

# **THE CAUSES OF NEONATAL MORTALITY IN AFGHANISTAN**

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**Afghanistan**

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# **THE CAUSES OF NEONATAL MORTALITY IN AFGHANISTAN**

A thesis submitted in partial fulfilment of the requirement for the degree of Master of Public Health

by

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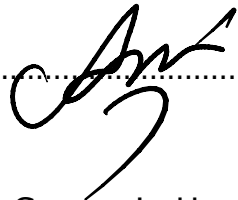
Afghanistan

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The thesis 'The Causes of Neonatal Mortality in Afghanistan' is my own work.

Signature .....



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## **Abstract**

*Background:* Neonatal mortality rate (NMR) is very high in Afghanistan. It is ranked as the fifth highest NMR in world. There is limited information about the immediate causes and underlying factors for high neonatal mortality.

*Objectives:* The objectives of this study is to explore the causes of neonatal mortality, describe the strengths and limitation of neonatal health care system and provide practical solutions to reduce neonatal mortality in Afghanistan.

*Method:* It is a descriptive study based on literature review.

*Findings:* The main immediate causes of neonatal mortality in Afghanistan are preterm birth (35%), intrapartum related complications causing asphyxia (26%), pneumonia (15%) and sepsis/meningitis/tetanus (16%). Various underlying factors contribute to neonatal mortality such as lack of access of people to MNH information and low attendance rate to formal education, the existence of sociocultural harmful practices against women and neonates and poor health seeking behaviour among households and communities. Shortage of professional health providers e.g. SBAs, distance to health facilities, disparity in distribution of health services are among main factors that limit access to health services. Low quality of MNH services reflects the inadequate performance of health system. Poverty, insecurity, sociocultural norms (e.g. violence against women and gender disparity) and religion are considered the basic causative factors.

*Conclusion:* Neonates are the most vulnerable population in Afghanistan. Policies alone cannot bring changes until they are implemented. Strong advocacy is needed to encourage the Afghan MoPH to formulate, implement and monitor appropriate, evidence-based policies on neonatal health.

## **Keywords**

Neonatal mortality, maternal and neonatal health, neonatal survival, causes, Afghanistan

## **Number of words**

12,304



## List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal care
BHC	Basic Health Centre
BMI	Body Mass Index
BPHS	Basic Package for Health Services
CAH	Child and Adolescent Health
CHC	Comprehensive Health Centre
CPR	Contraceptive Prevalence rate
CSO	Central Statistics Organisation
DH	District Hospital
EmONC	Emergency Obstetric and Neonatal Care
EPHS	Essential Package for Hospital Services
GCMU	Grants and Contract Management Unit
HIV	Human Immunodeficiency Virus
HP	Health posts
HSC	Health Sub-Centre
IEC	information, education and communication
Jhpiego	An affiliate of John Hopkins University
KMC	Kangaroo Mother Care
LB	Live Birth
MDG	Millennium Development Goal
MNH	Maternal and Neonatal Health

MOHIA	Ministry of Haj and Islamic Affairs
MoPH	Ministry of Public Health
NGO	Non-Governmental Organization
NMR	Neonatal Mortality Rate
PRSP	Poverty Reduction Strategic Paper
RH	Reproductive Health
SBA	Skilled Birth Attendants
STI	Sexually Transmitted Infections
TBA	Traditional Birth Attendance
TFR	Total Fertility Rate
UNAMA	United Nations Assistant Mission for Afghanistan
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
WHO	World Health Organization

## INTRODUCTION

As an obstetrician and gynaecologist, I worked at the Northern Regional Hospital in Afghanistan from 1997 to 2005. During my practice, I observed many newborns dying every day either immediately after birth at the delivery ward or later at the neonatal care ward. I decided to shift my practice from medicine to public health in order to improve the situation of maternal and newborn health at the national level; therefore, I joined Jhpiego, an affiliate of Johns Hopkins University, in 2005. As a technical director of Jhpiego, I worked with the Jhpiego team and the Ministry of Public Health (MoPH) reproductive health department to develop a newborn care training system including a training package for health care providers, to establish training centres in five regional hospitals, and to train national trainers and replication of trainings to health care providers.

Strengthening training system is a small portion of the reproductive health strategy to improve the neonatal health situation through improving the skill, knowledge and attitude of health care providers. In fact, the causes and underlying factors of neonatal deaths go beyond the performance of health care providers.

Lawn et al. (2005) found that mortality during the neonatal period [‘within completion of 28 days after birth’ (WHO 2006)] is estimated to be almost 30 times higher than after the neonatal period. Based on the analysis of Lawn et al. (2005), the crucial period for neonatal mortality is the first week after birth and three-quarters of mortality occurs during the first seven days and about 25%-45% of all neonatal deaths happen within the first 24 hours after birth. It is critical that neonatal deaths make up 38% of all under-five child deaths.

The neonatal mortality rate (NMR) in the country is one of the highest in the world and is estimated 45/1000 live births (UNICEF et al., 2011). Based on a systematic analysis by Liu et al. (2012), the NMR in Afghanistan remained unchanged at 45/1000 live birth (LB) between 2000 and 2010. Unfortunately, an in-depth analysis of causes and underlying factors of neonatal mortality in the country has not been conducted yet. The MoPH Reproductive Health (RH) and Child and Adolescence health (CAH) departments hold their own strategies and policies in which neonatal health is incorporated; however, those national documents were developed without availability of suitable data.

Considering the mentioned challenges, I realized that exploring and analysing the causes and underlying factors of neonatal mortality in Afghanistan is a necessity which will help the strategic direction of MoPH

towards reduction of neonatal deaths and achieve Millennium Development Goal (MDG) 4.

In this thesis, immediate causes, underlying and basic factors of neonatal deaths in Afghanistan are explored in separate topics in Chapter 3. The strengths and weaknesses of the health system regarding neonatal health are analysed as part of Three Delay model as well as in a separate topic on health systems as part of basic factors. In the final chapter, I explore evidence-based best practices, which address the key causes of neonatal deaths which are adaptable to the Afghan context, and provide recommendations to improve the neonatal health situation in the country.

I expect this document to help the MoPH, as a steward of the health sector, and other stakeholders to review the causes and underlying factors of neonatal deaths in the country and to formulate appropriate neonatal health policies and strategies.

## **CHAPTER 1: COUNTRY BACKGROUND**

### **1.1. GEOGRAPHY**

Afghanistan is a landlocked and mountainous country located in the South Asia. It has borders with six countries: Tajikistan, Uzbekistan and Turkmenistan in the north, Pakistan in the south and south-east, Iran in the west, and a shorter border with China in the east. The physical geography of the country is widely variable with mountains, valleys, deserts and forests with the total land area of 647,500 square kilometres. Mountains and deserts cover about 80% of the land area and only 2% of the land is covered by forest (Kelly, 2003). The administrative division of the country is 34 provinces and 362 districts which are further divided into villages (CSO, 2012).

### **1.2. POPULATION**

The estimated the population of Afghanistan is 26.5 million in 2011-12 with a population density of about 41 people per square kilometer (CSO, 2012). An estimated 77% of the population live in rural areas, including 6% nomads and about 23% live in urban areas. The average annual population growth rate between 2010 and 2015 is about 3.2 (UN Statistics Division, 2011). The estimated population of aged 0-15 years is about 46% and of those under five is about 19% (CSO, 2012). The total fertility is about 5.1 children per woman. The average household size is about 7.8 persons (APHI, 2010).

### **1.3. POLITICAL AND SOCIOECONOMIC SITUATION**

Afghanistan has been in war and political instability for more than three decades. War against Soviet Union in the 70s and 80s and civil war in the 90s damaged the socio-economic infrastructure. After establishing the new government in 2001, the country became relatively stable as the political structure of the country became a presidential republic with a multi-party parliament. The new constitution was endorsed and strategies for reconstruction and development were developed. Under the new constitution, government provides free health care and education for all citizens (Islamic Republic of Afghanistan 2004).

The economy of Afghanistan improved after the establishment of the new government in 2002. The reasons are mainly the infusion of foreign aid with military invasion as well investment due to improving security for investment. Based on an IMF report (2011), during the last five years, the average of real GDP growth rate had been more than 10% per year. Agriculture is an important source of income for Afghan people, constituting one third of country's economy (GAIN, 2011). But despite some economic

improvements, Afghanistan remains one of the poorest countries and it is positioning at 172 out of 187 countries in the world (UNDP, 2011).

The other big challenge for the country is the low literacy rate. Only 26% of people are literate and the formal educational attainment among the population aged 25 or over is only 17% (ICON-Institute, 2009).

#### **1.4. HEALTH SYSTEM**

The health sector, among the other sectors, was devastated during last three decades of war and instability. In 2001 the main challenges of the health sector were the very weak infrastructure, lack of capacity in health planning and institutional development, severe shortage of health facilities and poor health indicators such as high maternal mortality ratio [1600/100000 live births (LB)] high under-five child mortality rate (257/1000 LB) low access to skilled birth attendants (SBAs) (7%)(MoPH, 2003).

The evolution of the health system began in 2002 with the support of international partners. The MoPH successfully developed a fundamental Basic Package of Health Services (BPHS) aimed at providing basic quality health care services with the greatest impact on the main health problems, to extend coverage and to provide a foundation for the health system targeting community based health care (MoPH, 2005a). The BPHS prioritized seven core components including maternal and newborn health care, child health care, nutrition, control of communicable disease, mental health, disability and provision of essential drugs (MoPH, 2005a).

After establishing the BPHS, the Essential Package of Hospital Services (EPHS) was developed to improve and promote the referral system in integration with BPHS (MoPH, 2005b). In 2003, the MoPH began contracting out mechanisms for delivery of health services to Non-Governmental Organisations (NGOs) (Strong, 2003).

The implementation of the BPHS and EPHS is entirely supported by external donors including USAID, European Union and the World Bank. Overall, 75% of all health expenditure is contributed by donors, meaning that priorities of health care are driven by donors at the large scale (MoPH, 2011).

Despite the MoPH and its partners' efforts to improve the health system and service delivery, access to health services is a challenge for Afghan people (ICON-Institute 2009). The health system is facing a severe shortage of professional health care providers, especially skilled birth attendants (SBAs) (Belay, 2010).

##### **1.4.1 . Structure of Health Care Service Delivery**

The pyramidal structure of the health care system in the country is traditional and similar to other low income countries (Belay, 2010). The structure of

health care service delivery, described in the Health and Nutrition Sector Strategy (MoPH and MAIL, 2008) and BPHS (MoPH, 2009b), is as follow:

**Health Post (HP):** At the most peripheral levels, community health workers (CHW), as non-professional providers are the initial point of contact for health care services. HPs are staffed by one male and one female CHW and cover 1000-1500 people.

