0.000
Central Mountain	.332	.215 - .510	0.000
Western Mountain	.242	.164 - .358	0.000
Eastern Hill	.329	.227 - .477	0.000
Central Hill	.738	.508 - 1.072	0.010
Western Hill	.417	.285 - .610	0.000
Mid-western Hill	.411	.286 - .592	0.000
Far-western Hill	.362	.249 - .527	0.000
Eastern Tarai	1.003	.689 - 1.460	0.987
Central Tarai	.511	.356 - .733	0.000
Western Tarai	1.009	.695 - 1.465	0.961
Mid-western Tarai	.672	.466 - .969	0.033
Far-western Tarai	Ref.		

APPENDIX X: Use of safe motherhood services in Nepal according to social characteristics of women

Description	Utilization of full SM services		Non utilization of full SM services		Total respondents	
	Number	Percent	Number	Percent	Number	Percent
Development Region						
Eastern	179	17.9	820	82.1	999	100.0
Central	191	14.8	1102	85.2	1293	100.0
Western	151	18.5	667	81.5	818	100.0
Mid-western	83	13.9	515	86.1	598	100.0
Far-western	78	17.7	363	82.3	441	100.0
Eco-development Sub-region						
Eastern Mountain	9	11.5	69	88.5	78	100.0
Central Mountain	11	15.3	61	84.7	72	100.0
Western Mountain	11	7.1	143	92.9	154	100.0
Eastern Hill	39	11.8	292	88.2	331	100.0
Central Hill	104	25.7	300	74.3	404	100.0
Western Hill	65	13.3	423	86.7	488	100.0
Mid-western Hill	35	12.7	240	87.3	275	100.0
Far-western Hill	20	11.8	150	88.2	170	100.0
Eastern Tarai	131	22.2	458	77.8	589	100.0
Central Tarai	76	9.3	741	90.7	817	100.0
Western Tarai	86	26.1	244	73.9	330	100.0
Mid-western Tarai	44	18.6	193	81.4	237	100.0
Far-western Tarai	50	24.9	151	75.1	201	100.0
Total	681	16.4	3465	83.6	4146	100.0

APPENDIX XI: Effects of selected social variables on utilization of safe motherhood services in Nepal using logistic regression

Description	Odds ratio (OR)	Confidence interval (CI)	P value
Development Region			
Eastern	1.019	.751 - 1.38	0.903
Central	.810	.601 - 1.093	0.168
Western	1.056	.779 - 1.433	0.724
Mid-western	.751	.556 - 1.013	0.061
Far-western	Ref.		
Eco-development Sub-region			
Eastern Mountain	.435	.271 - .698	0.001
Central Mountain	.567	.345 - .933	0.026
Western Mountain	.264	.160 - .435	0.000
Eastern Hill	.434	.281 - .671	0.000
Central Hill	1.360	.913 - 2.026	0.130
Western Hill	.580	.377 - .892	0.013
Mid-western Hill	.547	.360 - .831	0.005
Far-western Hill	.458	.296 - .709	0.000
Eastern Tarai	.985	.655 - 1.482	0.942
Central Tarai	.404	.261 - .624	0.000
Western Tarai	1.332	.896 - 1.982	0.157
Mid-western Tarai	.738	.489 - 1.113	0.147
Far-western Tarai	Ref.	=	-

