UTILIZATION OF SKILLED BIRTH ATTENDANTS DURING CHILDBIRTH IN NEPAL: AN EVALUATION BASED ON THE 2001 AND 2006 NEPAL DEMOGRAPHIC AND HEALTH SURVEYS

SUJAN KARKI

A THISIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS
(POPULATION AND REPRODUCTIVE HEALTH RESEARCH)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVRSITY
2008

Thesis
Entitled

UTILIZATION OF SKILLED BIRTH ATTENDANTS DURING CHILDBIRTH IN NEPAL: AN EVALUATION BASED ON THE 2001 AND 2006 NEPAL DEMOGRAPHIC AND HEALTH SURVEYS

.....
Mr. Sujan Karki
Candidate

.....
Asst. Prof. Panee Vong-Ek, Ph.D.
Major Advisor

.....
Asst. Prof. Patama Vapattanawong, Ph.D.
Co-Advisor

.....
Asst. Prof. Auemphorn Mutchimwong, Ph.D
Acting Dean
Faculty of Graduate Studies

.....
Asst. Prof. Panee Vong-Ek, Ph.D
Chair
Master of Arts Program in Population and Reproductive Health Research
Institute for Population and Social Research

Thesis
Entitled

UTILIZATION OF SKILLED BIRTH ATTENDANTS DURING CHILDBIRTH IN NEPAL: AN EVALUATION BASED ON THE 2001 AND 2006 NEPAL DEMOGRAPHIC AND HEALTH SURVEYS

Was submitted to the faculty of Graduate Studies, Mahidol University
for the Degree of Master of Arts
(Population and Reproductive Health Research)
on
August 26, 2008

.....
Mr. Sujan Karki
Candidate

.....
Asst. Prof. Rossarin Gray, Ph.D.
Chair

.....
Asst. Prof. Panee Vong-Ek, Ph.D.
Member

.....
Emeritus Prof. Suporn Koetsawang, M.D.,Ph.D., F.R.C.O.G.
Member

.....
Asst. Prof. Patama Vapattanawong, Ph.D.
Member

.....
Asst. Prof. Auemphorn Mutchimwong, Ph.D
Acting Dean
Faculty of Graduate Studies
Mahidol University

.....
Assoc. Prof. Sureeporn Punpuing, Ph.D
Director
Institute for Population and Social Research
Mahidol University

ACKNOWLEDGEMENTS

It is my great pleasure to express my sincere thanks and profound sense of gratitude to my major advisor Asst. Prof. Panee Vong-Ek, for her continuous guidance, constant inspiration, support and encouragement which has led to the completions of this thesis successfully. I would like to express my deep sense of gratitude to my co-advisor Asst. Prof. Pattama Vapattanawong, for her immense support and valuable suggestions at every stage of preparing this paper.

I would like to express my sincere gratitude to IPSR Director Dr. Sureeporn Punpuing, former course director Dr. Pimonpan Isarabhakdi and all the professors who provided appropriate guidance throughout the period of my study. I wish to thank Ms. Luxana Nil-ubol who has always been helpful and willingness towards managing the academic and administrative problems. I would like to thank all other program and administrative staff of IPSR for their kind support.

I am grateful to MEASURE Evaluation for financial and academic support to my entire study period. I am most grateful to the Executive Director of New ERA Mr. Yogendra Prasai for his inspiration and support for further study.

My sincere thanks also go to all my colleagues for their cooperation and encouragement at each and every step of life in IPSR. I owe to my wife Sara for her love and encouragement that's made it possible to complete this work.

Sujan Karki

UTILIZATION OF SKILLED BIRTH ATTENDANTS DURING CHILDBIRTH IN NEPAL: AN EVALUATON BASED ON THE 2001 AND 2006 NEPAL DEMOGRAPHIC AND HEALTH SURVEYS

SUJAN KARKI 5038601 PRRH/M

M.A. (POPULATION AND REPRODUCTIVE HEALTH RESEARCH)

THESIS ADVISORS: PANEE VONG-EK, Ph.D.,
PATAMA VAPATTANAWONG, Ph.D.

ABSTRACT

The purpose of this study was to assess the factors influencing the utilization of skilled birth attendants (SBAs) during childbirth. Furthermore, this study assessed changes in the rate of utilization of SBAs over a five year period from 2001 to 2006 and also evaluated the impact of mass media on utilization.

This observational evaluation study is based on a pooled cross-sectional design and uses data from the 2001 and 2006 Nepal Demographic and Health Surveys. The utilization of SBAs in 2006 was still significant (OR 1.29, $p<0.01$) when compared to data from 2001, even after controlling for the socio-demographic and program variables. The odds of using SBAs was 1.3 times higher in women who had heard/seen reproductive health messages from both radio and television than their counterparts. Women's level of education and occupation also had a significant effect on utilization.

Although the findings show that utilization of SBAs during childbirth in Nepal had significantly changed in the five-year period examined, this proportion of utilization of SBAs (20.6%) is far below the millennium development goal target of 40 percent for 2005. Different community based programs need to reach poor, illiterate, farming and rural women.

KEY WORDS: SKILLED BIRTH ATTENDANTS/ UTILIZATION/ MASS MEDIA/ REPRODUCTIVE HEALTH/ NEPAL

50 pp.

CONTENTS

CONTENTS (cont.)

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF ABRIVIATIONS

ANC	Antenatal Care
ANM	Assistant Nurse Midwife
FCHV	Female Community Health Volunteer
FGD	Focus Group Discussion
HP	Health Post
IMR	Infant Mortality Rate
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MoHP	Ministry of Health and Population
NDHS	Nepal Demographic and Health Survey
NMR	Neonatal Mortality Rate
NPC	National Planning Commission
PHCC	Primary Health Care Center
PRB	Population Reference Bureau
RH	Reproductive Health
SBA	Skilled Birth Attendant
SHP	Sub Health Post
SM	Safe Motherhood
TBA	Traditional Birth Attendant
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
VDC	Village Development Committee
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background

Skilled birth attendants (SBAs) are directly related to achieving Millennium Development Goals (Goal 4 – reducing child mortality and Goal 5 – improving maternal health). According to the World Health Organization (WHO), the International Federation of Gynecologists (FIGO), and the International Confederation of Midwives (ICM), the number of skilled attendants in developing countries needs to be increased by at least 333,000 if the international community is to meet the Millennium Development Goal (MDG) of reducing maternal deaths by two thirds by 2015. Since skilled birth attendants play a vital role in reducing maternal and newborn mortality and morbidity, the international community has called for better monitoring and reporting on progress in achieving the MDG target of increasing the proportion of births attended by a skilled attendant to 90 percent by 2015 (WHO, 2004).

According to WHO, UNICEF, UNFPA and the World Bank, an annual decline of less than one percent in maternal mortality ratios is observed currently while an annual decline of 5.5 percent maternal mortality ratios between 1990 and 2015 is required to achieve MDG-5 (Improving maternal health). In 2005, about 536,000 women died of maternal causes; it was 576,000 in 1990. Ninety-nine percent of these deaths occurred in developing countries. The maternal mortality ratio in 2005 was highest in developing regions, with 450 maternal deaths per 100,000 live births, compared to 51 in the countries of the Commonwealth of Independent States (CIS), and it was only 9 in developed regions. This small drop in the global maternal mortality ratio is due to declines mainly in countries with relatively low levels of maternal mortality. Those countries which have the highest initial levels of mortality do not have any progress over the last 15 years (WHO, 2007).

Every minute of every day, somewhere in the world, a woman dies as a result of complications arising during pregnancy and childbirth. The majority of these deaths

are avoidable. In developing countries, many women are assisted in delivery by traditional birth attendants or only by relatives; many deliver alone. Only 53 percent of women in developing countries have the assistance of skilled birth attendants (a midwife or doctor), and only 40 percent give birth in a health facility. An estimated 15 percent of pregnant women will experience life threatening complications that require emergency care. In as many as 40 percent of pregnancies there will be a need for some form of special care (WHO, 1999).

There are several definitions of skilled birth attendants and their core skills. On the base of these ground realities, international community tries to make similar definition and meaning of SBAs throughout the world. The term “skilled birth attendant” refers to “an accredited health professional–such as a midwife, doctor, or nurse–who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns” (WHO, 2004).

“Traditional birth attendants (TBA)-trained or not-are excluded from the category of skilled health-care workers. In this context, the term TBA refers to traditional, independent (of the health system), non-formally trained and community-based providers of care during pregnancy, childbirth and the postnatal period” (WHO, 2004).

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications and infections that can cause the death or serious illness of the mother and/or the baby. It has been estimated that between 13 percent and 33 percent of maternal deaths could be eliminated by the presence of skilled attendants at delivery (UNFPA, 2006). On the basis of different theoretical insights and empirical evidence, researchers have hypothesized that utilization of skilled birth attendants (SBAs) strongly influences maternal and neonatal morbidity and mortality. Receiving the SBAs during childbirth can be hypothesized to reduce maternal mortality (Högberg, 2004; Shiffman, 2000; Maine, Akalin, Chakraborty, Francisco & Strong, 1996) and neonatal mortality. Due to this reason, the proportion of births attended by SBAs is one of the indicators used to monitor progress towards the achievement of the MDG-5 of improving maternal health.

1.2 Problem statement and rationale

Data from Nepal demographic and health surveys (NDHS) had indicated that in the last decade, proportion of births attended by SBAs is increased and maternal mortality ratio (MMR), infant mortality rate (IMR) and neonatal mortality rate (NMR) had been dramatically reduced from the year 1996 to 2006. For example, the utilization of SBAs is increased more than twofold. It was increased from 9 percent in the year 1996 to 18.7 percent in 2006 survey. Maternal mortality ratio is decreased from 539 to 281 per 100,000 live births in the decade. Similarly, infant mortality rate is decreased sharply from 79 to 48 per 1000 live births and NMR from 50 to 33 per 1000 live births in the same period (Ministry of Health, 1997; Ministry of Health, 2002 and Ministry of Health and Population, 2007).

It has been observed that the low utilization of SBAs may contribute to high level of maternal and neonatal mortality. Under given condition, it is necessary to identify the important determinants of low or poor utilization of skilled birth attendants. In addition, some reasons for the low utilization are partly due to inadequate coverage of health care service, lack of health personnel and health equipments. Furthermore, non-utilization of SBAs during childbirth may be caused by various socio-demographic and cultural factors which can be examined in proper way to show the real scenario.

However, relation between SBAs utilization and these factors, for example religion, media exposure, age at first marriage, education of husband, intended child, birth order are not yet to be known. It is therefore necessary to find out the factors underlying the utilization of SBAs by comparing the two surveys (2001 NDHS and 2006 NDHS) because they were nationally representative surveys. The findings will be helpful for formulating planning and policies to strengthening SBAs program. The findings will generalize national scenario on utilization of SBAs and its underneath factors. Therefore further analysis on SBAs utilization is necessary for supporting national health system.

1.3 Objectives

1.3.1 General objective

To provide supportive information for policy makers and program mangers for developing effective programs for the utilization of skilled birth attendants (SBA) during childbirth in Nepal.

1.3.2 Specific objectives

a. To examine the level of utilization of SBAs during childbirth in the two surveys (2001 and 2006 NDHS)
b. To assess socio-demographic and cultural factors influencing the utilization of SBAs during childbirth
c. To assess the effects of media exposure on the utilization of SBAs during childbirth

1.4 Research questions

What is the level of utilization of SBAs during childbirth in the two surveys?

What are the factors influencing the utilization of SBAs during childbirth in Nepal?

What is the effect of media exposure on the utilization of SBAs during childbirth?