**Health Sub centre (HSC):** The intention of the HSC is to provide services at the most difficult geographical areas. Each HSC is staffed with a community midwife and a male nurse and covers 3,000-7,000 people in its catchment area.

**Basic Health Centre (BHC):** The BHC as a small facility provides more complex outpatient services than HPs, including basic emergency obstetric and neonatal care (BEmONC). Each BHC is staffed with one nurse, one community midwife and two vaccinators and covers 15,000-30,000 people.

**Comprehensive Health Centres (CHC):** Each CHS has a limited capacity for inpatient service provision. Each CHC, beside nurses, midwives and vaccinators, is staffed with male and female medical doctors, and lab and pharmacy technicians. CHCs provide additional minor and essential surgery and provide BEmONC. They cover 30,000-60,000 people.

**District Hospital (DH):** Each DH provides broader medical care and functions as a referral hospital. It is staffed by surgeons, obstetricians and handles most complicated cases. DHs cover 100,000-300,000 people in their catchment area.

**Provincial Hospital (PH) and Regional Hospitals (RH):** Both hospitals are referral hospitals with a number of specialties and offer more sophisticated medical care. However, the provision of health care services at regional hospitals is more professional for inpatient and emergency cases.

**National or specialized hospitals** are referral centres mainly located in Kabul, which provide medical education and training as well.

CHWs offer maternal and neonatal health (MNH) education, limited medication and micronutrients during pregnancy and postpartum as well as recognition of maternal and neonatal danger signs and referrals. They do home visits. The basic MNH care services including antenatal care (ANC), delivery care, postpartum and neonatal care are provided at different levels of BPHS such HSCs, BHCs, or CHCs by health professionals such as midwives and nurses. The DH, PH and regional hospital, beside provision of basic MNH care, they provide Comprehensive EmONC (CEmONC) including surgery. Regional hospitals offer specialized MNH services and cover referral of

complicated cases. The national maternity and child health hospitals are considered to be more specialized institutions with residency programs and teaching facilities and provide a wide range of maternal and child-specialized services.

The private sector health service delivery is very large in the country, but there is little information about their services (MoPH and MAIL, 2008).

#### **1.4.2. Neonatal Health situation**

Afghanistan has one of the worst neonatal health indicators in the world. The neonatal mortality rate (NMR) is estimated at 45/1,000 live births and it is ranked as the fifth highest NMR in world after Somalia, Mali, DR Congo and Sierra Leone (Lawn et al., 2012). Beside high neonatal mortality, stillbirth is also very high. In 2000, the stillbirth rate was estimated 54/1,000 births (WHO, 2006).

Bartlett et al. (2005) shows that there is a strong link between maternal mortality and infant and stillbirth mortality in the country; with increasing maternal mortality, infant and stillbirth mortality become higher. In Afghanistan, the maternal mortality ratio (MMR) was estimated to be 1,600/100,000LB (Bartlett et al., 2005) and later in 2010 the estimation was 460/100,000LB (WHO et al., 2012b).



## CHAPTER 2: STUDY RATIONAL AND METHODOLOGY

### 2.1. PROBLEM STATEMENT

Based on the UNICEF et al. (2011) report, globally, about three million neonates died during 2010 and Afghanistan was among the top tenth countries where high number of neonatal deaths, estimated at 62,000, occurred.

The exact indication of neonatal health status in Afghanistan is somehow blurred. None of health surveys has measured the number and rate of neonatal mortality (Save the Children, 2008). The reason for omission of neonatal mortality measurement could be difficulty in distinguishing the fine line between neonatal death and stillbirth by surveyors (APHI et al., 2010). Although the Health Management Information System (HMIS) covers few neonatal health indicators at the health facilities such as low birth weight, neonatal tetanus and all complications together, the compilation and recording of utilization of services are weak (MoPH, 2009a).

However, UNICEF et al. (2011) estimated that in 1990 the NMR in Afghanistan was approximately 53/1,000 live births (LB) and in 2010 it was estimated to be 45/1,000 LB. It seems that there was a very slow progression in reduction of neonatal mortality between 1990 and 2010 in the country.

The NMR is slightly higher than neighbouring countries such as Pakistan (41/1,000 LB), and much higher than Iran (14/1,000 LB), Tajikistan (25/1,000 LB) and Uzbekistan (25/1,000 LB). It is still higher in other regional countries such as India (32/1,000) and Nepal (28/1,000) (UNICEF, et al. 2011).

Based on the analysis in Lawn et al. (2005), the prevalent causes of neonatal deaths in the world are infection, complication of preterm birth and asphyxia. Infection is a particularly major cause deaths in very high-mortality countries (Lawn et al., 2005). Many underlying and basic factors are involved in neonatal mortality and morbidity at household, community and societal levels in world (UNICEF, 2009).

In Afghanistan, it is unlikely that the prevalent causes of neonatal mortality are explored and any evidence based study of causes and underlying factors on neonatal mortality has been conducted to answer the question of why neonates are dying, what the dominant underlying and basic factors are.

At the MoPH, several departments and units, such as Reproductive health, Child Health and Adolescence, Health Promotion Department, and Grants and Contract Management Unit (GCMU) work simultaneously on neonatal health care with different policies and strategies. It seems that there are numerous strategic objectives and policies on neonatal health care and it is unclear if those policies overlap, contradict or support each other. Additionally, it is uncertain which department is the primary actor or coordinating body for formulating neonatal health strategy and policy, and for overseeing their implementation process.

In summary, despite the fact that Afghanistan has one of the highest NMRs in world, limited data is available about the causes and underlying factors of neonatal mortality. Beside these problems, there are many actors on the ground with their own strategic objectives for improving the neonatal health situation; however, there is a lack of coordination among different stakeholders and vagueness of their stewardship roles in improving the neonatal health situation in Afghanistan.

In this study, I will explore the immediate causes, and the underlying and basic factors of neonatal mortality in Afghanistan. I will come up with possible solutions and evidenced-based interventions to reduce problem of neonatal mortality in the country.

## **2.2. JUSTIFICATION OF THE STUDY**

UNICEF, et al. (2010) data shows that little progress has been made in reduction of neonatal mortality between 1990 and 2010 in Afghanistan. In order to improve the situation it is very important to review the up-to-date literature, explore the immediate causes and underlying factors, learn from evidenced-based practices, and prioritize the interventions.

When I was performing caesarean deliveries in the maternity ward at Northern regional hospital in Afghanistan, it was very disappointing to hear that the newborn, who was just delivered alive, was dead while I was busy with the surgery procedure. It was not a difficult practice by medical personnel to tell the mother and her family by expressing: "it was God's will that the newborn could not survive in this world, but the God saved the life of the mother; she can bear another one later". It was so hard to see another newborn die and the mother going home with empty hands. But, the question that always remained was why our professional staff including physicians, midwives and nurses could not save the life of newborns. Was it due to lack of skills or knowledge or behaviour? What were the other factors involved? If the newborns were dying in the hospital setting, what was

happening at the community level where there was lack of medical professionals?

Unfortunately, in Afghanistan, there are very few studies conducted on the neonatal health situation. The causes and underlying factors of neonatal mortality are not well understood. Most policies and strategies regarding neonatal health were likely developed without in-depth analysis.

My personal motivation for this study is to explore the cause and factors that are involved in neonatal mortality from the community level to health facility and hospital levels, to identify gaps in the health systems and discover how we can improve the situation of neonates through evidence based practices. I will not do a full policy analysis, which would be out of the scope of this paper.

### **2.3. OBJECTIVES**

The main objective of the study is to analyse the causes of neonatal mortality and provide practical solutions to tackle the challenge of high burden of neonatal mortality in Afghanistan.

#### **Specific objectives:**

1. Explore the causal, and underlying and basic factors of neonatal mortality at household, community and societal levels.
2. Describe the strengths and limitations of existing neonatal health care systems by highlighting key element of the three-delay model.
3. Identify international evidence-based best practices on neonatal health which are applicable to the Afghanistan context
4. Provide policy recommendation to address the problem of the high burden of neonatal mortality and improve the neonatal health situation.

### **2.4. METHODS**

The method of this study is descriptive. A literature review is conducted including journal articles, WHO, UNICEF, UNFPA, World Bank and the Afghan MoPH publications related to the topic. Unpublished data and documents are used with organizations' authority permission. The UNICEF conceptual framework for maternal and neonatal mortality and morbidity (2009) is adapted for this study.

#### **2.4.1. Search strategy**

For this study, an electronic search of Google Scholar, PubMed and Scopus was conducted by using keywords relevant to neonatal health. These key words included, either singly or in combination, the terms reflected in the

conceptual framework outlined below, as well as specific geographic indicators such as Afghanistan, Pakistan, and India. PubMed was searched through Hinari. Additional search of organization websites such as WHO, UNICEF, UNFPA, World Bank, UNFPA, Afghan MoPH and Central Statistics Organization, Save the Children and other organisation working in MNH area was conducted to identify reports and publications. The Healthy Newborn Network website was also search for reports and other publications. Google was used to obtain specific country data.

#### **2.4.2. Conceptual Framework**

For the analysis of causes of neonatal mortality, UNICEF's conceptual framework for maternal and neonatal mortality and morbidity (2009) was adapted to focus primarily on the causes of neonatal mortality (Figure1).

