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THE ROLE OF THE HEALTH SYSTEM IN WOMEN'S UTILISATION OF MATERNAL HEALTH SERVICES IN SUDAN

Ghada Hussein Ibrahim

A thesis submitted in fulfilment of the requirements of the City
University London for the degree of Doctor of Philosophy

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*I would like to dedicate this thesis to all **women died during maternal period** due to dysfunction of health system, all over the world ...*

My last word is...

PhD is not the end of the exciting journey as I always thought It is just a beginning..

Declaration

This written thesis is my own unaided work. I declare that the work in this thesis was carried out in accordance with the regulations of the City University London and the School of Health Science on plagiarism. The work is original except where indicated by special reference in the text and no part of the thesis has been submitted for any other degree. Any views expressed in the thesis are those of the author and in no way represent those of the City University London and the School of Health Science. The thesis has not been presented to any other university for examination either in the United Kingdom or overseas.

Signed.....*Ghada H. Ibrahim*.....
Date.....*30 September 2015*.....

Abstract

Background: Maternal mortality and morbidity still pose a significant challenge in Sudan, where no significant improvements in maternal health have been achieved despite the focus on the Millennium Development Goals. Under-utilisation is a major public health concern even though Sudan is among the African countries that have registered poor maternal and child health. Health services in Sudan are generally limited and with poor quality and disparate access. Therefore, there is a need for better understanding of the barriers to the provision and utilisation of maternal health services in order to improve the health and survival of Sudanese mothers.

Objectives: This study sought to assess the maternal health system functions and influences on utilisation as well as the social, cultural, and women's characteristics that may constitute barriers to utilisation.

Methodology: The study used an explanatory sequential mixed-methods design. A comprehensive analysis was conducted using several quantitative and qualitative data sets, guided by a new framework, the Maternal Health System Performance framework (MHSP) developed as part of this work in order to assess both the three objectives and four functions of the health system on both macro and micro levels.

Findings: The study findings provide clear evidence that the Sudan health system is not currently capable of achieving an adequate level of attainment of the health goals or equitable distribution, due to dysfunction of the four health system functions. In addition, the findings draw attention to the important role of the stewardship function in health system performance. This function can play a key role in health system reform, as it influences management of the health system and should work across all elements of the system to ensure a well-functioning health system and efficient use of resources. The findings also underline the important role of health system related factors rather than simply population factors (such as individual, household, and community factors) in the low service utilisation among women in poor settings. While it shows that certain population characteristics such as household income and education do have a significant impact on the utilisation, the health system functions, and in particular the stewardship function, are also demonstrated to be of considerable importance.

Implication: These findings have implications for policy and practice, indicating that simply blaming women for not using maternal health services is unhelpful and inappropriate and indicate that decision makers should focus more fully on improving the performance of the health system. According to the comprehensive assessment of the health system performance, the study proposes several recommendations for each health system function to enhance the performance in the context of limited resources, ultimately to improve women's and community health in Sudan.

Chapter 1

1.1 Introduction

Both the United Nations Conference on Population and Development ICPD Programme of Action (1994) and the United Nations Millennium Declaration (2000) brought into focus the importance of maternal and child health. Reduction of mortality for mothers and children was highlighted as two of the eight key areas that require progress and formed specific measurable goals in the Millennium Declaration “MDGs”. The 4th and 5th Goals aim to reduce both child and maternal mortality by two-thirds of its level in 1990. In order to achieve maternal and child health goals by 2015, a large number of countries that signed this declaration have increased their expenditure in order to improve and expand the health services.

Sudan is one of the countries that signed this declaration and has been committed to achieving the MDG targets. However, the Sudanese government has failed to achieve progression towards the health MDGs, particularly goals related to maternal and child health, to date (National Population Council, 2010). In addition, women still fall far below any acceptable standard of maternal welfare as well as maternal healthcare use (i.e., antenatal, delivery, and postnatal care services); further details will be discussed in chapter 2, section 2.1

Under-utilisation in Sudan is a major public health concern because of the massive number of maternal complications and deaths that can be averted by using appropriate healthcare services (National Population Council et al., 2010; Abd Gabbar, 2010). On the other hand, health services in Sudan are generally limited and with poor quality and disparate access. However, even the services that are in place are not utilised optimally. Therefore, there is a great need for better understanding of the barriers to the provision and utilisation of maternal health services in order to improve the health and survival of Sudanese mothers.

There is a growing consensus in the maternal health literature that maternal health services are dependent on the functioning of the entire health system (Graham, 2002). Existing maternal health publications were found to be focused mainly on maternal mortality while maternal morbidities and obstetric complications in Africa were less often addressed in the literature. Some useful systematic literature reviews were located, particularly in maternal health and some methodological papers. However, I could not find any methodological papers that applied both quantitative and qualitative indicators in order to assess health system performance, which is the technique that I have adopted in this study.

However, this study will show that the health system encounters various challenges that prevent achievement of this objective such as lack of attractiveness of the maternity

professionals' roles, low qualifications of applicants, and failure to incorporate village midwives in the Sudan health system. The stewardship function is shown as a crucial dimension of the Sudanese health system performance and in order to initiate reform, it is essential to start from this part of the system, yet the stewardship function receives little attention from the Federal Ministry of Health (FMOH). Consequently, there is a lack of improvement in this part of the system, even though it has a leading part to play in achieving reform within limited resources. Furthermore, human resources for health have notable impact on the quality of the health system in Sudan, particularly village midwives that are considered as the main maternal health providers in Sudan yet, as this thesis will illuminate, remain largely not integrated within the mainstream health system. The Federal Ministry of Health (FMOH) Sudan aims to enhance the role of village midwives by introducing a new two-year training programme, to work in parallel with the one-year training programme in order to improve the quality of maternal services; along with increasing the number of village midwives under the slogan of "One Village One Midwife". The village midwives challenge is not the only critical challenge that affects the quality of maternal health services and the level of utilisation; this study will also describe various challenges related to health system components that also have a significant influence on women's decisions in seeking maternal care.

Accordingly, understanding of the health system and how its functioning parts affects the maternal health service delivery assists in introducing health system reform interventions that effectively help to achieve the millennium development goal of a global reduction in maternal mortality and the recently introduced Sustainable Development goals.

1.2 Rationale of the study

Maternal mortality and morbidity are major challenges threatening women's life and health in low- and middle- income countries. Studies provide evidence that haemorrhage, primarily postpartum, accounts for approximately 25% of maternal deaths globally (Tsu et al., 2004); Filippi et al. (2016) concluded that nearly 73% of maternal deaths that occurred between 2003 and 2009 worldwide (115 countries) were attributed to direct obstetric causes. Of the maternal deaths due to direct causes, 27 percent of women died due to haemorrhage, 14 percent due to hypertension, 10.7 percent due to sepsis, 7.9 percent due to effects of abortion, and 12.8 percent due to embolism and other direct causes (Filippi et al., 2016).

In Sudan, haemorrhage and sepsis are the main causes of maternal mortality according to the annual report of the surveillance system in 2012 (FMOH, 2012). Another retrospective study at a teaching hospital in Khartoum that investigated maternal deaths occurring during the period 1985-1999, concluded that Sepsis, malarial haemorrhage and hypertensive disorders were the main contributory factors while poor perinatal services added more to the maternal problems in Sudan (Dafallah et al., 2003).

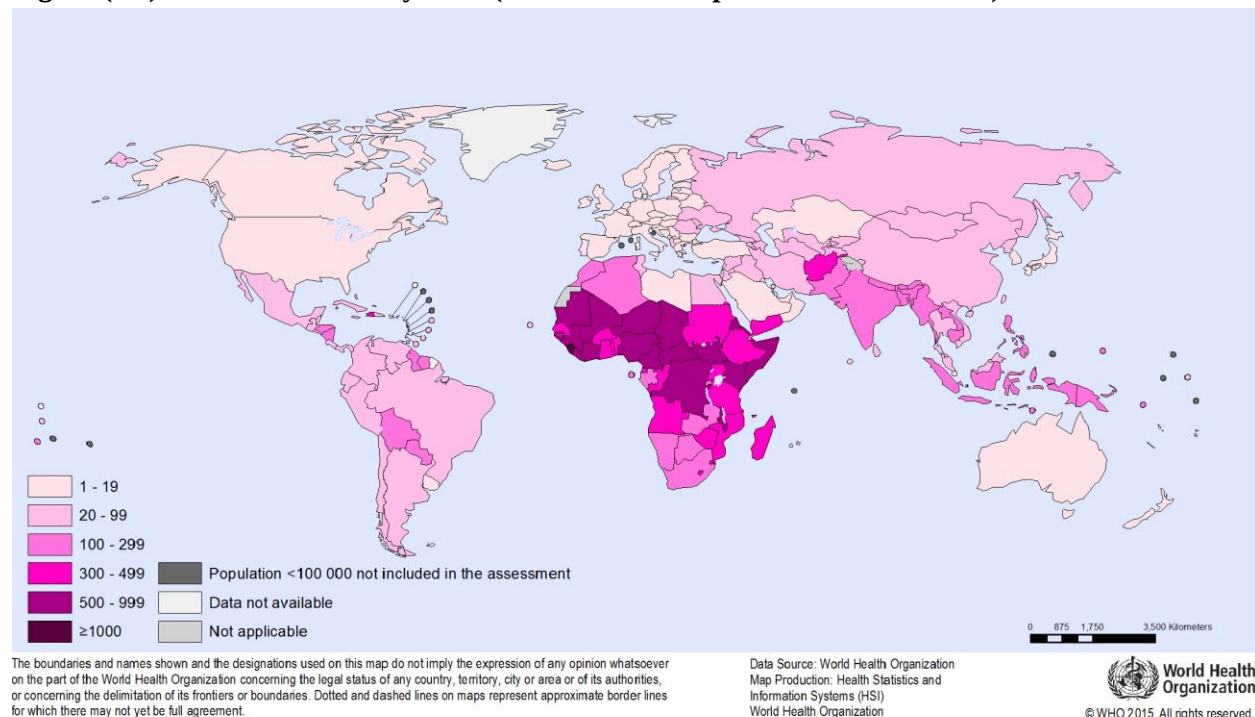
In addition, untreated pregnancy-related complications may lead to disabilities such as chronic pain, uterine prolapse, vaginal discharge, infertility, and depression (Filippi et al., 2016). Avoiding maternal deaths is possible if the right information on which to base programmes is available. Knowing the level of maternal mortality and understanding the underlying factors that led to the deaths can provide practical ways of addressing the problem.

a) The Magnitude of maternal mortality

UNFPA (2012) defined maternal mortality as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. Maternal mortality has been measured using three indicators: maternal mortality rate (the number of maternal deaths per 100,000 women aged 15-49 per year), the lifetime risk of a maternal death (the probability of maternal death faced by an average woman over her entire reproductive life-span), and maternal mortality ratio (number of maternal deaths per 100,000 live births). Maternal mortality ratio, which is the commonly used measurement, reflects access to maternal health services, their quality, and women's underlying health.

According to the world health statistics in 2015, 303,000 girls and women die due to pregnancy-related causes; 85% of the maternal deaths occur in two regions, Sub-Saharan Africa and Southern Asia, from preventable causes related to pregnancy and childbirth. Figure 1.1 provides an overview view on the levels of maternal mortality.

Figure (1.1): Maternal mortality ratio (maternal deaths per 100,000 live births), 2015



The WHO statistics indicated that there are substantial disparities among countries in a sense that maternal mortality ratios are more than 1000 deaths per 100 000 live births in some countries in Sub-Saharan Africa, where Sudan belongs, compared with less than 10 deaths per 100 000 live births in many developed countries.

All countries in Sub-Saharan Africa were estimated to have very high MMR based on the WHO estimates in 2015. The estimates were developed using a Bayesian maternal mortality estimation model which involved using country-specific data points, and uncertainty assessments that account for the varying levels of uncertainty associated with the different data points (WHO et al., 2015). The estimates ranged from 999 to 500. Three countries outside the sub-Saharan African region had comparably high MMR: Afghanistan (396 deaths per 100,000 live births), Yemen (385 deaths per 100,000 live births), and Haiti (359 deaths per 100,000 live births) while Sierra Leone was estimated to have the highest MMR at 1,360 deaths per 100,000 live births in 2015 (WHO, 2015). However, global maternal deaths showed a downward trend between 1980 and 2008 (Hogan et al., 2010). Some countries showed significant improvement between 1990 and 2008, such as Egypt (annual reduction of 8.4% on the average), Turkey (annual reduction of 4.2% on the average) (Hogan et al., 2010).

Although statistics show decreasing maternal mortality numbers worldwide (about 50% between 2000 and 2010), maternal mortality and morbidity still pose a significant challenge to policy makers and health professionals. The global reduction of the rates of maternal mortality is attributed to main four factors: 1) the global fertility rate has dropped; thus the effect of fertility on exposure to risk of maternal death; 2) increase in household incomes, which can affect maternal health through several channels such as better nutrition status and increased access to maternal health services; 3) increase in the average years of schooling attainment among women, thereby also increasing the average age at first marriage; 4) the increase in coverage of skilled birth attendance (Hogan et al., 2010).

