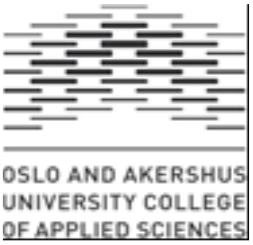

SUSHILA REGMI GHIMIRE

High Infant and Maternal Mortality Rate and Health Services: A Comparative Study between Far Western and Central Development Regions of Nepal

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Table of Contents

Abbreviations:

AD- Anno Domino

ANC- Antenatal Care

ANM-Auxiliary Nurse Midwife

ARI-Acute Respiratory Infection

BCG- Bacillus Calmette Guerin

BEOC-Basic Emergency Obstetric care

CIA- Central Intelligence Agency

CB-IMCI-Community Based Integrated Management of Childhood Illness

CB-NCP-Community Based Newborn Care Package

CBS-Central Bureau of Statistics

CR/CDR-Central Development Region

CMA-Certified Medical Assistant

CREHPA- Centre for Research on Environment Health and Population Activities

DFHRI-Democratic Freedom and Human Rights Institute

DHS-Demographic Health Survey

DPT- Diptheria, Pertussis and Tetanus

EPI-Extended Program on Immunization

EOF- Essential Obstetric Function

FWDR-Far Western Development Region

FAO/WFP- Food and Agriculture Organization/World Food Program

FCHV-Female Community Health Volunteers

HA-Health Assistant

HDI- Human Development Index

HIV/AIDS- Human Immunodeficiency Virus/Acquired Immuno Deficiency Syndrome

HMIS-Health Management Information System

HP-Health Post

ICU-Intermediate Care Unit

IMR-Infant Mortality Ratio

INGO-International Non –Governmental Organization

MDG-Millennium Development Goal

MMM-Maternal Mortality and Morbidity

MMR-Maternal Mortality Ratio

MoH-Ministry of Health

MCHW-Maternal Child Health Worker

MoHP-Ministry of Health and Population

MIRA-Mother and Infant Research Activity

NFHS: Nepal Family Health Survey

NIP: National Immunization Package

NGO: Non-governmental Organization

NORAD- Norwegian Agency for Development Cooperation

NSMNH-LTP- Nepal Safe Motherhood and Newborn Health-Long Term Plan

NDHS- Nepal Demographic Health Survey

ORC- Out-reach Clinic

PMDF- Proportion of maternal deaths among all deaths of females of reproductive age

PHC- primary Health Care

PHCC- Primary Health Care Centre

RDS- Respiratory Distress Syndrome

RAMOS- Reproductive Age Mortality Study

SDK- Safe Delivery Kit

SHP- Sub-health Post

SBA- Skilled Birth Attendants

SMPOA- Safe Motherhood Plan of Action

SIDS- Sudden Infant Death Syndrome

STD- Sexually Transmitted Disease

TBA- Traditional Birth Attendance

UNFPA- United Nations Population Fund

UNICEF- United Nations Children's Fund

UNDP- United Nations Development Program

UNFCO- United Nations Food Coordination Office

UN- United Nations

VDC- Village Development Committee

VHW- Village Health Worker

List of Figures and Tables

CHAPTER ONE

INTRODUCTION

Safe Motherhood Conference convened in Kenya in 1987 put light on the global maternal mortality rates and its dominant presence in the developing countries securing an agreement to establish Safe Motherhood initiatives. This conference set the goal of reducing maternal mortality by 50% until the year 2000 announcing the plight of the pregnant women to the global community (Nour 2008, 77). Since a long ago maternal mortality has become one of the most studied and talked matter in the international academia not only this rate was high enough to get attention but also its close cohesion with newborn, infant and child well being. Many demographic (like young maternal age and poverty), behavioral and environmental (like smoking, alcohol, occupational exposures), clinical (like HIV AIDS and tuberculosis) and health care circumstances (like awareness among the women about health care benefits, the availability of health facility and their status) factors have direct impact on the status of new-born babies (Orr and Miller 1995, 165).

As defined by the World Health Organization (WHO), a maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. Global initiatives to intensify policy intervention for maternal mortality began with the Safe Motherhood Initiative in 1987, a response to growing recognition that primary health-care program in many developing countries were not adequately focused on maternal health(Hogan, 2010).As the Lancet the report of available data mentioned, "Maternal mortality, as a largely avoidable cause of death, is an important focus of international development efforts, and a target for Millennium Development Goal (MDG) 5. However, data weaknesses have made monitoring progress problematic. In 2006, a new maternal mortality working group was established to develop improved estimation methods and make new estimates of maternal mortality for 2005, and to analyze trends in maternal mortality since 1990" (The Lancet 2007, 1311).

The infant mortality rate is, by definition, the number of children dying under a year of age divided by the number of live births that year. The infant mortality rate is also called the infant death rate. The infant mortality rate is an important measure of the well-being of infants, children, and pregnant women because it is associated with a variety of factors, such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices. Infant mortality rate is highly correlated with maternal health and maternal

mortality rate. The high infant mortality rate shows the pathetic condition of maternal health during the pregnancy period, the direct or indirect result of various aspects.

Maternal mortality may be affected by the factors like income, education, availability of health services and the number of skilled health workers. Various arguments for such relationships might be made. For instance, "if preventing maternal deaths requires relatively expensive hospital-based interventions, national income may be crucial, not only for its effect on public investment in medical facilities but also because it allows greater investment in such things as a better transport system and permits individuals to pay more easily for essential care or its components, such as needed drugs" (Bulatao 2003, 714).

The infant mortality rate (IMR) indicates the public health status of the society and its complex societal problems. There are numerous underlying set of ideas, principles and agreements in use to help to understand and identify the various factors causing infant mortality in a society and to purpose the interventions for the reduction of infant mortality rates. Because of the frequently noted social causes of infant mortality like persistent poverty, pervasive racism, subtle cast system, and the chronic stresses fused with them, the infant mortality rate is not easy to address. However, "it is still possible to identify the risks of infant death by examining the biological pathways (maternal age, chronic illness, nutrition, infection, and stress etc.) through which these societal forces act" (Rivera and Synder et.al. 2005, 5).

The task force report submitted by Rivera and Synder et.al to the government of Delaware further identifies that the sociological and biological forces on mother's health have adverse effect on her pregnancy and can result on delivery of premature or low weight or sick child. Thus both maternal and infant mortality rates or health status are highly related to each other. Maternal age both the high or low, chronic maternal illness like hypertension, gestational diabetes or asthma etc. , lack of nutritious food or consumption of lowly nutritious food, infections of various reasons like STDs, cervical and uterine infections or asymptomatic bacterial vaginosis, stress associated with poverty, racial discrimination, unemployment, low income or of any type, unwanted pregnancy, smoking and use of other drugs or the use of illicit substances; low quality prenatal care etc. are the factors that directly or indirectly associated with both maternal and infant mortality rate (Rivera and Synder et.al. 2005, 6-10). Hence, these problems could be ameliorated if the pregnant mothers are given proper care and attention by the family, society and the government through its health organizations implementing better health policies.

Beyond the above mentioned causes, there are some other causes that contribute on high maternal and infant mortality rates. Some of these issues are difficult to handle by the general people no matter if they reside in developed or developing countries. The untimely delivery and multiple births accelerate the chances of both maternal and infant death. In addition, congenital malformation, deformations and chromosomal abnormalities boost the chances of delayed delivery, painful pregnancy or delivery, or birth of underdeveloped child. According to Rivera and Synder the diseases like Sudden Infant Death Syndrome (SIDS) and Respiratory Distress Syndrome (RDS) have become the causes for high infant mortality rates (Rivera and Synder et.al. 2005, 10-12).

Both the level and pattern of maternal and infant mortality in a population group are important indicators of the status of maternal and infant health. "Reliable measures f these mortality rates and the causes and correlates are essential for successful planning in maternal and child health programs as well as in fertility regulation programs" (Khan 1996, 7).

Over the past two decades, the high level of maternal mortality and infant mortality in developing countries has increasingly been recognized as an urgent public health concern. In 1987, the Safe Motherhood Conference in Nairobi, Kenya, drew attention to maternal mortality, and the issue has remained on the international agenda ever since. A Maternal Mortality and Morbidity (MMM) study was conducted in Nepal in 1998 as part of the determined focus on maternal mortality. The study was designed to gain a better understanding of the causes of death for women of reproductive age. The study was popularly called Nepal Family Health Survey (NFHS). According to the study the maternal mortality rate in the year 1996 was 539 per 100,000 live births.

"One of the eight Millennium Development Goals (MDGs) that has made some progress, albeit slow, is MDG 5: Improve maternal health. The two targets for assessing MDG 5 are reducing the maternal mortality ratio (MMR) by three quarters between 1990 and 2015, and achieving universal access to reproductive health by 2015. The United Nations (UN) Secretary-General has launched the Global strategy for women's and children's health, to mobilize commitments by governments, civil society organizations and development partners to accelerate progress towards MDGs 4 and 5 (1)" (WHO 2010).The Millennium Development Goal-Five (MDG-5) aims to improve maternal health, with the target of reducing the 1990 maternal mortality ratio (MMR) by three quarters, by 2015. That is, on the basis of the known data the maternal mortality rate of Nepal is to be reduced to 213 by the year 2015. The Government of Nepal (GON) is committed to achieving this goal and

developed a national Safe Motherhood Plan of Action (SMPOA) in 1994. Since then, safe motherhood has been a national priority for Nepal (Lamsal, 2011).

According to the Nepal Demographic Profile 2012 the current infant mortality rate (IMR) is 44.54 per 1000 live births. While the maternal mortality rate, as calculated by the United Nations Development Organization, is 2.29 per 1000 live births and the Millennium Development Goal in Nepal aimed to reduce it to 2.13 by 2015 AD (CIA Fact book, 2011). After the implementation of Millennium Development Goal in 1990, many Asian-countries with high maternal death per year saw a significant drop-down in the number. Sri Lanka, one of these countries having better status of maternal health compared to other countries, reduced the maternal mortality rate from 85 to 74 per 1000 000 live births in first five year reached to 74 from 85 per 1,00,000 live births. The number reached to 58 in 2000, 44 in 2005 and 35 in 2010. In the same period, the rates have been terribly high in Nepal. In 1990, the maternal mortality rate of Nepal was 770 per 1, 00,000 live. Although there has been considerable improvement in maternal mortality rates (550 in 1995, 360 in 2000, 250 in 2005 and 170 in 2010) the rate is still high. The infant mortality rate between 1990 and 2010 has the same fate (CIA Fact book, 2011).

In the Same way, Sri Lanka has 24 out of 1000 live births in 1990, 20 in 2000, 16 in 2000, 14 in 2005 and 11 in 2010. During the same period, Bangladesh, another poor South Asian country has (97, 79, 62, 49 and 39) infant mortality rate consecutively. Bangladesh had the highest infant mortality rate among these three countries in the year 1990, while Nepal had 108 per 1000 live births. The number has been decreased to 64 in 1995, 50 in 2000, 48 in 2005 and 41 in 2010 (CIA Fact book, 2011) but this is not sufficient because the loss of premature lives is considerably high. The statistics show that the differences in infant mortality rates in every five years period since 1990 have been visibly narrowed.

1.1. Theme and Research Question

Theme of my thesis is: Central Development Region has comparatively lower maternal and infant mortality rates in comparison to the Far Western Development region of Nepal. It is because of the available health services and health personal in these two regions. Maternal and Infant mortality rates are directly related to the status of health facilities. Central Development Region is more feasible than other development regions in many aspects. Most of the government and private health services are located in central development regions. Because of the geographical difficulties and lack of modern facilities, the health services in the far western development region is of low quality that has directly resulted in low health

status of the people residing in this area. My assumption is that, the easier and the more affordable the health services, the lower the maternal and infant mortality rates. Differently, the quality and the number of the health organization do have direct impact on the maternal and infant mortality rates.

The thesis aims to answer the following research questions:

a. What are the trends of maternal and infant mortality rates of Far-western and Central Development regions of Nepal?
b. Does the under availability and inaccessibility of health services have any relation with high maternal and infant mortality rates in Far-western Development Region than in Central Development Region of Nepal?

1.2. Background

Nepal is among the least developed countries in the world, with almost one-quarter of its population living below the poverty line. Agriculture is the mainstay of the economy, providing a livelihood for three-quarters of the Nepali people and accounting for about 1/3 of GDP. Poverty is rampant especially in rural areas, gender disparities; unemployment, HIV/AIDS, child mortality and health related changes are key development constraints **(**WHO, 2004**).**

With development perspectives, Nepal has been classified into 5 development regions. The Far Western Region covers 19,539 km and comprises two zones, the Seti and Mahakali. It has nine districts with the regional headquarters at Dipayal, Doti district. The Far Western Region is remote and developmentally challenged. Some 44 % of people in the Far West Hills and 49% in the Himalayan districts live beneath the poverty line. The region has limited access to basic services and increasing services is challenging due to the difficult topography. The region has complex socio-economic structures and there is both widespread gender and caste based discrimination (UNFCO, 2003).

The remoteness of different regions and the inadequate healthcare facility are life threatening to women experiencing reproductive stages in Nepal. Among the five development regions of the country, the Far-Western Region is the most remote and the least developed. It is calculated that compared to the Far-Western Region, all other regions will have higher chance of survival for women going through maternity process (Suwal, 2008). The women of this region get early marriage. Not only this, they do not have good health services and

knowledge. Only 23% get the antenatal care during their pregnancy. This unsafe delivery leads high maternal mortality (Gurung, 2010)

Mortality rates in the Mountains are much higher than they are in the Terai or the Hills. The ratio of infant mortality is 70 (1996-2000),60 (2001-2005)and 46 in (2006-2010).For example, infant mortality declines from 70 deaths per 1,000 live births in the 10-14 years preceding the survey to 60 deaths in the 5-9 year period preceding the survey and to 46 deaths in the most recent five year period. A similar trend is seen for the other mortality indicators. However, comparison of mortality data from the four past Nepal District Health Surveys indicates that while mortality has been declining in the past, there has been a slow pace in the most recent years (Statistical appendix 5).