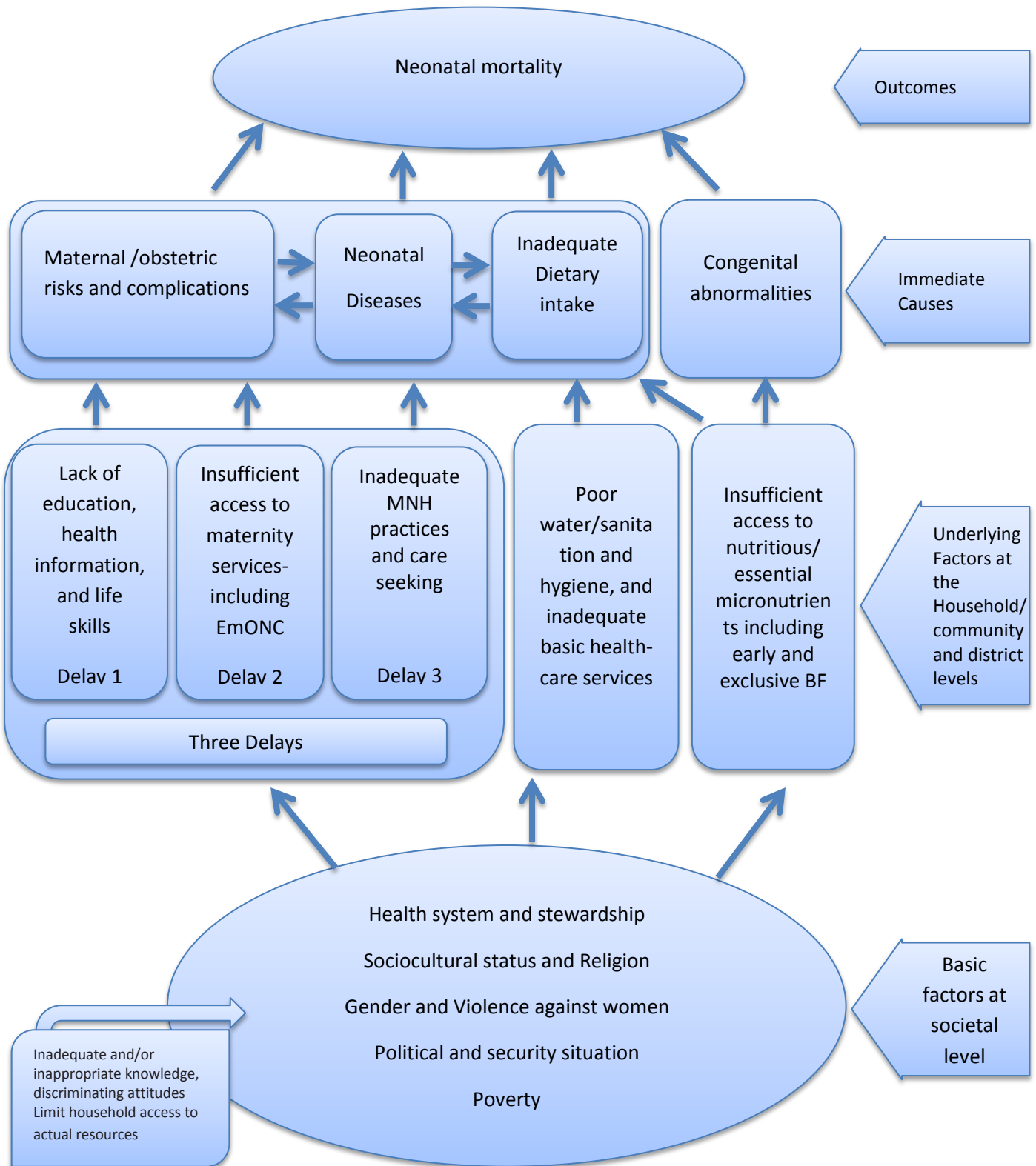
Because the framework was developed for maternal and neonatal mortality and morbidity, terms which were only suitable for neonatal mortality, were adapted. It was inappropriate to use some terms such as obstetric risks, as direct causes for neonatal mortality, using immediate causes was more appropriate. Additionally, underlying and basic causes were adapted to underlying and basic factors to make it more suitable for the study.

In order to appropriately examine the underlying factors for neonatal mortality in Afghanistan, Thaddeus and Maine's (1994) "Three Delay" model was used in this study. This model was originally developed for cause analysis of maternal mortality; however, several studies used the model to analyse the causes of perinatal and neonatal mortality in recent years, which was found very useful. Mbaruku et al. (2009) used this model to analyse the perinatal mortality at the hospital level in Tanzania and Waiswa et al. (2010) analysed the causes and contributing factors of neonatal deaths in Uganda.

The two other underlying factors - poor water/sanitation and insufficient access to nutritious food - are described individually as they independent from the three delay model. Basic factors were adapted by incorporating by six major determinants at the societal level including health system and stewardship, sociocultural status, religion, gender, political and security situation and poverty.

The adapted framework is useful for this study to explore the causes of neonatal mortality and to provide appropriate recommendations for improving the situation of neonatal health in Afghanistan.

**Figure 1: Neonatal mortality conceptual framework**



Adapted: UNICEF, 2009

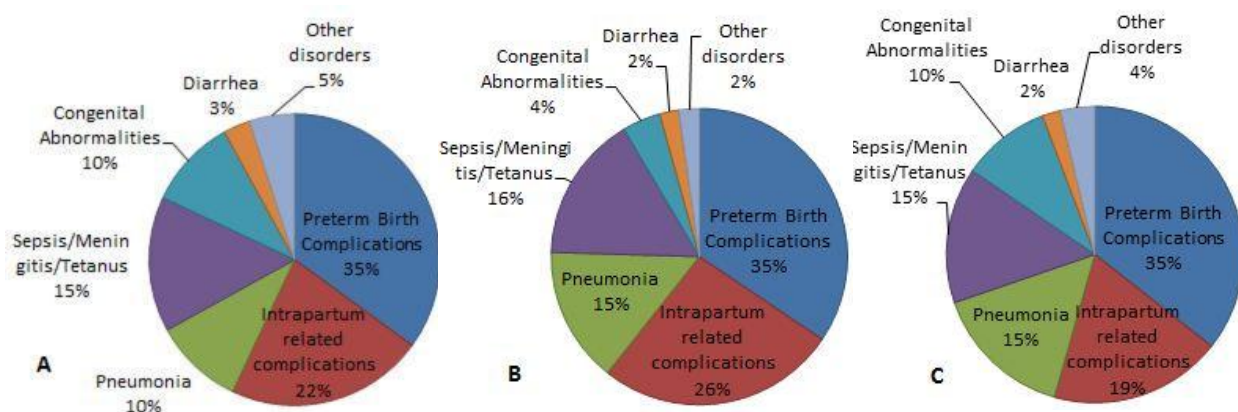
## CHAPTER 3: STUDY RESULTS

This chapter is mainly focused on the immediate causes and underlying and basic factors of neonatal mortality in Afghanistan. Each main immediate cause is described separately. For describing the underlying factors the Three Delay Model is used to find out the condition of health seeking behaviour, access to the health services and quality of care at the health facilities. The basic factors are described at six societal perspectives including health system and stewardship, sociocultural, gender, religion, political and security issues, and poverty. Some of the findings from Afghanistan were compared with international evidence.

### 3.1 IMMEDIATE CAUSES OF NEONATAL MORTALITY

Based on the analysis of causes of neonatal mortality conducted by Lawn et al. (2005), preterm birth (27%), sepsis/pneumonia (26%), asphyxia (23%) and tetanus (7%) were the main cause of neonatal mortality at the global level in 2000. However, recently, Liu et al. (2012) conducted a systematic analysis of causes of child mortality at the global, regional and national levels for 2000-2010. Based on Liu et al. (2012) analysis, the major causes of neonatal deaths were preterm and intrapartum related complications and sepsis/meningitis/tetanus at global level (figure 2 A), which are similar to South East Asian region (figure 2 C) and Afghanistan (Figure 2 B). However, in Afghanistan the proportion of neonatal deaths due intrapartum complications is higher and congenital abnormalities lower than South East Asian region and global figures (Liu et al., 2012). These three main causes collectively account for 92% of neonatal deaths in the country which is further described in this chapter.

**Figure 2: Estimates for 2010: Proportional causes of neonatal mortality, global (A) Afghanistan (B) and South East Asian region (C).**

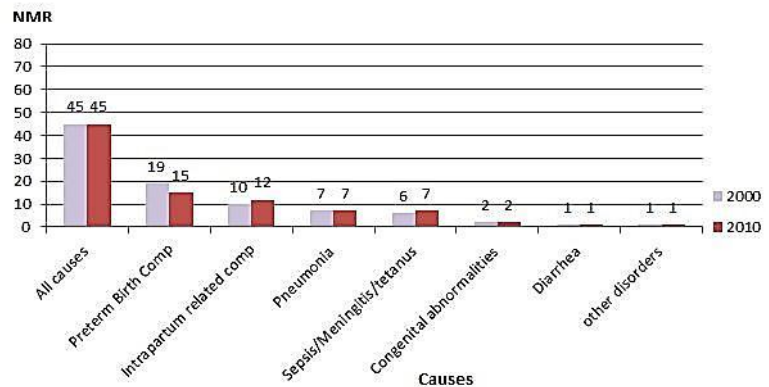


Data source: Liu et al., 2012.

### 3.1.1. Maternal and Obstetric risks and complications

Based on data analysis of Liu et al. (2012), the proportion of neonatal deaths due to preterm birth complication is high as it is considered the leading cause in Afghanistan. NMR caused by preterm birth and intrapartum complications varied between 2000 and 2010; for instance preterm birth complications slightly dropped from 19/1,000 LB in 2000 to 15/1,000 LB in 2010, in contrast, intrapartum complications slightly increased from 10/1,000 LB in 2000 to 12 in 2010, which are not significant (Figure 3).

Figure 3: Estimated NMR by cause in 2000 and 2010



Data source: Liu et al., 2012

#### 3.1.1.1. Preterm Birth Complications

WHO (2010) defines preterm birth as “the neonate is born alive before completion of 37 weeks of gestation”.

Based on meta-analysis of 41 countries, about 84 % of all preterm birth occur between 32 to <37 weeks (moderate to late preterm), 10.4% during 28 to <32 weeks (very preterm) and 5.2% during less than 28 weeks of gestation (extremely preterm). (Blencowe et al., 2012; March of Dimes et al. 2012).

Preterm birth syndrome is classified into two main types: *spontaneous preterm birth* and *provider-initiated preterm birth*. (Goldenberg et.al, 2012). The spontaneous preterm birth occurs after premature rupture of membrane before the pre-labour process. Provider-initiated preterm birth is defined as interventions such as induction of labour or caesarean section, for any foetal or maternal reasons, before 37 completed weeks of gestational age (Goldenberg et al., 2012; March of Dimes et al., 2012).

There are many factors involved in spontaneous preterm birth and changing the uterus to active contraction before the gestation age reaches 37 weeks (March of Dimes et al., 2012). Gestational length and maturity, and social and environmental factors are thought to be the various contributing factors for spontaneous preterm birth (Steer, 2005). Different mechanisms such as inflammation of the uterus, bleeding or ischemia of the utero-placenta, over-distension caused by multiple pregnancies, physical or psychological stress and immunological factors can initiate preterm birth (Goldenberg et al., 2008); however, half of the causes of spontaneous preterm birth are unclear

(Menon, 2008). The table below shows the risk factors associated with increasing risk of both spontaneous and provider-initiated preterm birth.