In Sudan, no significant improvements in maternal and child health indicators have been achieved up to the present time, threatening the achievement of the 4th and 5th Millennium Development Goals (MDGs) as will be discussed in chapter 2, (section 2.1 for more information) (NPC, 2010).

Table 1.1 presents the levels of maternal deaths in Sudan, neighbour countries in Sub-Saharan Africa and regional levels. Sudan was not among the highest in Sub-Saharan Africa countries although it is significantly higher as compared to countries located on its northern border; Egypt (33 deaths per 100,000 live births), Libya (9 deaths per 100,000 live births). In 2010, the national maternal mortality ratio (MMR) was estimated at 216 per 100,000 live births with notable disparity across states (see also chapter 7) whereas it was estimated to be 311 per 100,000 live births in 2015. In addition, for every woman who dies during the maternal period, approximately 20 more suffer from disabilities, particularly obstetric fistula, uterine prolapse, infertility and depression (UNFPA, 2012).

Table (1.1): Estimates of maternal mortality ratio (MMR, maternal deaths per 100 000 live births), and number of maternal deaths, 2015

Regions/countries	MMR	Range of MMR uncertainty		Number of maternal deaths
		Lower estimate	Upper estimate	
Sudan	311	214	433	
South Sudan	789	523	1150	
Kenya	510	344	754	
Ethiopia	353	247	567	
Chad	856	560	1350	
Egypt	33	26	39	
Libya	9	6	15	
Tunisia	62	42	92	
Developed region	12	11	14	1,700
Developing region	239	229	275	302,000
Northern Africa	70	56	92	3,100
Sub-Saharan Africa	547	511	652	201,000
World	216	207	249	303,000

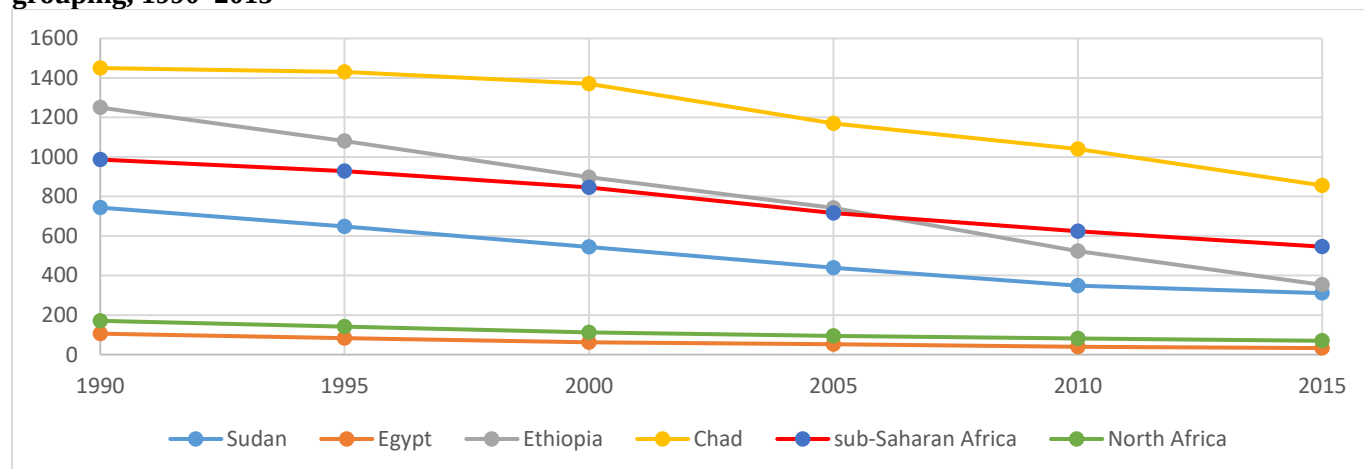
Source: WHO, 2015

Furthermore, within the low-income countries, there are large disparities in the level of maternal mortality between rich and poor women according to the place of residence due to the inequalities in accessing to health services. That is women in remote areas are less likely to receive adequate maternal health care particularly if these remote areas lack health professionals (WHO, 2012).

The world health organisation (2010) reported that the three main causes of maternal deaths globally are haemorrhage, sepsis, unsafe abortion which together account for nearly half of maternal deaths in Sub-Saharan Africa and South Asia. According to the systematic review of the causes of maternal mortality in 2006, there is notable regional variation in the causes of maternal deaths. Haemorrhage was the leading cause of death in Africa and Asia while hypertensive disorders and abortion were responsible for the most deaths in Latin America and the Caribbean, constituting approximately 30% of all maternal deaths in some countries in this region. In addition, sepsis was another leading cause of maternal deaths in Africa, Asia, Latin America and the Caribbean (Wojdyla et al., 2010). Indirect causes (such as pre-existing medical conditions) are also common causes of maternal death even though these are considered to be underestimated due to under-reporting (Filippi et al., 2006).

Most maternal deaths in Sudan as other low- and middle-income countries are due to direct obstetric causes, such as haemorrhage, eclampsia, sepsis, unsafe abortion, and obstructed labour (FMOH et al., 2006; UNICEF, 2003; Islam et al., 2005). Figure 1.2 demonstrates the pattern of maternal mortality in Sudan and selected neighbour countries since 1990. All countries achieved improvement although there is a variation in this achievement.

Figure (1.2): Trends in estimates of maternal mortality ratio (MMR, maternal deaths per 100 000 live births), by United Nations Millennium Development Goal (MDG) region and other grouping, 1990–2015



Source: WHO et al., 2015

Looking at the time when maternal deaths occurred, it is found that women die due to complications during pregnancy, delivery or following pregnancy and childbirth. Most of the complications develop during pregnancy. Other complications may exist before pregnancy but are worsened during pregnancy. Table 1.2 describes maternal deaths by time of death in 2010; it shows that the highest deaths occur during delivery accounting for 39.2% of deaths. The most common maternal complication that occurred directly before death were vaginal bleeding (28.4%), fever (25.8%), convulsions (12.1%) (Ibrahim, 2012).

Table (1.2): Percent distribution of maternal deaths by time of maternal death, Sudan 2010

Maternal Death	Number of maternal deaths	%
During Pregnancy	286	24.7
During Delivery	454	39.2
During postpartum period	418	36.1
Total	1158	100

Source: Maternal Mortality Survey, 2010

A Large number of women's lives can be easily saved by availing antenatal care, skilled birth professionals, and postnatal care. The World health organization (2012) addressed the reduction of maternal mortality by recommending action on the following three concerns:

- **Severe bleeding** after birth can kill a healthy woman within two hours if she is unattended. Injecting oxytocin immediately after childbirth effectively reduces the risk of bleeding.
- **Infection** after childbirth can be eliminated if a good hygiene is practiced and if early signs of infection are recognised and treated in a timely manner.
- **Pre-eclampsia** should be detected and appropriately managed before the onset of convulsions (eclampsia) and other life-threatening complications. Administering drugs such as magnesium sulphate for pre-eclampsia can lower a woman's risk of developing eclampsia.

b) The Magnitude of maternal morbidity

The term reproductive morbidity encompasses diseases that affect the reproductive system, although not necessarily as consequences of reproduction (Van de Wijgert et al., 2003). It is categorised into: a) obstetric/maternal morbidity implying the morbidity in women who have complications related to their pregnancy episodes and postpartum period but not from accidental or incidental causes; b) gynaecological morbidity indicating morbidities related to disorders in the functions of the reproductive system, and which may not relate to the pregnancy conditions; c) contraceptive morbidity implying disorders resulting from efforts that have been exerted to control fertility rather than abortion by using modern or traditional contraceptive methods (Van de Wijgert et al., 2003). Maternal complications are among the leading causes of mortality for women in reproductive age living in developing countries or could lead also to severe conditions among surviving women who did not receive appropriate treatment (Koblinsky et al., 2012).

Different terminologies have been used in the literature to reflect the same concept or differentiate between several degrees of the severity of maternal morbidities (Koblinsky et al., 2012). Obstetric or maternal complications are acute conditions that may cause maternal deaths and these comprise both physical and psychological morbidities. The term 'Complications' includes antepartum or postpartum haemorrhage, prolonged or obstructed labour, postpartum sepsis, complications of abortion, preeclampsia/eclampsia, ectopic pregnancy, and ruptured uterus (UNFPA, 1997). The term 'Severe obstetric complications' refers to life-threatening signs requiring a specific major obstetric intervention which can be verified through records of health services; so, the untreated cases or delays in treatment with severe obstetric complications such as foetopelvic disproportion (pre-rupture and uterine

rupture), and shoulder or transverse lie have a high probability of causing maternal or damage such as severe antepartum haemorrhage, placenta praevia and abruptio placentae, severe postpartum haemorrhage requiring surgical intervention (Koblinsky et al., 2012). Moreover, the WHO distinguished between two severe and less severe conditions of maternal morbidity in which a woman who nearly died (near-miss) during perinatal period (pregnancy, labour, or post-pregnancy) complications but survived due to chance or good hospital care (WHO, 2012). Moreover, the WHO systematic review of the available data concludes that the severe maternal morbidity cases are more likely to die in resource-poor settings than in more developed country settings (Say et al., 2004).

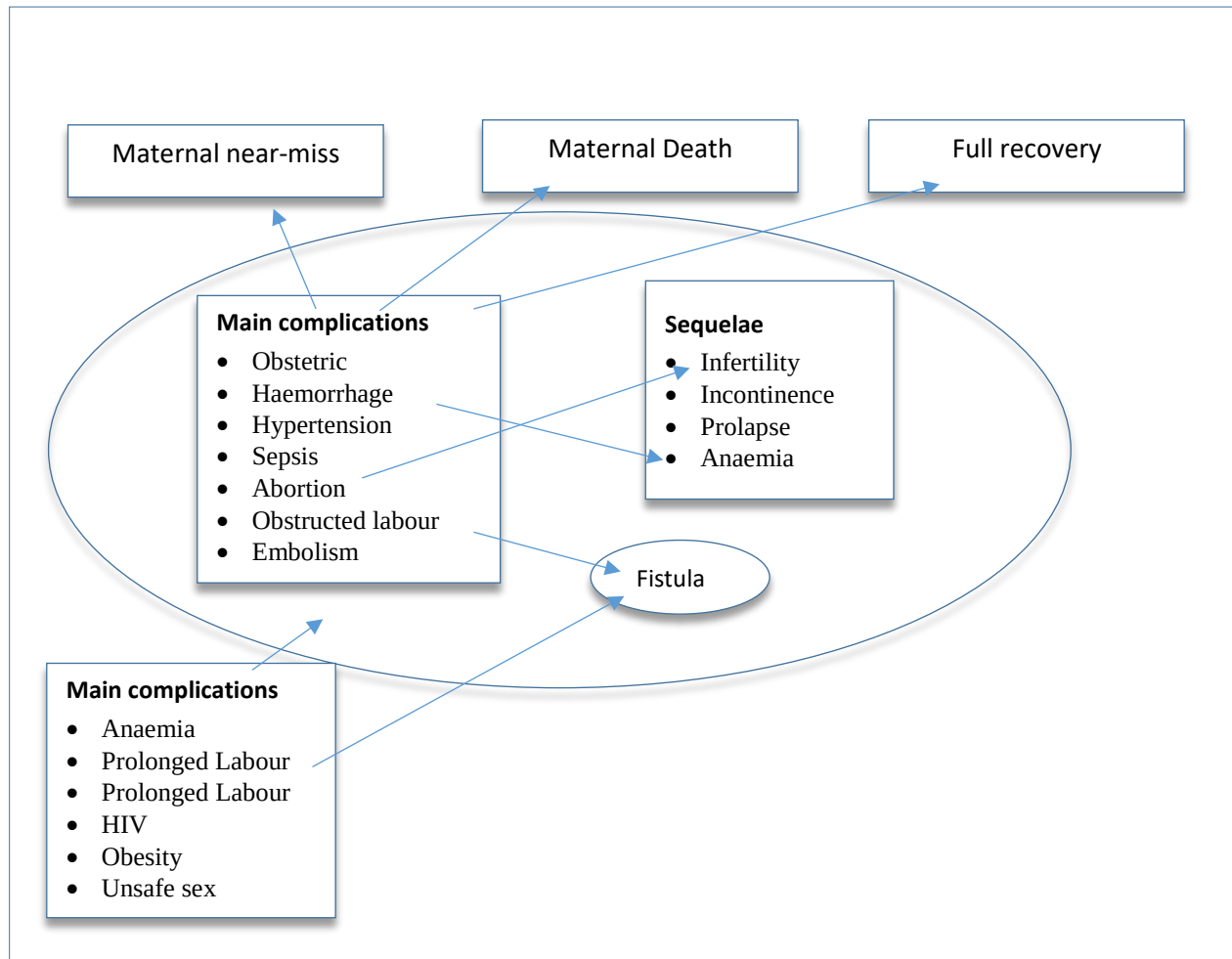
The term ‘Postpartum maternal morbidities and disabilities’ is defined as the long-term physical or mental-health consequences resulting from pregnancy, childbirth, acute maternal morbidities, or the management thereof, and most often referred to as long-term chronic morbidities and other problems experienced postpartum (Ashford, 2002). ‘Chronic morbidities’ are defined as the conditions caused by the birthing process that are not life-threatening but greatly impair the quality of life, such as fistula, uterine prolapse, and dyspareunia. Lastly the ‘Milder disabilities or postpartum maternal morbidities’ include urinary incontinence, hernias, haemorrhoids, breast problems, and postpartum depression (Koblinsky et al., 2012).