The millennium development goal explains that, "the direct causes of maternal deaths are hemorrhage, infection, obstructed labor, hypertensive disorders in pregnancy, and complications of unsafe abortion. There are birth-related disabilities that affect many more women and go untreated like injuries to pelvic muscles, organs or the spinal cord. At least 20% of the burden of disease in children below the age of 5 is related to poor maternal health and nutrition, as well as quality of care at delivery and during the newborn period" (http:// www.unicef.org/mdg/maternal.html). A collective study of government of Nepal and United Nations Country Team of Nepal mention that 'delays in seeking, reaching and receiving care' are the major challenges related to high infant and maternal mortality. The Millennium Development Goal Progress Report-2010 documents that 73 percent of the total births still take place at home in Nepal (45). When the delivery complication begins, the first priority is given to natural birth at home with or without the help of midwives. Only if the situation becomes worse, they are taken to the hospital. The situation even deteriorates because of the lack of proper transportation facility and difficult geographical constraints. Thus, most of the women arrive at health station in a critical condition (MDGs Progress Report 2010, 44).

Social Scientists admit that maternal mortality is an important, complex, and neglected field of study in the developing countries, which has only in the late 1980s been recognized as a public health problem (Boerma, 1987)**.** Estimation of maternal mortality levels is complicated, especially in a country such as Nepal where physical and health infrastructures are inadequate, and complex traditional cultures predominate.

First, very young and very old mothers are at risk, especially if they have poor access to prenatal care. Second, short birth spacing can increase the risk faced during delivery. Third, complications during pregnancy and childbirth can result from malnutrition, which is an

especially acute problem in South Asia. Fourth, empowered, literate, or educated women are more likely to avail themselves of reproductive or maternal health services and are more likely to possess better maternal skills. Fifth, cultural norms or traditions can have an important impact on healthcare practices such as delivery in homes, use of contraception, or intra-household distribution of expenditures. Sixth, access to quality healthcare is essential if women are to obtain help from trained professionals: not only must geographic coverage be adequate, but trained staff and medicines must be available.

Poor families are at further risk because the above determinants reinforce each other and can have a greater impact when combined with household poverty. Poor families may delay seeking emergency obstetric care when complications arise, not only because of financial constraints but for lack of information or knowledge about the severity of the problem. Poor families in remote areas may have difficulty accessing maternal health services because of difficult terrain or lack of transport, and they may experience gender, caste, or other forms of discrimination at the healthcare facility. These results argue for improvements in education and empowerment, nutrition, utilization of health institutions for delivery, contraception, and utilization of healthcare services for women. In addition, promoting late marriage72, to avoid young pregnancies, is desirable (MDG in Nepal, 2007)**.**

Nepal's Safe Motherhood Program is coordinated by the Family Health Division of the Directorate of Health Services of MOH, within the context of the National Reproductive Health Program. Under this program a Safe Motherhood Committee has been established, in which most stakeholders participate and contribute, amongst others, to policy and strategy development. The strategy that was adopted to reduce maternal mortality focuses on increased access to family planning, essential obstetric care, essential neonatal care, comprehensive safe abortion services and skilled birth attendants (SBAs). This programme made significant progress. It sets the target of reducing maternal mortality rate 134 by 2017. In the same way Skilled Birth Attendance policy was endorsed in 2006 and the government of Nepal has made the commitment to training and developing doctors and nurses, midwives and other required manpower (Nepal MDGs Progress Report 2010, 43).

To control morbidity and mortality, the government has initiated several child survival programmes including the Community Based Integrated Managemtn of Childhood Illness (CB_IMCI), the community Based Newborn Care Packages (CB-NCP), and the National Immunization Package (NIP) (Nepal MDGs Progress Report 2010, 42). Other programmes such as human resources for maternal newborn and child health, technical and vocational

program, auxiliary health workers, health assistances, primary health care centre, district hospitals, zonal, sub zonal and regional hospital have been established (MDG in Nepal, 2007).

1.3. Relevance of the Study

The statement 'Every four hour, day in, day out, a jumbo jet crashes and all on the board are killed. The 250 passengers are all women, most in the prime of life, some still in their teens…' (WHO, 1996) connotes the pathos of pregnant women. Maternal and infant health has a particularly close relationship with the right to the highest attainable standard of health. Almost all cases of maternal mortality are preventable. "An estimated 74% of maternal deaths could be averted if all women had access to the interventions for preventing or treating pregnancy and birth complication in particular emergency obstetric care" (Hunt and Mesquita 2007, 3). It is obvious to many practitioners that professionalization of delivery care is key to reducing maternal mortality (Jahn, 2001). Deliveries are far safer with professional assistance and that when a serious problem appears a pregnant woman should have access to an appropriately equipped health services. For this we need to have adequate health facilities with required equipments and proper referral system in case of necessary to reduce maternal mortality rates.

In addition, many studies have shown that preventing the bulk of maternal deaths requires curative care, i.e. using clinical services to treat conditions as they arise to prevent them from leading to death (WHO 1996).

Most of the maternal deaths occur in poor countries like Nepal where most of the deliveries still take place at homes without any support of TBAs. The major portion of the death takes place because of the inaccessibility of health care services because they are scarce or do not have enough required equipments for safe delivery or because they don't have skilled birth attendants practicing there. In this regard this study tries to penetrate the availability of health services comparatively in Far-western and Central Development regions of Nepal.

By comparing the far western and the central development region the study is able to focus on substantial variation within these two regions. The comparison helps us to understand if the status of health services is directly co-related with maternal and infant mortality rates in Nepal. If Nepal needs improve the maternal and infant health, health services should be available at the time of need before it becomes too late. If health institutions are too far, if they are ill-equipped and run by non-professionals, if there hasn't been any transportation

facilities the chances of finding ways to decrease the gap between women and services for rapid and appropriate response to the obstetrical complications that cause death is low.

1.4. Limitation of the Study:

The study is narrowed down in the area of maternal and infant mortality rates of Far Western and Central Development regions of Nepal in addition to occasional national and international examples. This is a work solely related with the rate of mother and infant mortality in comparison with the status of available health services. It tries to make the overall survey not focusing the issues like caste (Brahmins, Chhetri- so called higher castes and dalits-so called lower castes and untouchables), class (higher class-rich or lower class-poor) and other factors between men and women. It focuses only on health related issues concerned with maternal and infant health. It focuses the Far Western Development Region in occasional comparison with Central development region of Nepal. The comparison will be basically based mostly on the comparative units like past and present status of availability of health services and their status generally from the beginning and implementation of MDGs 5 to till the date. Beside this, the literacy rate, topography, transportation, communication, status of employment and cultural and economic aspects will have been taken in to the consideration.

1.5. Structure of the Thesis

The thesis is composed of three chapters following this introductory chapter. The first chapter following this chapter is devoted to methodology and the design of the study. It mentions the research design, approach of qualitative interpretation and content analysis and ways of searching related literature and the basis of comparative analysis between Far-western and Central Development Regions of Nepal. The third chapter is the crux of the thesis. It is composed of available related data and information and findings related to the topic. The data are all related to maternal and infant mortality rates and their trends in Far-western and Central Development Regions. The data (past and present) are presented in the form of various diagrams so that they could be understood easily and provide the real status at first glance. The comparative units are made on four basic components. They are availability of health institutions, antenatal care, place of delivery and postnatal care status. This chapter further deals with the government policies, their objectives and implementation period of such policies. In other words, this is the main chapter that deals with the research question put forth in 1.2. Chapter four is the concluding chapter. It will reiterate the findings and conclusion mentioned in the third chapter.

CHAPTER TWO

Methods, Data and Theory

In this chapter I describe some methodological consideration and data sources on which this thesis is based. In addition, the process of searching and selecting appropriate literature and the methods used to review the literature.

2.1 Research Design

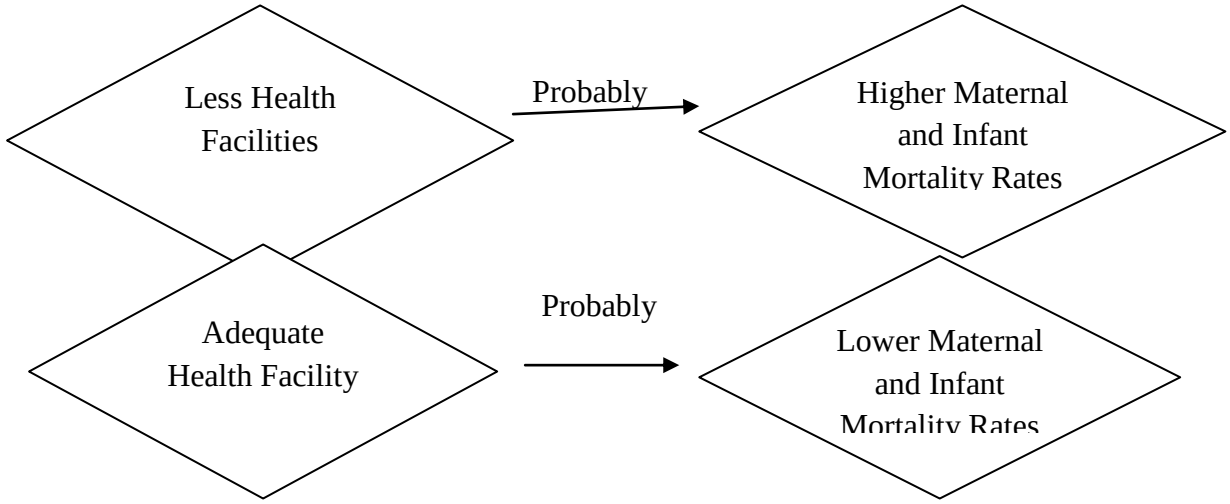
Research design enables us to foresee the thesis in its limited framework. "A research design is not just a work plan. A work plan details what has to be done to complete the project but the work plan will flow from the project's research design. The function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible" (de Vaus 2001, 9). In this thesis I aim to effectively address the research question that I put forth as unambiguously as possible. For this, I review the adequate literatures that are related to Maternal and Infant Mortality rate of Far western Development Region and Central Development Region of Nepal. In addition I will search for other material in order to document and assess the accurate status of the available health services in both of the regions.

The study is based on the literature review where the published books, reports, journals, e-books and previous master theses. This work follows the descriptive research method as it tries to present the secondary data and makes the analysis to yield the appropriate answer to the research question. "Descriptions can be concrete or abstract. By demonstrating the existence of social problems, competent description can challenge accepted assumptions about the way things are and can provoke action" (Gimblett 2006, 1).This study is the amalgamation of both qualitative and quantitative research design namely mixed research design. One of the important things to be understood is that this thesis does not include the data based on primary sources, hence, the reliance on secondary sources.

In the words of Gimblett "good description is fundamental to the research enterprise and it has added immeasurably to our knowledge of the shape and nature of our society" (Gimblett 2006, 1). There is a correlation between a number of factors related to maternal and infant mortality. The causes range from illiteracy, poverty, traditional values, social norms, and various other factors. The chance of infant mortality rate is highly cohesive to the maternal mortality rate. My approaches is to measure and or document and compare the maternal and infant mortality rates in relation with available health facilities in both Central and Far-

western Development regions of Nepal. While I was working on the title, I was constantly hit by the by the idea that both lower health facility (I mean the health facility provided by the under educated personals and unequipped health station) and or inaccessibility of health services in the time of need (because they are far from the rural villages that are not connected with the roads. Though, the patients reach there on time, there isn't availability of qualified health professional and required basic equipments) do have high relation with the higher maternal and infant mortality rates. Far-western Development region has less health facilities in comparison with Central Development Region, which consists mostly of rural areas, thus, has high maternal and infant mortality rates. The diagram below shows the relationship between the availability and status of health services and maternal and infant mortality rates. Diagrammatically,

Figure 1: Health Facility versus Maternal and Infant Mortality Rates



There are two ways of thinking about causes: deterministically and probabilistically. Deterministic causation is where variable X is said to cause Y if, and only if, X invariably produces Y. If the Lower Health Facility in the above diagram is X, and if it causes to happen 'Y', that is the high infant and maternal mortality rates, it would be deterministic in nature. That is, when X is present then Y will `necessarily, inevitably and infallibly' occur (Cook and Campbell, 1979:14). Though they (status of health facilities and maternal and infant mortality rates) have direct relation, the higher rate of maternal and infant mortality rates is not always the result of lower health facility. "The complexity of human social behaviour and the subjective, meaningful and voluntaristic components of human behaviour mean that it will never be possible to arrive at causal statements of the type `If X, and A and B, then Y will always follow'" (Gimblett 2006, 5).

Most causal thinking in the social sciences is probabilistic rather than deterministic (Suppes, 1970). That is to say, we work at the level that a given factor has its positive or negative impact on the probability of a particular outcome. In the context of this thesis, the availability and the status of available health services affects the maternal and infant mortality rates positively or negatively. The probabilistic explanations can be improved by specifying conditions under which X (status of health services) is less likely and more likely to affect Y (maternal and infant mortality rates). Gimblett asserts that human behaviour has a double sided character both willed and caused. People in different geographical location construct their social world taught according to their tradition, culture, economy and other factors and there are creative aspects to human action. Thus, it is almost impossible to decide that human behaviour is determined. To clarify this further, people living in two different culture and location have greater probability to take the same thing in different ways and to apply different measures to get rid of that. 'When the behaviour is not deterministic we cannot achieve deterministic explanations but probabilistic. However, we can say that a given factor may increase the likelihood of a given outcome but there will never be certainty about outcomes' (Gimblett 2006, 5).