**Table 1: Risk factors of preterm birth**

Type of preterm birth	Risk Factor	Examples
<b>Spontaneous preterm birth</b>	Age at pregnancy and space between pregnancy	Adolescent pregnancy, advanced maternal pregnancy, short intervals between pregnancies
	Multiple pregnancies	Rate of twins , triplets or higher with assisted reproduction
	Infection	UTI, Syphilis, HIV, Malaria, bacterial vaginosis
	Maternal chronic medical condition	Anemia, diabetes, hypertension, asthma, thyroid disease
	Nutritional	Under-nutrition, obesity, micronutrient deficiencies
	Lifestyle, work related	Smoking, excessive use of alcohol, excessive physical activity
	Maternal psychological health condition	Depression, violence again women
<b>Provider initiated Preterm birth</b>	Genetic	Family history, cervical incompetency
	Induction of labor, cesarean section Non-medical indication	Aggressive policies for performance of cesarean section deliveries

Source: March of Dimes et al. 2012

In Afghanistan, most preterm birth likely is spontaneous preterm birth because access to SBAs, diagnostic equipment and emergency care is limited. Most women deliver at home without SBAs and the rate of caesarean delivery is estimated to be about 3.6% (CSO and UNICEF, 2012). Therefore, the rate of provider-initiated preterm birth is thought to be very low compare to countries where caesarean delivery rate are very high such as US and France where about 40% of preterm birth were reported provider-initiated preterm birth due to high rate of caesarean births (Josef, Demissie and Kramer, 2002).

Preterm neonates are at high risk of death due to hypothermia, infection such as sepsis, pneumonia, tetanus and diarrhoea (Lawn et al., 2005). The lack of simple care and access to health care including SBAs intensifies the situation (Lawn et al, 2005), which is described as an underlying factor later in this chapter.

Afghanistan has country-specific maternal risk factors for spontaneous preterm birth and most of them are related to social and environmental status. Recognized risk factors for preterm birth are described in the underlying and basic factors on neonatal mortality further in this chapter. The prevalence of contributing factors (e.g., HIV AIDS/STI) and risk behaviour (e.g., smoking) is negligible (MoPH, 2012)

There is no data available in Afghanistan to show the incidence of multiple pregnancies, which raises the risk preterm birth about 10-fold compares to



singleton pregnancies (Blondel et al., 2006), but it may not be Afghanistan’s country-specific reason for having such a high preterm birth rate.

### 3.1.1.2. Intrapartum-related Complications

The definition of poor condition of neonate during labour and delivery process has changed over time (Lawn et al., 2009). WHO (1999) used the term “birth asphyxia” to refer the condition that “neonate fails to start breathing or is unable to sustain it”. The ACOG Committee Opinion (2005) recommended avoid using the term “birth asphyxia” because the term was not specific to diagnosis of a neonatal situation. The term “intrapartum-related neonatal deaths” has been used in recent years’ literature to properly define the condition of neonates who die with encephalopathy or who die due to unavailability of resuscitation or who cannot be resuscitated, though deathly congenital abnormalities and preterm birth are excluded (Lawn et al., 2009).

Intrapartum complications are identified as one of the major risk factors for neonatal deaths (Lawn et al., 2009). The risk of obstructed labour/dystocia and malpresentation on neonatal deaths most likely are very high compared to other intrapartum risks factors such as meconium staining, prolong labour and maternal high fever (table 2) (Lawn et al., 2005).

**Table 2: Adjusted odds ratio of intrapartum complications risk factors for neonatal mortality.**

Intrapartum factors	Odds Ratio
Malpresentation	
Breach	6.4-14.7
Other	8.3-33.5
Obstructed labour/dystocia	6.7-84.9
Prolong second stage	2.6-4.8
Maternal fever during labour (>38°C)	9.7-10.2
Reapture of membrane >24 h	1.8-6.7
Meconium staining of liquor	11.5

Source: Lawn et al., 2005

Lawn et al. (2009) showed that there is an inverse association between neonatal deaths related to intrapartum complications and access to SBA. In settings where almost all women have access to SBA they have very low NMR due to intrapartum complications; whereas where access to SBA is unavailable for half of the women, the intrapartum related neonatal deaths is very high (Lawn et al., 2009).

The inverse associate between NMR and SBA is applicable in Afghanistan’s setting. The NMR due to intrapartum complications is a very high estimated 12/1,000 LB (Liu et al., 2012) and only 39% of women have access to SBA (CSO and UNICEF, 2012).

Obstructed labour carried the high risk factor for neonatal deaths (Kusiako, Ronsmans and Van der Paal, 2000). Bartlett et al. (2005) found that obstructed labour in Afghanistan is the second leading cause of maternal mortality (MMR was estimated 16,000/100,000 LB). A later survey (APHI et al., 2010) ranked obstructed labour as the third leading cause of maternal mortality (MMR estimated 450/100,000 LB). Meanwhile, a survey (CSO and

UNICEF, 2012) found that the caesarean delivery rate was very low estimated 3.6%. These studies reflect the magnitude of insufficient access to maternal health care during the intrapartum period, which consequently increased the NMR due to intrapartum complications.

The other factors for intrapartum complication-related neonatal deaths such insufficient access and quality of care is further described in the underlying factors section.

### **3.1.2. Disease**

In this section, infection as one the main immediate causes of neonatal mortality is described.

#### **3.1.2.1 . Infection**

The proportion of causes of neonatal death due to infection is estimated to be 33%, including sepsis/meningitis/tetanus (16%), pneumonia (15%) and diarrhoea (2%) altogether, appear to be the second leading cause of neonatal death in Afghanistan (Liu et al., 2012). Based on Liu's (2012) analysis, the rate of cause-specific neonatal mortality due to infection between 2000 and 2010 was almost stable; the rate sepsis/meningitis/tetanus slightly changed from 6/1,000 LB in 2000 to 7/1,000 LB in 2010, but the rates of the pneumonia (7/1,000 LB) and diarrhoea (1/1000 LB) was constant.

There are several factors contributing to the high NMR caused by infection. The immediate contributing factors are most likely lack of antenatal care, deliveries unattended by SBAs, deliveries under poor hygienic environment and poor cord care, preterm birth, lack of practicing exclusive breast feeding and failure to recognize the danger signs of pregnancy, childbirth and neonatal sickness (Thaver & Zaidi, 2009).

In the Afghanistan context, the underlying and basic factors of the high incidence of neonatal infection are described under the Three Delays model, and socio-economic and cultural factors sections later in this chapter.

### **3.1.3. Congenital Abnormalities**

A number of terms are used to describe embryo or foetal development disorder such as congenital abnormalities, congenital malformation and birth defects; moreover, there is no single agreed definition or classification exists (Kurinczuk et al., 2010). However, WHO (2009) used the term birth defect and defined it as "either structural or functional abnormalities such as metabolic disorders that are present from birth".

Congenital abnormalities are the uncommon cause of neonatal mortality in Afghanistan which account for only approximately 4% of neonatal deaths. The NMR due to congenital abnormalities is estimated to be 2/1,000 LB and the rate has been stable since 2000 (Liu et al., 2012). The proportion of neonatal deaths due to congenital abnormalities is relatively lower in Afghanistan than south-east Asian countries such as Pakistan (5%), Nepal (6%), Bangladesh (7.5%) and India (8.7%) (Liu et al., 2012). The low prevalence of HIV/AIDS and the low proportion of drinking alcohol and cigarette smoking among women due to cultural inappropriateness may be reasons which are described below.

Although the causes of congenital abnormalities are unknown in majority of cases, the risk factors are genetic, parental consanguineous marriages, maternal overweight and obesity, diabetes mellitus, alcohol and tobacco use, maternal infection such as STI, HIV/AIDS and rubella and higher maternal age (March of Dimes et al, 2012; Talukder and Sharma, 2006; Kurinczuk et al., 2010). Talukder and Sharma (2006) in their study in India show that consanguineous parents, history of abortion, multigravida, and maternal age over 34 significantly increase the risk of congenital abnormalities. Folic acid deficiency before pregnancy can be a risk factor for neural tube defects e.g., spina bifida (Honein et al., 2009).

There is an association between preterm birth and congenital abnormalities. The probability of preterm neonates having a major birth defect, e.g., neural-tubal defects, is two times higher than at term; meanwhile, the risk of having birth defects is much higher in severe preterm than moderate preterm birth (Honein et al., 2009). It is more likely that neonates with congenital abnormalities are born preterm (March of Dimes et al., 2012).

In Afghanistan, there is lack of data on the prevalence and incidence of some of main risk factors for congenital abnormalities such as of STI, HIV/AIDS, rubella, diabetes mellitus, obesity and tobacco smoking. However, the prevalence of some of the risk factors may be lower in the country. The prevalence of HIV/AIDS is thought to be to be low (below 0.5%) among the general population (Saif-ur-Rehman et al., 2007; MoPH, 2012). It is estimated that 65% of pregnancies occur in women younger than 35 (ICON-Institute, 2009). Alcohol consumption and cigarette smoking among women are prohibited by cultural and religious norms. Other factors such as nutrition deficiency, fertility rate and consanguineous marriage are described in the underlying and basic factors.

## 3.2. UNDERLYING FACTORS

There are numerous underlying factors that contribute to the high NMR in the country, which are describe under three delay model. The other factors such as nutrition and water and sanitation are described in separate topics.

### 3.2.1. The First Delay

The first delay describes the delay in decision to seek both health curative and preventive care. Numerous socioeconomic, cultural and religious factors affect the woman, family and community's decision to seek health care (Thaddeus and Maine, 1994).

There is a strong and consistent positive association between education of mothers and health seeking behaviour. (Thaddeus and Maine, 1994; Gabrysch and Campbell, 2009). Mothers' education increases knowledge of the benefits of health care, raises awareness of availability of types of health services, increases receptiveness to the new health information, empowers women to have more access to household resources and strengths women's decision making ability (Gabrysch and Campbell, 2009). Meanwhile, husband education is crucial as well, because it makes them aware of the benefits of SBAs and they may put less constrains on women's decision making and mobility (Gabrysch and Campbell, 2009).

Considering the facts, in Afghanistan, only 26% of people are literate, and 17% of people aged 25 and above have attended formal education, whereas the figure for women is only 6% (ICON-Institute, 2009). The school enrolment at primary and secondary levels is at 52% and 61% respectively (ICON-Institute, 2009).

Low levels of education are associated with poor ANC and SBA seeking behaviour in Afghanistan (JHU and IIHMR, 2006). In a cross sectional study, Mayhew et al. (2008) found that the odds ratio of deliveries attended by SBA are much higher among literate women than illiterate ( $OR^1=3.8$ ; 95%  $CI^2=3.2,4.5$ ). The proportion of women attending ANC is also higher among educated women than the uneducated. Fifty-two percent women who had attended some school received ANC from skilled health providers compare to 31.1% for women who never attended school (JHU and IIHMR, 2006). Although the positive association between education and health seeking behaviour in Afghanistan is consistent with international evidence; however, the confounding factor might be access to health services, because the majority of educated women live in urban areas (ICON-Institute, 2009) where access to health services is easier than in rural areas.