REFERENCES CITED

- Abeje, G., Azage, M. & Setegn, T. (2014). Factors associated with institutional delivery service utilization among mothers in Bahir Dar City administration, Amhara region: A community based cross sectional study. *Reproductive Health*. Retrieved From <http://www.reproductive-health-journal.com/content/11/1/22>.
- Abera, M., G. Mariam, & Belachew A.T. (2011). Predictors of safe delivery service utilization in Arsi Zone, South-East Ethiopia. *Ethiopia Journal of Health Sciences*. Retrieved From <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3275878/>.
- Acharya, S. K. (2011). *Population, gender and development: A review of population and reproductive health policies of Nepal*. Germany: Lambert Academic Publishing.
- Adaji, S. (nd). *Defining and measuring maternal morbidity*. UK: Maternal and Newborn Health Unit, Liverpool School of Tropical Medicine. Retrieved From <http://www.comtecmed.com/figoafrika/Uploads/assets/pdf/saturday/Adaji%20S.pdf>
- Arthur, E. (2012). Wealth and antenatal care use: Implications for maternal health care utilization in Ghana. *Health Economics Review*, 2 (14). Retrieved From <http://www.healtheconomicsreview.com/content/2/1/14>.
- Baral, Y. R., Lyons, K., Skinner, J. & VanTeijlingen, E. R. (2012). Maternal health services utilization in Nepal: progress in the new millennium? *Health Science Journal*. 6 (4). Retrieved From <http://www.hsj.gr/medicine/php?aid=3154>.
- Baral, Y. R., Lyons, K., Skinner, J. & VanTeijlingen, E. R. (2010). Determinants of skilled birth attendants for delivery in Nepal. *Kathmandu University Medical Journal*. 8 (3). Retrieved From <http://www.kumj.com.np/issue/31/325-332>.
- Bintabara, D., Mohamed, A. M., Mghamba, J., Wasswa, P., & Mpembeni, R. N. M. (2015). Birth preparedness and complication readiness among recently delivered women in Chamwino district, central Tanzania: A cross sectional study. *Reproductive Health*. Retrieved From <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4447013/>
- Bloom, S. S. & Lippeveld, T. (1999). *Does antenatal care make a difference to safe delivery?* Research Study Report in India, Urban Uttar Pradesh: Health Policy and Planning. Retrieved From <http://www.researchgate.net/publication/12948370>.

- Bulatoo, R. A. & Ross, J.A. (2000). *Rating maternal and neonatal health programs in developing countries*. Research Report. MEASURE Evaluation Project, Carolina Population Centre NC: North Carolina. Retrieved From http://pdf.usaid.gov/pdf_docs/Pnacl165.pdf
- Campbell, O. M. R. & Graham, W. J. (nd). *Measuring the determinants of maternal morbidity and mortality: Defining and selecting outcomes and determinants, and demonstrating associations*. Review Report. London: LSHTM. Retrieved From <http://www.maternal-mortality-measurement.org.uk/Library/Measuring%20the%20Determinants%20of%20Maternal%20Morbidity%20and%20Mortality.pdf>
- Campbell, O. M. R. & Graham, W. J. (2006). Strategies for reducing maternal mortality: getting on with what works. *The Lancet*, pp. 1284–1299. Retrieved from <http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736%2806%2969381-1.pdf>
- 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 www.kit.nl/workingpapers.
- Central Bureau of Statistics (CBS). (2012). *National population and housing census 2011 National Report*. Kathmandu.
- ... (2015). *Nepal multiple indicator survey 2014: Key findings*. Survey Report. Kathmandu.
- Chao, Y., Peng, J., Lee, K. L. & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research*. Bloomington: Indiana University. Retrieved From <http://www.indiana.edu/~jopeng51/intrduclogistic-jer.pdf>.
- Chauhan, A. (2012). Antenatal care among currently married women in Rajasthan, India. *Asian Pacific Journal of Tropical Disease*. Retrieved From www.elsevier.com/locate/apjtd
- Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. SAGE Publications Ltd. Retrieved From <http://salbayrak.yasar.edu.tr/wp-content/uploads/2012/09/Lecture-1-Reading-Crotty-chapter-1.pdf>
- Czepiel, S. A. (nd). *Maximum likelihood estimation of logistic regression models: Theory and implementation*. Retrieved From <http://czep.net/contact.html>