2.2 The approach of qualitative interpretation and content analysis

This study will be based majorly on qualitative research taking the support of quantitative research. I am reviewing literature focusing on meanings backed up by available quantifiable data (Chambliss and Schutt 2006, 196-197). In the research question, I attempt to explore the current status of infant and maternal mortality and the factors that are responsible in the given phenomenon. The study is, therefore, mainly exploratory. By searching and selecting the representative literature, I am collecting data and, by drawing out the main arguments, I generate findings from the specific data, hence the research may be seen as inductive (ibid, 9). While conducting this research I will take into consideration several issues. In the literature review I will examine the secondary data, and subjectively selected and interpreted units of analysis. I will relate my thesis with different approaches i.e. positivist (historicism), interpretivist etc.

"Positivist work seeks to identify qualitative data with propositions that can then be tested or identified in other cases, while interpretive work seeks to combine those data into systems of belief whose manifestations are specific to a case"(Lin 1998, 181) . He further explains that discovering causal relationships is the province of positivist research, while discovering causal mechanisms is the province of interpretivists. Thus, as Lin suggested I tend to apply

the combinations of positivist and interpretive approaches, both at the level of thought experiment and in actual data collection and analysis. Throughout, I draw my examples from recent studies of maternal and infant mortality rates in relation to available health services, an area that has gained the international attention (and the Government of Nepal and other popular international non-governmental agencies have put their unprecedented effort to reduce the mortality rates. The issue has been included in Millennium Development Goals of United Nations as goal 5. The government of Nepal, local Non-Governmental bodies (NGOs) and International Non-Governmental Organizations (INGOs) have put efforts to extend awareness about maternal health and to upgrade the status of health services in Nepal. Beforehand, though it was recognized as a major national problem, no such activities were carried out.

According to Taylor, hermeneutics is the theory of interpretation, and interpretation and meaning must be seen in the context of the subjects' references (Hart 2005). "A major theme of contemporary hermeneutic philosophy is that a person's understanding of his/her life experiences always reflects broader cultural viewpoints that are implicitly conveyed through language. In these terms expressions of personal meaning should be viewed as self-interpretations in which these more general cultural viewpoints are adapted to the unique contexts of one's life" (Thompson et al 1994, 432). Taking this in consideration, reviewing and interpreting literature within the social sciences, and thus this study is, in my opinion, within the hermeneutical approach. In this respect, the thesis is not based on the hard facts, but on readings of meaning, which again are influenced by both the writer's (of related articles) and the researcher's (my) self interpretation, our previous experiences, knowledge, readings, culture, values and other references in our lives (Martin & McIntyre, 1994, chapter 13).

2.3 Searching and selecting literature

To answer my research question, the basis of the study has to be valid, reliable and authentic. According to Chambliss and Schutt, valid research should be supported by indicators measuring or observing what is intended. Reliability refers to measurement procedures yielding consistent scores (Chambliss and Schutt2006, 71-74). To further ensure a reliable and valid research, searching and selecting literature will be done systematically. I will use Google Scholar in my initial search for reliable data. Because of the limitation of the time and space available, I will focus on journals, articles, documentary, UNDP reports, UNICEF reports, GTZ reports and the different related publications of Nepal Government.

The given search words were used to access the relevant articles, reports, journals and books in 'Google scholar'*: Maternal Mortality +Nepal, Infant Mortality +Nepal, Status of Health Services in Nepal, MDG 5 + in context of Nepal, Central Development Region of Nepal, Western Development Region of Nepal, Research Design, Probabilistic and Intrepretativist approach, hermeneutics* etc. including the independent search in Google search engines *websites of UNDP Nepal, UNICEF Nepal, GTZ Nepal, CBS Nepal, Ministry of Health of Nepal.* The search provided abundant articles, journals, books and reports. Considering the literature, the first findings of articles consisted of arguments enlighten merely some aspects of the causes that hugely affected the maternal and infant mortality rates debate, but referred to other literature that were narrowed down to status of the health services and its impact on maternal and infant mortality rates of both Central and Far-Western Development regions of Nepal. So to capture a broader picture I have read several articles and journals.

The selection of the literature was conducted following certain criteria. To be relevant as aspects of the current debate, the literature first and foremost had to be about the topic and to be fairly recent. I therefore, read abstracts, list of contents, browsed through articles', and read several thoroughly to make a choice. I looked at the authors' background, citations on their literature, and how frequent their names showed up during the searches. The final selection was completed after deciding on the main categories focused on the literature, and according to the space available in the thesis.

2.4. Comparative Analysis

The study is based on comparative analysis of infant and maternal mortality rate in relation with availability of health status between far western development region and central development region of Nepal. The comparison is basically based mostly on the comparative units like past and present status of availability of health services and the facilities that they provide. Beside this, the literacy rate, topography, transportation, communication, status of employment, cultural and economic aspects have been considered to make the study more effective and significant.

The literature review is in the crux of this work. The comparison has been made on the basis of the literature that I assessed. According to Hart, a literature review can be conducted in several ways. "To analyze the literature you can critically assess definition and concepts, evaluate methodology, consider agreements and disagreements, develop new understandings through deconstructing categories, and draw up conclusion" (Hart 2005,153). Hart's approach is used as a framework for this analysis, but since it was not feasible or relevant to look at all

the features, they are prioritized to answer the research question. To better understand the essentials of the debate, it is found necessary to compare the various pieces of literature. Kjeldstadli describes "the method of comparison as looking at similarities and differences of, for instance, corporations, system, or processes, in order to explore issues and problem areas, and possibly identify causes. The variable must be synchronized in time and made comparable as objects or phenomena" (Kjeldstadli 1988, 437-438,440). In this case, the objects of comparison are the works of literature and the findings within the literature. Taking this in consideration, all of the articles' books and journals are chosen based on their relevance to the topic, thereby concerning High Infant and Maternal Mortality Rate and Health Services: A Comparative Study between Far Western and Central Development Region of Nepal.

To further explain the method of comparison, Kjeldstadli refers to John Stuart Mill and his method of argument and difference, where the first concentrates on finding the similarities and the later focuses on the differences (Kjeldstadli 1998, 437-439). In study, I use both methods, since I seek to identify the various causes of maternal and infant mortality rates and their data and try to focus on the literature that show the cohesion with status of health services. The different aspects are covered by literature with diverse methodological approaches. These are not compared, but to test the foundation for the arguments and results, they are to some degree described and evaluated. Taking Ragin's words in mind "comparative work has mainly be done through documentary research and by sifting heavily aggregated, national materials" (Ragin 1994, 5), I take the authentic national materials published by Ministry of Health of Nepal, and Central Bureau of Statistics of Nepal and other bodies of Nepal in consideration. Finally, the results and opinions are not measured as one favored at the expense of the other, but rather discussed theoretically.

CHAPTER THREE

High Maternal and Infant Mortality Rates in CDR and FWDR and Health Services

3.1. Overview of Nepal and two Study Regions

Located in the Northern part of the earth houses the highest peak of the world Mt. Everest and the birth place of Buddha, Nepal is a small land-locked country surround by. India borders Nepal to the South, East and West parts while China to the North. Though Nepal is a relatively small nation (it covers 0.03% land of the world), it contains huge variation in the basis of topography and bio-diversity. Nepal is 885 km long on East-West direction having its breadth 193 km on North South direction.

Geographically, Nepal has been classified in three divisions from East to West, the middle mountainous region, the Southern plain or Terai region and the Northern hilly region. The hilly region of North includes eight peaks higher than 8000 metres. The mountainous region is dominated by many high to low mountain ranges, numerous valleys and lakes. Kathmandu, the capital of Nepal is one of the valleys (Shaha 1975).

On the Administrative basis the country is divided in five development regions namely, Eastern Development Region, Western Development Region, Central Development Region, Mid-western Development Region and Far-western Development Region. There are fourteen zones altogether in five development regions. The Zones are further subdivided in seventy five districts. As a whole, there are fifty eight municipalities and three thousand nine hundred and fifteen Village Development Committees (VDCs) in Nepal. VDCs resemble the lowly developed rural areas while Municipalities represent fairly developed city areas (CIA World Fact Book).

According to the population census of 2011, the total population of Nepal is 2, 64, 94, 504 among which 1, 28, 49, 045 are males and the rest females. Out of the total population, among 25.16% people still live under the poverty line. This country has the annual population growth rate of 1.35% (CBS Report 2011).

3.1.1. Comparative Overview of Far Western and Central Development Regions

In this comparative overview this study aims to unravel the possible differences that lie between central and far-western development regions and that act as hindrances to make better use of the services for saving maternal and infant lives. The comparisons are made on the overall physical features of these two regions like the size, poverty, literacy, HDI,

contraceptive prevalence rate, fertility rates, health care consumption rates, distance of the nearest health facilities, including the geographical differences between them.

3.1.2. Comparison on the basis of Geography, Productivity and Population

Far western development region is one of the five development regions of Nepal. It is located in the western part of Nepal and it has the total area of 19,539 square kilometres. This region comprises two Zones namely Mahakali Zone and Seti Zone. Mahakali Zone consists of four districts and Seti Zone five. Diagrammatically,

Table 1: District Distribution of Far-western Development Region

Far-western Development Region-Nepal	
Mahakali Zone	**Seti Zone**
Baitadi District	Achham District
Darchula District	Bajhang District
Daduldhera District	Bajura District
Kanchanpur District	Doti District
Total Districts: 9	Kailali District

(Wikimedia Foundation, inc.)

The Far Western Development Region is remote and developmentally challenging because of its complex topography and complex socio-economic structures. Most of the villages are located in very remote areas and thus, inaccessible. However, almost all district headquarters that lie in this region are connected to the national road network. Five of them are through paved roads and four through earthen roads (Nepal Demography and Health Survey 2006). According to the report of Nepal info Database 2009 report, about 44% of people in the Far West Hills and 49% in the Himalaya districts live below the poverty line.

The districts lying in FWCR are at high risk of natural disaster and calamities. In the year 2013 alone around 20 people were killed, 8 were missing, about 257 families became homeless, 2000 homes were inundated, and about 600 homes were at high risk of being swept away due to continuous rainfall for 3 days and its aftermath result like flood and landslides (http://www.ekantipur.com/2013/06/19/headlines/monsoon-fury-claims-at-least-20-many-missing/373488). The rescue task and distribution of relief goods are very difficult as many of such natural disaster prone areas are not linked to the road facilities.

On the other hand Central Development region has the total area of 27,410 sq.km and its' headquarter lies in Kathmandu, the capital city of Nepal. This region comprises three

administrative zones namely Bagmati, Narayani and Janakpur which are further sub-classified in 19 districts. It incorporates all three eco zones-mountain, hill and plains. Central Development has 1,119 Village Development Committees (VDCs), 17 Municipalities, 2 Sub-Metropolitans and 1 Metropolitan. The diagram below puts light on the geographical division of Central Development Region:

Table 2: District Distribution of Central Development Region

Central Development Region-Nepal		
Bagmati Zone	**Narayani Zone**	**Janakpur Zone**
Bhaktapur District	Bara District	Dolkha District
Dhading District	Chitwan District	Mahottari District
Lalitpur District	Makawanpur District	Ramechhap District
Kathmandu District	Parsa District	Sarlahi District
Kavrepalanchock District	Rautahat District	Sindhuli District
Nuwakot District	**Total Districts: 19**	
Rasuwa District		
Sindhupalchock District		

(Source Wikimedia Foundation, inc.)

Bagmati Zones has 9 districts, Narayani Zones 5 districts and Janakpur Zones 6 districts. Kathmandu, Lalitpur and Bhaktapur Districts are collectively called the Kathmandu valley. They are small but highly developed. Kathmandu is the only metropolitan in Nepal and Lalitpur is sub-metropolitan.

The district headquarters of Central Development Region have road connectivity, though some of the roads are highly vulnerable and are in high risk of natural disasters like flood and landslides. The climate also varies from temperate in the hills and valleys to tropical in the plains. This region presents diverse landscape, ecology and biodiversity. Central development region has been regularly affected by natural disasters like flood, landslides, thunderstorms, cold waves, drought, food insecurity, epidemics, fires and earthquakes (An Overview of CR, UNFCO 2011).

Furthermore, far-western region is not able to produce enough food crops to meet its annual requirement though 97.4% of total population is engaged in Agriculture. Total of 8.8% land in this region is agricultural land (CBS Nepal Living Standard Survey 2004). Most of the remote districts lying in this region even have very high deficit production. Among 9 districts of Far

Western Development regions only 2 districts (Kailali and Kanchanpur) are able to produce required food crops.

Most of the people living in this sector own less agricultural land than the people in CDR. Owing less agricultural land and less annual food production, the Far Western dwellers migrate to the district, zonal or regional headquarters and even to the other major cities of Nepal and even to the big cities of India to work as daily wage laborers in construction, manufacturing, trade and transport (UNFCO Dadeldhura, 2011).

The situation quite less harsh in CDR where about 42% of total population is engaged in agriculture (NORAD, 2009), though they vary across the eco-zones: mountains 68%, hill 43% and Terai 37%. Another important fact for less severe condition is due to its ratio of agricultural land i.e. 26.2%. Average size of agriculture land per household is 0.7 hectares. But still, many districts including Kathmandu depend on other districts for its food need (FAO/WFP Food Security Assessment Report, July 2007). Collectively, central development region has the deficit food production of 496052 metric tons per year. The highest deficit production, 236265 metric ton is in Kathmandu while the highest surplus 51788 metric ton is in Bara district (CBS Population Census Report 2011, and FAO/WFP Crop and Food Supply Assessment Mission July 2oo7).

In addition, central development region share good industrial areas that produce garments, pashminas, carpets, handicrafts, herbal medicines, ornaments, leather goods, agro products, precious and semi precious stones, hand-made paper offering various employment facilities making its dwellers able to fill the food deficit gap. This region is famous for small big tourist hotels including many touristic activities. But, people in far-western development region hardly get this chance to earn living in their own areas.