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<sup>1</sup> Odds Ratio

<sup>2</sup> Confidence interval

There is also a link between education of women and fertility rate and utilization of family planning services. ICON-Institute (2009) found that the total fertility rate among women with secondary level education is four children per woman and among non-educated is 6.53 children per woman. The contraceptive prevalence rate (CPR) was more than two time higher among primary educated women (31%) than not educated (14%). Overall, the total fertility rate (TFR) was estimated 6.3 per in 2007-8 (ICON-institute, 2009), a later survey (APHI et al., 2010) showed that the TFR was 5.1 children per woman in 2010 which most likely has a linked with low literacy rate among women in the country.

Evidence suggests that the risk of preterm birth raises more than two times when the interval between two pregnancies is less than six months (Goldenberg et al., 2008). Moreover, one of the high risk factors for congenital abnormalities is multigravida (Talukder and Sharma, 2006). ICON-Institute (2009) showed that almost one third of women had birth intervals of less than 18 months and half the women less than 24 months. These figures demonstrate that shorter birth spacing is a problem in the country which, in fact, increases the risk of preterm birth and congenital abnormalities consequently raises the risk of neonatal deaths.

The perception of needs and benefits of seeking health care from the health facilities primarily depends on the availability of information and the health knowledge of women and families on the danger signs of pregnancy, delivery and postpartum as well as perceived quality of care (Gabrysch and Campbell, 2009).

In Afghanistan, various challenges exist on the availability and utilization of health information such as developing low standard information education and communication (IEC) messages and low coverage of the IEC messages (MoPH, 2008). Altai Consulting (2005) found that the majority of people have access to radio and the penetration figure for radio is 83% but only about 50% of people listen to health programs. The penetration figure for TV is 37% which is mainly available in major cities.

Evidence shows that health knowledge about danger signs during pregnancy, childbirth and postnatal increases the utilization of health services at the health facilities (Gabrysch and Campbell, 2009). Lack of health knowledge most probably increases harmful practices and decreases health seeking health behaviour from health professionals, which consequently affects the health condition of neonates.

In Afghanistan, most likely, there are many unsafe and harmful practices during delivery and the neonatal period that contribute to neonatal infection and death. A formative research (Altai Consulting, 2004) found that most traditional birth attendants (TBAs) cleaned the knife with water or cloth

when they cut the cord, very few of them used boiled water; nevertheless, most women knew that soap, clean plastic, cotton and cloth were needed for delivery. In a qualitative research (Governance Institute Afghanistan, 2010) women mentioned that breast milk immediately after birth was unclean and it had unpleasant smell, and it should begin after three days.

Additionally, a qualitative study (Governance Institute Afghanistan, 2010) found that the decision to seek health care from *Mullahs* (religious leaders) or health care professionals depends on the perception of families about the situation and category of neonates' problem. They believe if the neonate has a problem related to an evil spirit, such as being frightened, not sleeping well, not sucking the breast, discoloured skin and crying so much, they seek help from *Mullah*; however, if the neonates either have fever or diarrhoea or pneumonia, they go to traditional healers, TBAs or professional health care providers.

The perceived quality of care, which most likely has a main effect on health seeking behaviour, depends on receivers' quality assessment such as waiting time, previous experience, availability of supply, appropriateness to culture, and attitude of the staff (Gabrysch and Campbell, 2009). Peters et al. (2007) in his study of BPHS performance found that the median score for community perception of quality of care was 76% and the median score of patient satisfaction was 83% at the national level. Although the level of satisfaction of the patients is high in that study, but the data collection was conducted through exit interviews at the health facility which might increase the level bias on perceived quality of care and possibly ignored the depth of satisfaction of the patients. A qualitative study (Governance Institute Afghanistan, 2010) found a mixed picture of perceived quality of services. Long waiting times, shortages of medicine, staff inappropriate behaviour and demands for informal payment were among the community frustrations, while other service receivers were satisfied and mentioned improvement of services in recent years. Jhpiego and JHSPH (2011) found that most women and communities were satisfied with the quality of service provision and the attitude of newly graduated midwives.

The other main factors influencing the decision to seek MNH care among Afghan people are distance to the health facility and the cost of health care. The Governance Institute Afghanistan (2010) found the barriers against going to health facilities, emphasized by most people, were lack of physical access, shortages of means transportation and high costs. The Afghanistan Health Survey (JHU/IIHMR, 2006) found that there were three main reasons for deciding not to seek health care: 28% of people decided not to seek health care because they perceived that their disease was not severe, 27% due to great distance to the health facility and 24% could not afford the treatment.

Women's status - educational attainment, cultural and economic - is one the crucial aspects of health-seeking behaviour and directly affects the first delay (Thaddeus and Maine, 1994), which is most likely applied on neonatal health seeking behaviour. The cultural, religious and gender perspective of women's status in the country is described as the basic factor.

### 3.2.2. The Second Delay

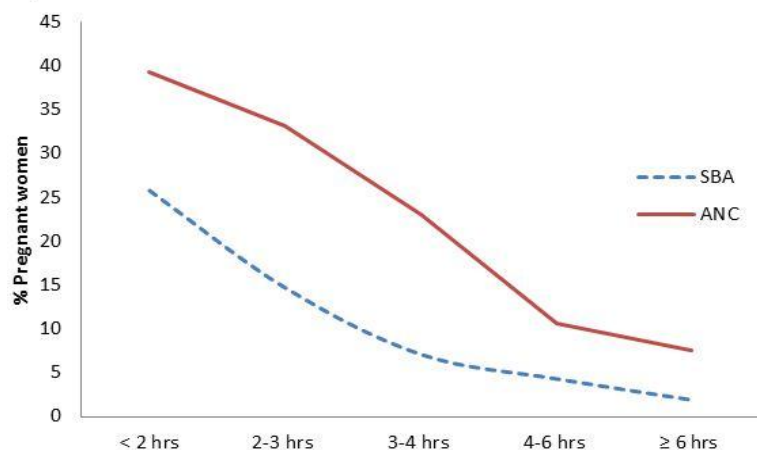
The second delay describes the situation when reaching health care services is delayed (Thaddeus and Maine, 1994). Mountainous geography, cold and snowy seasons, poor and unpaved roads in most of the country, unavailability of public transport and distance to the health facilities are the main obstacles that prevent access of women and neonates to health services in Afghanistan, especially in rural areas (ICON-Institute, 2009; JHU and IIHMR, 2006).

JHU and IIHMR (2006) found that the most common modes of transportation for people to travel to the nearest health facilities were foot (75.1%), bus (12.2%), car (11.5%) beasts/bikes (8.2%) and motorbike (0.6%). About 58.5% of people walk less than two hours to reach to the nearest health facility and more than 61.5% of people use routine types of transportation to reach to the nearest health facility within two hours (JHU and IIHMR, 2006). The ICON-Institute (2009) found that on the national average 68% of people can reach a health facility within one hour using foot or animal average. However, in urban areas it is much higher (97%) than rural areas (63%). The results of both surveys show that physical access to the health services is major constrain for Afghan people, especially in rural areas.

Based on JHU and IIHMR (2006) surveys, with increasing the distance from two hours (using routine transportation) to  $\geq 3-4 <$  hours, the utilization of ANC and SBA services reduces by almost four times. (See figure 4).

The CSO and UNICEF's (2012) figures show that 47.9% of women receive ANC from skilled providers at least once and 38.6% women have SBA at delivery. Later figures (CSO and UNICEF, 2012) show ANC (one visit) coverage is 47.9% and proportion of SBA at delivery is 38.6%. The disparity on access SBA and ANC between urban and rural areas is large. Seventy -

Figure 4: The effect of distance on utilization of ANC and SBA



Data source: JHU and IIHMR, 2006

seven percent of women in urban areas and 41% in rural areas receive ANC. The percentage of women who are assisted by SBA in urban and rural areas are 74.3% and 30.5 respectively (CSO and UNICEF, 2012). The proportion of women aged 15-49 who received toxoid tetanus (TT) vaccination prior to child birth is 40.8%.

Beside the effect of distance on utilisation of services, there is positive association between poverty and utilization of SBA (Mayhew et al., 2008). Mayhew et al. (2008) found that Women in poorest quintiles were more than 6 less likely to utilize SBA than women in wealthiest quintile (OR=6.3; 95%CI=4.4, 8.9).

There is large inequity in distribution of health services in the country. The number health workers per capita vary largely from one province to another (Belay, 2010). Medical specialists including OBGYNs and neonatologists are inequitably distributed throughout the country and the majority are located in major cities including Kabul, Herat, Mazar-I-Sharif and Jalalabad; in 11 out of 34 provinces OBGYN specialist are not available (CSO, 2012). In addition, 41% of district hospitals had the staff required to provide Comprehensive EmONC services, whereas, all specialized and regional hospitals had enough staff to perform the services (Kim et al., 2010). The need to treat obstetric and neonatal complications at the facilities is much higher in rural area than at major cities.

### **3.2.3. Third Delay**

The third delay occurs due to poor quality of care. Delays in provision of health care services at health facilities are caused by shortages of staff, staff competency, and availability of equipment, supplies and inadequate management (Thaddeus and Maine, 1994).

Based on a review of Afghanistan's health sector, there is a severe shortage of health workers to fulfil the current BPHS and EPHS services (Belay, 2010). The estimation of total shortfall is 39% and the shortfall of community midwives and female nurses is about 55% and 85.5% respectively; however, the shortage of physician is not severe at 9% (Belay, 2010). Based on human resource analysis (Sherratt and Abeykoon, 2007), Afghanistan probably needs more than 6087 midwives. The current number of midwives is about 2700 (MoPH Human Resource official, oral communication, August, 2012).

Moreover, in surveyed health facilities, Kim et al. (2010) found several gaps in provision of MNH services such as unavailability of staff, training issue, shortage of supplies/equipment and management issues. Some health facilities which did not provide specific services were asked the reasons. Training issue and shortage of equipment/supply were found the main



reasons for not performing required services in those health facilities (sTable 3). Delays in provision supply were reported in most health facilities. The main reasons for that those delays were administration procedures (27%) and transportation difficulties (21%) (Kim et al., 2010).