CHAPTER II

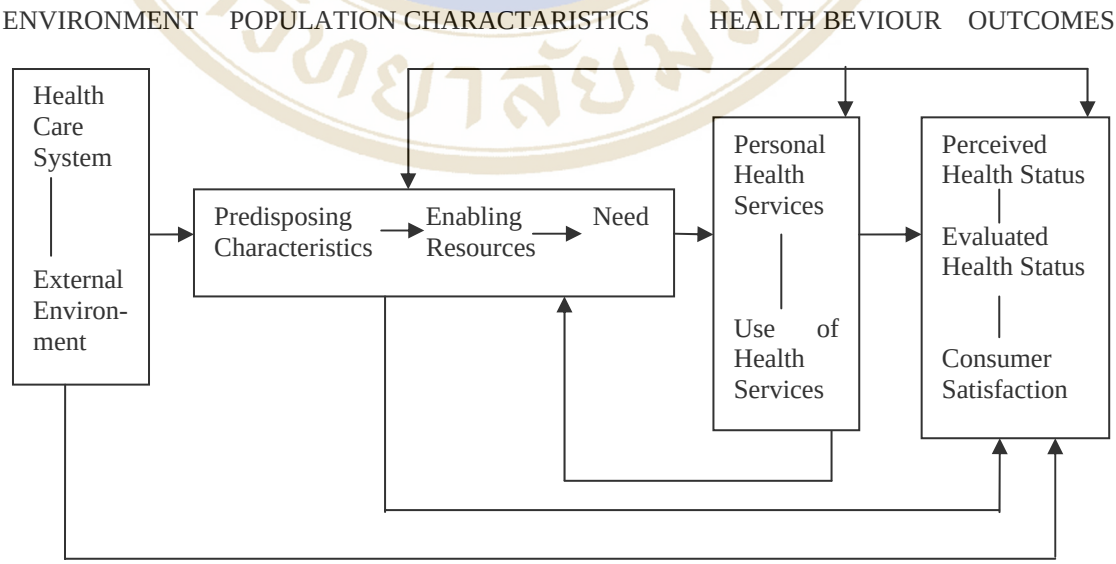
LITERATURE REVIEW

This chapter reviews the theoretical perspectives regarding health-seeking behavior and health service utilization. It includes the empirical evidences from the international and national studies relating to the utilization of health services and skilled birth attendants during childbirth and the relationship with other factors like socio-demographic and health services.

2.1 Theories on health service utilization

Andersen (1995) proposed a framework of health service utilization which provided more insights on the conditions that either facilitate or impede health service utilization. This framework describes that an individual's access to and use of health services was considered to be a function of three characteristics (Figure 2.1).

Figure 2.1: Andersen Framework of Health Service Utilization



(Source: Anderson, 1995, Revisiting the behavioral model and access to medical care: Does it matter? Journal of Health and Social Behavior, 36 (1), 1-10)

The framework mainly focused on predisposing factors, enabling factors and need factors. Predisposing factor includes the socio-cultural factors like demographic (age and gender); social structure (occupation, education, social networks, culture, social interactions); health beliefs (attitudes, values and knowledge towards the health care system). Enabling factor includes personal/family (access to health services, income, health insurance extent and quality of social relationships); community (available health care personnel, facilities and waiting time); possible additions (genetic factors and psychological characteristics). The third, need factor is the most immediate cause of health service use like functional and health problems. These all three factors are population characteristics and act as independent and control variables in the health care utilization.

2.2 Evidence from international studies

The shortfall of SBA is most acute in the developing world. In developed countries and countries in transition, the average rate of SBA utilization above 90 percent. The lowest levels are in Eastern Africa (33.6%), South-Central Asia (37.5%) and Western Africa (39.6%), with much higher levels in South America (84.8%). Globally, only 61 percent of all childbirths are attended by a skilled birth attendant. It is well known that life-threatening complications occur in 15 percent of all births. For a mother and her newborn, a skilled birth attendant can make the difference between life and death. Not only can they recognize and prevent medical crises on the spot, but also they can refer women for life-saving care when complications arise (WHO, 2004).

It is well known that different countries have their different health policy and health settings. Some countries have advanced health care settings and adequate human resources for health but many countries do not have both. They are out of minimal health care settings as well as human resources. So, utilization of skilled attendants during childbirth varies from country to country and even in different regions and ecological zones within a country. Different country specific data and studies show the highly association between utilization of SBAs and maternal mortality ratio (Högberg, 2004; Bernis, Sherratt, AbouZahr, & Lerberghe, 2003; Shiffman, 2000; Maine et al., 1996) and infant mortality rate.

Population Reference Bureau (PRB) data indicated that most of the developed countries have universal utilization of SBAs during childbirth. Due to universal utilization of SBAs, their maternal mortality ratio and infant mortality rate (IMR) are also very low (less than 20 per 100,000 live births and less than 7 per 1000 live births respectively). Sweden has only MMR of 2 per 100,000 live births which is the least in the world and utilization of SBAs in the country is almost universal. (Table 2.1)

Table 2.1: Proportion of births attended by SBAs, maternal mortality ratio and infant mortality rate in developed world

Countries	Proportion of births attended by SBAs	MMR per 100,000 live births (2000)	IMR per 1000 live births (2007)
Australia	100	8	5
Denmark	100	5	3.9
France	99	17	3.7
Germany	100	8	3.8
Japan	100	10	2.8
Netherlands	100	16	4.4
Sweden	100	2	2.8
UK	99	13	4.9
USA	99	17	6.5

Source: PRB

Adjusted data from UNFPA, NDHS and PRB on SBAs in South and West Asia, Afghanistan has the highest maternal mortality ratio and least proportion of SBAs utilization. Similarly second highest maternal mortality ratio observed in Pakistan. Although Pakistan and Nepal have similar proportion of SBA utilization, MMR is lower in Nepal. It may be due to lower total fertility rate (3.1 verses 4.1) and legalization of abortion in Nepal. Sri Lanka has used SBAs in highest proportion among region and also has low maternal mortality ratio. These data shows the higher the utilization of SBA, lower the maternal mortality ratio (UNFPA, 2004). Similarly, PRB data shows the infant mortality rate decrease with increasing of utilization of SBAs (Table 2.2).

Table 2.2: Proportion of births attended by SBAs, maternal mortality ratio and infant mortality rate by countries in South and West Asia

Countries	Proportion of births attended by SBAs	MMR per 100,000 live births	IMR per 1000 live births **
Afghanistan	8	1600	166
Bangladesh	13	320	65
Bhutan	24	255	40
India	34	407	58
Iran	87	37	32
Maldives	70	160	15
Nepal*	19	281	48
Pakistan	19	450	78
Sri Lanka	98	46	11

Sources: UNFPA, 2004, * Ministry of Health and Population, 2007, **PRB

There are sound medical reasons why governments should invest in skilled attendants, especially for the time of birth. Globally, about 80 percent of maternal deaths are due to direct obstetric complications, primarily hemorrhage (24%), sepsis (15%), unsafe abortion (13%), pre-eclampsia and eclampsia (12%), and prolonged or obstructed labor (8%). Remaining 20 percent of maternal deaths are indirect, that is, they are due to existing medical conditions that are aggravated by pregnancy or delivery. More than 80 percent of the maternal deaths can be preventable (WHO, 1999).

As stated that most of the deaths are preventable, these require the assistance of a skilled health care provider during pregnancy, birth and the immediate postnatal period for appropriate management and treatment. Complications during childbirth that result in maternal mortality and morbidity also contribute to the majority of newborn mortality and morbidity. Most of these complications can be prevented with appropriate management of labor and birth. Even when they cannot be prevented, like the vast majority of maternal complications they can be effectively managed. However, this requires health care providers who have the requisite skills, as well as a functional referral system.

Every year there are approximately 36,000 maternal deaths in the 12 countries in the region of East and South-East Asia (ESEA). Four countries (Cambodia, Lao, Myanmar, and Timor-Leste) have high levels of maternal mortality, with over 300 deaths per 100,000 live births. Lifetime risk of maternal death in these countries is

high, with one in every 25 women in Lao dying during her reproductive life (UNFPA, 2006).

Estimates of maternal mortality ratios (the number of maternal deaths per 100,000 live births) calculated for 141 countries included in the systematic review showed a strong association with three factors: the proportion of deliveries assisted by a skilled attendant; the infant mortality rate; and national per capita expenditure on health. The estimates were based mainly on vital registration data and on survey data for the period of 1997–2002. The estimated MMRs varied considerably between countries, even countries within a region or countries grouped by development status. MMRs ranged from 127 to 1289 in the least developed countries and from two to 695 in the less developed and developed countries. Development status clearly showed an inverse relationship with MMR: in general, the higher the level of development, the lower the MMR (Betran, Wojdyla, Posner & Gülmezoglu, 2005).

Some recent examples of countries that have successfully lowered maternal mortality, such as Cuba, Egypt, Iran, Jamaica, Bangladesh (only in Matlab district), Thailand, Sri Lanka and Malaysia, demonstrate that maternal mortality can be reduced using a variety of different models of care. Progress from these countries also clearly shows that such reductions are possible, even when resources are limited. The common feature in all these countries is that they all focus on ensuring that utilization of skilled attendant during the majority of births. The Thailand experience in particular shows how providing skilled attendants, in this case midwives, resulted in dramatically reduced maternal and newborn mortality (Bernis et al., 2003). The Matlab study in Bangladesh showed that the maternal deaths were reduced by more than two thirds after intervention of community midwives program. The decline in maternal deaths was due to combined efforts of community midwives and physicians in Matlab maternity clinic (Maine et al., 1996).

A cross-national regression of 64 countries shows that devoting resources to health care and delivery assistance may make a difference to maternal mortality levels. This regression results predicted step decline in maternal mortality ratio as the proportion of women receiving medical assistance at childbirth rises in low-income countries. For instance, a country with 20 percent of women receiving such assistance

will have an expected MMR of 551. If this percentage rises to 50, MMR falls to 442 and at 80 percent, the predicted MMR is as low as 333 (Shiffman, 2000).

Sri Lanka witnessed significant reductions in maternal mortality in a relatively short period. During the 1950s most births in Sri Lanka took place at home with the assistance of untrained birth attendants. By the end of the 1980s over 85 percent of all births were attended by trained personnel. For example, MMR reduced from 1500 per 100,000 live births in 1940 to 555 per 100,000 in 1950 and 95 per 100 000 by 1980. The figure in 1999 was 30 per 100,000. These improvements followed the introduction of a system of health facilities around the country allied to an expansion of midwifery skills and the spread of family planning. (WHO, 1999).

In Afghanistan, the study indicated that higher the utilization of SBA, lower the MMR. For example, MMR in Kabul city was 418 where skilled attended at birth immediately preceding death was 40 percent but in women of Maywand and Ragh had not received any skilled attendant at birth immediately preceding death and MMR was 2182 and 6407 per 100,000 live births respectively. Maternal mortality among women was high, and more increased with greater remoteness (Bartlett et al., 2005).

2.3 Skilled birth attendants and maternal child health situation of Nepal

Safe motherhood has been an issue of growing importance in Nepal over the past two decade. Government of Nepal formulated the National Health Policy in 1991 which identified safe motherhood as a priority program and institutionalized SM 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) demonstrated steps towards improving maternal health status in Nepal. In 1998, Ministry of Health and Population published the Reproductive Health Strategy, which includes safe motherhood in the integrated RH care package. This was followed by a SM Policy (1998) document that re-iterated the issues already contained in the Plan of Action 1994-97 and also gives very high priority to improving the maternal and neonatal health status of the nation. Government of Nepal has made 15 year long National Safe Motherhood plan in 2002 which is for 2002 to 2017. Similarly, government has given priority to the National Safe Motherhood Program within the Nepal Health Sector Program-Implementation Plan (NHSP-IP 2004-2009).

Finally, Skilled Birth Attendants policy came into endorsed in 2006 which was supplementary for the Safe Motherhood Policy 1998. The SBA policy was recently approved by the Government of Nepal. The main thrust of the Ministry of Health and Population (MoHP) towards reducing maternal and neonatal mortality in Nepal is through the Safe Motherhood Program, 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 SBA policy is to reduce maternal and neonatal morbidity and mortality by ensuring availability, access and utilization of skilled care at every birth. According to SBA policy of Nepal, those physicians, gynecologists, and obstetricians and other health personnel with at least 18 months training in maternal and child health are considered skilled birth attendants (Ministry of Health and Population, 2006).

Recent statistics show that only 18.7 percent of babies are delivered by skilled birth attendants (SBA) in Nepal. Likewise, only 14 percent are delivered at a health facility and 2.7 percent are delivered by caesarean section. Maternal and neonatal morbidity and mortality is more common in Nepal because of low utilization of SBA during delivery and the low proportion of deliveries in the health facility. For example, Neonatal mortality is 33 per 1000 live births and Maternal Mortality Ratio is 281 per 100,000 live births in Nepal. These mortality figures are still threatening the health situation of the country, though these figures have decreased remarkably over the last 10 years (Ministry of Health and Population, 2007). To reduce the risks associated with pregnancy and childbirth and address three delays, three major strategies have been adopted in Nepal:

- Provision of 24-hour emergency obstetric care services (basic and comprehensive) at selected public health facilities in every district
- Promoting the use of skilled birth attendants at every birth, either at home or in a health facility
- Promoting birth preparedness and complication readiness, particularly the availability of blood, transport and money.