Urbanization and development have been synonymous concepts to the extent that higher levels of urbanization lend to higher levels of development. The structural changes in the economy that accompany the process of urbanization, and the demand and sustainability of higher levels of services and facilities that is possible with higher levels of income contribute to make urban areas locations with better levels of living (Sharma 2003, 384). All human development and economic development indicators tend to be higher in urban than in rural areas. One can notice vast differences in fertility and health related statuses between urban and rural livings (DHS report, 2011). The studies prove that the population in CDR has been centralized while this is vaguely scattered in the rural parts in FWDR. According to one of the studies related to urban/rural population, the CDR has consistently the largest share of urban

population as well as the largest number of urban places. Out of total population of CDR 49.7% people live in urban places while just 7.6% people live in urban places in FWDR (Sharma 2003, 385).

All of the above mentioned indicators prove that far-western development region has been less developed, less accessible and presents less employment rate than central development region in Nepal.

3.1.3. Comparison on the basis of Health Services and Human Development Index

Under this heading this study makes the differences between the two study regions on the basis of some basic human development indices. They are poverty ratio, literacy, health service accessibility and their distances, fertility status and contraceptive prevalence rates. First and foremost, the health facility challenges and lack of awareness among the residents of both of the study regions.

Table 3: Comparative Measures of Far-western and Central Development Regions

Comparative analysis of the Nation, Central Development Region and Far-western Development Region on the basis of Poverty, overall literacy rate, human development index, and contraceptive prevalence rate-2011

Indicators	**Nepal**	**CDR**	**FWDR**
Poverty Prevalance (%)	25.89	23.2	35
Literacy Rate (%)	65.9	65.4	68.4
Human Development Index	0.526	0.530	0.497
Contraceptive Prevalance Rate (%)	49.7	54.7	51.9
Fertility per Woman	2.6	2.5	2.8

(Source: Nepal Life Standard Survey 2011, Nepal Demographic Health Survey 2011)

The above table presents the recent picture of Nepal and its two regions namely Central Development Region and Far-western Development Region comparatively on the basis of five different indicators. The national poverty rate 25.89% is below the poverty rate of FWDR i.e. 35% and higher than CDR i.e. 23.2%. This shows that far-western development region has the highest rate of poverty. This is further supported by the Human Development Index (HDI) ratio. The national HDI is 0.526 and CDR has better situation than national level i.e. 0.530 while FWDR has the least of all three i.e. 0.497. This means the people living in the far-western development region have the least facilities available to them.

In the same way, one woman is supposed to have 2.6 children in her life time in national scenario. This rate is lower in the women of central development region women. They have the probability of having 2.5 children. But, a woman in far-western has the higher fertility rate i.e. 2.8. This is further corroborated by the status of contraceptive prevalence rate. Nationally, there is 49.7% contraceptive prevalence rate and this is lower than both of the study regions. Still, central region has better rate i.e. 54.7% than far-western which is 51.7%. Ironically, far-western development region surpassed the national and central development region literacy rate. The least literacy rate is observed in CDR i.e. 65.4%. This rate is even lower than the national literacy rate that is 65.9%. Far-western development region has the highest of all three, i.e. 68.4%.

Some reasons for the low utilization of maternal health services are a result of the poor quality, unavailability and inaccessibility of services. While the low utilization of maternal health services in Nepal is partly due to the poor provision of services, the problem of non-use of health services is further exacerbated by various other social factors. The sub-health posts and primary health care centers that lie in the VDC levels do not have sufficient equipments and man power to deal complications during deliveries. Only the health-posts and some up-graded sub-health posts can provide limited emergency obstetric cares (EOCs). For the comprehensive services, the case should be referred to either private or district or zonal level government hospitals. The table below calculates the availability of CEOC and EOC facilities in central and far-western development regions of Nepal.

Table 4: Population versus available CEOC and EOCs in FWCR and CDR

Development Regions	**Total Population**	**Available CEOCs**	**Available EOCs**
Central	96 56 985	550	1172
Far-western	25 42 517	18	107

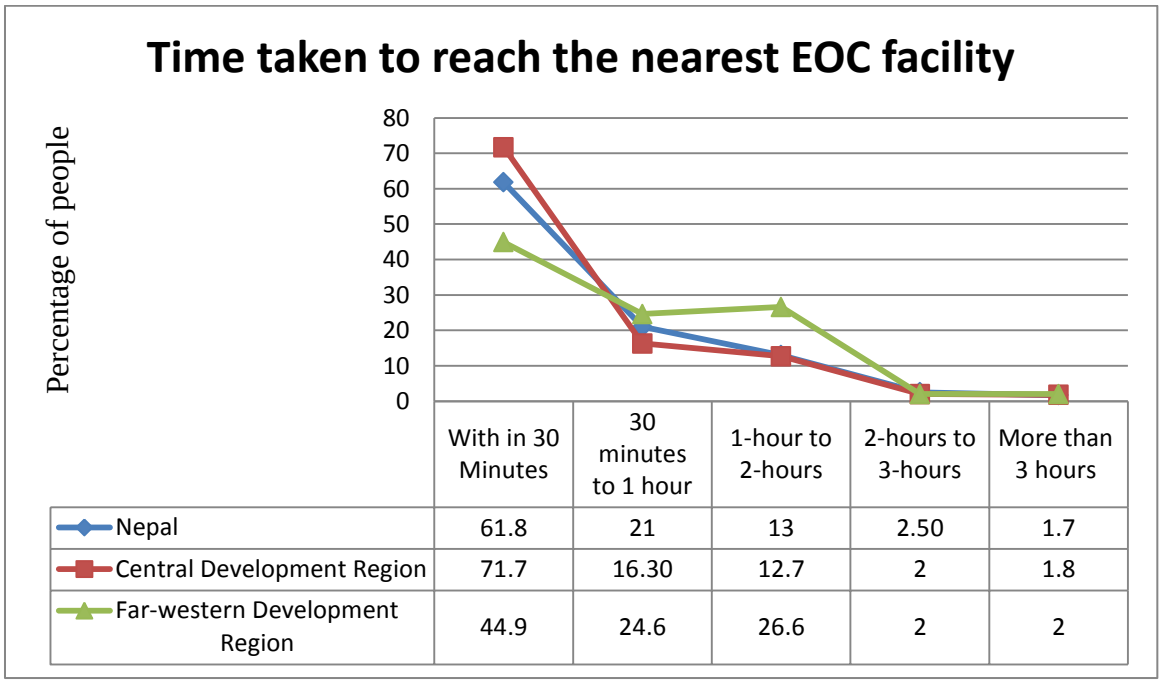
(Source: CBS Census Report 2011 and Far Western Regional Directorate Annual Report 2009/2010)

The table shows the huge variation on the health services in these two regions. There have been 18 CEOCs in far-western development region while this number is more than 40 times in central development region. The population variation is around 1:4 while the EOC variation is almost 1:11. This shows that women living in central development region have high chances of saving lives during the complications related to pregnancy. It is important to

note that there are 9 private hospitals in FWDR while there are 196 modern private hospitals in CDR. Most of the NGO and INGO run facilities are also centralized in central development region i.e. 256. The number of such health facilities in far-west is 40 (www.dohs.gov.np/sites/default/files/1/Annual_Report_2066_67.pdf).

Furthermore, this scenario can be further clarify by the following diagram that presents the accessibility of the nearest health facilities that can provide either comprehensive or basic emergency obstetric cares in both of the regions including national status.

Figure 2: Average time to reach the nearest EOCs in FWDR, CDR and Nepal



	With in 30 Minutes	30 minutes to 1 hour	1-hour to 2-hours	2-hours to 3-hours	More than 3 hours
Nepal	61.8	21	13	2.50	1.7
Central Development Region	71.7	16.30	12.7	2	1.8
Far-western Development Region	44.9	24.6	26.6	2	2

(Source: Nepal Living Standard Survey 2011)

According to the diagram, total of 71.7% CDR dwellers have the EOC facility available within 30 minutes of distance. In the national level, 61.8% of the total population lives within this distance. Ironically, only 44.9% of FWDR dwellers are into this proximity. 24.6% people need to travel around more than 30 minutes up to 1 hour to reach to EOC facilities in FWDR. This ratio is 16.3% in CDR and 21% in National total. Next 26.6% people in FWDR need to travel 1-2 hour to get such facilities while far less people 12.7% in CDR and 13% in national level are this far. Almost same percentage of people lives within 2-3 hours distance in all regions. The ration of the people who need to cover 3 hours or more travelling distances to reach the nearest EOC facilities are 1.8%, 1.7% and 2% in CDR, Nepal, and FWDR respectively.

The health sector challenges in Far Western Development region have been the direct reasons of inadequate number of medical facilities per capita that includes the gaps in health personnel, medicines and equipment. Most of the health institutions are supported by government of Nepal including very small quantity by INGOs and NGOs. The UNFCO 2011 report suggests that acute respiratory tract infection, headache, gastritis, pyrexia, diarrhea, intestinal worms and amoebic dysentery are some of the common diseases among the habitants of Far Western Development region. More than 70% of people in this region do not have access to toilets, thus, use 'open defecation areas'. This percentage is as high as 89% in the mostly rural, mountainous district named Bajhang. The people living in this district still have a strong preference to visit religions healers (Dhami, Jhakri) during their sickness rather than visiting health institutions UNFCO 2011).

3.2. Maternal Health Care System in Nepal

According to national guidelines (UNICEF and MOH 1996), maternity services aim to help families take necessary decisions through health information and counseling to provide basic antenatal and delivery related services to all pregnant women to ensure referral and adequate obstetric care to high risk-mothers and obstetric emergencies (Jahn et.al. 2000). The maternity health care system in Nepal operates at various levels:

The government of Nepal has taken steps to empower families with basic knowledge about pregnancy and get routine help from trained health care providers. They are encouraged to register births including maternal and neo-natal death if any. The communities, on the other hand are supposed to register all births and maternal and neonatal deaths. They need to ensure the availability of MCHWs and ANMs at community level including ensuring transport facility and availability of blood for obstetric emergencies through community mobilization. There present female community health volunteers (FCHVs) and they are to provide some maternal care services for safe delivery. They also need to distribute iron tablets to pregnant women (MoHP, Human Resources for Health, 2010, 10).

Sub-health posts are village level health institutions where MCHWs work. They conduct normal deliveries at home and ensure referral of appropriate cases. They also provide counseling of family planning and post natal services. They record maternal and neo-natal deaths. And, Primary Health Care Centers (PHCCs) provide essential obstetric functions (EOF) like veginal delivery, manual removal of placenta, treatment of anemia, pregnancy induced hypertension etc. Some PHCCs are upgraded as basic emergency obstetric care (BEOC) centers (MoHP, Human Resources for Health, 2010, 13).

The district level hospitals are developed and staffed as first referral facilities and basic emergency obstetric care (BEOC) sites providing all essential obstetric functions (EOF) as per WHO guidelines. They undertake live saving procedures to reduce maternal mortality. The Zonal and Regional hospitals provide one step higher facility as they work as comprehensive emergency obstetric care (CEOC) centers. They provide obstetric and gynecology special services. In the same way, central level hospitals function as tertiary level care centre and CEOC centre providing obstetric and gynecology special care services including facilities for intensive care (ICU). These hospitals also function as training units for special skills in midwifery and obstetric (MOHP, the Cost and Equity Implications 2009, 2).

3.2.1. Nepal Maternal Health Policy and their Objectives

First Long Term Health Policy was implemented throughout the year 1975-1990. This focused on integrated community health (including maternal health) development through primary health care (Dixit 2000, 204).

The National Health Policy was adopted in 1991 with the objective of enhancing the health status of the population of Nepal through extending the access and availability of the primary healthcare system. This program identified Safe Motherhood as a vital component of primary health care to reduce the high maternal mortality ration in Nepal. In addition, it tended to increase investment in MCHWs (Maternal Child Health Workers) and ANMs (Auxiliary Nurse/midwives)-the grass root health workers responsible for providing maternal and child health services. This program also focused to strengthening maternity care including family planning services at all levels of health care delivery system (MoHP, 1991).

National Safe Motherhood Plan of Action was brought in action for three years (1994-1997). This program identified the priority activities for safe motherhood and recognized high maternal mortality rate as one of the major public health problems that enforced the safe motherhood program to reduce the maternal deaths and disabilities setting priorities (MoHP, 1994).

Second Long Term Health Plan is a 20 years long health strategies launched by the government of Nepal in the year 1997. It lasts till 2017. This plan intends to improve health status of vulnerable groups of people ensuring appropriate numbers, types and distribution of technically competent and socially responsible health personnel to provide quality health care (MOHP, 1997).

Safe Motherhood Plan of Action (2001-2015) gives emphasis to establish BEOC (Basic Emergency Obstetric Care) and CEOC (Comprehensive Emergency Obstetric Care) services in all 75 districts of Nepal including increasing access to SBAs (Skilled Birth Attendants) at birth raising emergency fund and transportation facility (Malla and Giri et.al., 2011, 66).

National Safe Motherhood Plan is a fifteen year long plan implemented from the year 2002 and lasts until 2017. It carries the major corps of Safe Motherhood Plan of Action including national and local advocacy to keep safe motherhood on national policy agenda. This plan provides increased access to emergency fund and transportation plus strengthening FCHV (Female Community Health Volunteer) programs by motivation including dissemination of education to FCHVs and mothers for best utilization of available services (malla and Giri et.al., 2011 66).

The Tenth Plan remained through the years 2002-2007. It emphasized the importance of safe motherhood program and expanded various maternal and infant health programs like vaccination, family planning, reproductive health program and training to FCHVs (GoN, the Tenth Plan, 2002, 467).

On the other hand Nepal Health Sector Program Implementation Plan that ran from 2004 to 2009 emphasized provision of 24 hour emergency obstetric care ensuring the presence of Skill Birth Attendants (SBAs) at deliveries. This plan advocated a multi-sector approach in safe mother hood program (NSHP-IP, 2004:3-4).