**Table 3: Reason for not providing some of MNH service despite indication**

Type of services	Availability of Human resource %	Training issues %	Equipment /Supply%	Management issue %
Care of preterm birth or low birth weight neonates	8	42	42	8
Partograph usage	14	57	29	29

Source: Emergency Obstetric and Neonatal Care Needs Assessment, Kim et al, 2010

Although a recent survey (CSO and UNICEF, 2012) shows improvement in coverage of ANC, the full content coverage of ANC service [measuring blood pressure, urine testing for protein, detecting anaemia and syphilis through blood testing, and measuring weight (WHO, 2009b)] is only 12.1%.

In emergency caesarean deliveries, the time frame between the decision to perform the incision and the beginning of the procedure is critical and demonstrates the quality of care at the health facility. An assessment (Kim et al., 2012) found that in 30% of emergency caesarean deliveries the time space from decision to incision was less than 1 hour; in 39% and 13% of emergency cases, the incision was made 1-3 hours and 3-12 hours after decision, respectively. The perinatal deaths of those deliveries were 17% (Kim et al., 2012). These figures show poor performance health professional on caesarean deliveries in the country.

A study (Kandasamy et al., 2009) in a specialized maternity hospital in Kabul showed that perinatal mortality was 89/1,000 births and 50% of perinatal deaths were due to obstructed labour, malpresentation and ruptured uterus, which demonstrate the poor quality of service at the specialized referral hospital. The other study (Partamin et al., 2012) indicated that the score of knowledge of midwives and doctors on low birth weight neonatal care was and 45.7% and 49.5% respectively, and on initial action on neonatal infection was 48% and 55% respectively.

Despite several gaps in the quality of maternal and neonatal care services, a survey (JHU and IIHMR, 2010) shows improving quality of health services for the delivery of the BPHS in the country. According to the Balanced Scorecard survey (JHU and IIHMR, 2010), the composite score of performance of BPHS improved from 50.4% in 2004 to 71.7% in 2008, but slightly reduced to 70.4% in 2009 at the national level. However, that

survey did not intent to measure the depth of knowledge and skills of health care providers and the outcome of MNH services.

Lack of training widens the gaps between actual and desired performance of providers against the standards. In order to bridge the gaps, the MoPH with technical assistance of Jhpiego developed a training system (MoPH, 2010). As a result 412 health workers including nurses, midwives and physician were trained but this covers only 7% of the professional health workers who are working in the MNH field in the country (MoPH, 2012). In order to fill the gaps, considerable investment on performance improvement of maternal and neonatal workforce is required.

Supportive supervision of SBAs at the health facilities most probably is poor and most SBAs likely don't receive feedback about their skills and knowledge in regular basis. In addition, the behaviour of some of the staff on neonates care may not be appropriate (MoPH RH department official, oral communication, August, 2012).

Overall, quality of care at the health facilities in Afghanistan are inadequate which likely increase the risk neonatal deaths at the health facilities.

#### **3.2.4. Nutrition status**

Insufficient access of women to nutritious food and micronutrients is associated with increased maternal and neonatal mortality and morbidity (UNICEF, 2009).

The high risk of spontaneous preterm birth is associated with low body mass index (BMI) of women prior to pregnancy (Goldenberg et al., 2008). Preterm birth is more frequent among women with lower than normal levels of micronutrients such as iron, folic acid or zinc during pregnancy (Goldenberg et al., 2008). In Afghanistan the National Nutritional Survey (MoPH et al, 2004) shows that almost 27% of non-pregnant women aged 15-19 are underweight, and 26% of pregnant women are anaemic due to iron deficiency. A recent survey (CSO and UNICEF, 2012) showed that the prevalence of anaemia among non-pregnant women is 21.4% and among pregnant women is 16.3%. These figures indicate that around one fourth of Afghan women have poor nutritional status which puts them at a higher risk of preterm birth. Data on the prevalence of folic acid deficiency among pregnant and pre-conceptual women in Afghanistan is unavailable, though, based on the generally poor nutrition status of women, the prevalence of folic acid deficiency in pre-conceptual women may be similar to the prevalence of iron deficiency anaemia among non-pregnant women.

The low initiation of breast feeding raises the risk of neonatal deaths due to infection (Thaver & Zaidi, 2009). A survey (ICON-Institute, 2009) found that only 35% of women breast fed their neonates within the first three days

after birth. A survey (CSO and UNICEF, 2012) shows that the proportion of early initiation of breast feeding (within one hour after birth) is estimated 53.6%. The lack of availability of health information, low level of knowledge and awareness, cultural beliefs and practices most likely prevent women to initiate breast feeding immediately after birth.

### **3.2.5. Water Sanitation and Hygiene**

Much evidence shows that water sanitation and good hygiene reduces the burden of diseases such as diarrheal disease and pneumonia (Cairncross and Valdmanis, 2006). Access to clean water and hygienic practices reduces maternal and neonatal mortality and morbidity especially during delivery (UNICEF, 2009).

In Afghanistan providing access to improved water sources and improved latrines is a challenge. Almost 57% of people have access to improved water sources, and 28.5% use improved latrines. However, most people have access to hand washing facilities (70.4%) and to soap (74.4%) (CSO and UNICEF, 2012).

Because access to water sanitation and hygiene is a challenge in the country and because most deliveries are at home most mothers and neonates are probably at risk of infection due to unclean delivery and postpartum practices. Although most households have hand washing facilities with soap it is unclear how frequent they use these facilities to prevent transmission of infection to mother and neonates.

## **3.3. BASIC FACTORS**

Underlying factors of neonatal mortality are influenced by some basic interrelated factors such as health system and stewardship, sociocultural status, gender, religion, the political situation and poverty. These factors are described individually in this section.

### **3.3.1 Health system and Stewardship**

After the fall of the Taliban in 2001, the performance of the economy improved and the performance of the health sector was apparently in line with economic development (Belay, 2010). A lot of investment was made to improve the situation of MNH. Many strategies and policies were formulated to improve the health system. Improving access to MNH services, reduction of maternal mortality and a slight reduction of the TFR are major achievements in the field of RH since 2002. However, most of the challenges in the health system related to MNH are already described under the Three Delays model. As a part of health system, there are some challenges at the MoPH stewardship which plays the leading role for developing health system and policies.

Currently, each MoPH department has its own strategy or strategies concentrated on their specific area of their interest. Child and Adolescent Health (CAH) department has separate policy and strategy for maternal and neonatal health, BPHS and EPHS operate under GCMU with separate policy and strategic plans, while the Reproductive Health Department (RHD) functions with distinct policy and strategy under the office of the deputy minister. Some of the objectives of different strategies on MNH may be inconsistent with each other or overlapping (MoPH, 2008; MoPH, 2009b; MoPH, 2011; MoPH, 2009c) (table 4).

**Table 4: Summary of overlap and inconsistency of different MNH strategies**

Strategy	Intervention	Challenge
<b>RH</b>	Integrating neonatal health care into maternal health care	Different approach from CAH strategy
	Establishing Family Health Action Group <sup>1</sup> , expanding role CHWs and revising CHW's Job description accordingly	Different approach from CAH strategy
	Providing EmONC and basic neonatal care to professional health workers	Overlap with CAH strategy
	Improving maternal health services	Overlap with CAH
	Developing IEC materials, and establishing IEC distribution and monitoring mechanism	Overlap with HNC strategy
<b>CAH</b>	Establishing Mothers' support group <sup>2</sup>	Different approach from RH strategy
	Integrating essential neonatal care into IMCI	Different approach from RH strategy
	Developing community IMCI and revising CHWs curriculum and job description accordingly	Different approach from RH strategy
	Improving maternal health services	Overlap with RH
<b>Health and Nutrition Communication</b>	Raising awareness and increasing knowledge of people on MNH	Overlap with RH
	Developing IEC material, and establishing dissemination and monitoring/evaluation system for IEC materials	Overlap with RH

<sup>1</sup> CHWs mobilize the community and educate a group of men and women on MNH/FP and then those groups share their knowledge with the rest of the community. This approach is introduced by Jhpiego (Jhpiego, 2012).

<sup>2</sup>CHWs visit households and checkup neonates and mothers at household level and educate a group of mothers in the community on MNH. This approach was introduced by Management Sciences for Health (MoPH, 2009c).

Source: MoPH (2008); MoPH (2009b); MoPH (2011); MoPH (2009c)

In addition to inconsistency among different strategies, RH strategy also focuses on improving IEC and developing distribution and monitoring mechanism. The CAH strategy plans to improve maternal health care in larger scale using the same approach as RH strategy but also introduces different approaches. BPHS, which is the core programme of the health system, provides a package of MNH services, with clearly allocated resources. However, it does not reflect the recently developed RH and CAH strategies. Both RH and CAH strategies may replicate some the interventions that are already being implemented by BPHS. RH, CAH and Health and

Nutrition Communication strategies do not measure the resources needed for the implementation of the interventions.

These challenges may reflect a deficiency in stewardship of MoPH on MNH.

### **3.3.2. Sociocultural factors**

One of the cultural factors that prevent women from seeking health care from health facilities may be stigma. The Governance Institute Afghanistan (2010) found that in some districts during focus group discussions many people, including elders, husbands, women and mothers-in law, mentioned that going to the health facilities and seeking health care especially from male providers is shameful for the family and relatives. A group of husbands mentioned that they believed in God and Prophet Mohammad and they did not allow their wives to be injected by strangers; however, the other group mentioned that it was affordable and accessible for them to seek help from *mullahs* (religious leader) rather than going to the health facility, and that was not a matter of shame. Seeking help from *Mullahs* is more convenient and culturally acceptable (Governance Institute Afghanistan, 2010).

Many studies of Afghan society show that restriction of women's movement and their ability to travel is a very common practice, which in turn reduces their access to health care services (UNAMA and OHCHR, 2010).

Evidence suggests that adolescent pregnancy raises the risk of preterm birth (Muglia and Katz, 2010). In Afghan culture, arranged marriage is a very common practice and the families of boys and girls frequently agree to marriages (Landinfo, 2011). Afghan girls can marry with the consent of their families at the age of 16 (Landinfo, 2011). The ICON-Institute survey (2009) found that the early mean age of marriage, was 17.9 years; 8% of women were married before the age of 15 years and 35% of women got married before the age of 18 years. Bearing children immediately after marriage is common and newly married women are forced by families and relatives to follow the tradition (UNAMA and OHCHR, 2010). It is evident that the proportion of early marriage is high which can be followed by early pregnancy and increases the risk of high preterm birth rate in the country.

Consanguineous marriage, which raises the risk congenital abnormalities (Talukder and Sharma, 2006) is part of sociocultural norms and common in Afghanistan (Smith, 2009). The estimated proportion of consanguineous marriage is 46.2% and the first cousin marriage is the commonest consanguineous marriage, estimated 27.8% (Saify and Saadat, 2012).