According to three Demographic and Health Survey of Nepal, maternal health situation is increasing in trend. For example, antenatal care received from SBA is increased from 23.6 percent (in the year 1996) to 43.7 percent in the year 2006.

Similarly, women who did at least four ANC visit during in last pregnancy is increased by more than three folds. Regarding childbirth, nearly 18 percents were delivered in hospital and nearly 19 percents were assisted by SBA which was more than double in comparison to the survey year 1996. Similarly, postnatal care is also increasing. It was found that 18.7 percent of mothers get postnatal service from SBA. However, these maternal health statuses are not satisfied. MDG target for SBA assisted childbirth will be increased to the level of 60 percent and maternal mortality ratio will be decreased by 134 per 100,000 live births. Likewise, infant mortality will be reduced the level of 34 per 1000 live births (Table 2.3).

Table 2.3: Maternal health and mortality situation in Nepal by different years

Indicators	Year			MDG target[+]
	1996*	2001**	2006***	
Antenatal care				
Percentage receiving antenatal care from SBAs	23.6	27.9	43.7	
Percentage who have ANC visits (4+)	8.8	14.3	29.4	
Delivery care				
Percentage delivered in Health facility	7.6	9.1	17.7	
Percentage delivered by SBAs	9.0	10.9	18.7	60
Postnatal care				
Percentage receiving postnatal checkup by SBAs	9.0	-	18.5	
Percentage who had not postnatal checkup	-	79.3	67	
Mortality				
Maternal Mortality Ratio per 100,000 live births	539	-	281	134
Infant Mortality Rate per 1000 live births	78.5	64	48	34
Neonatal Mortality Rate per 1000 live births	49.9	39	33	

Source: *Ministry of Health, 1997; **Ministry of Health, 2002; ***Ministry of Health and Population, 2007, [+]National Planning Commission, 2005

2.4 Geographical information and socio-demographic situation of Nepal

Nepal is a land-locked country nestled in the foothills of the Himalayas. 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. According to the 2001 Census, the population of Nepal is just over

23 million. Nepal is divided into three distinct ecological zones. These are the mountain, hill, and *terai* (or plains). The mountain zone accounts for 35 percent of the total area but only about 7 percent of the total population lives here. In contrast, the hill ecological zone, about 44 percent of the total population lives in the hill zone, which covers 42 percent of the total area. Unlike the mountain and hill, the *terai* zone in the southern part of the country can be regarded as an extension of the relatively flat Gangetic plains of alluvial soil. While it constitutes only 23 percent of the total land area in Nepal, 48 percent of the population lives here (Central Bureau of Statistics, 2006).

The 2001 Census listed 103 diverse ethnic/caste groups, each with its own distinct language and culture. The percentage breakdown by size of some of these major groups is as follows: Chhetri (16 percent), Brahmins (13 percent), Magar (7 percent), Tharu (7 percent), Tamang (6 percent), and Newar (5 percent) (Central Bureau of Statistics, 2003).

The majority (77 percent) of households are headed by men. Average household size is 4.9 persons. Household size is smaller in urban areas than in rural areas (4.4 persons versus 5.0 persons). Literacy rate between men and women is vastly difference where 55 percent women and 79 percent men are literate. The literacy status also varies by place of residence. Urban people are more literate than their rural counterpart. Half of the households can access to electricity. Similarly, 61 percent households have radio and 28 percent households have television (Ministry of Health and Population, 2007).

Total fertility rate declines from 4.6 births per woman in 1996 to 3.1 births per woman in 2006. Fertility is considerably higher in rural (3.3 births per woman) than in urban areas (2.1 births per woman). Childbearing begins early. Almost one quarter of Nepalese women have given birth before reaching age 18, and more than half have had a birth by age 20. The median age at first birth is about 20 years for all age cohorts (Ministry of Health and Population, 2007).

The age at marriage has major effect on childbearing. Marriage occurs relatively early in Nepal. The median age at marriage in Nepal is only 17.2 years. Among women age 20-49, 60 percent are married by age 18, and 78 percent are married by age 20.The interval between births is relatively long in Nepal. Half of all births occur

just under three years (33.6 months) after a previous birth. The median birth interval increased by nearly two months in the past five years. The long period of breastfeeding in Nepal (34.3 months) and the corresponding long period of postpartum insusceptibility (10.5 months) are factors contributing to the long birth interval. Nearly half of currently married women are using a method of contraception, with most women using a modern method (44 percent). The two most popular modern methods are female sterilization (18 percent) and injectables (10 percent) (Ministry of Health and Population, 2007).

2.5 The relationship between utilization SBAs and various factors

2.5.1 The relationship between utilization of SBAs and socio-demographic factors

Age of women

Several studies show that women age and utilization of SBAs have relation. Proportion of women who were attended during delivery by a skilled attendant was seen to decrease significantly with increasing age of women (Mpebeni et al., 2007). In addition, women whose age is more than 35 are more likely to utilize the maternal health services (Chakraborty, Islam, Chaowdhury, Bari, Deter & Akhter, 2003). Moreover in Nepal, women whose age is more than 35 years are more likely to utilize SBAs with compare to 20 to 34 years age group (Sharma, Sawangdee, & Sirirassamee, 2007). The age of women at the time of last birth was not found to be significantly associated with the choice of birth place (Celik & Hotchkiss, 2000). In contrast, it was found in Cambodia that women age has no significant effect on utilization of SBAs (Yanagisawa, Oum & Wakai, 2006). Mekonnen and Mekonnen (2003) found in Ethiopia that age of women and utilization of SBAs are inverse relation but not significant. Similarly Paul and Rumsey (2002) found in Bangladesh, maternal age is not significant with the utilization of trained birth attendants during childbirth. Women age at survey has positive relation with utilization of health professionals during childbirth in Karnataka (Navaneetham & Dharmalingam, 2002).

Age at first marriage

Different studies show that age at marriage is directly associated with maternal health care utilization. Women whose marriage age was more than 15 years are more likely to utilize maternal health services for maternal morbidity during pregnancy (Chakraborty et al., 2003). Similarly in Nepal, young age at marriage (less than 16) is statistically significantly associated with high proportion of home delivery. Women who got marriage after 20 years of age use hospital for childbirth (Wagle, Sabroel & Nielsen, 2004).

Birth order

Women who had first or second parity, they are more likely to use skilled attendants during child birth. It is very low in fifth or more birth (Yanagisawa et al., 2006). In Ethiopia, women with more than one child were 50% less likely to receive professional delivery care compared to single-parity women (Mekonnen & Mekonnen, 2003). Paul and Rumsey (2002) found in Bangladesh, birth order is highly significant to the use of trained birth attendants during childbirth. They found that utilization of trained birth attendants more occurred in first birth. Mpebeni et al. (2007) found in Tanzania that parity equal or less than 4 or more than 4 don't have significant difference in the utilization of SBAs. Wagle et al. (2004) found in Nepal that multiparity is significantly associated with high prevalence of home delivery. Women with lower parity levels were found to be significantly more likely to choose a facility delivery vs. a traditional home delivery (Celik & Hotchkiss, 2000).

Household size:

Household size doesn't have significant effect on utilization of SBAs. In Tanzinian study, it was found that there was no significant difference either household size was big or small (Mpebeni et al., 2007). The Bangladesh study shows that, utilization of maternal health services decreases in women with less than four family members to mothers with four to six family members, and increases again in women with seven or more family members (Chakraborty et al., 2003).

Wealth status

Women from families in good economic condition are more likely to receive maternal health services from a doctor or nurse (Chakraborty et al., 2003). Similarly, household economic status has significant positive relation with utilization of SBAs during childbirth in Nepal (Sharma et al., 2007). In contrast, study in Tanzania shows that wealth status of the individual doesn't make significant difference on utilization of SBAs (Mpebeni et al., 2007). Poor and low income people of Nepal are more likely to have birth at home (Wagle et al., 2004). Similarly, study in Turkey shows that household wealth status is significantly associated with choosing health facilities deliveries (Celik & Hotchkiss, 2000). Women who are in high standard of living are more likely to utilize health professionals in reference to low standard in India (Navaneetham & Dharmalingam, 2002).

Religion

Religion and utilization of SBAs during childbirth have positive association (Mekonnen & Mekonnen, 2003). Navaneetham and Dharmalingam (2002) found that Muslim women are more likely to utilize health professionals during childbirth as compared with Hindu women in Karnataka, but they found opposite in Kerala state. Sharma et al. (2007) found in Nepal that Buddhist women are less likely to utilize SBAs during childbirth.

Residence

Women who reside in urban area are more likely to take assistance of SBAs during childbirth (Sharma et al., 2007; Mekonnen & Mekonnen, 2003). Urban women of Turkey were found to be more likely than rural women to choose a facility delivery vs. a traditional home delivery (Celik & Hotchkiss, 2000). Similarly study in India reveals that women who reside in urban area are more likely to utilize health professionals in reference to their rural counter (Navaneetham & Dharmalingam, 2002).

2.5.2 The relationship between utilization of SBAs and husband's socio-economic status

Husband education

Level of husband education has positive effect on utilization of maternal health services. A study in Bangladesh indicated that husband education is significantly association with utilization of trained birth attendants during childbirth (Paul & Rumsey, 2002). Husband education has positive relation with utilization of health professionals during childbirth in South India (Navaneetham & Dharmalingam, 2002). Study in Nepal shows that no education or low education level of husband is highly associated with home delivery (Wagle et al., 2004).

Husband occupation

Many studies reveal that husband occupation is associated with utilization of SBAs during childbirth. In Cambodia, women are less likely to use SBAs during childbirth whose husbands are farmer. However SBAs utilization is higher in women whose husbands are merchant or government official (Yanagisawa et al., 2006). Similarly in Bangladesh, husband occupation is significantly associated with utilization of trained birth attendants during childbirth. Women whose husbands are involved in business and service are more likely to use trained birth attendants than whose husbands are farmer (Paul & Rumsey, 2002).

In addition, women whose husband was in occupation rather than farmer are more likely to utilize maternal health services (Chakraborty et al., 2003). Women, whose husband's occupation is agriculture more likely to have childbirth at home (Wagle et al., 2004). However husband occupation has no significant effect on choosing delivery place in Turkey (Celik & Hotchkiss, 2000).

2.5.3 The relationship between utilization of SBAs and women's socio-economic status

Women Education

It was found that higher proportion of deliveries attended by skilled personnel among women who have more schooling years compared to those with fewer schooling years or those who did not go to formal schooling (Mpebeni et al., 2007;

Sharma et al., 2007; Yanagisawa et al., 2006; Mekonnen & Mekonnen, 2003). Women education has positive association with maternal health care utilization (Chakraborty et al., 2003). No education or low education level is highly associated with home delivery in Nepal (Wagle et al., 2004). Women with higher educational attainment levels were found to be significantly more likely to choose a facility delivery vs. a traditional home delivery (Celik, 2000). Women education has significant relation with utilization of health professionals during childbirth in South India (Navaneetham & Dharmalingam, 2002). Similar pattern were found in Bangladesh, maternal education is highly significant on the utilization of trained birth attendants during childbirth (Paul & Rumsey, 2002).

Women occupation

Women's involvement in gainful employment is one of the important factors positively affecting the use of maternal health services in Bangladesh (Chakraborty et al., 2003). Furthermore, farmer women are less likely to utilize SBAs during child birth in Nepal (Sharma et al., 2007). In contrast, study in South India found that working and earning women are less likely to utilize health professionals than women who do not work (Navaneetham & Dharmalingam, 2002). Women, working in agriculture area are more likely to have childbirth at home (Wagle et al., 2004). However study in Ethiopia, women working status; either who work or not, doesn't have significant association with SBAs utilization (Mekonnen & Mekonnen, 2003).

2.5.4 The relationship between utilization of SBAs and exposure to mass media

Exposure to mass media is directly associated with utilization of SBAs during child birth. Sharma et al. (2007) found in Nepal that mass media exposure has positive relation with SBAs utilization. For example, women who have listened to radio program and heard about family planning information from mass media are more likely to utilize SBAs. Similarly, women who watch TV and listen radio are more likely to utilize health professionals in reference to their counter who neither watch TV nor listen radio (Navaneetham & Dharmalingam, 2002).