- Dahal, R. K. (2013). Factors influencing the choice of place of delivery among women in eastern rural Nepal. *International Journal of Maternal and Child Health*. Retrieved From <http://www.academia.edu/8744603/>.
- Dahiru, T. & Oche, M. O. (2015). Determinants of antenatal care, institutional delivery and postnatal care services utilization in Nigeria. *The Pan African Medical Journal*, Vol. 23. Retrieved From <http://www.panafrican-med-journal.com/content/article/21/321/full/#.Vqc581JJhdi>.
- Debelew, G.T, Afework, M.F. & Yalew, A. W. (2014). Determinants and causes of neonatal mortality in Jimma zone in southwest Ethiopia: A multilevel analysis of prospective follow up study. *PlosOne*, 9 (9). Retrieved From <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4169420/>
- Deo, K. K., Paudel, Y. R., Khatri, R., B. Bhaskar, R. K., Paudel, R., Mehata, S. & Wagle, R. R. (2015). Barriers to utilization of antenatal care services in eastern Nepal. *Frontiers in Public Health*. Retrieved From <http://dx.doi.org/10.3389/fpubh.2015.00197>.
- Dhak, B. (2013). Use of maternal health care in rural India: Relative importance of socio-economic status and accessibility. *Journal of Population and Social Studies*, 21 (2). Retrieved From <https://www.Journal+of+Population+and+Social+Studies+C+Volume+21+Number+2+28Supplement+29+July+2013&ie=utf-8&oe=utf-8>.
- Dhakal, S., Chapman, G. N., Simkhada. P. P., Van, T. E. R., Stephens, J. & Raja, A. E. (2007). Utilization of postnatal care among rural women in Nepal. *BMC pregnancy and childbirth*, pp. 7-19. Retrieved From www.biomedcentral.com.
- Ekabua, J. E., Kufre, J. E. , Odusolu, P., Agan, T. U., Iklaki, C. U., & Etokidem, A. J. (2011). Awareness of birth preparedness and complication readiness in southeastern Nigeria. *ISRN Obstetrics and Gynecology*, Vol. 2011. Reprieved From <https://www.hindawi.com/journals/isrn/2011/560641/>
- Jhpiego. (2004). *Monitoring birth preparedness and complication readiness, tools and indicators for maternal and newborn health*. Policy & Strategy Paper. NY: Johns Hopkins Bloomberg school of Public Health, Retrieved From http://pdf.usaid.gov/pdf_docs/pnada619.pdf.

- FCI. (2007). *Safe motherhood a review: 1987–2005*. Review Report. New York: FCI. Retrieved From http://www.familycareintl.org/UserFiles/File/SM%20A%20Review_%20Full_Report_FINAL.pdf
- ... (2010). *Safe motherhood: current initiatives*. Status Review Paper. Safe Motherhood Inter Agency Group. Retrieved From <http://www.safemotherhood.org/priorities/initiatives.html>.
- ... (2010). *Safe motherhood 2010*. Retrieved From <http://www.safemotherhood.org>
- Freedman, L. P. (2001). Using human rights in maternal mortality programs. *International Journal of Gynecology and Obstetrics*. Retrieved From <https://www.google.com/search?q=Freedman%2C+L.P.%2C+Using+human+rights+in+maternal+mortality+programs+International+Journal+of+Gynaecology+and+Obstetrics%2C+2001%2C+p.+55.&ie=utf-8&oe=utf-8>.
- Gebre, M., Gebremariam, A., & Abebe, T. A. (2015). Birth preparedness and complication readiness among pregnant women in Duguna Fango district, Wolayta Zone, Ethiopia. *PLoS ONE*, 10 (9). Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/26379231>].
- Gill, K., Pande, R. & Malhotra, A. (2007). Women deliver for development. *The Lancet*, pp. 1347–1357
- Grown, C., Gupta, G. R., & Kes, A. (2005). *Taking action: Achieving gender equality and empowering women*. New York: United Nations Millennium Project. Retrieved From <http://www.unmillenniumproject.org/documents/Gender-complete.pdf>.
- Gruskin, S., Cottingham, J., Hilber, A. M., Kismodi, E., Lincettob, O., Jane, M. & Roseman, M. J. (2008). Using human rights to improve maternal and neonatal health: History, connections and a proposed practical approach. *Bulletin of the World Health Organization*, pp. 577-656. Retrieved From <http://www.who.int/bulletin/volumes/86/8/en/>
- Hogberg, U., Wall, S. & Brostrom, G. (1986). The impact of early medical technology on maternal mortality in late 19th century Sweden. *International Journal of Gynecology and Obstetrics*. 24 (4). Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/2878833>.