Regular maternal morbidity statistics rely on hospital registrations, which are representative of the women seeking care only. Maternal morbidity events are higher as compared to maternal mortality and some common risk factors are similar. The global estimate of maternal morbidity is ranged from 1-2% to 20% depending on the definition used in identifying the maternal morbidity; the lower percentage is limited to the most severe cases (Koblinsky, 2012). This means there is an estimated number of 20 million girls and women suffering from chronic maternal morbidities annually, 9.5 million of whom suffer other complications, and 1.4 million experience near-miss events yearly worldwide (National Research council, 2000; Hardee, 2012).

Obstetric morbidities have various aetiologies; some are related to the health system like the quality of the maternal health services that they received during pregnancy and childbirth while others are related to non- health system factors such as women and community factors. Untreated obstetric complications or seeking care in late stages worsens the women’s conditions and may lead to maternal deaths (Filippi et al., 2006). The medical causes of maternal morbidity have been conceptualised under the CHERG conceptual framework of maternal health developed by the WHO in 2006. Figure 1.3 outlines the leading causes of maternal morbidity, which are: a pregnancy with abortive outcomes, hypertensive diseases of pregnancy, obstetric haemorrhage, pregnancy-related infections, obstructed and prolonged labour, anaemia, fistulas, postpartum incontinence, postpartum prolapse, and postpartum depression (Filippi et al., 2006). The CHERG conceptual framework identified three

interrelated groups that have an influence on women's health outcomes: risk factors, main complications, and sequelae. Neglecting the proper treatment of risk factors during the perinatal period may lead to greater complication in the health conditions thus exposing women to greater morbidity or mortality.

Figure (1.3) : CHERG conceptual framework of maternal health



Source: Filippi et al., 2006 (referring to the CHERG framework)

There is some very patchy information to show that pregnancy-related illnesses and severe maternal morbidity in Sudan is mainly due to prolonged and obstructed labour, haemorrhage, sepsis, hypertensive disorders of pregnancy and unsafe abortion, while malaria, anaemia and hepatitis have an indirect contribution (FMOH et al., 2006; UNICEF, 2003; Islam et al., 2005). On the other hand, obstetric complications are widespread in Sudan, for instance, more than 1 in 3 women suffered from prolonged labour and high fever, 1 in 10 women suffered from convulsions and 1 in 4 women suffered from excessive bleeding (Abdel-Tawab et al., 2010). However, only 23.5% and 28.8 % of health facilities provided basic and comprehensive emergency obstetric care (EMoC) respectively with the obvious disparity in the distribution across states (Ibrahim, 2012).

Several relevant strategy and policy documents were produced during the last 10 – 15 years, the two most recent being: The National Policy on Reproductive Health (RH) (2004), and the National Strategy for RH (2006). As much as these documents are useful in providing broad guidelines for primary health services, they have several limitations such as these strategies and policies did not include action plans as well as lacking realistic, achievable targets, mainly due to lack of accurate, specific information on the supply side of services and output/outcome indicators (AbdGabbar, 2010).

It is widely understood that maternal health care relies on the entire health system. However, little empirical, country-specific, research has been done to trace out the ways in which health system functions can shape maternal health outcomes. Very few studies have addressed the maternal health system in Sudan and diagnosed the main challenges (Parkhurst et al., 2005). Correspondingly, in Sudan, studies focused on the identification of barriers to utilisation of maternal services are very few and attribute the lack of utilisation to the women's characteristics and the high expenses of maternal services. During the antenatal and postpartum periods, women may face complications that seriously threaten their lives. This is particularly the case where most births take place at home (76.5 %) with village/ traditional birth attendants who often are modestly educated and with little clinical training. Even though two-thirds of pregnant women aged 15-49 years received antenatal care at that time, village/ traditional home births were still the norm. In addition, 31% of women reported that they suffered from prolonged labour and more than 30% of women mentioned that they suffered from high fever during delivery (FMOH et al., 2006). No studies investigating the association between the lack of utilisation and the dysfunctions of the health system have been conducted to date.

The Sudan health system faces formidable challenges, including production, training, management and retention of the health workforce. Production of doctors, due to the increasing number of medical schools, has surpassed paramedic and other health workers, especially the nurses, midwives and medical assistants. As a result, there is an imbalanced skill mix with high doctors to nurses' ratio; having risen from 1:1.7 (FMOH, 2012) to 4:1 in 2010 and projected to rise to 6:1 taking into account those in the education pipeline. Yet, with a cumulative density of doctors, nurses and midwives of 1.23 per 1000 population, the country is still within critical shortage zone according to WHO criteria of 2.28 health personnel per 1000 population (WHO, 2006).

Indeed, the human resource management systems are not well developed and particularly variable across the 18 States of Sudan under the current health system of decentralisation (Federal Health System). One of the chronic challenges is the continuing 'brain drain', external as well as internal, further details have been discussed in chapter 9, section 9.1.1. Out of a total of 21,000 doctors registered with Sudan Medical Council, over 60% migrated to work outside Sudan (WHO, 2009). Similarly, as many shifts to the capital or major cities in

states, nearly 70% of health workforce is in urban settings serving 30% of the population; and two-fifths of the total health workforce (38%) is located in Khartoum (capital city). This urban bias is acute for specialised cadres, as 65% of specialist doctors and 58% of technicians are in Khartoum. This mal-distribution extends also to the levels of care, i.e. 67% of health workers staff secondary and tertiary care as opposed to only 33% in PHC settings. The above challenges are recognised within the Sudan Human Resources for Health (HRH) Strategic Plan 2012-16 to 'Develop policies/systems to ensure more equitable geographical distribution of health workers - especially doctors and nurses'. Among other objectives, this study analyses the current situation and recommends policy and practical solutions, including financial and non-financial incentives.

While health services in Sudan are generally limited and with poor quality as well as disparate access, even the services that are in place are not utilised optimally (FMOH, 2009; Ibrahim, 2012). There is thus a great need for better understanding of the barriers to the provision and utilisation of maternal health services in order to improve the health and survival of Sudanese mothers. One strategy is to identify the main causes of poor maternal health and barriers to accessing the existing services in Sudan. This study provides evidence that poor health system performance is one of the challenges, which has a severe impact on the women's health seeking behaviours. Therefore, the Federal Ministry of Health (FMOH) in Sudan intends to implement several interventions that aim to improve access to maternal health services with acceptable quality of care as well as finding more innovative solutions to increasing the performance of the health system, with respect to providing maternal health care, under limited resources and limited number of health personnel, along with efforts to continue to expand the coverage of primary health care services and the basic service packages.

Lastly, there is currently a significant information gap regarding reproductive health (RH) services in Sudan. Apart from routine data collection systems, few studies have been conducted to systematically assess the availability, accessibility and quality of RH services in Sudan. The Sudan Household Health Survey in 2006 and 2010 are the most comprehensive studies to date (FMOH et al., 2006), yet they did not focus sufficiently on the supply side of service provision. Also, there are two censuses conducted every 2 years since 2008 by Sudanese Federal Ministry of Health: the National Human Resources for Health (HRH) Survey in 2010 and Health Services Mapping survey in 2010. The main objectives of the two surveys are collecting data on human resources for health and health facilities. Although there is a consensus among decision makers regarding the limited quality of data of both surveys and some concerns about the methodology of data collection, they are widely dependent on them in developing the health plans, whether the 5-year or annual health plan (further details about the data limitations has been discussed in chapter 6, section 6.2). The data collected in the study presented in this thesis, which I will refer to as the Maternal Health Services Study (MHSS 2012) has a significant contribution to filling the gap in the information related to the

health system and women's perceptions towards the barriers of maternal healthcare utilisation in Sudan. The study aimed to provide integrated and comprehensive qualitative data collected from decision makers, stakeholders, health providers and village midwives, and women that help to assess the performance of the Sudan health system and improve the performance under limited resources, as well as further analyse and explain quantitative survey findings that have not been fully utilised to provide relevant evidence (see chapter 7 for more details). The study is, therefore, a pioneer study that shifts the concern of low utilisation and poor maternal health outcomes from users' aspects to health system aspects.

1.3 Research questions, aims and objectives

Sudan has a great need for better utilisation of maternal healthcare services in order to improve the health status of Sudanese mothers. Maternal mortality and morbidity still pose a significant challenges to policy-makers and health professionals. **The overall aims of the study** are therefore twofold, *firstly*, to identify the social, cultural, and women's characteristics' barriers to the use of maternal health services in Sudan during pregnancy, delivery and the immediate postpartum – when most deaths and serious morbidities occur; *secondly*, to analyse the different ways in which health system dimensions (i.e., stewardship, financing, maternal health services including referral system of maternal morbidities, and maternal health providers) can shape maternal health and the pattern of utilisation of maternal health services. Table 1.3 demonstrates the specific objectives and associated research questions.

However, the preliminary data analysis provided evidence that made me focus more on the health system components as they indicated a significant influence on the maternal health services utilisation, particularly the stewardship function. Therefore, I introduced a new conceptual framework (which will be discussed in chapter 11 - see figure 11.1) reflecting the finding that the health system components had more weight whereas women's, households', and community's characteristics had a less powerful influence.

It is important to mention also that due to lack of existing data relating to the culture and immediate postpartum, I could not investigate their impacts on women's behaviour through a quantitative approach, covering a large scale (see data limitation in section 6.4 for further discussion). Therefore, I aimed to collect these in the qualitative study. Further details about the project methods are provided in section 6.1.2; and findings of these two key aspects are covered comprehensively in chapter 7 and sections 9.4 and 11.2).

Table (1.3): Main and specific objectives of the study, research questions

MAIN AIMS	SPECIFIC OBJECTIVES	RESEARCH QUESTIONS
1. To identify the social, cultural, and women's characteristics', to the use of maternal health services in Sudan during pregnancy, delivery and the immediate postpartum – when most deaths and serious morbidities occur.	1.1. Analyse and assess deficiencies/obstacles in the health care system and identify required changes in policy with respect to health providers, referral system of maternal morbidities, and maternal health services delivery. 1.2. Identify barriers to the use of maternal health care service focusing on population factors including women's status.	- What are the main barriers to use of maternal health services among women in need? - Are the women satisfied with the maternal services?; how can women's satisfaction level be increased? - How is maternal morbidity treated in a facility setting and does this vary by women's characteristics?
2. To study the different ways in which health system function can shape maternal health and the pattern of utilisation of maternal health services.	2.2. Identify barriers to the use of maternal health care service focusing on health system (maternal health services delivery, referral system for poor women with pregnancy-related morbidities, and health providers) 2.3. Identify potential low cost models to improve maternal health system functions under scarce resources in Sudan.	- What are the health system resources available for ante-, intra-, and post- natal women in Khartoum and, - What is the quality of maternal health services provided both for routine cases and complications? - What are the main challenges that hinder the health system with respect to health providers, referral system of maternal morbidities, and maternal health services delivery to perform in an efficient way in Sudan; - How can health system functions be improved to be more responsive to the poor? - What elements of an equitable strategy for improving access to maternal health care in Khartoum can be implemented to reduce the extent of morbidity while maintaining and improving care that is attuned to women's needs in a context of limited existing health facilities?

1.4 Literature search strategy

The review of the literature was carried out at several stages of the study and different points of time starting from preparing the proposal, in which a brief literature review was completed in November 2010, and updated several times as well as conducting additional searches throughout the study. The 2010 search was conducted in order to meet several objectives: to conceptualise the research objectives and research questions, to determine which conceptual framework and methodology that would be appropriate for the research study, and to explore the determinants of health service utilisation in low-income countries. A further comprehensive literature review was conducted in October 2012, focused on women's health and factors associated with the population component. Another comprehensive literature review was carried out in 2013 to identify the association between health system items and women's seeking behaviour in the perinatal period. In 2014 and 2015, other updates were conducted to see more applications of the behavioural models particularly models that studied the influence of contextual components on health services, particularly papers that applied the latest version of Andersen model (see section 4.2 for further discussion) as well as updates related to health system performance that I had adopted along with the health system performance model in conceptualising the study conceptual framework (see chapter 3 and section 4.3).