Women who had seen TV are more likely to use SBAs during childbirth (Yanagisawa et al., 2006). It was found that substantial increase in the cervical smears being performed in the weeks following the soap opera story line (Howe, Owen-Smith & Richardson, 2002).

2.6 Conceptual framework

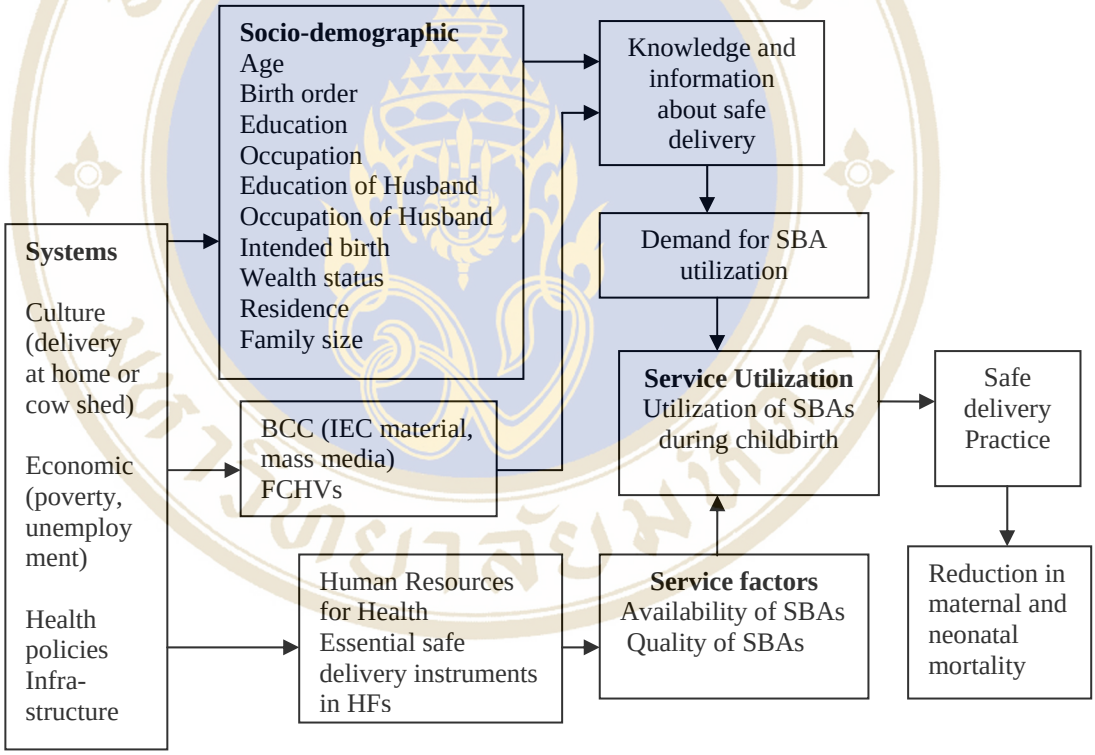
Based on the literature reviewed three type of conceptual frameworks have been presented here. First one is conceptual framework of safe motherhood program focused on utilization of SBAs, second is the result framework and last one is the conceptual framework of this study. Conceptual framework of safe motherhood program presents the different issues to evaluate and understand the safe motherhood program. Result framework of safe motherhood program is presented to maintain the thesis in track of safe motherhood program endorsed by Nepal government. Since the thesis is based on secondary data, all of the safe motherhood component couldn't be included. Furthermore, it is very difficult to cover all components to evaluate safe motherhood program in a single study. Thus, conceptual framework for the study was prepared according to available information on Nepal Demographic and Health Survey data set. Conceptual framework of the study discussed more about socio-demographic variables rather than program variables.

2.6.1 Conceptual Framework for Safe Motherhood Program

Conceptual framework for safe motherhood program is based on current program and policies of the government on safe motherhood (focus on utilization of skilled birth attendant). Figure 2.2 shows the general conceptual framework for safe motherhood. This figure reflects that ultimate goal of SM program is to reduce maternal and neonatal mortality. The strategic objective of this framework is to increase the utilization of maternal health services which is focused on utilization of SBAs during childbirth. Utilization of service always depends on the supply and demand of the available services. Demand is always influence by the individual's information and knowledge of that particular service. Furthermore, individual demand and practices of the available health services are influenced by socioeconomic and cultural factors. In Nepal, many awareness raising programs are launched to create the

demand. Behavioral change communication program and female community health volunteers (FCHVs) program are the foundation for the health service utilization. Without supply of quality health services, individual demand couldn't make difference on service utilization. Increased availability of SBAs in grassroots level and supply of essential safe delivery instruments are the main supply side of the program. Demand and supply of the services affect the utilization of SBAs very much. The increase in the utilization rate is the indicator of positive effects of these factors.

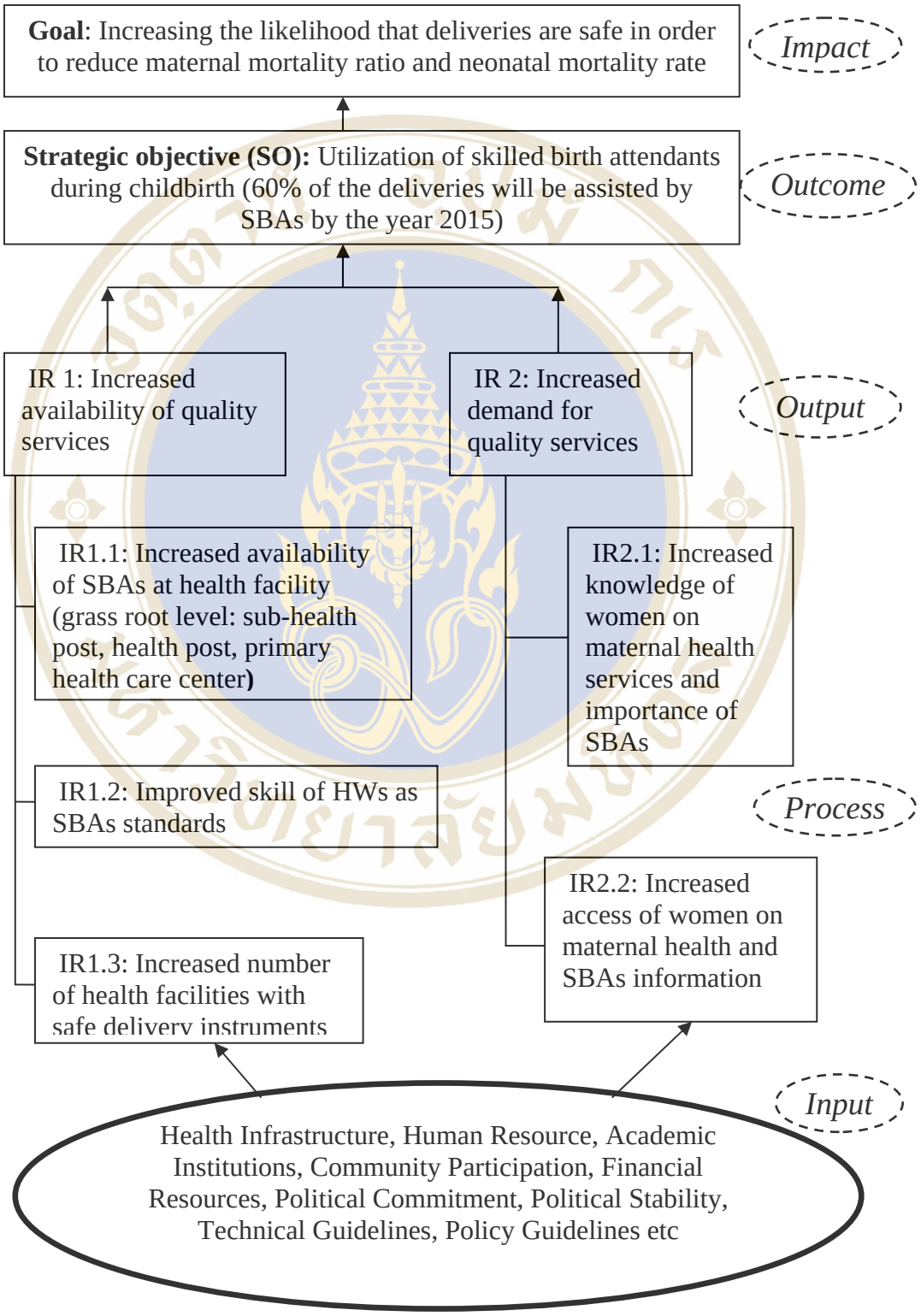
Figure 2.2: Conceptual Framework for impact of Safe Motherhood Program on Utilization of SBAs



2.6.2 Result Framework of Safe Motherhood Program

Figure 2.3 shows the result framework of safe motherhood program in Nepal. The objective, target and strategies for Safe Motherhood Program for Millennium Development Goal were adopted. Emphasizing the utilization of SBAs, result framework is developed with targeting 60 percent (MDG target) SBAs utilization by the year 2015. Rate of utilization of SBAs is used for evaluating program because the impact of SM program is the maternal mortality and neonatal mortality which are very

Figure 2.3: Evaluation of Safe motherhood program by the indicator- utilization of skilled birth attendants during childbirth



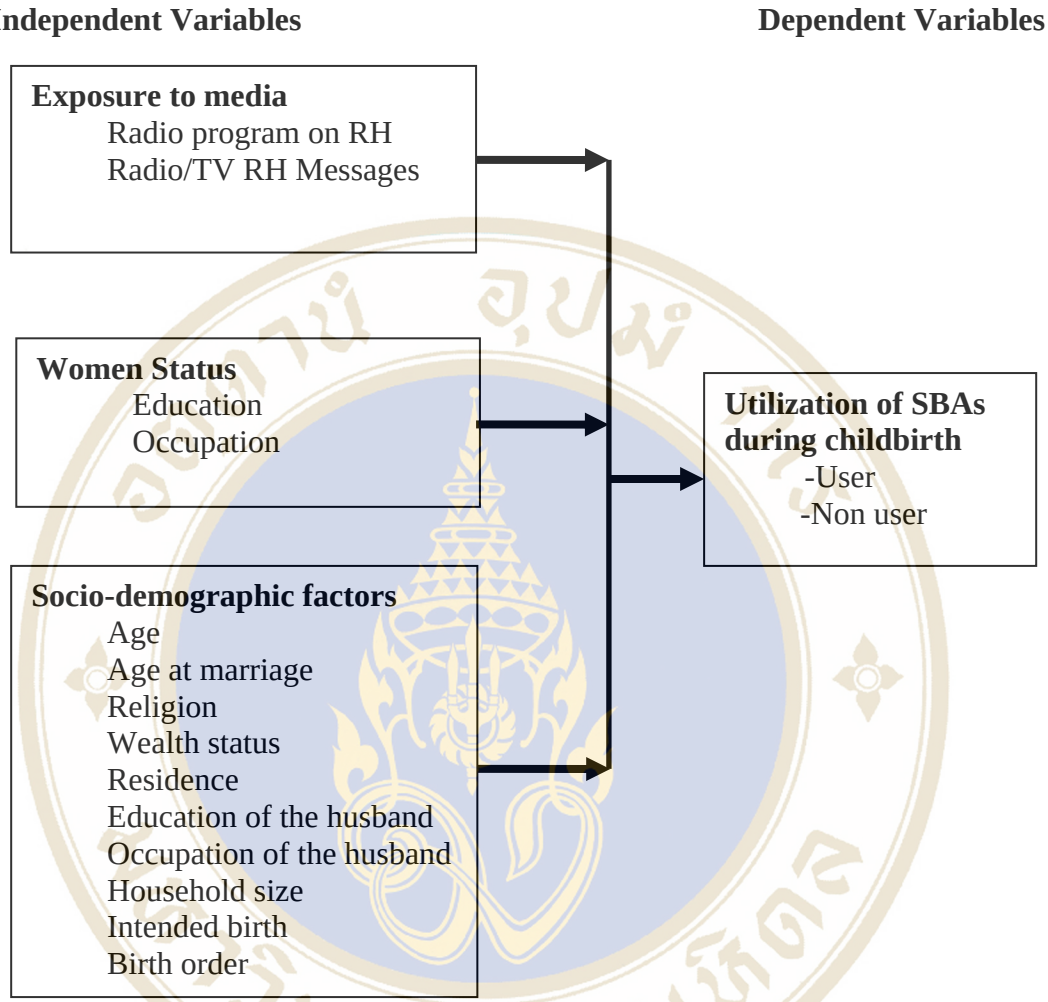
difficult to calculate and monitor. These mortality rates are rare event and methods to estimate these rates are technically complicated. Thus, this study is focused on utilization of SBAs rate which is only intermediate outcome.