There is no data to show the prevalence of women who consume alcohol and smoke tobacco in the country, however, based on cultural and religious norms, it can be presumed that the practices, which increase the risk of

preterm birth and congenital abnormalities (Talukder and Sharma, 2006) are very low.

### **3.3.3. Gender discrimination and violence against women**

Based on UNDP's Human Development Report (2011), Afghanistan's Gender Inequality Index is 141 out of 146 countries.

The ICON-Institute (2009) survey shows that there is large disparity between the status of women and men in Afghan society. Gender segregation is very strong, and there are very strict rules for women's mobility. Women culturally, socially and economically adhere to their husbands.

Women have least power on household level decisions which are mostly made by husbands or fathers. For instance, 77% of decisions about spending on medicine for children and 80% of decisions about spending on medicine for the wife are made by the father or husband and only 4% of decisions are made by the wives for those purposes (ICON-Institute, 2009).

There is huge disparity on the literacy rate between men and women. The literacy rate among women aged 15 or over is 12% compare 39% among men aged 15 or over (ICON-Institute, 2009). A later survey (CSO and UNICEF, 2012) shows that the Gender Parity Index is estimated 0.49 for secondary education. The gender discrepancy between male and female students who are entering to secondary education is 43% and 21%, respectively. Insufficient access to education among women can be one of the factors that diminish their power to decide to seek health care for themselves and neonates.

Poor mental health including depression and violence against women, which are both associated with higher risk of preterm birth (Goldenberg et al., 2008), are huge problems in Afghanistan. A study showed that more than 73% of Afghan women above aged 15 years had symptoms of depression and about 48% had posttraumatic stress disorder (Cardozo et al., 2004). The Afghan Mortality Survey (APHI et al., 2010) showed that about 10% of all female over aged 15 injury-related deaths were intentional and caused by violence, and more than 5% were self-inflicted injuries (triggered by domestic violence). A study (Nijhowne and Oates, 2008) showed that 87.2% of women had experience of at least one type of violence such as physical, sexual or psychological violence and 62% of women suffered from multiple types of violence. Since prevalence of depression among women and violence against them is very high probably can happen during pregnancy, pregnant women might be at higher risk of preterm term birth, which may be the other country-specific risk factor for preterm birth.

### **3.3.4. Religion**

Afghanistan is an Islamic state and Islam is the formal religion of the country (Islamic Republic of Afghanistan, 2004). Almost all citizens are Muslims. Religious leaders are the respected and trusted people in the country.

Recently, a powerful council in the country, the All Afghanistan Ulema Council (2012), declared a *Sharia Law* (the moral code of Islam) about women's mobility. In that declaration, women were prevented to go out without a *Mahram-e Sharee* (male chaperon). It was also declared that any expression that contradicts superiority of man over woman should be strictly avoided and it was emphasized that the rights of men on polygamy are based on Quranic versus (All Afghanistan Ulema Council, 2012). Although this declaration was not approved by the Afghan president or parliament, it probably has an effect on male behaviour and men's feelings and practice of superiority over women. The declaration may strengthen the existing sociocultural practice of women's movement restriction and encourage men to have more control of women's mobility and may have an effect on health seeking behaviour of women and neonates.

In Afghan society, early marriage, as risk factor for adolescent pregnancy and preterm term birth, adheres to Islamic norms beside the traditional practices. Although the minimum age of marriage is not mentioned in the Holy Quran, Islam, according to Islamic scholars allows child marriage when the child reaches puberty (UNAMA and OHCHR, 2010). Child marriage was originated during the foundation of Islam. Prophet Mohammad married Aisha when she was six but the marriage was not consummated until she turned nine (Sahih Bukhari, Volume 7; Book 62; Number 65).

The linkage of child marriage between tradition and religion is very strong. It may be a big challenging to change the practice of child marriage and eliminate it from the country in a short term.

### **3.3.5. Political situation and security**

In spite of the considerable amount of foreign aid and with military support, the government has failed to transform the country into a politically stable state and address the economic and social challenges (Federal Research Division, 2008). The government does not have control to over the entire country. Some parts of the country are controlled by warlords and tribes and some other parts by Taliban (Federal Research Division, 2008).

Anti-government militias and the Taliban have intensified their military attacks targeting pro-government forces and institutions in recent years. The security situation became worst in 2011 with more loss of human lives than previous years (UNAMA and OHCHR, 2012). In 2011 alone, the number of

civilian deaths due to armed conflict rose to 3,021 people which were an 8% increase since 2010. Women and children's casualties also increased. In 2011, 166 women and 306 children were killed, which showed a rise of 29% for women and 51% for children compare to 2010 (UNAMA and OHCHR, 2012).

The worsening security situation probably restricts women's and children's mobility and causes delayed to health care seeking, beside other social, economic and environmental impacts. Women and their families may not decide to go out of the houses due to insecurity. If the health care need is recognized, it is might be a challenge to access health care. If they reach the health facility, the health facilities may not have staff to provide service. All these factors probably raise the risk of maternal and neonatal mortality in the country.

### **3.3.6. Poverty**

Despite improving economic growth, Afghanistan remains one of the poorest countries in the world and it is ranked 172 out of 187 countries (UNDP, 2011). In 2010/11 (Afghan solar year 1389), the GDP per capita at the current prices was estimated as \$530 (IMF, 2011). The national poverty rate is estimated as 36% which indicates that almost one-third of people are unable to meet their basic needs (ICON-Institute, 2009). The Gini coefficient index is measured as 29, which is lower than that of neighbouring countries (ICON-Institute, 2009), and it can be due to wide spread poverty (Islamic Republic of Afghanistan, 2008).

The Poverty Reduction Strategic Paper (PRSP) (Islamic Republic of Afghanistan, 2008) identified numerous factors that contributed to wide-spread poverty in the country. Poor infrastructure, lack of economic environment, corruption, political instability and conflict, poor social protection and equity, and vulnerability of people to food insecurity and natural disaster are recognized as the main contributing factors to poverty (Islamic Republic of Afghanistan, 2008). Although the PRSP describes one of the important strategic government directions toward reducing poverty in the country it is has failed to reduce political stability which is one the root cause of poverty, and it is unable to recognize practical ways of poverty reduction with details of how to achieve its goals (Kantor et al., 2009).



## CHAPTER 4: DISCUSSION

Available evidence indicates that the immediate causes of neonatal deaths in Afghanistan (mainly preterm birth, infections and intrapartum complications causing birth asphyxia) are found to be profoundly influenced by key cross cutting themes such as health seeking behaviour, access, quality and governance, under which most underlying and basic factors can be summarized. In this section, I will discuss the challenges and opportunities of these four themes in improving neonatal health in the country.

### 4.1. Health Seeking Behaviour

Available data has indicated that there is a strong link between education of families and utilization of health services in the country such as ANC, using SBAs during delivery, and family planning services, all of which in turn have proven effectiveness in reducing neonatal mortality. Education is therefore crucial, but most women in the country are not educated. They are unlikely to recognize danger signs during pregnancy, childbirth and postpartum as well as neonatal illness which raise the risk of neonatal deaths. Not only is education important, but lack of access to health information among women and families likely contributes to the continuation of harmful and poor hygienic maternal and neonatal practices at household and community levels and reduces the demand for health care from professional health workers.

Therefore, in order to improve health seeking behaviour, both the issue of knowledge and education need to be addressed. It is not within the scope of the MoPH to address education (although they could play an advocacy role). However, they can aim to improve knowledge of the population regarding appropriate health seeking behaviours. With a high national ownership rate of radios, radio programs can be developed modelled on the popular BBC program 'new home new life', which has demonstrated high coverage, as well as proven effectiveness in promoting positive coping strategies in an equitable fashion (Altai Consulting, 2005).

Education, however, can be addressed in an indirect way by involving CHWs to educate women and their families on prevention of postpartum haemorrhage using misoprostol. Sanghvi et al. (2010) showed that the intervention achieved high coverage even in difficult geographical areas of Afghanistan, and that CHWs were effectively able to educate women on this life-saving intervention. The program increased its effectiveness through community mobilization through engaging religious and community leaders as well as families in the entire process of the project. This type of community mobilization indirectly addresses women's status in society and

can be scaled up in a systematic way to educate households and communities on the benefits of MNH care such as ANC, use of SBAs during childbirth, birth spacing, exclusive breast feeding, and preterm neonatal care, as well as avoiding harmful and poor hygienic practices for mothers and neonates, and respect women.

Sociocultural barriers regarding mobility of women can have an effect on health seeking behaviour and induce women to prefer culturally appropriate traditional health practices and seek help from *mullahs* or TBAs. Socio cultural barriers and women's status in society can be addressed through governance mechanisms, which will be described in a later section.

#### **4.2. Access to maternal and neonatal health care**

Evidence has suggested that professional health workers, especially SBAs, most likely have a significant role in reducing the neonatal deaths while Afghanistan faces a critical shortage of SBAs, especially midwives. In the country 34 midwifery schools are functioning. Each school graduates 25 students every two years (President of Afghan Midwives Association, Kabul, oral communication, August, 2012). If we assume 6,087 more midwives are required, as mentioned in 3.2.2, it may take one and half decades to fulfill the need for midwives, disregard the population growth or risk of closing some of the schools due to lack of funds. Afghanistan will continue facing shortage of SBA unless new midwifery schools are established.

While expanding midwifery schools can be considered a better way to address the shortage of midwives, strengthening household care using a community-based approach can be a substitute strategy to promote exclusive breast feeding, clean home delivery with hygienic cord care and thermal care which likely reduce neonatal deaths by 10-50% (Darmstadt et al., 2005). Implementation of home-based preventive and curative neonatal care package (ANC with health education, early neonatal visits, diagnosis of neonatal illness, injectable antibiotics to severe cases and referral) provided by CHWs in Bangladesh has demonstrated that neonatal deaths can be reduced by 34% (Baqui et al., 2008). Another study in India (Bang et al., 1999) showed that home-based treatment of sepsis using injectable antibiotics by CHWs likely reduced the neonatal deaths by 76%.

These types of home-based curative and preventive interventions can be considered as a task shifting strategy to more equitably distribute basic neonatal health care services among population and partially address the issue of insufficient access due to unavailability of professional health workers, unaffordability to basic health care and distance to the health facilities. CHWs will need to receive intensive training, regular supervision,

monitoring and supply as well as regular incentives and motivation to ensure a sustained impact.