The searches were limited to English language articles. The search strategy was mainly reliant on electronic databases, although relevant textbooks and reports were also consulted. With respect to electronic databases, I did extensive searches in several databases (i.e., Science Direct, PubMed, Ovid, Jstor and Ebscohost, supplemented by google scholar). Relevant keywords for each search were used, including maternal health, health system, maternal morbidity, maternal health services utilisation, health seeking behaviours, developing countries, Sudan, health system, maternal healthcare delivery. In later searches, the keywords Andersen Behavioural Model, and referral system were added. Boolean commands such as "AND", and "OR" were applied to ensure the searches were sufficiently focused on my areas of interest. Selecting papers to be read and used in the study was based on reading the abstracts first. That is, where abstracts indicated relevance to my study, I downloaded the article full texts and read relevant parts of or entire papers.

Regarding textbooks, I scanned relevant books in the university library, particularly books related to behavioural models, health behaviours, research methods, and statistical analysis.

Additionally, the final reference lists of the most relevant papers were scanned for more relevant articles or for more information about particular aspects that may not have been identified through the electronic search.

1.5 Structure of the thesis

This thesis is structured over 12 chapters. Chapters 1 and 2 provide the background information for the study. Chapter 1 provides an introduction and the rationale of the study and sets out the aims and specific objectives of the study and its associated research questions.

Chapter 2 provides detailed information about the context of the study and the living conditions of women in Sudan; it is divided into three sections. The first section gives a background of the country and socio-demographic and the conditions in which women live; in addition to the maternal and child health profile of Sudan. The second section demonstrates the health system in Sudan with a special focus on the public sector; it includes the health system organisation, maternal health services, and human resources for health (HRH). The last section presents the system of maternal health cadres in Sudan.

Chapter 3 gives a detailed overview of the concept of the health system as discussed in the literature. It is divided into eight main sections. The first section demonstrates the literature review strategy that has been used in this study. Sections two and three discuss the concept of the health system and the health system goals from different perspectives. The following two sections discuss the conceptualising of the types of health system and system components as well as health system performance and how this performance can be quantified for the purposes of the study described in this thesis. In the following three sections, current maternal healthcare, maternity referral systems, and human resources for health have been addressed with a special focus on low-income countries.

Chapter 4 presents an overview of maternal health and maternal morbidity in low-income countries and factors that have an influence on health-seeking behaviours among women in their maternity period. Moreover, several health system aspects are discussed: human resources for health, health services delivery, referral system.

Chapter 5 provides an overview of the research design of the study and the use of mixed methods. It starts with the concept of mixed methods and methodology, the main advantages and challenges in applying mixed methods, and rationale for adopting a mixed methods approach. The underpinning philosophy and worldview and philosophical assumptions relating to evidence are also discussed. This is followed by exploring the range of mixed methods research designs and the research design of the study. Lastly, the ethical considerations and research ethics of the study, as well as validity issues are discussed.

Chapter 6 sets out the qualitative and quantitative data sources used in the study. Quantitative data are provided by two surveys; Sudan Household Health Survey (SHHS) in 2010, which is a national survey and Situation Analysis of Reproductive Health Services Survey (SARH) in

2008, which is conducted in Khartoum state. The qualitative data are provided by Maternal Health System Study (MHSS) collected by the author in 2012 in Khartoum using both focus group discussions (FGDs) and in-depth interviews. The first section discusses the sample design, data collection tools, and objectives of the two surveys and qualitative study. Section 2 describes the statistical methods applied, multilevel models, as well as the framework analysis technique that is applied in analysing the qualitative data. The last section discusses the data limitations of the three data sources.

Chapters 7-10 present the findings of the study, organised on a thematic basis; chapter 7 focuses on three main aspects: maternal mortality and women's satisfaction as intrinsic health system objectives and women's utilisation of antenatal and birth care services as intermediate goals. In addition, the second part of the chapter discusses the barriers to utilisation and challenges affecting the performance of the health system based on the findings of focus group discussions (FGDs) with users and non-users. This chapter draws mainly on the two surveys, supplemented by some qualitative data analysis. Chapters 8-10 present the findings relevant to assessing the four functions of the health system (i.e., stewardship, human resources for health, financing, and health services delivery) in Sudan based on the data from FGDs with village midwives and in-depth interviews with decision makers, stakeholders, and health providers.

Chapter 11 discusses the overall performance of the Health system according to the findings synthesised from the previous four chapters and in relation to the wider literature on the subject.

Chapter 12 draws conclusions and provides recommendations for improving the performance of the health system in Sudan taking into consideration the limited resources available. It also discusses the scientific contribution of the study and attempts to draw out the implications relevant to other low-income countries and health systems.

Chapter 2

The health system in Sudan

This chapter provides a detailed account of the context of the study and the conditions in which women live in Sudan; it further discusses the rationale of the study. The second section presents a description of the health system in Sudan from an administrative perspective including health system organisation, maternal health services, human resources for health, and health cadres in Sudan.

2.1 Context of the study

Sudan is an African country (the third largest country in Africa) and belongs to the Arab region, bordered by several countries (i.e., Egypt to the north, the Red Sea, Eritrea and Ethiopia to the east, South Sudan to the south, the Central African Republic to the southwest, Chad to the west and Libya to the northwest). The total population of Sudan for 2013, the year of data collection for the study, was about 38 million, of which 34% lived in urban areas and 8.9% were nomads.

Sudan is a multi-ethnic, multicultural country. However, two major distinct ethnicities prevail -Arab and African- with hundreds of ethnic and tribal divisions and languages. The northern states cover most of Sudan and include most of the urban centres. The majority of the Sudanese (83%) who live in this region are Arabic-speaking Muslims, though a large proportion of the population also uses a traditional non-Arabic mother tongue. While south Sudan has 17% of the overall population, most of whom live in rural areas, subsistence economy. This region has been severely affected by war since Sudan independence in 1956. In late 2011, a separation decree was approved between north and south Sudan. It was actually implemented in 2012, a few months before my main data collection period. The dominant religion in Sudan (North Sudan) after separation is Arab-Islam whereas in South Sudan, the country is dominated by Christianity and other African belief systems (Abd Gabbar, 2009; Health Metrics Network, 2007).

Total fertility was estimated to be over 4.5 births per women in Sudan as shown in table 2.1 (UNFPA, 2015); only 13 % of women have ever used modern family planning methods, early marriage is quite common across the country: 36% of women of reproductive age were married before age 18 years; 12.4 % of them were married before age 15 years.

Table (2.1): Selected demographic indicators for Sudan and some neighbour countries, 2015

	Births attended by skilled health personnel, percent 2006-2015	Adolescent birth rate per 1,000 women aged 15-19 1999-2014	Contraceptive prevalence rate, women aged 15-49, any method 2015	Contraceptive prevalence rate, women aged 15-49, modern method 2015	Unmet need for family planning , women aged 15-49 2015	Life expectancy at birth (years), 2010-2015		Total fertility rate, per woman 2010-2015
						Male	Female	
Sudan	23	102	16	13	29	62	65	4.5
South Sudan	19	158	7	3	30	54	56	5.2
Kenya	62	101	57	56	19	59	62	4.4
Ethiopia	16	71	36	36	25	61	65	4.6
Chad	23	203	6	3	23	50	52	6.3
Egypt	92	56	60	58	12	69	73	3.4
Libya	100	4	49	28	20	69	74	2.5
Tunisia	99	7	64	53	11	72	77	2.2
Arab States	75	56	51	43	17	67	71	3.5

Source: UNFPA, 2015

The Sudanese population is multi-ethnic and multi-linguistic but mostly Islamic. There are two distinct major cultures, Arab and Black African, with around 600 ethnic and tribal subdivisions and language groups. It is classified as a low-income country with a low late rank according to the human development index. Gross national income per capita was \$ 2,370 while total expenditure on health per capita was \$ 221 in 2013, while more than 40 percent of the population in sub-Saharan Africa (where Sudan is located) lives in extreme poverty (UN, 2015). The gross enrolment rate in primary education was 71.1% with a notable disparity among states ranging from 93.75% in Khartoum to 36.1% in the Red Sea. Regarding gender equality, MDG indicators for Sudan showed modest progress and variations of girls' education as compared to boys in the general education in 2009 (UN, 2010).

Table 2.2 demonstrates the levels of both under-five mortality and infant mortality in 1990 and 2013. Sub-Saharan Africa (SSA) still has still had a high burden of child mortality and other child health indicators although the region has achieved progress on child health since 1990. The under-five mortality rate across SSA declined by nearly half during the period 1990 - 2013, dropping from 179 to 92. In Sudan, the under-five mortality level declined from 128 per 1000 live births in 1990 to 77 per 1000 live births in 2013 (UNICEF, 2015). The main causes of under-five mortality were pneumonia, malaria, diarrhoea, and malnutrition as FMOH reported in the statistical yearly books (2004-2009). Infant mortality also declined

from 80 per 1000 live births in 1990 to 51 per 1000 live births in 2013. However, the major causes of neonatal mortality were not identified while epidemics and high burden of communicable diseases, particularly infectious, parasitic and water-related diseases, as well as the high prevalence of malnutrition and inadequate health services contribute significantly to the high levels of infant and under five-mortality in Sudan (NPC, 2010). Moreover, there was significant variation in the levels of infant and under five mortality among states within Sudan (NPC, 2010). Generally, health indicators in Khartoum are better as compared to other states in Sudan due to the concentration of both resource and services in Khartoum, which affects the levels of health service utilisation there.

Table (2.2): infant and child mortality in Sudan and some other neighbour countries, 1990, 2013

	Under 5 mortality		Infant mortality	
	1990	2013	1990	2013
Sudan	128	77	80	51
South Sudan	253	99	150	64
Kenya	99	71	64	48
Ethiopia	205	64	122	44
Chad	215	148	116	89
Egypt	85	22	63	19
Libya	42	15	36	12
Tunisia	52	15	41	13
Sub-Saharan Africa	179	92	107	61
Middle East and North Africa	70	31	52	24

Source: UNICEF, 2015

Furthermore, Sudan has been deeply affected by conflict, with one of the longest civil wars in history as well as frequent natural disasters and climate challenges. Therefore, the Sudanese have not experienced stability since Sudan got its independence from Britain in 1956. Since the resumption of the Southern Sudan conflicts in 1983, internal displacement has been one of the major humanitarian matters in Sudan and a major challenge for the health system. The number of internally displaced persons (IDPs) in Sudan is estimated in 2009 to be 4.9 million (IDMC, 2010), which is the largest number of IDPs worldwide. The ongoing conflicts in Darfur have added between 1.5 and 2 million displaced to these early estimates. Khartoum state, where the capital city is located, is the most populated with 6 million inhabitants. Khartoum includes a large number of squatter settlements, which have been inhabited by internally displaced persons (IDPs).

Following the separation of South Sudan at the end of 2011, Sudan (the north part of Sudan), which is the focus of the study described in this thesis, is in the process of stabilizing its socioeconomic status; yet, Darfur, South Kordofan and Blue Nile states are suffering from

conflicts up to date. During the last 5 years, Sudan has faced several socio-political changes including administrative subdivisions changing from 15 to 18 states with consequent health system administrative changes. Huge population movements occurred within and outside Sudan; about two million South Sudan returnees and nearly half a million people have been displaced or severely affected by conflicts in the three protocol areas. The political instability has influenced the health systems in Sudan negatively, particularly after recent diminishing of external aid which has also drawbacks on population health and their pattern of utilisation of health services (see Habbani, 2006 and chapter 8).

Reports indicate high rates of population deprivation; an estimated 46.5% of the population lived below the poverty line in 2012. The status of women in Sudan varies across regions; for example, the average age at first marriage among females in Khartoum was 21 years as compared to only 17 years in Darfur. Similarly, we can find a comparable difference in the fertility levels not only across regions, but also in the same region between poor vs. not- poor settlements (Ibrahim, 2012).

In Sudan, particularly in poor communities, women still persistently lack access to maternal health care services. That is attributed not only to the socio-economic situation of women and their families, but also affordability, accessibility, and quality of the maternal care services, which reflect the limitations of the Sudan health system as will be discussed further throughout this thesis.

2.2 Health systems in Sudan

Sudan has adopted a decentralisation approach in managing the health system since 1990 through the Federal Ministry of Health (FMOH) and the State Ministry of Health (SMOH) in every state. The World Bank had a leading role in the emergence of decentralisation concept among countries, particularly global south, in the early 1980s as the dominant reform technique utilised to improve the performance of health systems as well as provide services that correspond to local needs. The term ‘Decentralisation’ is identified in several ways according to the analytical framework that is adopted in the health sector. Decentralisation is defined under a public administration framework as ‘the transfer of authority, or dispersal of power, in public planning, management and decision-making from the national level to subnational levels or more generally from higher to lower levels of government’ (Millis, 1990, p.11).