National Policy of SBAs and National Safe Abortion Policy came into effect from the year 2006. National policy of SBAs addressed the challenges related to human resource development and management, socio-economic and cultural barriers to accessing SBAs and weak referral system. It focuses on the availability of SBAs at every birth and even on the necessary training of them. It develops regulating, accrediting and licensing system for ensuring that all SBAs have the abilities and skills to practice in accordance with the required core competencies (GoN and MoHP, National Policy of SBAs, 2006). On the other hand, National Safe Abortion Policy realized and addressed the casual relationship between abortion and maternal mortality. This policy attempted to protect the rights of women to continue or discontinue an unwanted pregnancy within the legal framework. It also takes initiatives to disseminate the information on legal provision of safe pregnancy termination and the complication of unsafe abortion to policy makers, communities and especially to women of reproductive age (CREHPA, 2000).

Similarly, Safe Motherhood and Newborn Health Long Term Plan (2006-2017) focuse on improved maternal and newborn health and survival especially of the poor and excluded people of Nepal. It aims to improve equity, service, public private partnership, decentralization, SBA Strategy, information management, physical asset, procurement and finance (GoN and UNFPA, NSMNH-LTP, 2006:3-6).

According to the Millennium Development Goal Government has planned to reduce the infant mortality from 93 to 77, and has been investing huge amount in far western region. Other program such as human resources for maternal newborn and child health, technical and vocational program, auxiliary health workers, health assistances, primary health care centre, districts hospitals, zonal, sub zonal and regional hospital have been established (MDG in Nepal, 2007).

3.3. Maternal Mortality: History (Global Issue)

Maternal mortality in Nepal is still high relative to many developing countries. The Nepal Family Health Survey (1996) estimated Nepal's maternal mortality ratio (MMR) to be 539 per 100,000 live-births (Ministry of Health, 1997a), which was the highest among the South-Asian countries at that time (United Nations, 2000). All these years, the strategies to deal with high maternal mortality in Nepal have often been omitted from social and health development policies as in most other developing countries.

Maternal mortality refers to the death of a woman from the causes related to pregnancy. WHO defines it as the death of a woman during pregnancy or within 42 days of delivery by any cause cohesive to or aggravated by pregnancy or its management. The death of a woman could be the result of a complication direct cause or of pre –existing medical conditions that may be worsen by the physiologic demands of pregnancy 'indirect causes'. Direct causes of maternal mortality are unpredictable and they account 80% of total maternal death. Hemorrhage, infection, hypertensive disorders, prolonged or obstructed labor, unsafe abortion are the direct causes. On the other hand, indirect causes account about 20% of maternal death. The risk of adverse outcome can be reduced through parental identification and treatment. Pre-existing medical conditions such as malaria, hepatitis, heart disease, HIV/AIDS, anemia etc can boost the risk of maternal death (WHO 2004).

The maternal mortality rate (MMR) is the total number of female deaths per 100,000 live births from any causes related to pregnancy in a given year .It also includes the death within 42 days of termination of pregnancy irrespective of duration and site of the pregnancy for a

specified year (Hill and Yoonjoung, 2004). Maternal mortality registration initiated in many countries before any of the definition on maternal mortality was internationally agreed upon. Generally, deaths caused by maternal conditions were counted as maternal deaths (Hanson 2010, 5).

Sweden started registering both birth and death in 1749. This has been ongoing uninterruptedly then after. The statistics have been reported reasonable. Initially, the Swedish defined the maternal death "as a death of a woman caused by complications of pregnancy, labor or puerperium". Høgberg in his paper 'Maternal Mortality in Sweden' writes that 'the death cause list was revised several times in the 1800s but it was not before 1911 that a standardized Scandinavian cause of death list was used. Maternal deaths have only been defined according to the International classification of disease since 1951 in Sweden (30).

England and Wales started vital registration system in 1837, but it hadn't been complete then. According to Loudon more than 80% of deaths were registered in 1860s (Loudon 1992, 23). Sending out letters of inquiry during the last quarter of the nineteenth century provided with highly fluctuating maternal mortality rates in England and Wales (ibid). The United States of America was late to start the complete system of death registration thought it was expanded only during the 1910s and 1920s, complete data are only available from the 1930s onward. The actual maternal mortality rate was difficult to count because of the highly scattered and mobile population in the United States (Hanson 2010, 13).

3.3.1. Maternal Mortality in Nepal

In the context of Nepal, we do not find adequate data concerning the maternal mortality rate before the period 1960 (Judith 1986). During the period between 1960 and 1990 different category hospitals were established at district, zone and central levels including health posts and sub health posts at the local or Village Development Committees (VDCs) levels (MoHP 1991). This trend brought about the certain changes in health seeking behavior and approach of health facilities among the Nepalese. But, the health status did not improve as it was desired. Only after the restoration of democratic system in 1990s, government of Nepal initiated several efforts to upgrade the health condition of Nepalese people including maternal and child health (Bhandari 2012, 3).

It is often said that maternal mortality is overwhelmingly due to a number of interrelated delays which ultimately prevent a pregnant women accessing the health care she needs especially in the poor countries. In the context of Nepal all of these three delays have strong

hold as the causes of high maternal mortality rate. Delay 1: Delay in seeking appropriate medical help for an obstetric emergency for reasons of cost, lack of recognition of an emergency, poor education, lack of access to information and gender inequality. Delay 2: delay in reaching an appropriate facility for reasons of distance, infrastructure and transport. Delay 3: delay in receiving adequate care when a facility is reached because there are shortages of staff or because of electricity, water or medical supplies are not available (Maine 1991).

Many studies prove that the postpartum hemorrhage, unsafe abortion, infection, pre-eclampsia, and long obstructive labor as the main causes of maternal deaths. Postpartum hemorrhage and long obstructive labor are generally reported at country-side, while unsafe abortion, infection (particularly hepatitis E), hypertension with pre-eclampsia are observed in the urban areas (Rana et.al. 2009 35, 243-51). This analysis can be further supported by the observation of World Bank and the Ministry of Health of Nepal 'the main direct causes of maternal mortality in Nepal are identified as hemorrhage (anti-partum, post-partum and abortion-related) and birth trauma (ruptured uteri, cephalo-pelvic disproportion and so on) (The World Bank Report 1989 and MoHP 1998). Among these, hemorrhage was found to be the number one cause of death. The World Bank Report 1989, mentioned that complication of pregnancy, childbirth and puerperium were primary causes of hospital admission in Nepal in 1980/81 and 1983/84 with 47 percent admissions accountable to this cause in the latter year.

The two main sources of data providing national level MMR estimates are Nepal Demographic Health Surveys (NDHS)/Nepal Family Health Surveys (NFHS) and the World Health Organization (WHO). Other sources of data on maternal deaths in Nepal include surveillance data from Mother and Infant Research Activities (MIRA) and the Government Health Management Information System (HMIS) data. This study has attempted to access the data from all reliable sources to present the exact status of maternal mortality in Nepal. The first table has been cited by the report presented by the reputed INGOs like WHO, UNICEF, the World Bank and the UN and collective effort to trace the correct trend of Maternal Mortality in Nepal. In addition, the second table is drawn on the basis of the surveys conducted by the government of Nepal in different years.

Table 5: Maternal Mortality Trend in Nepal 1990-2010

WHO, UNICEF, UNFPA, The World Bank and UN Population Division Maternal Mortality Estimation Inter-Agency Group Nepal					
Period	Median Year	**Sources**			
		WHO/World Bank/UNICEF/UNFPA			
		Nepal Total	Central Development Region	Far-Western Development Region	Life Time Risk of 1 Maternal Death in Nepal among every
1988-1992	1990	770	430	1400	24
1993-1997	1996	550	310	990	36
1998-2002	2002	360	210	640	60
2003-2007	2007	250	140	430	110
2008-2013	2011	170	100	290	190

The table shows the maternal mortality trend over the mentioned period. It has tried to find the differences between the total national maternal mortality rate including the differences between Central and Far Western Development Regions. Furthermore, it shows the changing scenario of life time risk of a maternal death.

During the period 1988 to 1992 the maternal mortality rate was very high i.e. 770 per 100 000 live births in Nepal. Central Development Region has the maternal mortality of 430 and Far Western Development Region (a staggering) 1400. The life time risk of the maternal death was 1 in every 24 live births. But the MMR rate in Nepal decreased to 550 in the year 1996 and same trend could be seen in CDR and FWDR i.e. 310 and 990 per 100 000 live births respectively. The life time risk of maternal death decreased to 1 per 36 live births. In the same way the maternal death decreased by more than 50% in Nepal and so did with CDR and FWDR in comparison with 1990s in 2002. National total declined to 360 and CDR to 210 and FWDR to 640 creating the decline to life time maternal death risk to 1 in every 60 live births.

Furthermore, the continuous decline could be observed in the following years. The national and CDR maternal mortality rate of 1990 got reduced by almost two third in the year 2007 and even more in FWDR with almost five times decrement in life time maternal death risk at

national level. The fall in maternal mortality rate and risk of life time maternal death have been continuously achieved during the period 2008 to 2013. The national maternal mortality rate is 170 with the mortality of CDR and FWDR 100 and 290 per 100 000 live births respectively. In addition, the data shows that the life time risk of maternal deaths has been significantly decreased to one death per 190 live births.

The table presented below shows the glimpse of the maternal mortality trends from the year 1989 to 2009 depending upon the various studies done under the supervision of government of Nepal. The data are taken from the National Maternal Mortality and Morbidity Survey 2008, Demographic Health Survey (DHS) 2006 and Demographic Health Survey (DHS) 1996.

Table 6: Maternal Mortality Trend in Nepal on the basis of DHS and NMHS

Source	Period	Mternal Deaths	Female Deaths (15-49)	Live Births	PMDF (%)	MMR Per 100 000 live births
National Maternal Mortality and Morbidity Survey 2008	2008-2009	160	1496	69755	...	229
National Maternal Mortality and Morbidity Survey 2008	2008-2009	172	1496	69755	...	247
DHS 2006	1999-2006	39	217	...	18	281
DHS 1996	1989-1996	87	320	...	27	539

The Nepal Demographic Health Survey 1996 studied the maternal mortality rate between the years 1989 to 1996. It presents that the proportion of maternal deaths among all deaths of females of reproductive age (PMDF) to be 27 accounting national maternal mortality rate 539 per 100 000 live births. The PMDF has been calculated divided the total female death of reproductive age by maternal deaths. In the same way the Demographic and Health Survey of 2006 attempted to calculate the maternal mortality rate applying the same theory. According

to the data, the maternal mortality rate after 1996 has been almost halved in the period 1999 to 2006. Total death of the female of the reproductive age i.e. 15-49 is 217 is divided by the maternal deaths 39 and that amounted to be 18% PMDF. This survey concludes the maternal mortality rate during this period was 281.

In the same way, National Maternal and Morbidity Survey has presented the total mortality rate of the survey year (2008-2009) 247 per 100 000 live births. The total live births taken into consideration were 69755. Out of the total live births 1496 female of reproductive age died among whom 172 were recorded to be the maternal death. The total maternal death of this period is lower than the previous years but the reduction in maternal mortality rate is very low. The table shows the sharp decline of maternal mortality rate (almost 48%) in two consecutive time periods i.e. 1989-1996 and 1999-2006. This ratio relegated in hardly 12 % compared the time frame between 1999-2006 and 2008-2009.

In contrast, the same study presents the different maternal mortality rate taking the maternal related deaths 160 instead of 172. Total live births have been same and the death of the females of reproductive age has been remained intact i.e. 1496. This way, total maternal mortality rate has been changed into 229 instead of 247.

Measuring the reliable rate of maternal mortality is a difficult task. Maternal deaths are difficult to investigate because of their comparative rarity on a population basis, as well other context-specific factors, such as reluctance to report abortion-related deaths, problems of memory recall, or lack of medical attribution. Thus, no single source or data collection method is sufficient for investigating all aspects of maternal mortality in all settings (WHO 2006). The DHS estimates have various limitations as it uses the direct sisterhood method to measure the maternal mortality rate. On the other hand, WHO estimates the maternal deaths using the proportion of maternal deaths among all deaths of females of reproductive age (PMDF). This method is not fully reliable either as it takes both numerator and denominator of two different sources (numerator –total female death, from sisterhood method and denominator-estimates of total live births, from the United Nations' Demographic year book (Pradhan and Subedi, 158).

Vital registration and health information system is the traditional and commonly used measure. But, it is weak and often fails to provide an accurate assessment of maternal as it collects data through household surveys. Even estimates derived from complete vital registration systems, such as those in developed countries; suffer from misclassification and underreporting of maternal deaths. This system is very costly and carries the possibility to

result in large confidence intervals. The sisterhood method on the other hand is a survey based measurement technique that reduces sample size requirements as it relies on the information collected through interview about the survival of all their adult sisters. Hence, the sample size requirements are reduced, the problem of wide confidence intervals remains intact. Thus, this technique is not appropriate for monitoring. This method also provides a retrospective estimate rather than a current estimate (Abouzahr and Wardlaw, 2001).

The Reproductive Age Mortality Study (RAMOS) involved identifying and investigating the causes of all deaths of women of reproductive age. This system was successfully applied in countries with good vital registration system. In this system interviews with household members and health-care providers and reviews of facility records are used to classify the deaths as maternal or other. Though, it is the most complete estimation if applied properly, it can be complex and time consuming to take data on a large scale (Hill and Choi 2004, 6). Furthermore, Ramos is not completely applicable in the places/countries where medical certification of cause of death is not available.

Verbal autopsy method is being established by some of the studies. But, this method fails to identify the correct proportion of maternal deaths because it tends to ignore the cases occurred both during early pregnancy period and sometime after pregnancy termination (ibid 6). In search of an exact calculating method of maternal mortality, studies showed interest towards the census data. "A high-quality decennial census could include questions on deaths in the household in a defined reference period, followed by more detailed questions that would permit the identification of maternal deaths on the basis of time of death relative to pregnancy (ibid 6). However, this method is not flawless. It requires the careful evaluation of the data related to recent deaths and they often needed adjustments (ibid 7).