Outreach neonatal care likely strengthens the link between community and health facility and create more demand for health care (Darmstadt et al., 2005). This practice can be implemented through BPHS mobile clinics which may not only strengthen the link between health facilities and communities, but will likely improve the performance of CHWs through continuous supervision and monitoring.

#### **4.3. Quality of Maternal and Neonatal Health Services**

The quality of MNH services including basic and comprehensive EmONC and ANC at the health facilities appears to be insufficient, which contributes to high level of neonatal deaths at the facility level. The reasons behind that are probably inadequate knowledge and skills and inappropriate behaviour of health workers, insufficient management of the health facilities, lack of supervision and monitoring and the impaired health system.

In order to improve neonatal health care at the health facility, improving the performance of health care providers and management aspects of the health facility are necessary. A collaborative approach for improving quality of care at the health facility is proven to be an effective way for improving MNH outcomes (Franco et.al., 2009). This approach creates opportunity to improve quality of care such as mobilize the health teams to identify future changes toward better outcome, provide learning opportunities, implement best practices in compliance with standards, establish good working environment and measure input, process and output indicators. The effectiveness of this approach is proven in the 12 low and middle income countries by improving the performance of health facilities from 50% to 80% within six months (Franco et al., 2009). This approach can be an ideal way to improve the quality of care in a large scale since MoPH has already developed evidence based standards for MNH care and neonatal care training packages.

For improving quality of preterm birth care, Kangaroo mother care (KMC) at the facilities can be integrated at the BPHS, since incubator is not including in most BPHS health facilities(BPHS, 2009b). KMC is proven to be effective in reduction of neonatal deaths due to preterm birth, and is strongly recommended by WHO (March of Dimes et al., 2012; PMNCH, 2011).

#### 4.4. Governance

It appears that RH, CAH and Health Communication strategic objectives on MNH possibly are overlapping or inconsistent to each other and may be overambitious as funding sources and availability of resources are limited. Beside these challenges, demands from CHWs seem to be huge with diversity of interventions. These facts suggest a lack of coordination among different departments at the MoPH.

Deficiency in stewardship as well as existing overlapping or inconsistencies in MoPH strategies and policies may put the health system at risk of losing the direction towards improving access and quality of MNH services in the country, and raise the risk of losing the interest of donors to invest on MNH. In order to improve the health policies, MoPH may need to establish policy review committee to review the MNH policies and to:

- make sure those documents are internally consistent
- evidence-based;
- the strategic objectives are consistent with MDG 4 and 5 indicators and sub-indicators;
- service delivery are prioritized based on burden of disease and influential factors, and
- financial resources and health workforce are adequate and equally distributed.

The outcome of the review process can possibly be set of recommendations for modification and unification of neonatal health policy, which may be necessary for the improving health sector stewardship and consequently may have a positive impact on neonatal health in the country. A uniform and comprehensive approach may convince donors to invest in MNH.

Lack of adequate policy implementation is evidence by the unequal distribution of MNH services described earlier in this chapter. In order to address this unequal distribution at policy level, for the short term, the MoPH can review its human resource policy and allocate more resources to provide monetary incentives as well as non-monetary incentives such as improving working environment and learning opportunities and career development in order to increase retention of health workers and motivate health professional to work in rural areas. These factors were found as key motivating factors in a study in Ghana (Snow et al., 2011). For the longer term, the MoPH will need to collaborate with the Ministry of Higher Education to increase the number of health professional education programs required to respond to the shortage of the health workforce. The MoPH may need to modify the EPHS and BPHS and establish more health facilities based on population density to address the unmet need for MNH services especially in rural areas.

As discussed earlier, sociocultural barriers on mobility of women are likely a major constrain on health seeking behaviour for mothers and neonates. Because this traditional practice conforms to Islamic culture, therefore, MoPH can allocate more resources to collaborate with Ministry of Haj and Islamic Affairs (MoHIA), other related ministries, civil society and the private sector to improve the rights of women to access health services and reduce violence against women. The MoPH, in collaboration with the MoHIA and civil society (e.g. the religious council), can train religious leaders on some rights of women in Islam, e.g. the Holy Quran emphasizes the rights of women for having wealth and property along with of their husbands and treatment of women with kindness (Quran, Al Nisa, verse19). That working with religious leaders can be effective was demonstrated by the postpartum family planning (PPFP) project where religious leaders in intervention areas were trained on benefits of PPFP for families and communities and made them aware of the link between PPFP and Islamic norms (Jhpiego, 2012). This practice can be scaled up to train religious leaders on the benefits of health care and promoting demand for MNH according to the Islamic perspectives.

The main limitation of this study is that little research has been conducted on neonatal mortality in Afghanistan. This limited the amount of evidence available on links with causative factors and 'good practices' which could be successfully implemented to address the high rates of neonatal mortality. Nevertheless, use of the conceptual framework to guide the analysis brought factors to light that may otherwise have been overlooked. Data was often available on these factors, and therefore, even given the limited data available, it is felt that a well-rounded analysis of key contributing factors has been possible.

## **CHAPTER 5: CONCLUSION AND RECOMMENDATION**

### **5.1. CONCLUSION**

In Afghanistan there is a strong association between neonatal mortality and four key cross-cutting themes including health seeking behaviour, access to MNH care, quality of MNH care and governance. MoPH does not have unlimited resources to tackle all challenges related to these four themes, but from a political perspective, there is evidence of goodwill for improving neonatal health situation, reinforced by the fact that MNH is a component of the MDGs and is currently the top priority of the health sector., MoPH can leverage political support in order to reduce the effect of these four cross-cutting themes on neonatal mortality. This can be achieved through intersectoral collaboration with other ministries, civil society, the private sector and donor agencies.

MNH policy review is needed to ensure that existing policies address MNH in a uniform, efficient, and effective way. Allocation of sufficient resources for the implementation of these policies is essential to make sure that the policies are implemented in a sustainable manner, rather than remain as stand-alone documents on the shelves.

Health seeking behaviour can be improved through initiation of intersectoral collaboration between MoPH and related ministries e.g. MoHIA and civil society to reduce gender discrimination and increase mobility of women to seek health care, which has been shown to improve neonatal health outcomes. It is the right of people to have access to health information; therefore, collaboration with media regarding health information can be an optimal solution to increase access to health information and raise awareness of people on MNH which in turn improves health seeking behaviour.

Parallel to improving health seeking behaviour, access to MNH needs to be improved. Investment on expansion of good quality health professional education programs can address the shortage of qualified health care professionals in the long term. For the short term, task shifting of specific basic MNH home care to CHWs can be considered as an approach to address the challenge of access to MNH care.

Meanwhile, it is necessary to address the challenge of insufficient quality of care at the health facilities. One of the international best practices on improving quality of care is a collaborative approach between communities, health facilities, and health managers, which can be an ideal solution to address the need for improving quality of care at the health facilities.

Overall, neonates are the most vulnerable population in Afghanistan. Policies cannot reduce their vulnerability to death until those are implemented. Immediate and long term actions are required to change the current situation and improve neonatal health care at home, at the community and at the society level.

## **5.2. RECOMMENDATIONS**

The following policy level recommendations are provided to MoPH and other stakeholders that may improve the neonatal health situation.

- In order to optimize the impact of effectiveness MoPH needs to conduct a review on different policies addressing neonatal health challenges and make sure they are in line with each other .
- MoPH needs to strengthen its capacity to initiate and sustain collaboration with other sectors (e.g. MoHIA) and civil society to improve women’s status in the society and reduce gender discrimination.
- MoPH needs to improve access to information on MNH among population through radio programs and by delivering health messages through CHWs and professional health workers.
- Quality of MNH care services needs to be improved through initiating a “collaborative approach” for quality improvement of MNH health services.
- The number of SBAs needs to be increased through expansion of health professional education programs. Candidates should primarily be recruited from rural areas.
- Task shifting of some of MNH services to CHWs is recommended to improve access MNH care services:
  - Modification of policy is required to allow CHWs to use injections
  - Motivation of CHWs through non-monetary incentives needs to be considered

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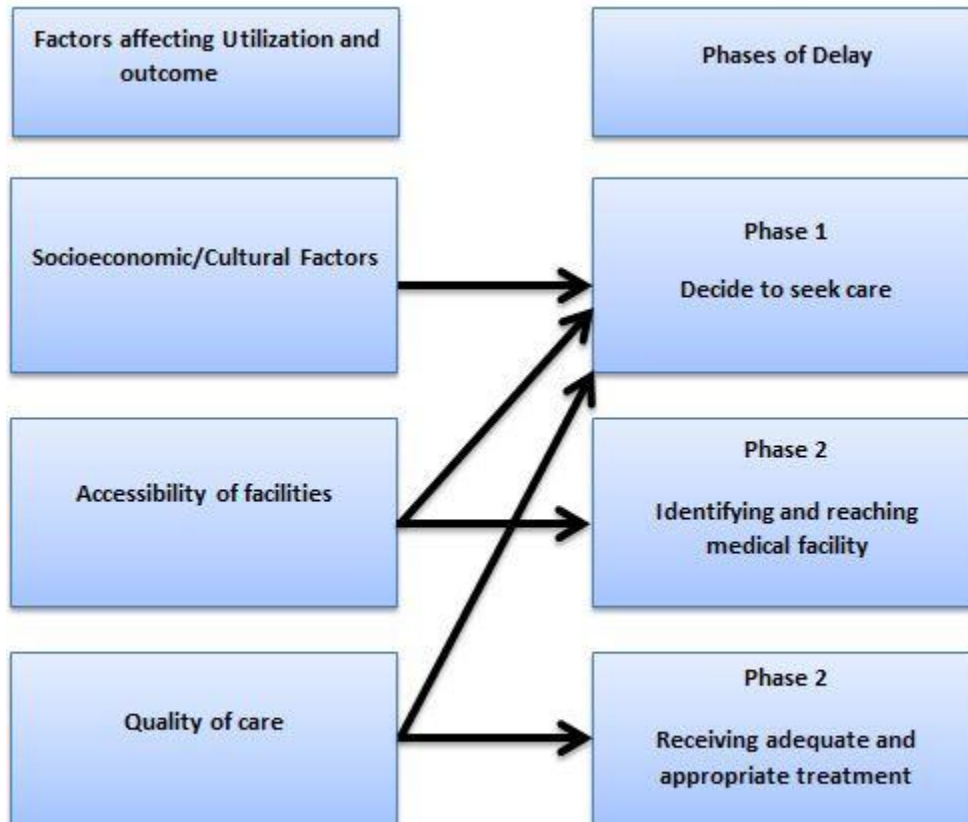
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## ANNEXES

### Annex 1: Three Delay model



Source: Thaddeus and Maine, 1994