Safe motherhood program which is shown in the result framework follow the five distinct elements: the inputs, processes, outputs, outcomes and Impact. The inputs mainly refer to the resources for quality health services. The processes refer to the different activities where the program inputs are utilized to obtain the expected result. Similarly, outputs are the results obtain at the program level which can be seen by different activities in program intervention. Program outcomes and impact are hierarchy in the framework which can be seen only in population level.

2.6.3 Conceptual Framework of the study

The conceptual framework that underpins the study is presented in figure 2.4. It is based on the "Revisiting the behavioral model and access to medical care: Does it matter?" (Anderson, 1995). The framework illustrates how a complex set of interaction between variables may influence the individual behavior. The model seeks to examine the inter relationship between utilization of SBAs with exposure to media, women status and socio-demographic factors.

Figure 2.4: Conceptual Framework of the study



2.7 Research hypotheses

- Women who have live births in 2006 survey are more likely to utilize SBAs during childbirth compared to 2001 survey.
- Women who listen to a radio reproductive health program are more likely to utilize SBAs during childbirth.
- Women who expose to mass media (reproductive health messages on radio and TV) are more likely to utilize SBAs during childbirth.
- Women who have higher education level are more likely to utilize SBAs during childbirth.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Sources of data

Nepal Demographic and Health Survey 2006 and 2001 were used for the analysis. These two surveys were nationally representative cross sectional surveys. The NDHS 2006 is the seventh in a series of national-level population and health surveys conducted in Nepal. It is the third nationally representative comprehensive survey conducted as part of the global Demographic and Health Survey (DHS). Similarly, NDHS 2001 was the second comprehensive survey conducted as part of the global DHS.

3.2 Study design and sample population

This is an observational evaluation study based on pooled cross-sectional design. This study used the pooled dataset from two demographic and health survey data, NDHS 2006 and NDHS 2001. This survey used the sampling frame provided by the list of census enumeration areas with population and household information from the 2001 population census and 2001 NDHS used the 1991 population census. The primary sampling unit (PSU) for the both study is ward, subward, or group of wards in rural areas, and ward or subward in urban areas. The sample for the survey is based on a two-stage, stratified, nationally representative sample of households. At the first stage of sampling 260 PSUs were selected in 2006 survey and 257 PSUs in 2001 survey using systematic sampling with probability proportional to size. At the second stage, households were selected systematically from each PSU. The population of the study was the women of Nepal aged 15-49 years who have at least one live birth in last five years preceding the survey.\ Sample for this study was the women who had at least one live birth in last five years preceding the survey and use and non use of skilled birth attendants during their last childbirth were considered for analysis. The sample for the analysis is 4731 women from NDHS 2001 and 4182 women from

NDHS 2006. After pooling the data together total sample size is 8913 women.

3.3 Data management and analysis

All the data were analyzed in statistical software program. Necessary coding was performed to simplify of data entry and analysis. Summary tables of percentage distribution were presented. The Chi square ($\chi 2$) test was used to assess association between use of skilled birth attendants and socio-demographic variables, and other health service characteristics. P-values of less than 0.05 were considered significant. Binomial logistic regression was used to assess individual effect of variables on use of skilled birth attendants while adjusting for potential confounding variables.

3.4 Limitations

This study cannot cover those women who have still births. So the study can't be generalized about utilization of skilled birth attendants during all childbirths. It can be generalized only in live births. Due to secondary data, most important variables like distance to health facilities and availability of SBAs in health facilities were not included in this study.

3.5 Operational definition

Following operational definitions of the variables were used for the purpose of the study.

Skilled births attendants: Skilled births attendants in this survey were ANMs, nurses and doctors despites to their competencies and skills on assisting deliveries. This variable is used to measure the use or non-use of SBA. Assistance received from SBAs was coded as 1 and rests were coded 0.

Exposure to radio RH program: In Nepal, many reproductive health programs are aired from radio. Women who heard at least one radio RH program in last 12 months were coded 1 and rests were coded 0.

Media Exposure: In media exposure, both radio and television were considered. In the survey, the questions asked about family planning messages. Here, those family planning messages used as part of reproductive health messages. Women who did not have heard/seen RH messages neither from radio nor television in last few months was coded 0, women who have heard RH messages from radio only were coded 1 women who have heard/seen RH messages from television only in last few months were coded 2, and women who have heard/seen RH messages from both radio and television in last few months were coded 3.

Education: Education of women was measured in terms of completion of highest level of formal education i.e. years of schooling. It was divided into four categories- no education (code 1), primary (code 2), secondary (code 3) and higher education (code 4).

Occupation: Occupation of women means the current working status of women and it was divided into 4 categories- agriculture (code 1), professional/service (code 2), manual work (code 3) and no employment (code 4).

Age of women: Age was categorized on the basis of risk age for pregnancy. Age refers to the completed years of current age of women who have live births in last 5 years preceding the survey. The age of the respondents is divided into 3 categories; less than 20 years, 20-34 and 35-49 years.

Age at marriage: Age at marriage was categorized on the basis of risk age for marriage and pregnancy. The age at marriage of the respondents is divided into 3 categories; less than 15 years, 15-19 and 20 and above years.

Occupation of husband: Occupation of husband means the current working status of husband and it was divided into 4 categories- agriculture (code 1), professional/service (code 2), manual work (code 3) and no employment/don't know (code 4).

Education of husband: Education of husband was measured in terms of completion of highest level of formal education i.e. years of schooling. It was divided into four categories- no education (code 1), primary (code 2), secondary (code 3) and higher education (code 4).

Wealth index: This is the composite index of different household characteristics and assets. This is divided into quintiles. Code 1 was for poorest group, 2 was for poorer, 3 for middle, 4 for richer and 5 for richest.

Residence: This is category of residence where the respondent lives. It is divided into urban and rural area. Definition of urban and rural area is followed the Nepal government where 58 municipalities are called urban area and rests are rural area. Urban area was coded 1 and rural was coded 0.

Religion: Hindu is the main religion in Nepal. So religion was divided into four main categories- Hindu (code 1), Buddhist (code 2), Muslim (code 3) and other religions (code 4).

Birth order: This variable indicates the birth order of the children. It is divided into 3 categories on the basis of replacement level of fertility: low parity (first birth), average parity (2-3 birth) and high parity (4 or more than birth order).

Intended birth: This variable indicates that whether women intend this birth at that time or not. It was divided into 3 categories; intended births (code 1), wanted later (code 2) and did not want birth at all (code 3).

Family size: Family size was categorized into two groups. Family size with 4 or less was coded 1 and rest was coded 2.

CHAPTER IV

RESEARCH FINDINGS

4.1 Characteristics of the respondents

This chapter describes the characteristic of respondents and sample population in two different surveys. In 2001, there were altogether 8,726 ever married women aged 15-49 years in the survey. Among them, 4,745 women had had at least one live birth in the five years preceding the survey. Similarly, 8,644 ever married women aged 15-49 years were interviewed. Among these women, 4,066 women had had at least one live birth in the five years preceding the survey. It was 4,731 women in 2001 and 4,182 women in 2006 before weight was applied in the data. It begins by comparing background characteristics of women having at least one live birth in the previous five years preceding the surveys and ever married women in the two surveys.

The proportion of women in each age group is similar in two surveys. Proportions of women who had live birth and ever married women are not similar due to women giving birth at a young age. Age at first marriage of women is similar in two surveys as well as similar between ever married women and selected women for analysis. Table 4.1 shows that one in five women had gotten married before the age of 15 years in the year 2001 and this proportion had decreased in 2006 survey. In 2001, one fifth of women who had live births in the previous five years had also gotten married before the age of 15 but this situation had decreased to 14 percent in 2006. Nearly three fourth of women did not have any formal education in the year 2001 but it was only three fifths in 2006. Only a few percent (1% in 2001 and 3% in 2006) had received a higher education. Level of education is increasing in trend among women in two surveys.

Most Nepalese women work in agriculture sector and remarkable proportions of women do not do any work. Most of the respondents (85%) are Hindu. The place of residence is another characteristic that determines access to health care services. The majority of women reside in rural areas. Only 10 percent of women in 2001 and 15

percent women in 2006 were residing in urban areas. The background characteristics of women who have at least one live birth in the previous five years preceding the survey and all ever married women are similar (Table 4.1).

Table 4.1: Background characteristics of women

Variable	2001		2006	
	Women with live birth	**Ever married women**	**Women with live birth**	**Ever married women**
Age of women				
15-19 years	8.0	10.8	8.0	9.1
20-34	75.3	54.4	78.2	53.8
35+	16.7	34.8	13.8	37.1
Age at first marriage				
Less than 15 years	19.7	20.8	14.2	16.3
15-19 years	67.9	66.8	69.5	68.2
20 or more years	12.3	12.5	16.3	15.4
Level of education				
No education	72.4	72	58.0	62.6
Primary	14.4	14.8	18.3	16.8
Secondary	12.0	12.0	21.1	18.0
Higher	1.1	1.2	2.7	2.6
Occupation				
Agriculture	77.6	76.3	71.1	72.0
Professional/service	4.1	5.4	6.1	7.9
Manual work	2.1	2.3	3.4	3.8
Not working	16.3	15.9	19.4	16.3
Religion				
Hindu	84.2	85.5	84.9	85.5
Buddhist	7.4	7.1	7.7	8.1
Muslim	5.6	4.7	4.8	4.0
Other	2.8	2.7	2.6	2.4
Residence				
Rural	93.0	90.0	86.8	85.2
Urban	7.0	9.6	13.2	14.8
Total	**4745**	**8726**	**4066**	**8644**

4.2 The relation between utilization of SBAs and various variables (Bivariate results)

The level of SBA utilization increased from the year 2001 to 2006. It was 11.7 percent in 2001 and increased by nearly two fold in 2006 to 20.6 percent. The details of SBA utilization were shown in table 4.2.

Table 4.2: Percentage distribution of utilization of SBAs during childbirth in the two different surveys

Variable	2001 Total Number	2001 Do not use SBA (%)	2001 Use SBA (%)	2001 χ^2 (P value)	2006 Total Number	2006 Do not use SBA (%)	2006 Use SBA (%)	2006 χ^2 (P value)
Listened to RH program								
Do not listen	**2827**	91.8	8.2	**84.7**	**2052**	87.3	12.7	**158.1**
Listen	**1872**	83.0	17.0	***	**2013**	71.4	28.6	***
Mass media								
No media exposure	**2110**	94.5	5.5		**1181**	91.3	8.7	
Radio only	**1799**	93.1	6.9		**1526**	89.6	10.4	
TV only	**77**	66.1	33.9	**653.5**	**191**	58.6	41.4	**590.6**
From both radio and TV	**659**	61.8	38.2	***	**1168**	57.5	42.5	***
Level of education								
No education	**3437**	94.6	5.4		**2357**	91.0	9.0	
Primary	**685**	85.5	14.5	**761.6**	**743**	79.0	21.0	**752.8**
Secondary	**571**	59.4	40.6	***	**858**	55.9	44.1	***
Higher	**53**	32.1	67.9		**108**	15.7	84.3	
Occupation								
Agriculture	**3679**	93.4	6.6		**2891**	87.8	12.2	
Professional/service	**193**	62.7	37.3		**246**	48.8	51.2	
Manual work	**99**	65.7	34.3	**434.6**	**140**	61.4	38.6	**448.4**
Not working	**773**	73.4	26.6	***	**789**	61.5	38.5	***
Age of women								
15-19 years	**379**	83.1	16.9	**46.5**	**325**	72.3	27.7	**40.6**
20-34	**3574**	87.4	12.6	***	**3178**	78.5	21.5	***
35+	**792**	94.9	5.1		**562**	88.6	11.4	
Age at first marriage								
<15 years	**938**	93.6	6.4		**576**	86.5	13.5	
15-19 years	**3222**	88.6	11.4	**82.6**	**2826**	83.0	17.0	**221.8**
20 or more years	**586**	78.3	21.7	***	**663**	58.2	41.8	***
Partners' occupation								
Agriculture	**2405**	94.9	5.1		**1545**	90.9	9.1	
Professional/service	**1154**	74.6	25.4		**1305**	65.0	35.0	
Manual work	**1009**	87.9	12.1	**312.3**	**1073**	79.9	20.1	**293.2**
Not working/DK	**178**	91.0	9.0	***	**143**	84.6	15.4	***
Partners' education								
No education	**1755**	95.7	4.3		**977**	91.1	8.9	
Primary	**1170**	92.8	7.2	**444.1**	**1170**	86.1	13.9	**436.3**
Secondary	**1538**	82.2	17.8	***	**1598**	75.4	24.6	***
Higher	**282**	56.7	43.3		**321**	39.9	60.1	
Residence								
Rural	**4413**	91.4	8.6	**558.9**	**3530**	84.6	15.4	**430.1**
Urban	**332**	48.2	51.8	***	**536**	45.7	54.3	***
Religion								
Hindu	**3995**	87.8	12.2	**6.0**	**3453**	79.4	20.6	**21.5**
Buddhist	**353**	91.2	8.8		**312**	72.1	27.9	***
Muslim	**264**	90.5	9.5		**195**	85.6	14.4	
Other	**134**	91.0	9.0		**106**	89.6	10.4	
Wealth index								
Poorest	**1181**	97.8	2.2		**956**	94.4	5.6	
Poorer	**1011**	96.1	3.9	**874.4**	**859**	89.8	10.2	**876.4**
Middle	**921**	92.2	7.8	***	**812**	87.8	12.2	***
Richer	**923**	88.3	11.7		**751**	75.5	24.5	
Richest	**710**	56.5	43.5		**687**	40.2	59.8	
HH size								
≤4	**980**	85.0	15.0	**13.4**	**1123**	69.9	30.1	**86.3**
>4	**3765**	89.2	10.8	***	**2942**	83.1	16.9	***
Intended birth								
Wanted then	**2877**	87.2	12.8	**58.1**	**2707**	79.2	20.8	**43.5**
Wanted later	**649**	82.9	17.1	***	**564**	71.3	28.7	***
No more	**1219**	93.8	6.2		**795**	85.9	14.1	
Birth order								
First birth	**992**	76.2	23.8	**229.4**	**1094**	62.0	38.0	**325.5**
2or 3 birth	**1899**	87.9	12.1	***	**1786**	81.7	18.3	***
>3 birth	**1853**	95.3	4.7		**1186**	92.1	7.9	
Total	**4745**	88.3	11.7		**4066**	79.4	20.6	