Generally, although decentralisation is politically driven, it is considered to have had a significant impact on improving the performance of the health systems in low- income countries (Lakshminarayanan, 2003). The experience of improving health performance due to applying decentralisation method is varied internationally so that it is difficult to evaluate its impact. Despite potential benefits, decentralisation may cause severe inequality in a country if

not managed well and may also increase the public expenditure at the central government level to monitor the federated system (Costa-Font, 2013; Mosca, 2006). Mills (1990) discussed some of the challenges encountered in health systems that adopted a federal model: **1)** poor coordination and lack of integration between the different vertically organised programmes, **2)** more difficulty for intersectoral collaboration between nongovernmental and private services in the decentralisation process, **3)** need for agreement on district and regional boundaries to promote closer intersectoral coordination and communication with local government authorities (Mills, 1990). The second and third important sources of potential difficulties in decentralisation are health financing and personnel, particularly with a wide variety of health financing mechanisms and poor levels or variability of personnel qualification.

The scope of the term ‘health system’ in this study is limited to activities performed by ministries of health which constitutes the major health provider on the country level while private health sector or other health providers such as universities, police and army health services are insignificant particularly in providing maternal health services, as discussed in chapters 8 and 10.

2.2.1 Health system organisation

Sudan is a federalist country with executive, judicial and legislative branches of government. Federalism was introduced in Sudan’s health system in 1991 by setting up a three-layered health system structure. Sudan is constituted from 18 states, with each state divided into several local authorities. The Health system in Sudan can be viewed as three interconnected subsystems which operate at different levels: the Federal Ministry of Health (FMOH), the State Ministries of Health (SMOH), and the Local Health System (LHS). The Federal Ministry of Health (FMOH) is located in Khartoum, the capital of Sudan; its remit is to supervise or oversee the performance of the entire health system and it is considered as a source of high-level technical advice, particularly for aspects related to regional health plans and Monitoring & Evaluation (M&E). Furthermore, the FMOH is responsible for performing the following functions: health policy formulation including policies on inter-sectoral level as well as setting the national health priorities; resource allocation and implementation of national interventions; regulation of health personnel development including training, coordination and management of national level health organisations, although very recently the management responsibilities of tertiary care facilities (or what is called Federal Hospitals) have been delegated to the State Ministries of health. Before this administrative change the FMOH granted semi-autonomy to the federal hospitals in Khartoum state by permitting them to constitute a board of directors in each hospital and providing its budget directly from the Ministry of Finance. Furthermore, a governing body, the Higher Council for Teaching Hospitals and National Specialised Medical Centres were formed; its functions are to plan, manage and supervise health services provided by teaching hospitals in Sudan. Another

function performed by the FMOH is to communicate with and coordinate the international and health organisation and aid agencies.

The second level in the institutional hierarchy is State Ministries of Health (SMOH). Each of the 17 states' health system is managed by a SMOH. The administrative structure of the SMOH is similar to that of the FMOH and performs all functions related to the local provision of services, with some degree of autonomy in managing their resources. Generally, the SMOH is in charge of the day to day health activities affecting local communities and support of the local health system. The SMOH have some degree of autonomy in managing their resources within the state. Nevertheless, due to their weak capacities, there are notable gaps in performing their roles, as will be discussed comprehensively in chapter 8.

The third level in the institutional hierarchy is the Local Authority Health Council providing general local and social services like education, recreation, housing and health. There are 184 local authorities across Sudan. The role of these authorities with respect to health is to overcome the problems of supervision, leadership, curative-preventive dichotomy and to support the referral system as well as to support the process of bottom-up planning; thus they are given administrative and executive authority and become responsible for service provision where the primary health care approach is the model adopted for service delivery, monitoring, and supervision. Furthermore, local authorities represent the SMOH in running the mandates and functions of the respective ministries the localities, responsible for environmental health particularly water and sanitation services, and malaria control. The team who are working in each local authority are technically supervised by SMOH.

2.2.2 Maternal health services

Sudan was one of the African countries that signed the Abuja Declaration in Nigeria in 2001; accordingly, members pledged to increase their health funding to at least 15% of GDP. However, the total expenditure on health was 6.5 as % of GDP in 2013. This represents very low resources and leads the Sudan health system to be persistently underfunded.

Moreover, notable disparities of healthcare services are found across states in Sudan where urban areas enjoy more and better public and private services than rural areas as shown in figure 2.1 (refer to chapter six for more details about levels of maternal health service utilisation). Even within the same city, there is inequality in accessing the primary healthcare centres (PHCs) particularly among migrant and remote settlements. In addition, table 2.3 demonstrates the percentage of the population who have no access to a health facility located within 5km² from the place of residence by the state. About 14% of the population have no health facility near to their place of residence (5km² or less). This percentage is varied among states in which nearly half of population in West Darfur (43.3%) do not live near a

health facility whereas only 0.1% in Northern do not have a health facility near to their place of residence.

Several initiatives have been adopted by Sudanese authorities to ameliorate population health since the late 1970s through increasing the coverage and quality, such as the Primary Health Strategy, which was the main strategy for health care provision in Sudan in 1976, the National Comprehensive Strategy for Health in 1992, the 25-Year Strategic Health Plan 2003-2027, the National Health Policy and the first and second five Year Health Strategies (2007-2011) and (2012-2016). In 1991 a policy of user fees in public health facilities was introduced followed by implementing the federal health system as a step towards healthcare system reform in Sudan that was imposed by World Bank. Accordingly, the private for-profit clinics, hospitals and medical centres have expanded considerably, particularly in Khartoum and other big cities after many decades of predominance by the public sector (FMOH, 2007). The FMOH issued in 2005 a policy to regulate the private service delivery and there was a trend in this policy to encourage private sector involvement in tertiary care in order to fill the public service gap in this kind of services; yet the government fail to apply an efficient supervising system in the private health sector (Habbani, 2006). Along with the public health service (FMOH, SMOH) and private services, health services are provided through armed forces, police, universities, and the civil society. However, those partners are performing in isolation due to lack of coordination and very poor managerial system (details will be discussed in chapter 7, the stewardship function section).

Figure (2.1): Distribution of the primary health facilities by population and state, Sudan 2008

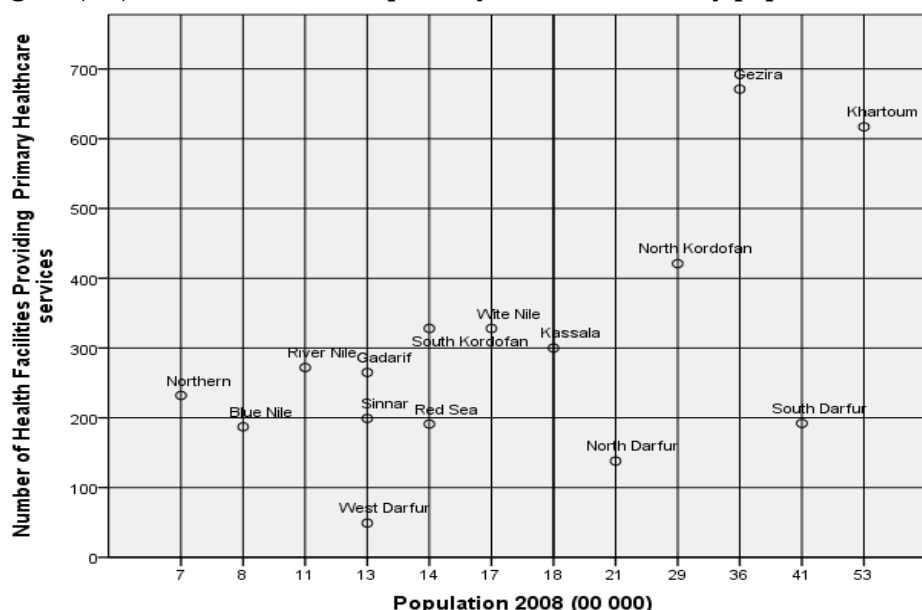


Table (2.3): percentage of population who have no access to health facility located within 5km2 from the place of residence by state, Sudan 2014

State	Total population	No. of villages that have not had health facility within 5km2 or less	No. of population with no access to health facility located within 5km2 or less	% population with no access to health facility located within 5km2 or less
South Darfur	4497682	1035	1583293	34.5
West Darfur	1111081	493	469751	42.3
North Darfur	2336688	1592	512385	22
North Kordofan	3649616	1276	524497	20
South Kordofan	2549324	260	140168	6
White Nile	1,948,472	626	273130	13.9
Kassala	1950726	136	310773	16
Gadarif	1398037	143	125942	9.7
Red Sea	1396110	192	113731	25.5
Blue Nile	1136230	37	40379	3.6
Sinnar	1706979	265	264677	15.5
River Nile	1132441	23	27666	2.1
Gezira	4338514	52	87.35	2
Northern	610247	1	738	0.1
Khartoum	6311688	236	562039	8.9
Sudan	36073835	6367	4949256	13.7

Source: FMOH, 2014

Maternal and child health (MCH) services have received increasing attention from Sudanese government and policy makers as a result of the persistence of poor MCH indicators in Sudan and the poor outcomes from all health initiatives. Therefore, the FMOH issued a decree in 1996 to add a new unit of maternal and child health/family planning (MCH/FP) at the Federal Reproductive Health Directorate (FRHD) under the hierarchy of the Directorate General of Primary Health Care (DPHC) to be responsible for reproductive health services in the country. Also, health authorities have been able to incorporate the goal of reducing maternal mortality as a national priority in all strategic as well as long and short plans since 1992 (Omer, 2001). Several national reproductive health (RH) strategies and policies were produced, such as the Making Pregnancy Safer (MPR), National reproductive health (RH) strategy 2007-2015, which issued a decree to provide all MCH services for free in 2003 although it has not been applied due to limited health resources, the National Policy on Reproductive Health 2004, and the National Strategy for RH 2006 (RHSO, 2007). Indeed, although these official documents are useful in providing broad guidelines for primary, secondary and tertiary services, they have several limitations. First, there is no recent plan of action to detail how these strategies and policies could be achieved. Second, these strategies and policies lack realistic, achievable targets, mainly due to lack of accurate, specific information. Beyond information gaps, often the targets were too ambitious relative to the

actual capabilities and resources available to the FMOH and SMOH (Abdel-Tawab, 2010; Ibrahim, 2012). Despite these policies, the FMOH has stated that some reproductive health services are seriously lacking (i.e., EmOC, standard protocols, adolescent services, community awareness sessions, care of abortion and HIV/AIDS services); none of those provided is offered by more than one-third of the available RH facilities (Abd Gabbar, 2009; Bayoumi, 2005; Ibrahim, 2012).

2.2.3 Human Resources for Health (HRH)

The Sudan health system faces formidable challenges, including training, management and retention of the health workforce. With a cumulative density of doctors, nurses and midwives of 1.23 per 1000 population, the country is still within critical shortage zone according to the WHO criteria of 2.28 health personnel per 1000 population (WHO, 2006).

Furthermore, production of doctors, due to the increasing number of medical schools, has surpassed other health workers and created an imbalanced skill-mix resulting in a high doctor to nurse ratio that is projected to rise to 6:1 taking into account those in the education pipeline (FMOH, 2012). This has implications for the affordability, effectiveness and sustainability of the healthcare system as there can be opportunity costs, depending on how limited resources for healthcare personnel are distributed. Another challenge facing human resources for health is the lack of well-developed HRH management systems, and particularly variability across the 18 decentralised states of Sudan. Nearly 70% of the health workforce is in urban settings, serving 30% of the population; while two-fifths of the total health workforce (38%) is located in the capital Khartoum. The 65% of specialist doctors and 58% of technicians are in Khartoum. This mal-distribution extends also to the levels of care, where 67% of health workers staff secondary and tertiary care as opposed to only 33% in PHC settings (FMOH, 2006). There is a retention problem and continuing ‘brain drain’: out of a total of 21,000 doctors registered with Sudan Medical Council, over 60% migrated to work outside Sudan (WHO, 2009). The main reasons for the mal-distribution are considered to be the substantially lower incentives and employment conditions for health care professionals working in rural areas compared to urban areas. Weak and unclear payment system (salaries and incentives) lead to a lack of motivation of human resources for health and influence, low compliance to directives including working in remote and rural areas, and lack of accountability (AbdGabbar, 2009). Table 2.4 indicates the satisfaction level of the health providers working at health facilities in Khartoum according to the situation analysis of reproductive health. The health providers were less likely to be satisfied with the salary whereas the likelihood of being satisfied with the work is high. However, this conclusion is based on workers in Khartoum where the health providers are enjoying better-working conditions and better salary as compared to their counterparts working in other states. SARH2008 was conducted in 7 states of Sudan; analysis was restricted on the Khartoum data as the data of the other states were not accurate (see chapter 6 for further discussion).

Table (2.4): Distribution of interviewed service providers working at reproductive health departments at the surveyed health facilities by the satisfaction level, Khartoum 2008

	Number of health provider	%
satisfied with job		
Satisfied	205	73.5
Not satisfied	74	26.5
Total	279	100.0
satisfied with salary		
Satisfied	85	29.9
Not satisfied	199	70.1
Total	284	100.0

Source: SARH, 2008

The FMOH itself and in collaboration with SMOHs has applied several initiatives to retain health providers in remote and rural regions such as providing monetary/ non-monetary incentives, exempting physicians who are working in remote/ urban areas from professional exam fees. However, most of these incentives failed to keep physicians in the remote health facilities (FMOH, 2011).