- International Institute for Population Sciences (IIPS). (2010). *District level household and facility survey (DLHS-3) 2007-08:Madhya Pradesh*. Survey Report. Mumbai: IIPS. Retrieved From <http://rchiips.org/pdf/rch3/report/mp.pdf>.
- Jat, T. R., Nag, N. & Sebastian, M. S. (2011). Factors affecting the use of maternal health services in Madhya Pradesh state of India: A multilevel analysis. *International Journal for Equity in Health*. Retrieved From <http://www.equityhealthj.com/content/10/1/59>.
- Jhpiego. (2004). *Birth Preparedness and Complication Readiness: A matrix of shared responsibilities*. Policy Paper. Retrieved From <http://www.jhpiego.org/files/bpcrmatrix.pdf>.
- Kaphle, H. P., Neupane, N., Kunwar, L. B. & Acharya, A. (2015). Birth preparedness and complications readiness among women in Lekhnath Municipality, Nepal. *Global Journal of Medicine and Public Health*, 4 (3). Retrieved From <http://gjmedph.com/uploads/O1-Vo4No3.pdf>
- Karkee, R., Lee, A. H. & Binns, C. W. (2013). Birth preparedness and skilled attendance at birth in Nepal: Implications for achieving millennium development goal 5. *Midwifery*. Retrieved From www.elsevier.com/midw.
- Kaso, M. & Addisse, M. (2014). Birth preparedness and complication readiness in Robe Woreda of Central Ethiopia: A cross-sectional study. *Reproductive Health*. Retrieved From www.reproductive-health-journal.com/content/11/1/55.
- Kaule-sabiti, Y., Acheampong A. & Ngake, M. (2014). The Effect of Socio-demographic Factors on the Utilization of Maternal Health Care Services in Uganda. *African Population Studies*, Vol 28 (1). Retrieved From <http://www.bioline.org.br/pdf?ep14007>
- Kesterton, A. J., Cleland, J., Slogett, A. & Ronsmans, C. (2010). Institutional delivery in rural India: The relative importance of accessibility and economic status. *BMC Pregnancy and Childbirth*. Retrieved From <http://www.biomedcentral.com/1471-2393/10/30>.
- Kuhn, T. S. (1970). *The Structure of Scientific Revolutions*. International Encyclopedia of Unified Science. USA: The University of Chicago. Retrieved From: http://projektintegracija.pravo.hr/_download/repository/Kuhn_Structure_of_Scientific_Revolutions.pdf

- Kulkarni, M. S. & Nimbalkar, M. R. (2008). Influence of socio-demographic factors on the use of antenatal care. *Indian J. Prev. Soc. Med*, 39. Retrieved From <http://medind.nic.in/ibl/t08/i3/iblt08i3p98.pdf>.
- Kwast, B. E. (1996). Reduction of maternal and perinatal mortality in rural and peri-urban settings: What works? *European Journal of Obstetrics & Gynecology and Reproductive Biology*. Retrieved From <http://www.sciencedirect.com/science/journal/03012115/69/1>
- Lindsay, M. (2010). The philosophical underpinnings of educational research. Retrieved From http://www.apu.ac.jp/rcaps/uploads/fckeditor/publications/polyglossia/Polyglossia_V19_Lindsay
- Lule, E., Ramana, G. N. V., Oomman, N., Epp, J., Huntington, D. & Rosen, J.E. (2005). *Achieving the millennium development goal of improving maternal health: Determinants, interventions and challenges*. Discussion Paper. Washington: The World Bank. Retrieved From <http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/281627-1095698140167/LuleAchievingtheMDGFinal.pdf>.
- Magadi, M. A., Madise, N. J. & Rodrigues, R. N. (2008). Frequency and timing of antenatal care in Kenya: Explaining the variations between women of different communities. *Social Science & Medicine*. Retrieved From www.healtheconomicsreview.com/pubmed/related/23919511.
- Maine, D. (1991). *Safe motherhood programs: Options and issues*. New York: Center for Population and Family Health/Columbia University. Retrieved From <http://www.amddprogram.org/v1/resources/SMProgOptionsandIssuesEN.pdf>.
- Mandal, T., Biswas, R., Bhattacharya, S. & Das, D. K. (2015). Birth preparedness and complication readiness among recently delivered women in a rural area of Darjeeling, West Bengal, India. *American Medical Student Research Journal*, Vol. 2. Retrieved From <https://www.google.com/search?q=birth+preparedness+practices&ie=utf-8&oe=utf-8#q=birth+preparedness+practices&start=20>.
- Markos, D. & Bogale, D. (2014). Birth preparedness and complication readiness among women of child bearing age group in Gobaworeda, Oromia region, Ethiopia. *BMC Pregnancy and Childbirth*. Retrieved From <http://www.biomedcentral.com/1471-2393/14/282>.