3.4. Infant Mortality Trend in Nepal (Far-western and Central Development Regions)

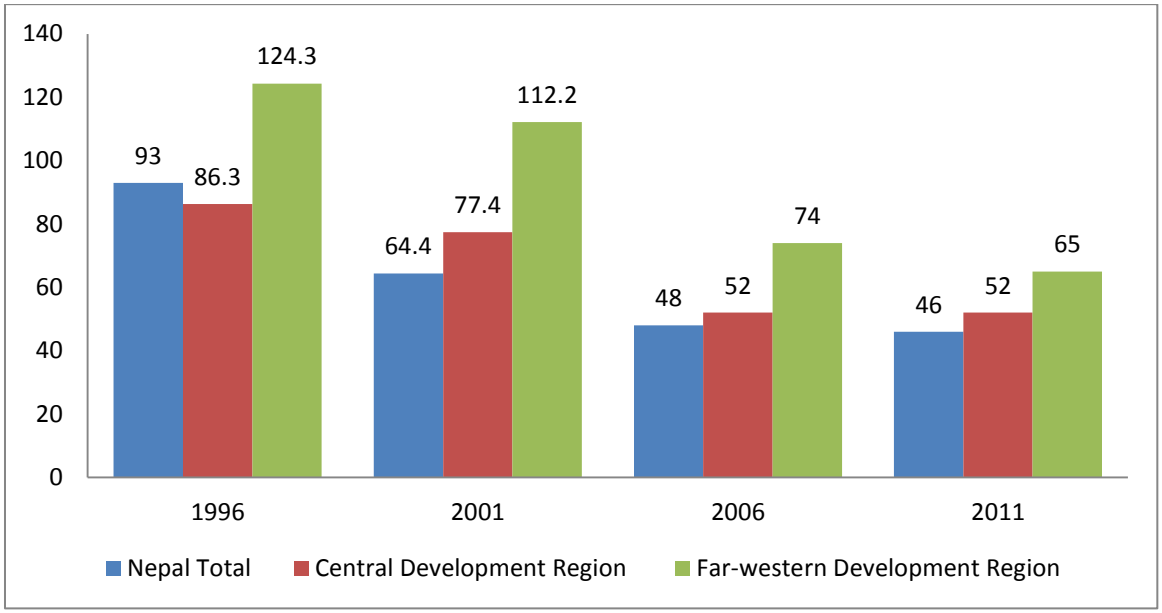
Infant mortality Rate (IMR) is defined as the number of deaths of children less than one year of age per 1000 live births. The rate of infant mortality for a given region is the number of children died under one year of age, divided by the number of live births during the year, multiplied by 1000 (Andrews, Brouillette et.al. 2008, 343). IMR incorporates neonatal, postnatal and prenatal mortalities. Neonatal is the death of a child within 28 days of postpartum. Post-neonatal represents the mortality of a child aged 29 days to one year, while prenatal mortality represents the death of a newborn child up to one week postpartum (ibid). Inadequate basic medical care during pregnancy and after pregnancy is the cause of neonatal mortality. Malnutrition, infectious disease, traditional home delivery and home environment

are the causes of post neonatal and prenatal mortality (Norton 2005 and Andrews, Brouillette et.al. 2008).

Before 1900, infant mortality rates remained between 200 and 300 throughout the world. The infant mortality rate would fluctuate sharply according to the weather, the harvest, and epidemic disease. But, by the early decades of the 1900s the infant mortality rates began to drop sharply as the wide range of improvements began. Better hygiene, cheaper clothing, trend of giving births in hospitals, invention of antibiotics and vaccinations were the major causes for the drastic drop down (Cahalan, 1986).

Globally, an estimated 2.9 million babies die in their first month of life every year (UNICEF 2012). Most of these deaths occur in developing countries like Nepal. The Demographic and Health Survey (DHS) is a nationally representative comprehensive survey conducted periodically in more than 90 countries. There have been four DHS surveys in Nepal, in 1996, 2001, 2006 and 2011 (Pradhan et. al. 1997, MOH 2002, MoHP 2007, MoHP 2012). Every time the DHS survey in Nepal attempted to decipher the infant mortality rates. Though it is still high in Nepal, there has been significant decline in infant mortality rates both in National level and development regions. The below diagram attempts to present the comparative study of Nepal's total infant mortality rates including Central and Far-western Development regions over the period of latest 20 years.

Figure 3: Infant Mortality Trend in Nepal 1996-2010



During the period of the 90s the infant mortality rate of Nepal was 93 per 1000 live births. During this period the infant mortality rate of CDR was 86.3 while it was 124.3 in FWDR.

Far-western Development Region had the highest rate of infant mortality rate among other development rates of Nepal. That is 124.3 infants used die among 1000 live births in the Far-western Development region while 86.3 in Central Development region. We can see that the rates of infant mortality have been in constant decline during the given period. During the year 2001 national total decreased to 64.3 per 1000 live births, CDR to 77.4 and FWDR to 112.3. The IMR of the country fell by 31%, of CDR by 25% but the percent of decline in FWDR is the least among all these places i.e. 4%.

Furthermore, it can be traced that the infant mortality rates of 2006 are National level 46, CDR 52 and FWDR 74 per 1000 live births. National IMR declined by 10%, CDR by 33% and FWDR by 34%. The national total declining level has been slowed down while that of FWDR has been accelerated to reach the highest among other two. In the same way, the rates of IMR of National total, Central Development Region and Far-western Development Region in the year 2011 are 42, 52, and 65 respectively. The rate of reduction of IMR among three places could be seen slow during this year. The highest decline rate is by 12% in FWDR while national total declined by just 4% but the IMR of Central Development Region remained same.

It is important to note that there isn't any recent data available after 2011 till the date of making this study. In many studies the 2011 data are considered to be the latest. Though we see the significant drop down on the rates of infant mortality rates in Nepal including Central and Far-western Development Regions, the rate is still high in comparison with many other countries. 42 infants per 1000 live births die before their first birth day. This number could have been dramatically reduced and many lives could have been saved, but still, whatever the rate is in the present context is sole soothing in comparison the Nepal 20 years back.

Infant and Maternal Mortality rates are always the result of various causes a community practices. To know the real picture of a community on the basis of its mortality rates, it is important to know the entities like prenatal care, antenatal care and the delivery places.

3.4.1. Antenatal Care (ANC) Status in FWDR and CDR

Antenatal care represents the regular check up of a pregnant woman about pregnancy related cases by trained medical personnel. "If sought early in pregnancy and continued up until delivery, ANC can help to avoid adverse pregnancy outcomes" (Pradhan and Suvedi 2010, 10). The National Motherhood Program recommends that at least four ANC visits throughout pregnancy, irrespective of whatever a woman suffers from any complications or danger signs.

In one of the studies, it is mentioned that they make their first visit before the fifth month of pregnancy, while service providers felt that women, esp. from remote rural and marginalized groups, only seek ANC service after six months unless they experience a problem (ibid 156).

Pregnancy is taken to be natural in Nepal. Still regular follow ups with doctor thought to be unnecessary especially in rural and poor areas. The health centers are used only when any complication during pregnancy is appeared. A study made my Suwal pointed out that some groups of women in Nepal do not seek prenatal Care because they think that there is high chance of dying of the infant if they were observed by the doctors when they were in the womb (Suwal 2008).

The data shows the percentage of the women who took the periodic ANC from different levels of trained health workers available within in their areas. Here, HA stands for Health Assistant, MCHW for Maternal Child Health Workers, VHW for Village Health Workers, TBA for Traditional Birth Attendants (local priests or experienced relatives or traditional healers-who are supposed to treat enchanting the sacred formulas). In addition the table also shows the trend of women who do not take any antenatal cares during pregnancy. The percentage of the pregnant women not taking any antenatal care is still big and most of the maternal and infant mortality occur within this group. To make our comparative study clear and easy, the researcher has tried to adjust all the comparative entities like urban and rural, mountain, hill and terai and Central Development Region and Far Western Development Regions. Though, the table presents the total scenario of different comparative units, the researcher explains the comparison between CDR and FWDR.

In 1996, out of total pregnant women 14.9% went at least once to the doctors for their antenatal care in CDR. The rate of visiting doctor for the same reason is just 9.2% in FWDR in the same year. 9.1%, 2.8%, 3.7%, 14% and 0.5% of the pregnant women got at least one antenatal care from Nurse, Health Assistants, Maternal Child Health Workers, Village Health Works and Traditional Birth Attendants respectively in CDR. But, unfortunately, 49.6% of the total pregnant women couldn't get any sort of antenatal care for the safe delivery. In the same way, 14.3% in FWDR got antenatal care from nurses, 1.8% from HA, 2.2% from MCHW, 1% from VHW. The major portion i.e. 71.2% was out of the any kind of antenatal care in FWDR. This represents the severe status of poor health consciousness among the women of FWDR.

Table 7: Antenatal Care Trend in Nepal

Antenatal Care								
Percent distribution of women who had a live birth in the five years preceding the survey by antenatal care (ANC) provider during pregnancy for the most recent birth according to background characteristics 1996, 2001, 2006, 2011								
year	Development Region	Doctor	Nurse/Auxiliry Nurse/Midwife	HA	MCHW	VW	TBA	No One
1996	Central	14.9%	9.1%	2.8%	3.7%	14.0%	0.5%	49.6%
	Far Western	9.2%	14.3%	1.8%	2.2%	1.0%	0.0%	71.2%
2001	Central	18.6%	7.8%	10.1%	2.3%	13.2%	0.6%	47.4%
	Far Western	11.1%	11.0%	5.8%	2.2%	2.6%	0.2%	67.0%
2006	Central	27.8%	18.6%	10.3%	12.4%	2.7%	0.1%	24.1%
	Far Western	10.4%	15.5%	11.5%	34.2%	2.7%	0.0%	25.3%
2011	Central	34.9%	21.6%	14.5%	10.5%	1.5%	0.0%	17.0%
	Far Western	16.2%	45.6%	6.9%	20.0%	0.7%	0.0%	9.5%

The year 2001 shows a little brighter picture of antenatal care. Total of 18.6 percent women got the antenatal care from doctors in CDR while the percentage just lifted to 11.1 in 2001 from 9.2 of 1996 in FWDR. The available antenatal care by the nurse or Auxiliary mid-wives dropped down to 7.8% from 9.1% in CDR and 11%from 14.3% in FWDR. But the care by Health Assistants significantly took upward direction to meet 10.1% in CDR and 5.8% in FWDR in the year 2001. Furthermore, the percentage of antenatal care receivers by maternal community health workers (MCHW) and village health workers (VHW) in the central development region and far-western development regions were 2.3, 13.2 and 2.2, 2.6 respectively. That as a whole contributed to get down the percent of the pregnant women not getting any sort of antenatal care in the year. The percent slightly drop to 47.4% from 49.6% in CDR and to 67% from 71.2% in FWDR. But unfortunately, the percentage of TBA (Traditional Birth Attendants) slightly increased in both of the regions.

The increment in the percent of antenatal care receiver is bigger in 2006 than in 2001. 27.8% of the total pregnant women in CDR got at least one antenatal care from the doctors and 18.6% from trained nurses or auxiliary nurses. Similarly, the percent of antenatal care receiver from HA, MCHW and VHW are 10.3, 12.4 and 2.7 respectively. The women taking assistance from traditional birth attendants have been dramatically declined in both CDR and FWDR. The percent of service receivers from all mentioned service providers have gone up

instead of the doctors. Only 10.4% of the pregnant women managed to get antenatal care from the doctors in the year 2006. The percent of MCHW visitors for their pregnancy related cases has the highest increment rate touches 34.2 from 2.2 of 2001. The pregnant women taking antenatal health care from nurse, HA and VHW are 15.5%, 11.5% and 2.7% respectively. Similarly, the number of pregnant women not attending any trained health workers fell down to 24.1% in the central development region and to 25.3% in the far-western development region of Nepal.

Finally, the antenatal care seeking behavior has been changing for the betterment of both mother and her child. The percentage of women taking regular checkups and follow ups has been continuously rising. In the year 2011, out of total pregnant women, 34.9%, 21.6%, 14.5%, 10.5% and 1.5% visited doctors, nurse or auxiliary nurses, health assistants, maternal child health workers and village health works to know their and their fetus' status during pregnancy in CDR. The women of far-western development region show the same sort progress in this year. 16.2% visited doctors, 45.6% visited nurses, 6.9% visited health assistants, 20% visited maternal child health workers and 0.7% visited village health workers for antenatal care and checkups. The number of traditional birth attendants has been declined to zero in both development regions. Looking the past history it is far better condition in present in Nepal, but still 17% of total pregnant women in Central Development Region and 9.5% in Far-western Development region do not get any sort of antenatal care. This is a big number to affect the maternal and infant mortality rates adversely.

3.4.2. Place of Delivery (and access to health services)

Where the delivery takes place always affects the maternal and neo-natal health. There is always a high chance of complication and physical loss if the delivery takes place at home and without assistance of trained health workers. Most births in Nepal take place at home without any assistance from a skilled birth attendant (NDHS 2006). And sometimes, thought the women visit the health centers for the safe deliveries, they become victim of losing their lives or that of their children because of the non-skilled birth attendants. A high proportion of maternal and infant deaths occur during delivery and within 48 hours of post partum (Dhakal et.al. 2007). The type of assistance women receive during childbirth is dependent on the place of delivery. Most home deliveries are assisted by close relatives or FCHVs (Female Child Health Volunteers). Generally, hot water, clean clothes and heated blades are used during home delivery and women are provided with hot food and oil message. Use of safe delivery kit (SDK) is reportedly uncommon (Pradhan and Suvedi et.al. 2010, 158).