*p<0·05; **p<0·01; ***p<0·001.

Reproductive health radio program and utilization of SBAs

Altogether 17 percent of women who listened to RH radio programs utilized SBAs during childbirth in the year 2001 while 28.6 percent women utilize in 2006 survey which were higher than national rate (11.7 and 20.6% respectively in two surveys). In contrast these rates were 8.2 percent and 12.7 percent among women who did not listen to RH radio program. Reproductive health radio program and SBAs utilization are significantly associated to a high degree in both surveys.

Mass media and utilization of SBAs

In both years, it was found that women who had not been exposed to both radio and television RH messages had low utilization rate but it was highest in women who had exposed to TV only or both radio and TV(38.2% and 42.5% in two surveys respectively). Women who did not get RH messages either from radio or TV were hardly utilizing SBAs (5.5% and 8.7% in two surveys respectively). Similarly, women who had got RH messages from radio only had also low utilization rate which were 6.9 percent and 10.4 percent in two different surveys. Utilization of SBAs during childbirth is highly associated with reproductive health messages from mass media.

Education and utilization of SBAs

Utilization of SBAs varies according to level of education of women. SBAs utilization increases with increase in level of education. Table 4.2 reveals that utilization rate increased with level of education of women in both surveys. More than two-thirds of women in 2001 and 84.3 percent of women in 2006 who were highly educated utilized the SBAs during their childbirth. Similarly, more than two fifths of women (40.6% in 2001 survey and 44.1% in 2006 survey) who had secondary education utilized SBAs in their last childbirth. In contrast, these utilization rates among uneducated were 5.4 percent in 2001 and 9 percent in 2006. Education and SBAs are statistically significantly associated in both surveys. There is strong association between education and utilization of SBAs.

Occupation and utilization of SBAs

Women, whose occupation was agriculture, utilized less SBA compare to their counterparts who worked in other sector or who did not work at all. Only 12.2 percent of farmer women utilized SBAs in the year 2006 while this rate was only 6.6 percent in the year 2001. Utilization rates among professional women were 37.3 percent and 51.2 percent in two surveys respectively. In 2006, labor women and women who did not work had similar utilization rate which was about 39 percent. There is highly significant association between different type of occupation and utilization of SBAs.

Wealth status and utilization of SBAs

The richest women have the highest rate of utilization of SBAs. In 2001, 44 percent of the richest women took assistance of SBAs while this rate was 60 percent in 2006. In contrast, only 2 percent poorest women in 2001 and 6 percent poorest women in 2006 had taken SBAs service in their last childbirth. Among poorer women, the utilization rate was 3.9 percent in 2001 while the rate was 10.2 percent. Similarly, utilization rate of middle level women were not more difference than poorer women which were 7.8 percent and 12.2 percent in two surveys respectively. Wealth status is highly significant relation with utilization of SBAs.

Women age and utilization of SBAs

It is found that younger women (15-19 years) utilized the SBAs more than other age groups. It was 16.9 percent in 2001 and 27.7 percent in 2006. Similarly, women aged 20 to 34 have utilization rate of 12.6 percent and 21.5 percent in two surveys. In contrast, another risk age group of women for childbirth (35+ years) utilized SBAs only 5.1 percent in 2001 and 11.4 percent in 2006. Like other demographic variables, age of women is also highly significant relation with utilization of SBAs.

Age at first marriage and utilization of SBAs

Women who had gotten married in her childhood (less than 15 years old) have less proportion of utilization rate than women who had gotten married by more than 20 years of age. It was 6.4 and 13.5 percent respectively in two surveys among women who have married before age 15 years which was quite lower than average utilization

rates. Table 4.2 reveals that increase in marriage age leads to gradually increase in utilization rate.

Residence and utilization of SBAs

Due to access and availability of health facilities and SBAs, there are remarkable differences in utilization of SBAs between urban and rural women. It was found that only 8.6 percent rural women utilized SBAs in 2001 and it was sharply increased to 15.4 percent in 2006 in rural areas, in contrast, the utilization rate in urban areas was gradually increased from 51.8 percent of 2001 to 54.3 percent in 2006.

Religion and utilization of SBAs

In 2001 survey, women who follow the Hindu were more utilizing the SBAs than other religions which were 12.2 percent. In contrast, it was found in 2006 that women who follow the Buddhist were more utilizing the SBAs during childbirth (27.9 percent). In this survey, the proportion of Hindu women who utilized the SBAs is similar to national average of 20.6 percent. The association between religion and SBAs utilization was not significant in the year 2001 but it was highly significant in 2006.

Partner's education and utilization of SBAs

Like in women education, utilization of SBAs varies according to level of education of partners. SBAs utilization gradually increased with the increase in level of education. The pattern was similar in both surveys. More than two-fifths of women whose husband had higher education utilized SBAs in 2001 while this situation was 3 out of 5 women in 2006. Education and SBAs utilization are highly statistically significantly associated in both surveys. There is no much difference in utilization rate between women who have no education and women whose husband's have no education.

Partner's occupation and utilization of SBAs

Women, whose partner's occupation is agriculture, utilized less SBA compare to their counterparts who work in other sector or who do not work at all. The rate was

very remarkable which was 5.1 percent in 2001 and 9.1 percent in 2006 compared to professional husbands (25.4% and 35% in two surveys respectively).

Household size and utilization of SBAs

Table 4.2 shows that women from small family (4 or less members) utilized SBAs more than women from big family (more than 4 members). The proportion of utilization was 15 percent in small family compared to 10 percent in big family in the year 2001. Similarly utilization rate was 30.1 and 16.9 percent respectively in small family and big family in 2006.

Intended birth and utilization of SBAs

It was found that utilization of SBAs varied on the basis of types of birth whether it was intended or not. Utilization of SBAs was lowest in unintended birth which was 6.2 and 14.6 percents in two different surveys. In contrast, it was 12.8 and 20.8 percents in wanted birth (wanted at the time of birth). Interestingly, the proportion of utilization was highest in those births which births were wanted later. This proportion was 17.1 percent in 2001 and 28.7 percent in 2006.

Birth order and utilization of SBAs

The study shows that utilization of SBAs during childbirth was highest in first birth. One in five women utilized the SBAs during their first childbirth in 2001 while almost two in five women utilized the SBAs in their first birth in 2006. The rates were 4.7 percent in 2001 and 7.9 percent in 2006 in fourth or more birth.

4.3 Results from multivariate analysis

Although it is seen from bivariate analysis that utilization of SBAs during childbirth is significantly associated with program and control variables, this is only the gross effect and could not tell the real or net effect of the program and other variables. Multivariate analysis was performed to know the net effect of the program variables on utilization of SBAs. There was total of 8913 cases from pooled data. After cleaning data, 8908 cases were ready for running regression.

It is known that many of the socio-demographic characteristics are interrelated to utilization of SBAs, the study examined the specific effects of RH radio program, exposure of RH messages from mass media and women status while controlling for socio-demographic variables. The influence of each independent variable was examined by using binary logistic regression. This analysis also looks after specific change in utilization of SBAs in two different surveys. The results of logistic regression are based on four models. First model describes the trend of utilization of SBAs in 2001 and 2006. Second model describes the effects of program variables on the trend of utilization of SBAs. Third model describes women status with trend of utilization and program variables. Lastly, final model describes the change in trend of utilization, effects of program variables and women status on SBAs utilization by controlling socio-demographic and cultural factors. In each model, odds ratio and significant level are presented. After presenting logistic results, the impact of program variables is estimated by simulating the predicted probability of SBAs utilization with and without the program intervention.

Model 1

Model 1 is based on the survey years. This model reveals that odds of using SBAs increased during the time period of 2001 and 2006. The odds of using SBAs were 1.9 times higher in 2006 than in 2001. This is highly significant change during two survey period.

Model 2

Model 2 is focused on effects of media factors on utilization of SBAs during childbirth. After adding media variables, the odds of survey year are reduced from 1.9 to 1.3. This model revealed that the media exposure variables are associated with utilization of SBAs. In this model, reproductive health radio programs had significant effect on SBAs utilization. Women who had heard RH radio program were 1.6 times more likely to utilize SBAs. Similarly, women who had heard and seen RH messages from both radio and television were 6.6 times more likely to utilize the service than women who had not heard messages from both radio and TV or from neither radio nor TV.

Model 3

In this model, women status namely education and occupation were added. Both of these two variables had highly significant effects on SBAs utilization. After addition of women status, RH radio program did not have significant effect as in model 2.

Model 4

This is the final model of the logistic regression where all the explanatory variables were included in the model. After controlling the socio-demographic variables, the utilization of SBAs has still significant ($p<0.01$) in two different years. The women who had live births in the last five years were 1.3 times more likely to utilize SBAs in 2006 compared to 2001.

Radio program on RH was not significant when controlling other variables but it has still positive relation with SBAs utilization. Regarding mass media exposure, women who got RH messages from mass media was highly significantly associated with SBAs utilization. It was due to television rather than radio. For example, women who only had heard RH messages from radio were 7 percent less likely to utilize SBAs than women who neither heard messages from radio nor TV but women who had heard/seen RH messages from TV were 1.6 times more likely to utilize the services compared to their counterparts. Similarly, women who had heard/seen RH messages from both radio and TV were 1.8 times more likely to utilize than women who hadn't heard or seen RH messages from both radio and TV or any media.

According to women status, women who had higher level of education were more likely to utilize SBAs. It was significantly associated with SBAs utilization even other variables were controlled in the model. Women who had primary level of education were 1.4 times more likely to utilize SBAs than women who never had in formal schooling. Similarly, women utilized 2.5 times SBAs during childbirth who had secondary education compared to no education. At the same time, women who had higher education level were 4.2 times more likely to utilize SBAs than women with no education. Regarding women's occupation, women who worked in professional and service sector were 1.4 times more likely to utilize SBAs than farmer

women. Similarly, women who did not work were 1.6 times more likely to utilize SBAs than their farmer counterparts.

Most of the socio demographic variables have significant effect on utilization of SBAs except intended birth. For example, women whose age was 35 years and above were 1.5 times more likely to utilize SBAs than women whose age was only less than 20 years. In contrast, women whose age was 20-34 years were less likely to utilize SBAs than their counterparts.