- Mbalinda, S. N., Nakimuli, A., Othman, K., O'Osinde, M., Kakande, N. & Kaye, D. K. (2014). Does knowledge of danger signs of pregnancy predict birth preparedness? A critique of the evidence from women admitted with pregnancy complications. *Health Research Policy and Systems*. Retrieved From <http://www.healthynewbornnetwork.org/sites/default/files/resources/1478-4505-12-60.pdf>.
- Mehari, A. M. (2013). *Levels and determinants of use of institutional delivery care services among women of childbearing age in Ethiopia: Analysis of EDHS 2000 and 2005 data*. DHS Working Papers. Maryland: ICF International. Retrieved From dhsprogram.com/publications/citations/cite_WP83.
- Mehari, K. & Wencheke, E. (2013). Factors affecting maternal health care services utilization in rural Ethiopia: A study based on the 2011 EDHS data, *Ethiop. J. Health Dev*, 27. Retrieved From www.ajol.info.
- Mekonnen, Y. & Mekonnen, A. (2003). Factors influencing the use of maternal healthcare services in Ethiopia. *Journal of Health, Population and Nutrition*. Retrieved From <http://www.jstor.org/stable/23499346>.
- Ministry of Health and Population. (1998). *Safe Motherhood Policy 1998*. Kathmandu: Ministry of Health and Population.
- . . . (2012). New ERA, and ICF International Inc. *Nepal demographic and health survey 2011*. Kathmandu: Ministry of Health and Population, New ERA, and ICF International, Calverton, Maryland.
- . . . (2007). New ERA, and Macro International Inc. *Nepal demographic and health survey 2006*. Kathmandu: Ministry of Health and Population, New ERA, and Macro International Inc.
- . . . (2002). *National Safe motherhood plan 2002-2017*. Kathmandu: Ministry of Health and Population.
- . . . (2006). *National policy on skilled birth attendants*. Kathmandu: Ministry of Health and Population.
- Mutreja, S. & Kumar, A. (2015). Knowledge and practice of birth preparedness among tribal women in Sukma district of Chhattisgarh, India. *IOSR Journal of*

Humanities and Social Science (IOSR-JHSS), 20 (3). Retrieved From www.iosrjournals.org

- Nair M., Ariana P., Webster, P. (2012). What influences the decision to undergo institutional delivery by skilled birth attendants? A cohort study in rural Andhra Pradesh, India. *The International Electrical Journal of Rural and Remote Health Research, Education, Practice*. Retrieved From <http://www.rrh.org.au/articles/subviewasia.asp?ArticleID=2311>.
- Nziokil, J. M., Onyango, R. O. & Ombaka, J. H. (2015). Socio-demographic factors influencing maternal and child health service utilization in Mwingi; A Rural Semi-Arid District in Kenya. *American Journal of Public Health Research*. Retrieved From www.sci epub.com/portal/downloads?doi=10.12691/ajphr.
- O'Donnell, O. (2007). Access to health care in developing countries: Breaking down demand side barriers. *Cad. Saúde Pública. Rio de Janeiro*, 23 (12). Retrieved From <http://scielo.br/pdf/csp/v23n12/02.pdf>.
- Oscar, S. & Johnson, K. (2004). *DHS Comparative reports- 6*. Calverton, Maryland: ORC Macro. Retrieved From <http://dhsprogram.com/pubs/pdf/CR6/CR6.pdf>.
- Pandey, J. P., Dhakal, M., Karki, R. S., Poudel, P. & Pradhan, M. S. (2013). *Maternal and child health in Nepal: The effects of caste, ethnicity, and regional identity: further analysis of the 2011 Nepal Demographic and Health Survey*. Nepal: Ministry of Health and Population, New ERA, and ICF International.
- Paruzzolo, S., Mehra, R., Kes, A., & Ashbaugh, C. (2010). *Gender inequality is a critical and neglected factor in utilization of maternal healthcare services*. Washington: International Center for Research on Women. Retrieved From [http://www.eif.gov.cy/mlsi/dl/genderequality.nsf/0/12D2A22FAC60DA74C22579A6002D950A/\\$file/icrw-targeting-poverty-gender-inequality-oct2010.pdf](http://www.eif.gov.cy/mlsi/dl/genderequality.nsf/0/12D2A22FAC60DA74C22579A6002D950A/$file/icrw-targeting-poverty-gender-inequality-oct2010.pdf)
- Prusty, R. K., Gouda, J. & Pradhan, M. R. (2015). Inequality in the utilization of maternal healthcare services in Odisha, India. *International Journal of Population Research*. Retrieved From <http://dx.doi.org/10.1155/2015/531485>.
- Rahman, K. M. M. (2009). Determinants of maternal health care utilization in Bangladesh. *Research Journal of Applied Sciences*, 4 (3). Retrieved From <http://scialert.net/asci/author.php?author=K.M.%20Mustafizur&last=Rahman>.