Maternal health services provision is mainly reliant on village midwives through community-based services where most deliveries still take place at home (79.5% according to findings of Sudan Household Health Survey (SHHS) in 2010). However, village midwives in Sudan are basically independent fee-paid practitioners and not incorporated in the health system even though FMOH are responsible for training them and give licenses to the graduates to practice midwifery in communities. Therefore, we can consider that all home deliveries are effectively outside the formal health system, even though subject to some limited regulation. The FMOH practices some kinds of supervision and can withdraw the licence from any village midwife. However, due to not incorporating them in the health system, the exact number and distribution of village midwives are not known for the health system and a precise system of supervision and assessment cannot be implemented.

Among various challenges facing maternal health care services are the poor competences of village midwives and lack of accessibility where almost 56.6% of Sudan are covered by midwifery services in 2009 to the extent that there are rural and remote areas completely with no maternal health services at all (FMOH, 2009) (further discussion is in chapters 8 and 9).

2.3 Health cadres in Sudan

Skilled Birth Attendant (SBA) is defined by WHO a health professional that is trained and competent in the skills needed to manage normal childbirth and the immediate postnatal period (WHO, 2006). In Sudan, various cadres of providers of midwifery related services are

found in Sudan with varying competencies and not providing the full range of midwifery care. With the exception of physicians and nurse midwives, other midwifery cadres are not well qualified to provide pre-referral emergency management and thus are not regarded as skilled birth attendants as per the WHO standard definition (AbdGabbar, 2010). Indeed, village midwives who attended a one-year training program constitute the majority of maternal health providers in the communities. Regardless of the way village midwives are classified in Sudan, they don't have a full midwifery qualification comparable to many other countries, but neither are they really traditional birth attendants. The rather ambiguous position of the village midwives – falling between 'Skilled Birth Attendant' (SBA) and traditional midwife (TBA) will be discussed further in chapter 9.

Little documentary evidence is available regarding the training programme of the village midwives. The skills that the one-year training programme equips the trainees with are: assisting in normal delivery, ANC, health education, working with health team in providing health services in the local community, and helping the family to register the new-borns in the vital registration office (Abd Gabbar, 2010). Indeed, competencies acquired from the one-year programme could be described as very far from the standard competencies recommended by WHO standards for skilled birth attendants. The FMOH conducted a study in 2002 to assess the village midwives' performance in 5 states. The findings indicated that 75% of village midwives gave a wrong definition of maternal death; knowing the correct definition of maternal death is considered essential for the midwife to notify maternal deaths consistently as well as to recognise serious complications and prevent it. In addition, only 57% of village midwives reported that they received a supervisory visit during the past three months and only 14.7% reported that they ever received any additional training courses after graduation (FMOH, 2006). Additionally, as will be described in the study findings, I found that village midwives in Sudan are not considered as an integral part of the health system and not treated structurally as a part of it, despite the central reliance on village midwives to provide maternity care, particularly for rural women (for further discussion see section 9.4).

Moreover, the human resources for health (HRH) are fragmented along more than 20 categories, whose production has not been adequately planned, resulting in over-representation of some categories and shortage of others. I will identify the types of health professional that are varied in meaning across countries or has domestic meaning whereas the well-known standard health Professions mainly physician and nurses will not be defined.

- a) Traditional Birth Attendant (TBA):** refers to women who provide maternal services in the communities and not certified or have not attended any academic midwifery training programme. Thus, they are considered to have limited midwifery knowledge and unable to deal with emergency cases. They are not supervised by local authorities and usually they inherit this job from their mothers, from whom they also learn

following a more traditional apprenticeship style approach. They are not considered as a skilled birth attendant in Sudanese health policy or in terms of WHO definitions.

- b) Village Midwife:** refers to the maternal and child health care provider in the community where she provides antenatal care, giving advice on the place and mode of delivery (birth plan), attends home deliveries and undertakes appropriate intervention or referral when complications arise, identifies danger signs and timely referral of complicated cases for further care, birth and death registration (AbdGabbar, 2010). Enrolling women at village midwife schools is done through local authorities as they are community health cadres and should be selected from their original communities and by their communities where they are required to stay for good and serve them after fulfilment of the training programme. The eligibility conditions are: to be single with age no less than 15 years (older women are preferred) as well as nomination letter from local authority of the community where the candidate lives. Previous formal education is not required to join the one-year training programme; thus the programme relies more on practical training and little reading is required. The priority in selection is given to candidates from remote areas and areas that are not covered by midwifery services. Indeed, village midwives have characteristics of TBAs but with a better level of training to complement practical experience and ‘apprenticeship’ type learning that characterised many TBAs. Due to the perceived poor outcomes of this programme, the FMOH recently delegated the responsibility of midwifery training to Academic Health Sciences (AHS) and initiated a new 2-year midwifery training programme which will work in parallel with the 1-year training programme for a transitional period after which the 1-year programme will be closed. The new programme requires educated candidates (having completed basic education at least) in order to be able to read advanced material and acquire new competencies such as managing EMoC services (Ibrahim, 2013).
- c) Nurse-midwife:** is a certified nurse who had nursing certificates after attending a 2-year nursing programme at nursing schools and then a one-year midwifery training programme. They provide midwifery services at health facilities and they are considered as SBA with high qualifications while village midwives provide services mainly at the community level. Unfortunately, the number of nurse midwives graduates is insufficient; only covering less than 20% of the actual need (Ibrahim, 2012). Nurse-midwives follow a standard curriculum and they all have high school certificate in order to be admitted to the Nurse-midwife program while the admission to the village midwife programme does not require any level of education. However, the Nurse-midwife programme is currently suspended although there is a critical need for its graduates. As will be discussed further in chapter 9, all stakeholders that I

interviewed were unable to explain the reasons but they mentioned that the programme may be reinstated in the future.

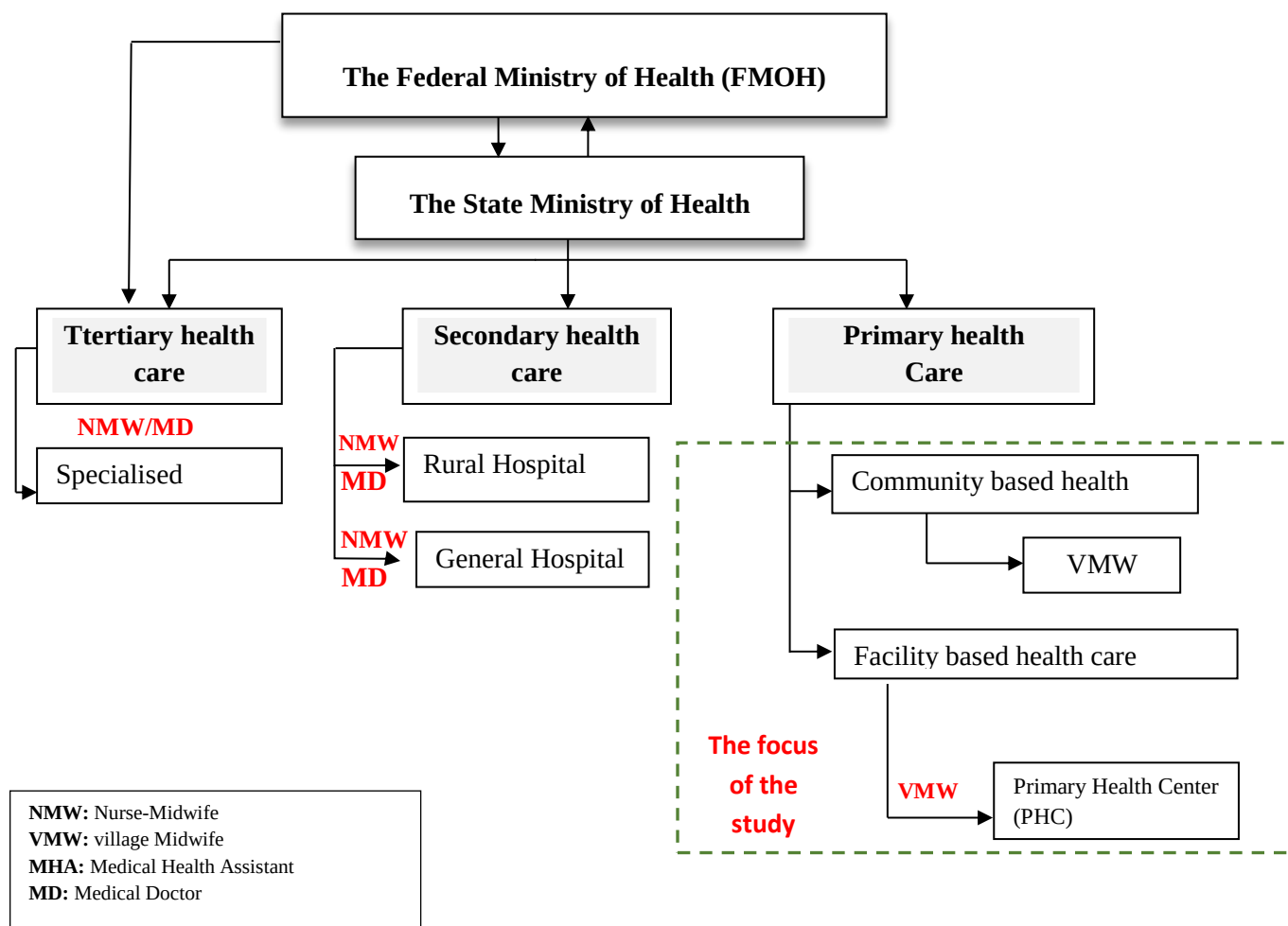
- d) Health visitor:** is a certified nurse-midwife who has 2-years of experience as a midwife after her graduation and then one year training at the health visitor school (only one school, which is located in Khartoum) to become health visitors. Health visitors provide maternal and child healthcare and family planning services at health facilities as well as supervision of village midwives working in the same community where the health visitor works. According to their job description they are not allowed to conduct home deliveries since primary health centres (PHCs) are not providing delivery services; this means less financial allowances. Due to the long-time (around 7 years) that health professionals should attend in order to become health visitors along with the unattractive financial package that they receive from their work as health visitors, only a few (543 health visitors) are currently working as Health visitors in Sudan according to academy of health sciences statistics in 2011.

Therefore as an alternative solution to fill the gap in this job, FMOH started to recruit village midwives with long experience to work as health visitors or as Assistant Health visitors particularly in remote and rural areas across Sudan. As a result of that, except the 543 health visitors on the national level, village midwives are the main maternal health providers at PHCs which mainly provide only antenatal care services.

Accordingly, village midwives are providing maternal health services at the community level, which mainly involves attending labour and birth, whereas village midwives who have been recruited at PHCs to substitute the shortage of health visitors are mainly providing antenatal care services as maternal services provided in the vast majority of PHCs are limited on providing only antenatal care services and treating maternal complications.

- e) Medical assistant:** refers to health providers (male or female) who graduated from nursing school and attended a 2-year training programme at a general assistants' institute. This cadre has been created to find a way to substitute the lack of medical cadres particularly in remote and rural areas where physicians do not prefer to work. However, they cannot substitute all tasks that physicians are entitled to undertake as they can give some medical care such as assisting child birth using instruments (e.g., forceps and ventouse) but cannot conduct any obstetric operations including caesarean sections. The following figure 2.2 illustrates maternal health system in Sudan and the main HRH providers in each type of facility.

Figure (2.2): Maternal Health System in Sudan, 2012



Source: Ibrahim, 2012

Figure 2.2 demonstrates the system of providing maternal health services in Sudan. The maternal health care services are delivered through primary, secondary and tertiary levels of care. On the primary level of healthcare, maternal health services have been provided through two pathways:

a) Community-based health care:

The community-based services are provided by village midwives and comprise mainly antenatal care and birth care services. It is supervised by the locality health level (see health system organisation in section 2.2.1; also further discussion about midwives and community services in sections 9.4 and 10.1.3)

b) Facility-based health care:

This depends primarily on primary health centres (PHCs) and rural hospitals in providing the maternity services. Primary health care centres are structured and staffed to deliver the essential package of primary health care services including antenatal care and may provide delivery care services in remote areas where no other alternatives are accessible; a few of them are equipped with labs and so can provide basic laboratory services, and referrals for complicated cases in need of more specialised care.

There are no in-patient services at PHCs. Thus the main maternal health providers are village midwives (79% of women gave a birth at home and 55% of women were assisted at birth by village midwives in 2010, as shown in table 7.3); for further discussion see section 7.2. Usually these centres are headed by a physician (medical officer/ general practitioner ‘GP’). The primary health centre (PHC) is the first referral point for the lower-level facilities. It provides a basic health services package including only ANC and it is not equipped with labour ward except in the remote areas where there are no hospitals. In addition, many village midwives with long experience are permitted to work in the PHCs to cover the lack of nurse-midwives who are formally entitled to provide the midwifery services in health institutions (for further details see sections 9.4, 10.1.1, and 10.1.2. The rural hospitals are located in the bigger towns and have bed capacities of 40 to 100 and managed by SMOHs and can provide caesarean section and EMoC services.