Regarding age at first marriage, women who had gotten married by 15-19 years old were 1.1 times more likely to utilize SBAs than women who had gotten married in her childhood age (less than 15 years). Similarly, women who had gotten married by 20 years or more were 1.7 times more likely to utilize SBAs than women who had gotten married before 15 years which was highly statistically significant in the model.

Like in other studies, urban women were 2.2 times more likely to utilize SBAs in this study. When comparing to other religions (Christian, *Kirat* etc.), Hindu, Buddhist and Muslim were more likely to utilize SBAs during childbirth. Women who were in middle wealth status utilized SBAs 2 times more than the poorest women. Similarly, richer women utilized 2.5 times than their counterparts. There was vast difference between poorest and richest women. The richest women utilized nearly 5 times than poorest women.

Like in women's occupation and education, similar results were found in their partner's education and occupation. Women whose husbands had more education and had professional and service sector were more likely to utilize SBAs than their counterparts like no educated husband and farmer.

Although the intended birth had no significant effect, women whose last birth was either wanted then or wanted later were more likely to utilize the SBAs than women whose last birth was not intended. It was highly significant effects of birth order on SBAs utilization. Women utilized SBAs 3 times more likely in their first birth than fourth or more birth.

Table 4.3: Logistic regression results (odds ratio) for utilization of SBAs during childbirth in Nepal

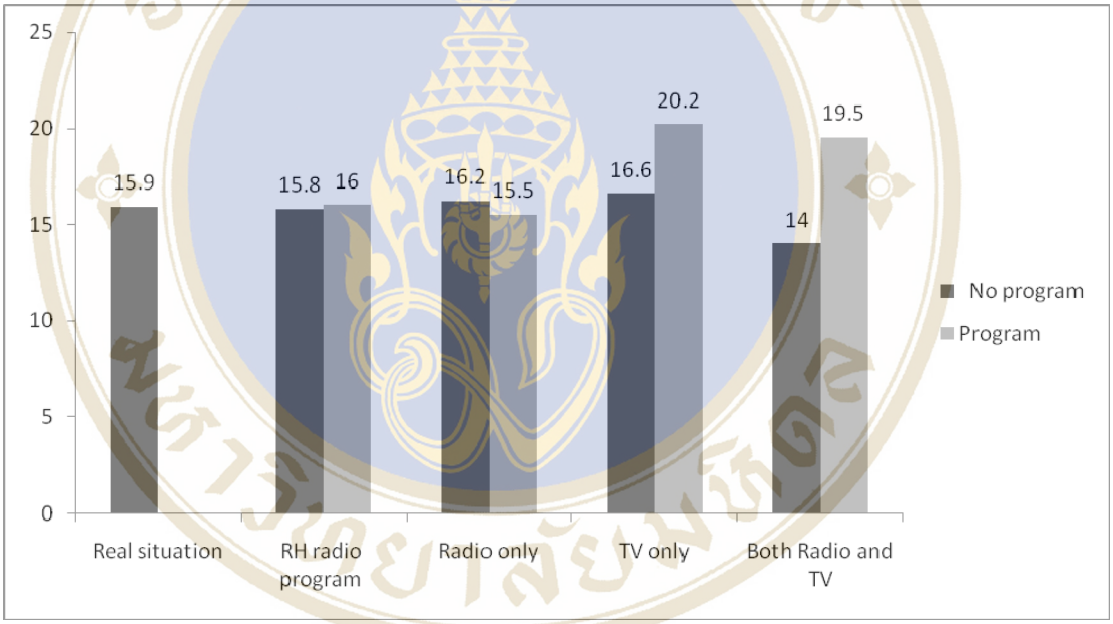
Variable	Model 1	Model 2	Model 3	Model 4
Survey year				
Survey year (Ref. 2001)	1.866***	1.337***	1.262**	1.291**
RH radio program				
Listen to RH radio program (yes)		1.601***	1.144	1.024
Mass media (Ref. Neither heard from radio or TV)				
Radio only		.947	.941	.923
TV only		8.031***	3.138***	1.603**
Both Radio and TV		6.601***	2.932***	1.759***
Women status				
Level of education (Ref. no education)				
Primary			1.937***	1.400**
Secondary			4.860***	2.500***
Higher			14.030***	4.200***
Occupation (Ref. agriculture)				
Professional/service			2.853***	1.420**
Manual work			2.681***	1.382
Not working			2.864***	1.556***
Socio-demographic variables				
Age at first marriage (Ref. <15 years)				
15-19 years				1.141
20 and above				1.662***
Age of women (Ref. 15-19 years age group)				
20-34 years				.981
35 and above				1.500*
Residence				
Urban (Ref. Rural)				2.153***
Religion (Ref. other religions)				
Hindu				1.666*
Buddhist				1.743*
Muslim				2.040*
Wealth index (Ref. poorest)				
Poorer				1.648**
Middle				2.019***
Richer				2.508***
Richest				4.696***
Partners' education (Ref. no education)				
Primary				1.287*
Secondary				1.348*
Higher				1.699**
Partners' occupation (Ref. agriculture)				
Professional/service				1.537***
Manual work				1.193
Not working/don't know				.864
HH size (Ref. more than 4 member)				
Equal or less than 4 member				.936
Wanted birth (Ref. wanted no more)				
Wanted now				1.183
Wanted later				1.135
Birth order (Ref. more than third birth)				
First birth				2.961***
Second or third birth				1.244
Number of observation	8908	8908	8908	8908
Log likelihood ratio	-3850	-3272	-2883	-2627
Pseudo R^2	0.0146	0.1626	0.2624	0.3277

*p<0·05; **p<0·01; ***p<0·001.

Simulation Results:

The figure 4.1 indicates that the proportion of SBAs utilization would be 15.8 % if the all women did not listen to the radio reproductive health program and if the all women listened to the radio reproductive health program, 16 % women would have utilized the SBAs during their childbirth. Thus, radio reproductive health program alone has minimal effects on utilization of SBAs during childbirth. Even this program variable did not show significant effect on SBAs utilization in the final model, simulation were run in order to estimate the predicted probability of SBAs utilization.

Figure 4.1: Simulated effects of program variables on the utilization of SBAs during childbirths



Simulated effect of exposure of mass media in terms of radio and television were also calculated. Women who only heard RH messages from radio would have less probability to utilize SBAs than who didn't hear radio. But in the case of RH messages from TV, SBAs utilization increased by nearly 4% in case of all women who heard/seen RH messages from TV as compared to the situation when none of the women heard/seen RH messages from TV only(16.6% versus 20.2%). Regarding exposure to both radio and TV; if all women who had heard/seen RH messages from both radio and TV, proportion of SBAs utilization would be 19.5 percent. In contrast, this proportion would be only 14 percent if none of the women had not heard/seen RH messages from both radio and TV.

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussions

Various factors contribute to maternal and infant mortality; however utilization of SBAs during childbirth is widely recognized as an important factor for the safe delivery practices which can reduce the maternal and infant mortality. Thus, purpose of this study is to assess the factors influencing the utilization of SBAs during childbirth. Secondly, purpose of this study is to evaluate the utilization of SBAs program in five years period and lastly, to assess the effects of mass media on utilization of SBAs. For assessing the effects of mass media, two proxy program variables were used in the study. First program variable is women who had listened to reproductive health radio program in last 12 months and second is women who had heard or seen RH messages from radio and television.

It is well known that questions were focusing on family planning in the demographic and health survey. In Nepal, reproductive health programs are integrated at all levels of the health delivery points. Family planning component is the part of reproductive health. In DHS questionnaire, questions asked about family planning messages from radio and TV. This study used these family planning messages as reproductive health messages.

Bivariate analysis shows that all the dependent and independent variables are highly significant. All independent variables have significantly associated with utilization of SBAs. Multivariate analysis was performed to confirm the results from bivariate analysis. The findings from multivariate analysis are in consistent with the theories and hypothesis stated in chapter II. Except RH radio program, all hypotheses are statistically proved even after controlling socio-demographic variables.

Utilization of SBAs during childbirth increased from 2001 to 2006 in Nepal. The trend is statistically significant. It was changed over from 11.7 percent to 20.6 percent and women in 2006 survey are 1.3 times more likely to utilize SBAs during their

childbirth. Even though the findings show that utilization of SBAs during childbirth is significantly changed in the five year period by 1.3 times in Nepal, this utilization is far below the MDG target of 40 percent for the year 2005. Nepal government set the MDG target for utilization of SBAs of 60 percent by 2015. It is very hard to reach MDG target from this current progress rate. This is mostly due to unavailability of SBAs during childbirth. Under the geographical condition of the country, health facilities are very hard to access in hill and mountain region. Lack of skilled birth attendants is one of the big problems in the remote health facilities.

Government of Nepal implements different programs to improve maternal and child health situation of the country. These programs help the accessibility and availability of SBAs. Primary health care centers (PHCC) are gradually upgraded and equipped to function as a basic emergency obstetric care (BEOC) site. Similarly, some district hospitals are equipped to function as a Comprehensive emergency obstetric care (CEOC) and some hospitals will be equipped. Government plans to upgrade the sub-health post to health post level, where the service of auxiliary nurse midwife (ANM) is available. Another plan is in place to train about 5,000 SBAs in the next 5 years. Doctors, nurses and midwives will be trained to have the core skills to be SBA and deployed to the health institutions. Safe delivery incentive program (formerly maternity incentive scheme) is providing the stage for the institutional delivery.

Though the RH radio program was not significant in the final model, RH radio program has positive association with utilization of SBAs. It was significant in second model but it was not significant in latter models due to adding other variables in the model. Bivaraite analysis shows that RH radio program and utilization of SBAs is statistically significant. The result shows that RH radio program has no significant effect on utilization of SBAs during childbirth. In the last 5 years, household having radio were increased from 41 percent to 61 percent (Ministry of Health, 2002; Ministry of Health and Population, 2007). Two out of 5 Nepali household do not access to radio. This is one of the reason that RH radio program has not significant effect on utilization of SBAs.

Women who heard about RH messages from mass media were more likely to utilize SBAs. Similarly, women who have heard RH messages from both TV and radio were more likely to utilize SBAs in reference to their counterpart. Similar results were

found in many studies (Navaneetham & Dharmalingam, 2002; Sharma et al., 2007). Result from regression reveals that only radio RH messages could not make difference on utilization of SBAs. Though the RH messages from TV alone or from both radio and TV are very effective, it is very difficult to expand the television messages. The recent study shows that only 61 percent of Nepalese households have radio and 29 percent households have TV. Similarly, 38 percent women watches TV at least once a week and 61 percent women listen to radio at least once a week. Though most of the women reside in rural area, only less than one third women are able to watch TV at least once a week (Ministry of Health and Population, 2007). Less access to radio and TV is the one of challenge of radio and TV messages and program.

This study doesn't focus on female community health volunteers (FCHVs). FCHVs are the foundation of the health system of Nepal where 50,000 FCHVs are working to improve the health status of the country. There is at least one FCHV for one ward (1 FCHV for 250 to 1000 population). The role of the FCHVs is mainly to focus on motivation and education of local mothers and community members for the promotion of safe motherhood, mother and child health, family planning, and community health. With the support of health personnel from the SHPs, HPs, and PHCCs, the FCHVs are expected to promote available health services, such as immunization, family planning, and control of diarrheal diseases (Department of Health Services, 2007). FCHVs are only the options for raising awareness on SBAs in Nepal where low accessibility and availability of radio and TV.

Women with higher level of education were more likely to utilize SBAs than their uneducated counterpart. Education has significant effects on utilization of SBAs. Similar results were found in a study conducted in Southern India by Navaneetham & Dharmalingam (2002). From bivariate analysis, There is no much difference in utilization rate between women who have no education and women whose husband's have no education but the difference is higher in primary, secondary and higher education. Even in primary education, there is difference in utilization rate. These facts show that the women education is more effective on utilization of SBAs. Though the study found that women education has significant effect on utilization of SBAs, literacy rate was quite low in Nepal. Among this low literacy rate, difference between men and women is significant where 55 percent women and 79 percent men are

literate. Similarly, urban people are more literate than their rural counterpart (Ministry of Health and Population, 2007). Low literacy rate is challenging issue for increasing utilization of SBAs.