The below table presents the overview of the deliveries classified on the places they took place from 1996 to 2011. Here government sector incorporates the Zonal Hospitals, District Hospitals, or any other government funded institutions they are given authorities to conduct deliveries, Non-government sector represents the health institutions that are run by the non-governmental both national and international organizations and private sector means all the institutions that are run for profit by individual or group.

Table 8: Place of Delivery Trend in Nepal

Place of Delivery						
Percent distribution of live births in the five years preceding the survey by place of delivery, according to the development regions 1996, 2001, 2006, 2011						
Year	Development Region	Health Facility			Home	Other
		Government Sector	Non Government (NGO Sector)	Private Sector		
1996	Central	5.3%	2.0%	4.0%	88.0%	0.7%
	Far Western	2.8%	0.7%	0.4%	94.8%	1.3%
2001	Central	9.0%	1.3%	1.4%	86.2%	2.5%
	Far Western	5.2%	0.5%	0.5%	92.3%	1.2%
2006	Central	18.4%	1.0%	4.7%	74.2%	1.7%
	Far Western	5.9%	0.5%	2.1%	89.0%	2.4%
2011	Central	25.7%	1.8%	9.5%	63.0%	1.2%
	Far Western	22.8%	1.7%	4.4%	68.9%	2.2%

The table clearly presents the increment in the percentage of women taking deliveries at health institutions but still the deliveries done at home are frighteningly high. In the year 1996, 5.3% of the total deliveries took place at government facilities, 2% at NGO facilities and 4% at private facilities in CDR. At the same time, the percentage of delivery in government sector, NGO sector and Private sector were 2.8%, 0.7% and 0.4% respectively.

0.7% of total deliveries in CDR and 1.3% deliveries in FWDR took place in other places like in TBA's home, at work or etc. This time around 88 births in CDR and 95 births out of 100 in FWDR took place at home.

In the year 2001, the deliveries that took place at the govern sector facilities rose to 5.0% in CDR and 5.2% in FWDR. In NGO sector facilities 1.3% and 0.5% deliveries took place in CDR and FWDR respectively. 1.5% of total intra partum services happened in the private sector facilities in the central development region while just 0.5% of that service took place in the far-western development region. The deliveries that took place in other services rose higher in this year than the year 1996. In spite of slight increment in using trained birth attendants in Nepal, the number deliveries that took place at home remained still high. During this year, total of 86.2% in CDR and 92.3% in FWDR took place at home.

One could easily grasp the change for betterment in the table presented. The percentage of the deliveries conducted under the supervision of government services and authorities has increased with a high leap in CDR reaching to 18.4 while this rate got a nominal change (from 5.2 to 5.9) in FWDR in the year 2006. NGO sector deliveries dropped to 1.0 in CDR and remained same i.e. 0.5 in FWDR this year. However, the expansion of private sector health institutions in both central and far-western development regions brought colors as the service users for safe delivery rose to 4.7% and 2.1% respectively. Deliveries took place in 'other' places has the mixed changes, it dropped in CDR while rose in FWDR. The deliveries that took place at home dropped to 74.2% in CDR and to 89% in FWDR.

Finally, in the year 2011, the table shows the data that the facility users are still growing larger in both places. The government sector, NGO Sector and private sector facility users for safe delivery in CDR are 25.7%, 1.8% and 9.5% respectively. The deliveries that took place at home dropped to 63% with the drop of the deliveries that took place in other places i.e. 1.2%. But the increment in the government facility users dramatically rose to 22.8% in the year 2011 in FWDR. The process of partum took place in NGO and private sector also grew to 1.7% and 4.4% respectively. That brought down the percentage of the deliveries took at other places or at home to 2.2% and 68.9% respectively.

3.4.3. Postnatal Care Trend

The postpartum period is particularly important for women, during this period they may develop serious, life-threatening complications. This visit is also important because the mothers could be taught better ways of caring themselves and their children (DHS 2006).

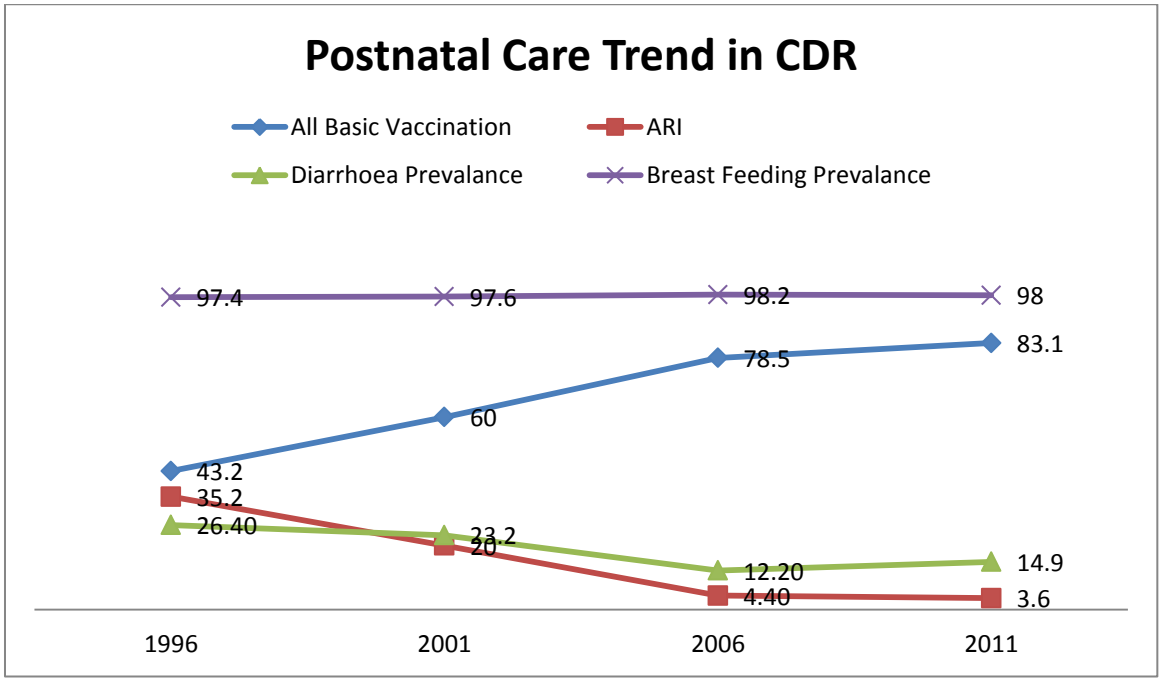
Thus, it is highly recommended that women receive at least three postnatal checkups, the first within 24 hours of delivery, the second on the third day following delivery, the second on the third day following delivery, and the third on the seventh day after delivery (MOHP, 2011a).

The researcher has attempted to present if all basic things have been conducted for the better health of both mothers and their children and how the trends have been. Mothers are directly benefited from the checkup but the infant's well-being depends on the four basic things: basic vaccination coverage, access of breast feeding and getting rid of rampant basic diseases like acute respiratory infection and diarrhea (DHS 1996). The prevalence of the diseases like ARI and diarrhea presents the poor health concerns of a mother. Thus, they are important indicators to identify the postnatal cares. In addition, breast feeding is an important measure to mitigate the various harms that could bother infants. The higher the breast feeding ratio, the better the health of children and mothers (DHS 2006).

The first line diagram is devoted to present the postnatal care trend of Central Development Region and the Second of Far Western Development Region since 1996 to 2011. In both diagrams we could see the fast change in all basic indicators of postnatal care. The table shows that there is satisfactorily enough breast feeding habit of the mothers of both CDR and FWDR. The percentage is always more than 95 in the given years. It shows that breast feeding is popular among the mothers and they do it without any hesitations.

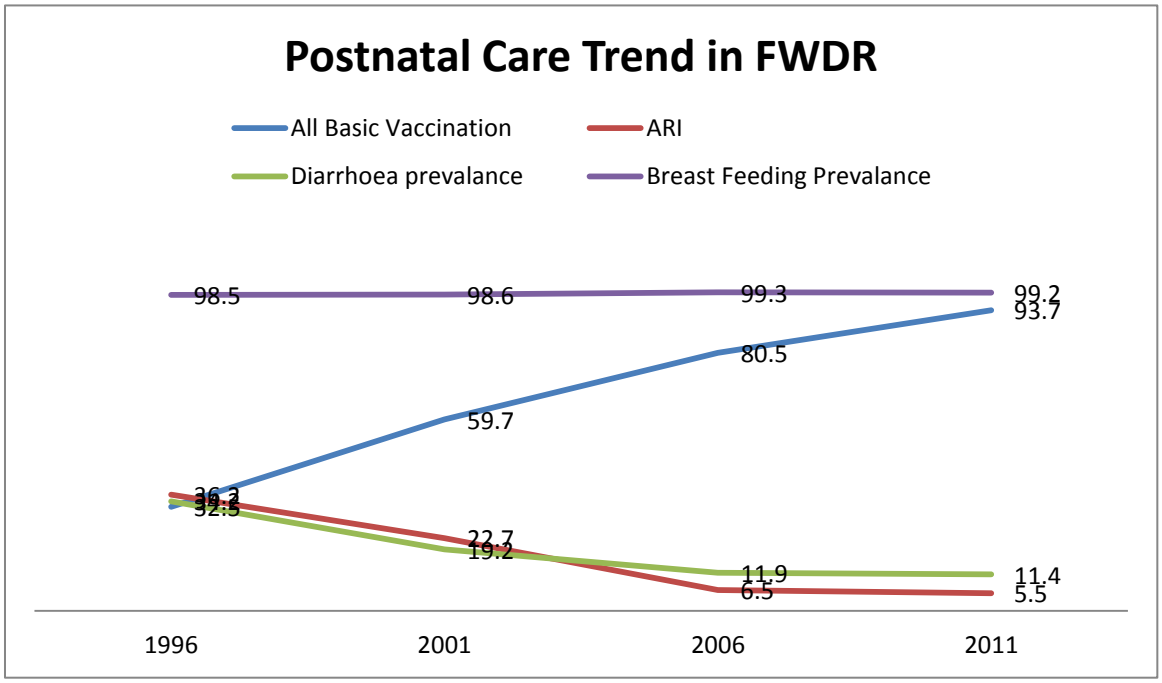
However, there had not been such optimistic data showing the basic vaccination coverage among the infants during the year 1996. Here, all basic vaccination represents BCG, DPT × 3, Polio × 3 and measles. Only 43.2% in CDR and 32.5% infants in FWDR received all basic vaccination. Major portion of the infants 57.8% in CDR and 68.5% in FWDR couldn't get the required vaccinations that would help them fight the diseases in their future. Out of total live infants 35.2% and 36.2% suffered from acute respiratory infection (ARI) in both of the regions respectively. Similarly, a huge portion of the infants got suffered from diarrhea i.e. 26.4% in CDR and 34.2% in FWDR in this year. Though the health condition in both of the regions was critical, it was even worse in FWDR during the given year.

Figure 4: Post-natal Care Trend in CDR



In the year, 2001 the scenario has been slightly changed. The all vaccination coverage reached to 60% in CDR and 59.7% in FWDR. It means almost 60 infants out of every 100 infants got the desired vaccination. This trend kept taking its upward direction in both of the places reaching 78.5% in CDR and 80.5% in FWDR in the year 2006. FWDR ratio lurched higher and faster than that of CDR. Again, in its raising movement it reached to 83.1% in CDR and 93.7% in FWDR in the year 2011.

Figure 5: Post-natal Care Trend in FWDR



The line diagrams portray the decreasing trend of Acute Respiratory Infection among the infants of Central Development Region and Far-western Development Region. In 2001, total of 20% of infants suffered from any disease related to ARI in CDR while it was 22.7% in FWDR. With its sharp fall in both of the regions, the ARI prevalence ratio relegated to 4.5% in CDR and 6.5% in the next one. The legacy remained same but in slower level in the year 2011. 4.4% of CDR lowered down to 3.6% and 6.5% of FWDR to 5.5% prevalence.

In the same way, the diarrhea prevalence rate also suffered the same fate throughout the mentioned years. Regarding the context of its trend, FWDR has been better than CDR. Its falling ratio is faster and larger and its prevalence is lower than in central development region in the present time. 35.2% diarrhea prevalence rate of CDR dropped to 20% and 36.2% of FWDR to 19.2% in the year 2001. The ratio sharply fell to 12.2% in CDR and 11.9% in FWDR during the year 2006. FWDR carried the same trend in the year 2011 as well bring it down to 11.4% but unfortunately diarrhea prevalence rate in CDR increased to 14.9% the same year.

3.5. Major Findings from the above Study

In this chapter through the use of various charts and diagrams the study presented the available data concerning maternal and infant health issues of two study areas including Nepal as a whole. The discussion of the overall related data puts forward the following major findings and with the help of these findings this study provides the logical proofs for the hypotheses made on the second chapters.

Basically, far-western development region is lagging behind central development region and even the national level in both types of mortalities namely maternal and infant mortality rates. The rates are still higher though the major accomplishment of MDG 5 has been almost made. Many pregnant women still need to fear the nightmare of the delivery night in cold and dark homes beyond the reach of any technical support and trained birth attendants. Still 290 mothers among 100 000 live births in far-western region die because of pregnancy related complications. This number is around three times bigger than in central development region and almost twice than the national level.

Same is the situation with infant mortality rates. The inter-regional gap is not as big as that of maternal mortality but still far-western development region possess bigger threat than the national and central development region. 65-neonats among every 1000 live births die before their first birth day in far-west while 46 in central. The risk of infant death is 20% higher in

far-west than in central region. Hence both of the regions possess high threat level of infant mortality than national average. Central development region has almost 12% higher risk while far-western development region has around 30% higher risk than national average.

The above mentioned figures appear to be justifiable while the study presented the antenatal, post natal and place of delivery statuses among the residents of these regions. Despites the implementation of various measures and policies by the government of Nepal with the help of national and international charitable organizations, the desirable improvements seem far beyond the ken. The situations of Antenatal care, postnatal care and place of delivery show that there is sheer lack of EOC and CEOC facilities, trained manpower and the awareness among the dwellers about the benefits of using such facilities.