Tertiary hospitals, including teaching, specialised, and general hospitals, are located in State capitals and are operated by the SMOHs. In addition, there are other tertiary-level hospitals and specialised centres operated by the FMOH. Maternal health services in both secondary and tertiary hospitals are provided by nurse-midwives (the number of which are very few) and medical doctors (general practitioner ‘GP’, specialised doctors, and consultants).

Chapter 3

The Maternal Health System

This chapter gives a detailed overview of the health system as conceptualised and described in the literature. It is divided into seven main sections. The first and second sections discuss the concept of the health system and the health system goals from different perspectives. The following two sections discuss the conceptualising of types of health systems and system components as well as health system performance and how this performance can be quantified for the purposes of the study described in this thesis. In the following three sections, current maternal healthcare, maternity referral systems, and human resources for health have been addressed with a special focus on low-income countries.

According to my literature review, studies related to health system have been increasing since 2000 but still there is a lack in covering all components of the system, particularly in developing countries and Sudan. A few studies addressed the assessment of the entire health system performance but no published paper was located assessing the entire health system or maternal health system in Sudan. There are many published studies on the quality of health services and determinants of utilisation. Most of them are quantitative and qualitative; yet, few studies used mixed methods in identifying the determinants of utilisation. Most of the foundations of the health system have been addressed in WHO publications. Indeed, I found it to be a significant source in this regard.

3.1 The concept of the health system

There has been increasing attention to the concept of the health system that applies a horizontal multi-problem approach in dealing with population health after a long period of neglect in favour of vertical programmes, community based small-scale projects, and donor directed thematic health investment (Kruk et al., 2008). Vertical programmes call for the solution of a given single or a few health problems such as immunisation, HIV, TB through the application of specific measures through single-purpose machinery (Mills, 1983); thus, this approach deals with selective targeting of specific interventions. The vertical programmes can be suitable in dealing with a health crisis in a community but this approach cannot be relied on permanently. The horizontal approach deals with the overall health problems on a wide front and on a long-term basis through the creation of a system of permanent institutions commonly known as general health services. This concept is very close to the primary health care system, the health delivery system; yet the health system still has a wider scope. An alternative approach integrates the horizontal and vertical approaches in different ways: 1) integration within health services (e.g., vertical immunisation programmes with horizontal health care programmes; 2) integration within the broader health

sector, of population control or sanitation programmes with health services; 3) there is integration of all public sector activities affecting the goal of health improvement through multi-sectoral strategies, programmes and activities, incorporating all sectors that affect health, such as agriculture, education, and public utilities (Mills 1983). Mills advocated the adoption of the three strategies, arguing it is important to select the most cost-effective strategy in dealing with health problems taking into consideration the country's circumstances particularly its existing resource, organisational capabilities, and availability of human resources for health (Mills, 1983). The World Bank (2004) argued that the factors influencing the choice of approach in developing countries - whether vertical or horizontal – should be one in which public officials would consider factors such as geographical demands of health services, poverty levels and distribution, resource limits (human and financial) and sustainability of programmes and political dynamics. However, in practice factors affecting decisions such as choice of donors and non-governmental organisations (NGOs) in providing services are more often those such as obtaining quick results to attract political support from their constituents for additional funding in the future (Msuya, 2004).

The term “health system” is constituted from two different terms; each having its own connotation. The WHO identified the term ‘health’ as ‘a state of complete physical mental and social well-being and not merely the absence of disease or infirmity’ (WHO, 2007, p4), whereas the term ‘system’ refers to a set of interconnected parts that must function together to be effective; these parts could be individuals, items, and/or organisations (Atune et al., 2008). Most health system studies have been focused only on health care including preventive, promotive and curative care rather than other aspects that are included in the wide definition of health (Smith et al., 2012), such as social structure or policy.

Although there is an increasing interest in health system strengthening and reform, no consensus in the literature on a particular scope and components of the health system can be identified; alternatively, there are a number of different health system definitions and approaches that are supported and advocated by different organisations (Smith, 2012). These also range from very broad definition to include all activities related to health whether directly or indirectly, as discussed later in the WHO definition, or to confine the health system to be only providers and organisations that deliver personal medical services. The World Bank defined the health system as including health financing, development of public-private partnerships, public sector reform, and macro-economic factors (World Bank, 2007). Roemer (1991) defined a health system as “the combination of resources, organisation, financing and management that culminate in the delivery of health services to the population.” (Roemer, 1991).

The World Health Organisation (2000) introduced the concept of health system as including all organisations, people and actions whose primary intent is to promote, restore or maintain health (WHO, 2007); yet, it narrowed this down to include only the activities which are under

complete or partial control of government since the majority of governments worldwide, particularly in low- income countries are the main funders or health services providers or both (Kruk et al., 2008). Similarly, Smith (2012) suggested that a health system should be concerned with all the factors that may, directly or indirectly, impact upon population health.

Looking at the WHO definition, it does not include non-health specific activities belonging to other systems in a society that may significantly contribute to the population health indirectly by contributing to the wider system function (e.g., activities to increase the girls' enrolment in schools, improving road networks, and the home care of sick, which constitutes the majority of all health care). However, quantifying the performance of the health systems by adopting the wider definition is a challenge as almost all data available are data related to the more narrowly defined health care system including preventive, curative, and palliative interventions, whether directed to individuals or to communities.

Healthcare system activities constitute the great bulk of both employment and expenditure that would be included in a broader notation of the health system. As a result of that, the majority of health system research focuses on the aspects related to the narrower definition of the health system. Nolte et al. (2012) consequently identified the healthcare system as 'the combined functioning of public health and personal healthcare services that are under the direct control of identifiable agents, especially ministries of health' (Nolte, 2012)

Consistent with the concept of health system introduced by the WHO, for the study described in this thesis I proposed an operational definition of the maternal health system that includes all organisations, people and actions whose primary intent is to promote, restore or maintain women's health during the maternity period. However, only activities performed or supervised by ministries of health (i.e., public sector and village midwives) are included in the study to give more focus to the analysis while activities provided by private, police, and army sectors are not included in this study.

3.2 Health system goals

Health systems have three intrinsic intended outcomes or goals. The first goal is achieving better health for populations and health equity through equitable service delivery and fair financing (Kruk M et al., 2010). The second health system goal is responsiveness by responding to people's expectations related to health care and how they should be treated by health providers. In addition, it contributes to health by promoting utilisation as many patients with poor experiences of health services are hesitant to use services again. People's satisfaction among other things reflects the level of responsiveness of the system. Individual's satisfaction with healthcare can be defined as a "personal evaluation of healthcare services and providers" (Ware et al., 1983, p.247). The individual evaluation is

influenced by many factors such as personal preferences and expectations, knowledge, attitude and previous experiences with health care. The third intrinsic goal of the health systems is financing fairness and providing financial protection against the cost of ill- health since healthcare need is unpredictable and can be catastrophically costly; thereby, it is essential for people to be protected from having to choose between financial disaster and loss of health by developing mechanisms for sharing risk and providing financial protection.

Fair financing and responsiveness goals can be perceived also as partly instrumental goals, in that they promote improvements in health status but they would be valuable even if that did not happen.

In addition to the intrinsic goals of the health system, the WHO (2000) discussed other instrumental goals (intermediate goals), such as being accessible, affordable, equitable and sustainable whose attainment will raise the level of health, responsiveness and fairness in financing. They are quantified as a proxy for intrinsic goals (health, responsiveness, and fair financing) in the case that there are challenges in measuring the main goals. Taking “accessible” as an example for more illustration about the WHO rationale with respect to this classification, it is assumed that the more accessible a system is, the more people will utilise it to ameliorate their health whereas if the attainment of the three intrinsic goals are measured adequately, this would entirely reflect the impact of access to care or other instrumental goals (WHO, 2000; Kruk et al., 2008; Murray, 2000). Also, there are cross-system goals for health systems by which achieving these goals are considered as health system contribution into other systems and vice versa; for instance, the impact of the health system through achieving better health on the improvement of economic growth through fitness for work as well as the significant contribution of education on health behaviours (Murray, 2000). Indeed, the cross-system goals could be considered as conjunctions among systems and in order to fulfil them, inter-sectoral activities from related systems need to be accomplished.

3.3 Conceptualising types of health system and system components

The health system, like any other system, is a set of interrelated elements, individuals, or organisations, also called parts of the system, that must function together to be effective. Understanding a system begins with identifying its nature; specifically, whether it is primarily mechanical or adaptive. The responses of mechanical systems can be predicted according to a given stimulus and under specific circumstances whereas adaptive systems have the freedom to respond to different stimuli in complex and unpredictable ways (i.e., nonlinear). That is, system parts have freedom to act in ways that are not always predictable and whose actions are interconnected so that one part’s actions change the context for other parts’ actions (Plsek, 2001). On the other hand, other parts’ feedbacks affect the initial part in the way that it behaves in the future. It is, therefore, characterised by multiple direct and indirect feedback

loops between parts. Undoubtedly, understanding the past interchangeable influences on the current behaviours and their mechanisms of interaction can be useful in providing a basis of learning and then modifying these influences towards the desired direction. Furthermore, parts may belong to many systems simultaneously. Due to the fact that they move in and out from the memberships of the systems across time, change is constant in such systems (Smith et al., 2012). Improvements in one part cannot be achieved without contributions from others. Accordingly, health outcomes are not a simple product of a set of physical inputs, human resources, organisational structure, and managerial processes (Plsek et al. 2001). Indeed, most human systems are adaptive (World Bank, 2007).

Moreover, systems can be preserved as subsystems that are nested within other systems, thereby change in one subsystem has repercussions on the other subsystems; thus any improvement in a certain subsystem or element cannot be achieved without getting contribution from other subsystems or the other parts of the sub-system and potentially impacting on them (Smith, 2012).

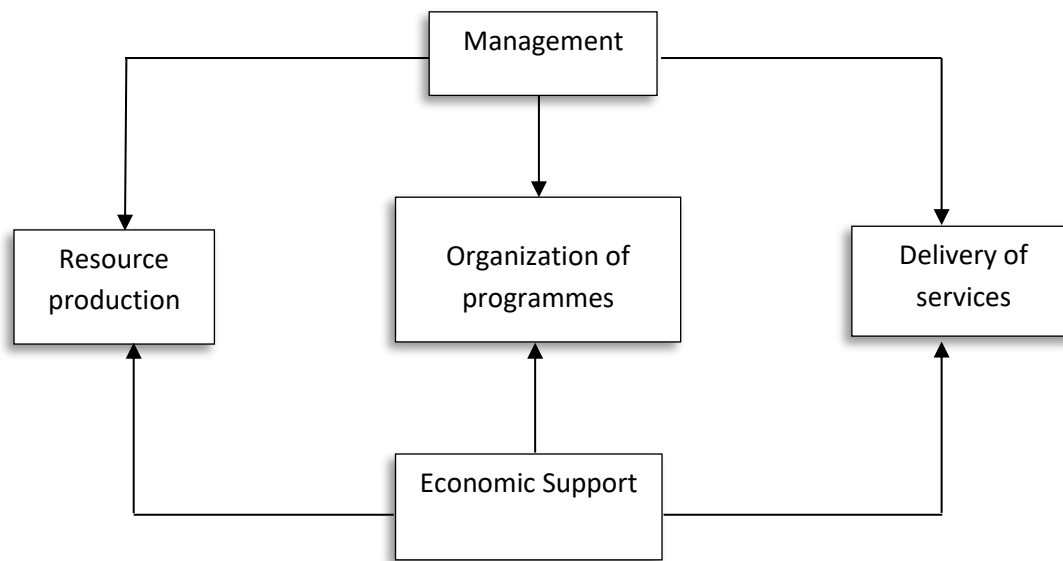
The maternal health system is an adaptive, complex and non-linear system constituted from several parts, functions and activities aimed at improving maternal and infant health. Thus, any of the characteristics or attributes of the health system can be applied also to the maternal health system. There is a growing consensus among recent literature that a well-performing health system is needed to improve maternal and child health as well as reduce maternal and infant mortality (WHO, 2005; WHO, 2007; USAID, 2011) although there is less agreement on the priority functions, as well as elements that constitute each function, of health systems and on what initiatives contribute to strengthening systems to deliver acceptable quality of health services (Kruk et al., 2010). Indeed this disagreement may be attribute to several issues; one of them is the nature of each health system, and the context and the political system of each country. However, applying health system approach rather than population characteristics; thus including the government as an important partner in health service utilization rather than largely depending on population characteristics gives the decision makers a more comprehensive view about the under-utilization of maternal health services and may support the development of more realistic solutions rather than limiting the solutions sought through focusing only on enhancing women's and their families' characteristics. Indeed, I will argue that the conceptual framework implemented in this study, by focusing on both health system *and* women's characteristics, with a special focus on the health system functions when considering health system performance has the potential for a greater impact on maternal health (see chapters 11 and 12 for further discussion). In response to this critique of studies or programmes that focus simply on system factors *or* women's and families' characteristics, a mixed methods approach was adopted in this study, to be able to look across the different levels and interactions among the health system functions as well as between the health system and users.