Women's involvement in gainful employment is one of the important factors positively affecting the use of maternal health services in Bangladesh (Chakraborty et al., 2003). Similarly, farmer women were less likely to utilize SBAs during child birth in Nepal (Sharma et al., 2007). Similar to universal trend, women who work other than agriculture were more likely to utilize SBAs during childbirth. Interestingly, women do not work were more likely to utilize SBAs. It is due to poor, rural and uneducated women are working in agriculture sector in Nepal. Among working women, 86 percent women working in agriculture sector. Middle level Nepalese women are mainly housewives and they do not work outside. Mostly, they are from urban areas, educated and rich family (Ministry of Health and Population, 2007). So they utilize SBAs more than farmer women.

Level of husband education has positive effect on utilization of maternal health services which is similar to study in Bangladesh (Paul & Rumsey, 2002). Similarly, occupation of partners also has significant effect on utilization of SBAs. Women whose husbands work in agriculture sector were less likely to utilize SBAs than working in professional and service sector.

Poor people have less access to health services everywhere in the world. This is also very common to Nepal. Household economic status has significant positive relation with utilization of SBAs during childbirth, similar to another study in Nepal (Sharma et al., 2007). Difference between richest and poorest is nearly 5 times. Addressing this problem of high financial cost of childbirth (transport, loss of earning/support and medical costs), the Government of Nepal is implementing a policy, referred to locally as the "safe delivery incentives program" (formerly maternity financing scheme), to provide financial assistance to women seeking institutional care at childbirth.

It is universal trend that accessibility and availability of SBAs is common in urban areas than rural areas. It is more common in Nepal due to geographical and the economical situation of the country. Women who reside in urban area were more likely to take assistance of SBAs during childbirth which is similar to other studies

(Sharma et al., 2007; Mekonnen & Mekonnen, 2003). Government of Nepal plans to upgrade the Sub-health post to health post level, where the service of Auxiliary Nurse Midwife (ANM) is available. This will improve access by the rural population to skilled birth attendants. This strategy will fill the gap between not rural and urban area and also among mountain, hill and plane area.

Women who had had first parity were more likely to use skilled attendants during child birth. This finding is supported by different studies (Sharma et al., 2007; Yanagisawa et al., 2006; Mekonnen & Mekonnen, 2003; Paul and Rumsey, 2002). As we know that first birth is very risk for women, it is good health care behavior that more Nepalese women utilize SBAs in their first birth.

5.2 Conclusion and recommendations

Although the findings show that utilization of SBAs during childbirth is significantly changed in the five year period in Nepal, this proportion of utilization of SBAs is far below the MDG target of 40 percent for the year 2005. It is very hard to reach the MDG target of 60 percent by 2015 from this current progress rate. Because of various interventions (expansion of BEOC and CEOC centers, safe delivery incentives program, birth preparedness package etc.) in last five years period, utilization rate is increasing in trend. However, this trend is less likely to meet the target by 2015.

The results suggest that radio RH program is less successful to increase the utilization of SBAs. It is necessary to modify or improve the component or contents of radio RH program for better results. Specific radio program should disseminate information on the benefit of utilization of SBAs should. Due to multi-linguistic population in Nepal, program should be aired in different local language. Programs on *Bhojpuri, Maithili, Tharu, Gurung, Tamang, Magar, Newari* languages would be effective to disseminate the information because these languages are mostly spoken languages after Nepali.

Mass media has significant effect on utilization of SBAs especially among women who heard and seen RH messages from both radio and television. So it is recommended that effective radio and television RH messages should be further expanded throughout the country for easy accessing of RH messages. Similarly,

FCHVs are only the options for raising awareness in Nepal where low accessibility and availability of radio and TV. It is recommended that FCHVs should be actively mobilized to raise the awareness on SBAs. . Another option would be primary health care outreach clinic (PHC-ORC). This is mainly for health promotion activities. This clinic is conducted by local health facilities in 3 to 5 different places of the villages once in a month.

Rate of utilization of SBAs varies with level of education. Women with higher level of education are more likely to utilize SBAs. Half of the Nepalese women are illiterate, so it is necessary to launch effective programs to increase literacy rate in the country. Though the government is implementing different programs (free mid-day lunch, school dress, books etc.) to attract the children to come school, school enrollment of girl child is quite low. Current programs should be enforced to enroll girl child in school. “Health, Population and Environment” is compulsory subject in secondary school. This subject covers major issues in safe motherhood. Integration of this subject with local health facilities could help to utilization of SBAs. In Nepal, non formal education also assists to increase the literacy rate. So, non formal education with content of safe motherhood is effective for increasing utilization of SBAs.

It was found that women who work in agriculture sector are less likely to utilize services. The program should be focused on women working in agriculture sector because they are poor and illiterate. One of the channels to reach this group may be FCHVs.

In Nepal, TBAs are neglected in the health care system although they contribute more in assisting deliveries. In 2001, 23.4 percent women who had live births were delivered by TBAs and this rate was 18.8 percent in 2006 (Ministry of Health, 2002; Ministry of Health and Population, 2007). Government should rethink about the policy on TBAs. Therefore, identified TBAs should be trained in giving care for safe delivery or referring to SBAs. Supply of safe home delivery kit to TBAs can also help for self delivery.

Government and non government organization working in reproductive health, especially on skilled birth attendants have to recognize the vulnerable and risk population. Community based programs like co-operative, non formal education, income generative activities etc. need to reach poor, illiterate, farmer and rural women.

Although distance to health facility and availability of SBAs in the health facilities are important variables that influence the utilization of SBAs. The demographic and health survey does not cover these components in the surveys. It is recommended that distance to health facility where SBAs are available and component of facility survey should be incorporated in the DHS.

This study is based on pooled cross sectional data where there is lack of some key variables for example information of health facilities. This study tells only about user perspective. There is necessary of further study to evaluate the program. A further study combined with qualitative and quantitative for both users and providers, which should includes detail of the safe motherhood components. Furthermore, study should be questions about TBAs in order to plan for TBAs training in the future.

BIBLIOGRAPHY

Anderson, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, *36*(1), 1-10.

Bartlett, L. A., Mawji, S., Whitehead, S., Crouse, C., Dalil, S., Ionete, D., et al. (2005). Where giving birth is a forecast of death: maternal mortality in four districts of Afghanistan, 1999–2002. *Lancet 365*, 864-870.

Bernis, L. D., Sherratt, D. R., AbouZahr, C., & Lerberghe, W. V. (2003). Skilled attendants for pregnancy, childbirth and postnatal care. *British Medical Bulletin, 67*, 39-57.

Betrán, A. P., Say, L., Gülmezoglu, A. M., Allen T., & Hampson, L. (2005). Effectiveness of different databases in identifying studies for systematic reviews: experience from the WHO systematic review of maternal morbidity and mortality. *Biomed Central Medical Research Methodology*

Betrán, A. P., Wojdyla, D., Posner, S. F., & Gülmezoglu, A. M. (2005). National estimates for maternal mortality: an analysis based on the WHO systematic review of maternal mortality and morbidity. *Biomed Central Public Health.*

Celik, Y. & Hotchkiss, D.R. (2000). The socio-economic determinants of maternal health care utilization in Turkey. *Social Science & Medicine, 50*, 1797-1806.

Central Bureau of Statistics (2003). Population monograph of Nepal Vol I. Kathmandu, Nepal: Central Bureau of Statistics.

Central Bureau of Statistics (2006). Statistical pocket book. Kathmandu, Nepal: Central Bureau of Statistics.

Chakraborty, N., Islam, M. A., Chaowdhury, I. R., Bari, W. & Akhter. H. H. (2003). H.H. Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International*, *18*(4).

Department of Health Services (2007), Annual report 2005/2006. Kathmandu, Nepal: Department of Health Services.

Högberg, U. (2004). The Decline in maternal mortality in Sweden: The role of community midwifery. *American Journal of Public Health, 94*(8), 1312-1320.

Howe, A., Owen-Smith, V. & Richardson, J. (2002). The impact of a television soap opera on the NHS cervical screening programme in the North West of England. *Journal of Public Health Medicine, 24*(4), 299-304.

Mekonnen, Y. & Mekonnen, A. (2003). Factors influencing the use of maternal healthcare services in Ethiopia. *Journal of Health Populaton and Nutrition, 21*(4), 374-382

Maine, D., Akalin, M. Z., Chakraborty, J., Francisco, A. d., & Strong, M. (1996). Why did maternal mortality decline in Matlab? *Studies in Family Planning, 27*(4), 179-187.

Ministry of Health and Population (MoHP), New ERA and Macro International Inc. (2007). Nepal demographic and health survey 2006. Kathmandu, Nepal: Ministry of Health and Population, New ERA and Macro International Inc.

Ministry of Health and Population (MoHP) (2006). National policy on skilled birth attendants: Supplementary to safe motherhood policy 1998 . Kathmandu, Nepal: Ministry of Health and Population.

Ministry of Health (MoH), New ERA and ORC Macro. (2002). Nepal demographic and health survey 2001. Kathmandu, Nepal: Ministry of Health, New ERA and ORC Macro

Ministry of Health (MoH), New ERA and ORC Macro. (1997). Nepal family health survey 2006. Kathmandu, Nepal: Ministry of Health, New ERA and ORC Macro.

Mpembeni, R. N. M., Killewo, J. Z., Leshabari, M. T., Massawe, S. N., Jahn, A., Mushi, D., et al. (2007). Use pattern of maternal health services and determinants of skilled care during delivery in southern Tanzania: Implications for achievement of MDG-5 targets. *BMC Pregnancy and Childbirth, 7*(29).

National Planning Commission (2005). Nepal millennium development goals: Progress report 2005. Kathmandu, Nepal: National Planning Commission and United Nations Development Programme.

Navaneethama, K. & Dharmalingam, A. (2002). Utilization of maternal health care services in Southern India. *Social Science & Medicine, 55*, 1849–1869.

Paul, B.K. & Rumsey, D.J. (2002). Utilization of health facilities and trained birth attendants for childbirth in rural Bangladesh: an empirical study. *Social Science & Medicine, 54*, 1755–1765.

Sharma, S.K., Sawangdee, Y. & Sirirassamee, B. (2007). Access to health: women's status and utilization of maternal health services in Nepal. *Journal of Biosocial Science, 39*, 671-692.

Shiffman, J. (2000). Can poor countries surmount high maternal mortality? *Studies in Family Planning*, 31(4), 274-289.

Sloan, N. L., Winikoff, B., & Fikree, F. F. (2001). An ecologic analysis of maternal mortality ratios. *Studies in Family Planning, 32*(4), 352-355.

UNFPA. (2006). Maternal and neonatal health in East and South-East Asia. Bangkok, Thailand: UNFPA Country Technical Services Team for East and South-East Asia.

UNFPA. (2004). Consensus and concerns: Regional workshop on skilled birth attendants in South and West Asia. Kathmandu: UNFPA, CST for South and West Asia.

Wagle, R.R., Sabroel, S. & Nielsen, B.B. (2004). Socioeconomic and physical distance to the maternity hospital as predictors for place of delivery: An observation study from Nepal. *BMC Pregnancy and Childbirth*, **4** (8). http://www.biomedcentral.com/1471-2393/4/8.

WHO. (2007). Maternal mortality ratio falling too slowly to meet goal. London/Geneva. Joint News Release WHO/UNICEF/UNFPA/World Bank.

WHO. (2004). Making pregnancy safer: the critical role of skilled attendant; A joint statement by WHO, ICM and FIGO. Geneva: Department of Reproductive Health and Research, World Health Organization.

WHO. (1999). Reduction of maternal mortality: A joint WHO/UNFPA/UNICEF World Bank statement: World Health Organization, Geneva.

Yanagisawa, S., Oum, S., & Wakai, S. (2006). Determinants of skilled birth attendance in rural Cambodia. *Tropical Medicine and International Health, 11*(2), 238-251.

Population Reference Bureau, www.prb.org, accessed in January 2007

BIOGRAPHY

NAME:	Sujan Karki
DATE OF BIRTH:	August 15, 1977
PLACE OF BIRTH:	Kathmandu, Nepal
INSTITUTIONS ATTENDED:	Bachelors Degree in Public Health Institute of Medicine, Tribhuvan University, Nepal
	Masters Degree in Public Health Institute of Medicine, Tribhuvan University, Nepal
	M. A. in Population and Reproductive Health Research Institute for Population and Social Research Mahidol University, Thailand
FELLOWSHIP	Measure Evaluation Project University of North Carolina Chapelhill, USA
POSITION & OFFICE	Assistant Research Officer New ERA, Kathmandu Nepal E-mail: karkisujan@yahoo.com