The data show that around 35% of total pregnant women receive postnatal cares from the doctors and this rate is 16% in far-west. Around half of the postnatal cares in the far-western region is conducted by middle class health workers and 20% by the maternal community health volunteers (the ground level health workers). 37% of the total births take place at facility in CDR and this is 31% in FWDR. Still around two-third of total births take place at home in both of the regions but again CDR has better situation than FWDR. Dramatically, the antenatal care status is better in FWDR than in CDR. The prevalence of two major killer diseases namely diarrhea and acute respiratory infection prevalence ratios are still high, but FWDR has higher ratio than that of CDR. Diarrhea prevalence rate is higher in the central region than in far-west. The percentage of all vaccination coverage in FWDR is 93.7% while it is 83.1% in CDR.

The population size of central development region and far-western development is near 4:1 but the EOC and CEOC facilities ration is almost 13:1. This huge gap is the prime indicator of high maternal and infant mortality rates in far-western. In the same way, each EOC/CEOC is responsible for 1574 pregnancies in the central region while this is 5711 in the far-west. Here, it is necessary to note that the population is most scattered in far-west and because of its difficult topography there is hardly any modern means of transportation available. Still, around 93% of people live in the villages in this region while 50% of people live in the villages in the central region. Thus, the average time taken to the nearest health facility is 2-3 hours in FWDR but just 30 minutes in CDR.

When both central and far-western development regions are looked through the other indicators like fertility rates, poverty and contraceptive prevalence rates, far-west still has the worse situation than central development region and the national total. Every woman is

supposed to have 2.6 children throughout her active maternal period i.e. 16-49 years. Central development region woman have the total fertility of 2.5 but far-west 2.8. This shows that an average woman in far-west bears many children than the average woman of Nepal and central development region. Poverty is comparatively higher in FWDR than CDR. And the contraceptive prevalence rate is lower in this region than in CDR.

Relating these findings to the global evidence, the maternal health care seeking is dependent on a complex mix of factors operating at individual, family and community level on both supply and demand sides and addressing one without the other cannot create a significant effect on increasing uptake of services (Ensor and Cooper, 2004). Demand side is backed up by cultural traditions, the physical environment, social norms and values including women's status. They are such strong influences that they may even override changes that might be expected to result from improved availability and quality of services, even when women and their families know about these services (Pradhan and Suvedi et.al. 2010, 167).

Factors operating on the supply side include women's past experiences with health services, availability of alternative health providers, and their perception on the quality of the services. Studies confirm limitations in both availability and quality services as an obvious barrier to utilization (Campbell and Graham, 2006), especially among poor, low caste and less educated populations and those in rural areas, as they have fewer options, being less able to access services at the district centers or pay the cost of better quality private services (Pradhan and Suvedi et.al. 2010, 167)

Obstacles in making use of maternal health care services are manifold in Nepal: First, very young and very old mothers are at risk, especially if they have poor access to prenatal care. Second, short birth spacing can increase the risk faced during delivery. Third, complications during pregnancy and childbirth can result from malnutrition, which is an especially acute problem in South Asia. Fourth, empowered, literate, or educated women are more likely to avail themselves of reproductive or maternal health services and are more likely to possess better maternal skills. Fifth, cultural norms or traditions can have an important impact on healthcare practices such as delivery in homes, use of contraception, or intra-household distribution of expenditures. Sixth, access to quality healthcare is essential if women are to obtain help from trained professionals: not only must geographic coverage be adequate, but trained staff and medicines must be available (Jimba et.al. 2003, World Bank 2001, WHO/SEAR 2005).

Poor families are at further risk because the above determinants reinforce each other and can have a greater impact when combined with household poverty. Poor families may delay seeking emergency obstetric care when complications arise, not only because of financial constraints but for lack of information or knowledge about the severity of the problem (WHO/SEAR, 2005). Poor families in remote areas may have difficulty accessing maternal health services because of difficult terrain or lack of transport, and they may experience gender, caste, or other forms of discrimination at the healthcare facility. These results argue for improvements in education and empowerment, nutrition, utilization of health institutions for delivery, contraception, and utilization of healthcare services for women. In addition, promoting late marriage, to avoid young pregnancies, is desirable (MDG in Nepal, 2007).

CHAPTER FOUR

Conclusion

This study provides the comparative information regarding current status of maternal and infant mortality in relation with available health services in the Central and Far-western Development Regions of Nepal. The study demonstrates that the far-western development region is less advanced than the Central Development Region in almost every aspect of comparative entities mentioned in this study. In addition, this study presents the picture of total population of both of the regions and available health services including their status depending upon the various studies, surveys and reports available in the print and electronic media. The pattern of maternal and infant mortality revel large level of inequity between far-western and central development regions of Nepal. Despite the commitment of the government of Nepal and national and international NGOs to reduce maternal and infant mortality rates the magnitude of the problem still remains immense in all sector though significant achievements have been made in some years.

A multitude of demand and supply side barriers contribute to maternal and infant mortality rates in both of the study regions. The level of understanding in the community regarding the need for routine care, and where to go has reportedly increased over time. However, it is still common practice to approach the informal sector first, and only seek formal care once it is clear a complication cannot be treated in the community this claim seems to be proved as we see the data supplied in the previous chapter. This is comparatively highly applicable in far-western development region. Furthermore, many women prefer home deliveries. Some of them are influenced by peers, some prefer home environment to the expense of long, difficult journey to cold, uncomfortable facility with lack of privacy, basic amenities, beds and equipment, while some are too shy to seek care from a health facility, especially if they have to see a male health provider.

The low social status of women does not let them make decision regarding care seeking and thus, can result in maternal and infant mortality. Even, during the period of complication many people involve in decision making process assessing severity of the complication, finance and logistics. It has been clearly presented that most of the pregnant women in both CDR and FWDR do not take any antenatal consultation from skilled health workers. Though this rate has been continuously declining since 1996 to 2011 it is still big enough to affect the maternal health awareness status adversely. Among the females who receive antenatal cares, very few of them get chance to see the highly qualified health workers like doctors and

auxiliary midwives while the majority gets consulted by semi skilled health workers. In addition, the percent of the women getting antenatal care from doctors has been dramatically lowered to 34.9 from 45.7 in central development region. Still around 24.1% women in CDR and 25.3% women in FWDR are out of any antenatal care services.

This study, in addition presented the places of delivery as one of most important indicator that has its directly relation in national and regional maternal and infant mortality rates. Most of the maternal and infant mortality deaths occur when the delivery happens at home. Interestingly enough, the total number of deliveries that took place at home during the period 1996 has been declined in the year 2011 but still majority of it (63% in CDR and 68.9% in FWDR) takes place at home. Among the total deliveries that take place at facilities, 25.7 in CDR and 22.8 in FWDR take place in government sector health institutions and 9.5% in CDR and 4.4% in FWDR take place in private health institutions. This means people living in the central development region have more access of health institutions than the people living in the far-western development regions.

Moreover, the post natal care status of a region is also an important measure to know the real maternal and infant health status of this region. The coverage of all vaccination, the acute respiratory infection prevalence ratio, the diarrhea prevalence ratio and the breast-feeding ratio are major postnatal cares. Among these indicators, breast feeding ratio is highly satisfactory in both central and far-western regions of Nepal. Almost all new-born gets the chance of breast feeding if we avoid some exception. This ratio is always over 95 throughout the period mentioned i.e. 1996 to 2011. All vaccination coverage ratio is the only one aspect of analysis in which far-western development region has stood better than central. FWDR showed the drastic upward motion from 32.5% of 1996 to 93.7% of 2011. The ARI prevalence ratio is higher in CDR but diarrhea prevalence ratio is higher in FWDR.

The above mentioned scenario is the direct outcome of various factors like education of the mother, frequency of giving birth, age at the time of pregnancy, women's empowerment, role of family and community, cultural and tradition, and availability and status of health institutions. Lack of human resources is one of the major factors affecting the availability and quality of maternal health services, especially in remote hill and mountainous areas. In addition, those who want to access formal care are often prevented from doing so by the long distance to health facilities and their poor infrastructures. More than this, the major factors affecting the availability of services are inadequate levels of human resources, lack of drugs and supplies. We can see that the number of health workers and health institutions are very

few in both central and far-western development regions. Private sector health institutions have been boomed in last some years but they are mostly located in urban areas. In this line, it is important to note that around eighty percent of total population still lives in rural areas in Nepal. The ratio of health workers per 1000 population is 0.29. And, this is a very small fraction compared to WHO's recommendation of 2.3 health workers per 1000 residents.

This study attempted to find the number of health institutions in central and development regions. The tables presented in chapter three provide the district wise health institution distribution in all the districts lying in central and far-western development regions. There have been total of 9 government hospitals in FWDR and comparatively fewer private hospitals than in CDR. The number of government hospitals in CDR are 30 and there are 196 private hospitals. Only the district hospitals are supposed to provide comprehensive obstetric care in Nepal but still many of them are reported to be ill equipped and unable to cope with obstetric emergencies. Total numbers of health posts, sub-health posts, EPI Clinics, PHCs, outreach clinics in CDR are around four times greater than in FWDR.

The medicines are not readily available and are highly expensive. As far-western development region is mostly composed of mountainous and hilly terrain the scenario is even worse. Lack of road connectivity keeps the pregnant women out of the reach of trained antenatal care, postnatal care and of skill birth attendants during delivery. They are vulnerable, during pregnancy related emergencies because of lack of transportation. Thus, the VHWs and MCHWs are the only SBAs they can approach for consultation in the period of their pregnancies. Many a times, they are supposed to be partial, irresponsible and ill mannered, that forbids the locals of low caste groups and poor getting help at the times of need. They are often supposed not referring the case in timely manner. Sometimes, they refer to an inappropriate facility and they do not have clear mechanism for following up clients once they are referred to another facility. Many of them are reported to not to have appropriate training regarding the key competencies and are not confident in managing life threatening situations.

There is increasing international recognition of the necessity of a holistic approach that mothers and baby should be treated as one entity. The government of Nepal needs to develop policies that account for the above mentioned holistic approach. It should acknowledge that obstetric complications directly affect the foetal and newborn health, and that many maternal health initiatives also improve neo-natal health. These include safe motherhood program, reproductive health initiatives such as encouraging birth spacing, immunization and nutrition education. The strategy also need to address the importance of behavior change, proposing the

wide range approach to engage all aspects of the community in parallel with improving the competence and coverage of the public health system. Only then, the untimely death of mother and infant can be reduced to the level of developed countries in Nepal.

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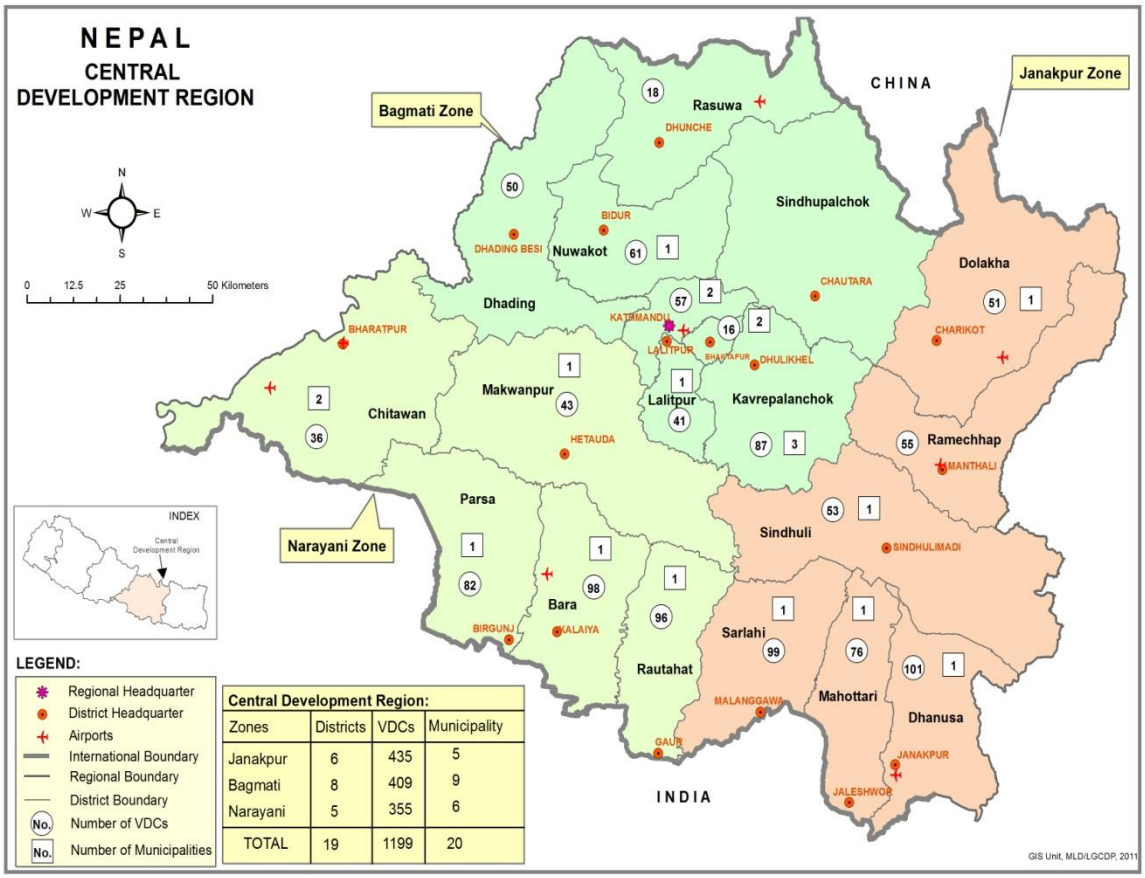
Appendix-1 Administrative Map of Nepal

Appendix-2: Administrative Map of Central Development Region



Appendix 3: Administrative Map of Far-western Development Region