- Rahman, M. (nd). The determinants of use of postnatal care services for mothers: Does differential exist between urban and rural areas in Bangladesh? *The Internet Journal of Epidemiology*, 8 (1). Retrieved From ISPUB.COM.
- Ravindran, S. (ed.). (2001). *Transforming health systems: Gender and rights in reproductive health. A training curriculum for health programme managers*. Geneva: World Health Organization. Retrieved From http://www.policyproject.com/policycircle/documents/transforming_health_systems.pdf.
- Ronsmans, C. & Graham, W. (2006). Maternal mortality: Who, when, where and why? *The Lancet Maternal Survival Series*. Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/17011946>.
- Rosenfield, A. & Maine, D. (1985). "Where is the M in MCH? Maternal mortality: A neglected tragedy." *The Lancet*. Retrieved From <http://www.eldis.org/vfile/upload/1/document/0708/DOC18134.pdf>
- Rutstein, S. H. & Johnson, K. (2004). The DHS Wealth Index. DHS Comparative Reports No. 6
Maryland, USA: ORC Macro.
- Safe Motherhood Inter-Agency Group. (2000). *Skilled attendance at delivery: A review of the evidence*. Draft Review report. New York: FCI. Retrieved From <http://www.jsieurope.org/safem/collect/safem/pdf/s2934e/s2934e.pdf>.
- Onda, S., Caglia, J., Özge T. & Langer, A. (2014). *Postnatal care in Nepal: Components of care, implementation challenges, and success factors*. Women and Health Initiative, Maternal Health Task Force - Harvard School of Public Health.
Retrieved From www.womenandhealthinitiative.org
- Sarin, A. R. (1997). Underutilization of maternal health services. *World Health Forum*. Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/9233074>
- Shah, R., Rehfuess, E. A., Maskey, M. K., Fischer, R., Bhandari, P. B. & Delius, M. (2015). Factors affecting institutional delivery in rural Chitwan district of Nepal: A community-based cross-sectional study. *BMC Pregnancy and Childbirth*. Retrieved From www.biomedcentral.com/1471-2393/15/27

- Sharma, A., Singh, P., Thakur, P., Kasar, P. K., Tiwari, R. & Sharma R. (2014). Utilization of postnatal care in tribal area of Madhya Pradesh: A community based cross sectional study. *International Journal of Medical Science and Public Health*, 3 (10). Retrieved From www.ejmanager.com/mnstemps/67/67-1404271809
- Shen, C. & Williamson J. B. (1999). Maternal mortality, women's status, and economic dependency in less developed countries: A cross-national analysis. *Social Science and Medicine*, pp. 197-214. Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/10414829>
- Simkhada B., Teijlingen, V., Porter M., & Simkhada P. (2008). Factors affecting the utilization of antenatal care in developing countries: Systematic review of the literature. *Journal of Advanced Nursing*, 61(3). Retrieved From [https://scholar.google.com/scholar?q=Journal+of+Advanced+Nursing+61+\(3\)](https://scholar.google.com/scholar?q=Journal+of+Advanced+Nursing+61+(3))
- Sines, E., Syed, U., Wall, S. & Worly, H. (2007). *Postnatal care: A critical opportunity to save mothers and newborns*. Population Reference Bureau. Retrieved From http://www.prb.org/pdf07/SNL_PNCBriefFinal.pdf
- SMIAG. (2000b). Can Skilled Attendance at Delivery Reduce Maternal Mortality in Developing Countries? Safe Motherhood Strategies. Retrieved From <http://www.nzdl.org/gsdImod?e=d-00000-00---off-0safem--00-0----0-10-0---0---0direct-10---4-----0-11--11-en-50---20-about---00-0-1-00-0--4----0-0-11-10-0utfZz-8-00&a=d&cl=CL1.1&d=HASH 0178fd00e5e6e9f06f1db8.4>
- Soubeiga, D., Gauvin, L., Hatem, M.A., & Johri, M. (2014). Birth preparedness and complication readiness (BPCR) interventions to reduce maternal and neonatal mortality in developing countries: systematic review and meta-analysis. *BMC Pregnancy and Childbirth*. Retrieved From: <http://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-14-129>
- Stephenson, R. & Tsui, A. O. (2002). Contextual influences on reproductive health services use in Uttar Pradesh, India. *Studies in Family Planning*, 33 (4). Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/12561780>
- Suvedi, B. K., Pradhan, A., Barnett, S., Puri, M., Chitrakar, S. R., Poudel, P., Sharma, S. & Hulton, L. (2009). *Nepal maternal mortality and morbidity study 2008/2009: Summary of preliminary findings*. Kathmandu: DoHS/Ministry of Health and Population.

- Tabassum, F., Chou D., Dadelszen, P., Agrawal, P., Vanderkruik, R., Tunçalp, O., Magee, L. A., Van Den Broek, N., Say, L. (2013). Measuring maternal health: Focus on maternal morbidity. *Bulletin of World Health Organization*, pp. 794-796. Retrieved From <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3791656/>
- Teferra, A. S., Alemu, F. M. & Woldeyohannes, S. 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*. Retrieved From <http://www.biomedcentral.com/1471-2393/12/74>
- Tesfahun, F., Worku, W., Mazengiya, F. & Kifle M. (2014). Knowledge, perception and utilization of postnatal care of mothers in Gondar Zuria district, Ethiopia: a cross-sectional study. *Maternal Child Health Journal*. Retrieved From Springerlink.com
- Tsegay, Y., Tesfay, G., Goicolea, I., Edin, K., Lemma, H. & Sebastian, M. S. (2013). Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: A cross-sectional study. *International Journal for Equity in Health*. Retrieved From <http://www.equityhealthj.com/content/12/1/30>.
- Tura, G. M., Afework, F. & Yalew, A. W. (2014). The effect of birth preparedness and complication readiness on skilled care use: A prospective follow-up study in Southwest Ethiopia. *Reproductive Health*. Retrieved From <http://www.reproductive-health-journal.com/content/11/1/60>
- Tura, D., G., Afework, M. F., & Yalew, A.W. (2014). Factors affecting birth preparedness and complication readiness in Jimma Zone, Southwest Ethiopia: A multilevel analysis. *The Pan African Medical Journal*. Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/25870727>
- United Nations. (1994). *Report of the international conference on population and development*. Cairo, Egypt. Retrieved From http://www.un.org/ga/search/view_doc.asp?symbol=A/CONF.171/13
- UNICEF, (2003). *Maternal mortality reduction strategy. UNICEF Eastern and Southern Africa Regional Office*. Retrieved From <http://www.unicef.org/health/files/MMreductionstrategyShoo2003.pdf>

- ... (2003). *A human rights-based approach to programming for maternal mortality reduction in a south asian context: A review of the literature*. UNICEF Regional Office for South Asia. Retrieved From <http://www.unicef.org/rosa/HumanRights.pdf>
- ... (2012). *Maternal and newborn health*. New York. Retrieved From http://www.unicef.org/health/index_maternalhealth.html.
- UNICEF, UNFPA & World Bank. (2012). *Trends in maternal mortality: 1990 to 2010*. Retrieved from <http://www.unfpa.org/publications/trends-maternal-mortality1990-2010>.
- UNFPA. (2004). *State of the world population 2004 report- the Cairo consensus at ten: population, reproductive health, and the global effort to end poverty*. New York: UNFPA. Retrieved From https://www.unfpa.org/sites/default/files/pub-pdf/swp04_eng.pdf.
- ... (2004). *Programme of action adopted at the international conference on population and development, Cairo, 5-17 September, 1994*. New York: UNFPA. Retrieved From https://www.unfpa.org/sites/default/files/event-pdf/PoA_en.pdf.
- ... (2004). *Maternal mortality update 2004: Delivering into good hands*. New York. Retrieved From http://www.unfpa.org/sites/default/files/pub-pdf/mmupdate05_eng.pdf
- United States Agency For International Development (USAID). (nd). *Maternal health task force*. Retrieved From <http://www.mhtf.org/topics/postnatal-care/>.
- ... (nd). *Human rights matrix. The Policy Project*. Retrieved From <http://www.policyproject.com/matrix/>
- Upreti, S. R., Baral, S. C., Tiwari, S., Elsey, H., Aryal, S., Tandan, M., Aryal, Y., Lamichhane, P. & Lievens, T. (2012). *Rapid assessment of the demand side financing schemes: Aama programme and 4 ANC*. Kathmandu: MoHP/ NHSSP/HERD
- Wang, W., Alva, S., Wang, S. & Fort, A. (2011). *Levels and trends in the use of maternal health services in developing countries*. Calverton, Maryland, USA: ICF Macro, Retrieved From <https://dhsprogram.com/pubs/pdf/CR26/CR26.pdf>.

- World Food Program (WFP). (nd). *Food security analysis*. Retrieved From <https://resources.vam.wfp.org/sites/default>).
- World Health Organization & Global Coalition on Women and AIDS. (2012). Violence against women and HIV/AIDS: Critical intersections-intimate partner violence and HIV/AIDS. *Information Bulletin Series*, 1. Retrieved From <http://www.who.int/gender/violence/en/vawinformationbrief.pdf>.
- World Health Organization (WHO). (1978). *Declaration of Alma-Ata international conference on primary health care, Alma-Ata, USSR*. Retrieved From http://www.who.int/publications/almaata_declaration_en.pdf.
- ... (1996). *Coverage of maternity care: A Listing of Available Information*. Geneva: WHO
- ... (1999). *Reduction of maternal mortality*. Geneva: WHO. Retrieved From www.freepaperdownload.us/1764/Article4001397.htm.
- ... (2003). *Antenatal care in developing countries: Promises, achievements and missed opportunities, an analysis of trends, levels and differentials, 1990-2001*. Geneva: WHO. Retrieved From http://www.childinfo.org/files/antenatal_care.pdf
- ... (2010). *Maternal mortality ratio (per 100 000 live births)*. Geneva: WHO. Retrieved From www.who.int/whosis/mme_pdf.
- ... (2007). *Maternal mortality in 2005: estimates developed by WHO, UNICEF, UNFPA, and The World Bank*. Geneva: WHO. Retrieved From www.who.int/whosis/mme_pdf.
- ... (2012). *Trends in maternal mortality: 1990 to 2010*. Geneva: WHO. Retrieved From http://apps.who.int/iris/bitstream/10665/44874/1/9789241503631_eng.pdf
- ... (2015). Ten facts on maternal health. *Newsletter, 2015*. Geneva: WHO. Retrieved From http://www.who.int/topics/maternal_health/en/
- ... (2015). *Trends in maternal mortality: 1990 to 2015*. Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. WHO: Geneva. Retrieved From <http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/>.

- Yang, Y., Yoshida, Y., Or-Rashid, H. & Sakamoto, J. (2010). Factors affecting the utilization of antenatal care services among women in Kham district, Xiengkhouang Province, Lao Pdr. *Nagoya Journal of Medical Sciences*. Retrieved From http://www.med.nagoya-u.ac.jp/medlib/nagoya_j_med_sci/7212/p023-034_Ye.pdf
- Yegezu, R. T. & Kitila, S. B. (2014). Assessment of factors affecting choice of delivery place among pregnant women in Jimma zone, south west Ethiopia: Cross sectional study. *Journal of women's Health Care*. Retrieved From <http://dx.doi.org/10.4172/2167-0420.1000211>.
- Yunus, A., Iqbal, S., Munawar, R., Zakar, R., Mushtaq, S. K., Sadaf, F. & Usman, A. (2013). Determinants of postnatal care services utilization in Pakistan: Insights from Pakistan demographic and health survey (PDHS) 2006-07. *Middle-East Journal of Scientific Research*. Retrieved From http://www.idosi.org/mejsr/mejsr18_2810_2913/11.pdf.