The elements of a health system may include patients, families, and communities, ministries of Health, health providers, health services organisations, pharmaceutical companies, and health financing bodies. Their interconnections can be perceived as the functions and roles played by these parts. Tracing the ways these functions are accomplished provides a basis that can be used in comparing the performance variation of a particular system across time or even among different health systems.

Roemer's framework (1993) proposed five principal components, as shown in figure 3.1:

1) resources: health workforce, health facilities, commodities, and knowledge; **2) organisation,** which is usually dominated principally by governmental authority; **3) management,** which involves several managerial processes that is varied from one system to another according to the country's dominant political ideology; **4) economic support,** e.g., mechanisms in financing health systems; **5) delivery of services:** primary, secondary, and tertiary care delivered through a range of models.

Figure (3.1): Roemer's framework



Source: Gilson, 2007 (referring to the Roemer's framework)

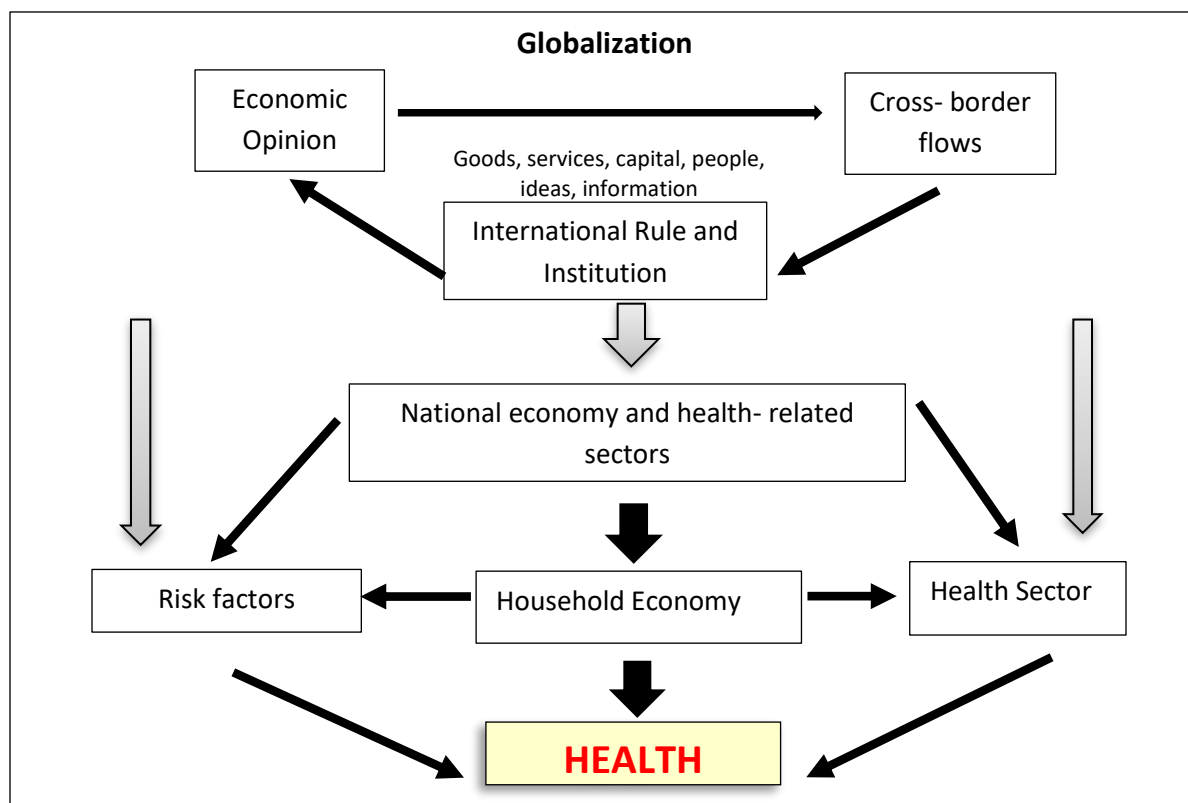
Similarly, the World Bank (2007) introduced four principal functions of health systems: stewardship, health service provision, health service inputs, and health financing whereas households' demand behaviour and overall health sector governance largely determine how these functions are carried out. The first function “**Stewardship**” involves oversight of all other functions, proposing the policy framework and regulation of health system. It is also concerned with identification of health priorities in order to set mandatory basic maternal health packages; activities should be coordinated with other systems outside the realm of health care such as road safety, health education in the school curricula, sectoral strategic planning, inputs and health service quality control, information needed for effective decision-making on health matters and assessing the performance of health system. Stewardship function is frequently the responsibility of governmental authorities.

The second function “**Health Service Inputs**” involves managing resources, which include human resources, medication and medical equipment. These inputs are mostly outside the direct control of the health system (e.g., medical training for health staff is accomplished principally by the education system; producing medical equipment is performed mainly by the manufacturing system); while health system policy makers have to respond to immediate population needs with whatever resources are available. The third function, “**Health System Financing**” is the core function of the health insurance mechanisms. It includes three aspects; *a*) collecting revenues to pay for healthcare services; *b*) risk pooling: collecting and managing financial resources in a way that spreads financial risks from an individual to all pool members (WHO 2000), thus avoiding payment at the moment of health services utilisation, particularly among the poor; *c*) allocating revenue which is related to strategic purchasing of

service and regions. ‘Strategic purchasing’ is the way most risk-pooling organisations (purchasers) use collected and pooled financial resources to finance or buy health care services for their members. In the practical, day-to-day interaction between purchasers and providers, the purchaser, within a regulatory framework, plays a key role in defining a substantial part of the external incentives for providers to develop appropriate provider-user interaction and health service delivery models’ (World Bank, 2007. P.177). Also, the financing function is determined by the funding policy of the health systems (level, source, fiscal space). The fourth function is **“Public and Private Health Services Provision”** in which delivering healthcare services is the most obvious and essential part of the health system. Indeed, the differentiation between health systems depends to large extent on the quality of health services provision. These four functions principally rely on both households’ demand behaviours and overall health sector governance (World Bank, 2007).

The WHO (2000) suggested a simplified view of a comprehensive health system based on its definition of health.

Figure (3.2): health system



Source: Smith, 2012 (referring to the WHO definition)

As shown in figure 3.2, the lower half of the figure present the domestic sphere of the health system in a country whereas the upper part represents the more global context. Taking the lower part of the figure, health as a core concern is influenced by several main interlinkages of factors. Risk factors comprise genetic predisposition to disease, environmental factors, infectious disease, and other factors; the household economy represents factors associated with human capital and the investment in health by individuals and households; the health sector representing the impact of goods and services consumed principally to ameliorate health status; the national economy represents the meta-influences of government structures and general economic well-being. Regarding the upper part, which represents the global impact, there are international impacts on the health of the domestic community such the rapid-border transmission of communicable diseases; increased marketing of unhealthy products and behaviours, and increased environmental degradation as a result of industrialisation (Smith et al., 2012).

The majority of the conceptual frameworks of health system or healthcare system do not conceptualise them as open systems that interact with their external environment, including international factors that have considerable influence on national health/healthcare systems through, for instance, trade in goods, services, international agreements, bio-technological advances, financial and technical support (Gilson, 2007). The international influence particularly is important in the health systems in low and middle-income countries where they rely on donors in underpinning financing and indirectly providing some services. These types of systems can be severely affected by the international variability if the system completely or heavily depends on the donor's funds in financing particular health activities or services such as primary healthcare services and could cause fragility in that system.

3.4 Health system performance

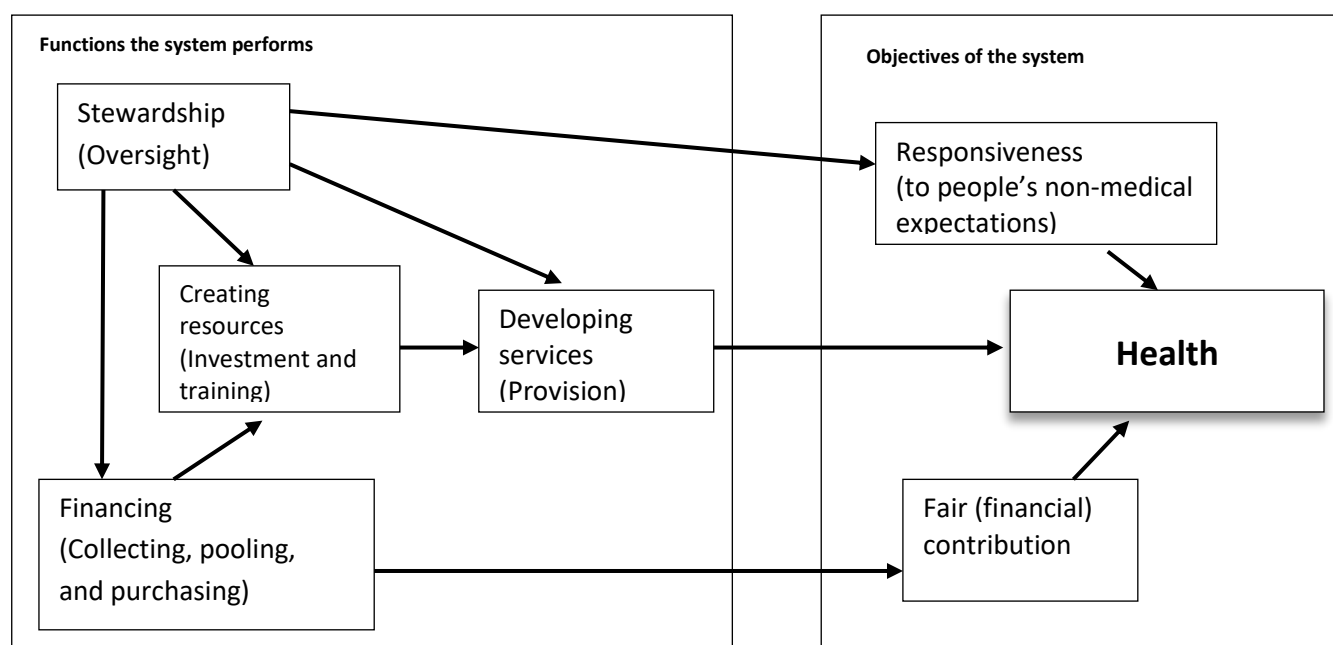
Public dissatisfaction with the way health services are run or financed is common due to failing to achieve the health system goals. This is commonly occurring among health systems of low and middle-income countries, even though much improvement in the performance of health systems could be achieved with little or no cost. Therefore, there is a growing interest in health system performance research and many frameworks have been developed in order to assess and improve the quality of healthcare.

The world health organisation (2000) referred to the performance as 'the extent to which the resources used by a given health sector to achieve their objectives' (Murray, 2003). Assessing the health system performance and how it reacts towards external shocks as well as how systems carry out certain functions, is a complex procedure; accordingly needs a complex and multifaceted methodology that may vary based on the paradigm utilised in the health system.

One of the early initiatives in assessing the health system performance was a new national framework that was first used to assess the National Health Systems of the UK in 1998. Using the NHS data, the model proposed six areas to be assessed: health improvement, fair access, effective delivery of appropriate healthcare, efficiency, patient/carer experience, and health outcomes of NHS care (NHS Executive, 1998).

Among various initiatives that have been proposed after the UK one, the WHO introduced the framework of Health System Performance Assessment (HSPA) in 2000, which provides a comprehensive assessment of the performance of a health system by identifying three intrinsic goals that cannot be achieved without fulfilling four key functions. The association between the health system goals and the key functions is presented in figure 3.3.

Figure (3.3): The WHO framework for health system performance assessment



Source: WHO, 2000

Furthermore, one of the major factors that influence the performance of the health system and should be considered in the health system assessment is **the political nature** of health. Indeed, population health and health care is a highly politicized area worldwide to the extent that political decisions are predominant in certain aspects such as designing the health sector and policies that determine the broader social determinants of health; even policy development such as health sector reform is driven by economic and financial factors, which may be politically framed. Therefore, considering the political economy of the health system is a core factor in the analysis (Smith et al., 2012).

This research will assess the three objectives and the four functions of the health system described above in Sudan.

a) **Assessing the health system objectives**

A good health system is a system that can attain the three main goals of the system: improving health, improving responsiveness to the expectations of the population, and ensuring fairness in financial contributions and access. That indeed includes two sub-goals: 1) goodness which refers to the best attainable average level; 2) fairness involves minimising the differences among individuals and population groups by preferentially improving the health conditions of the worse-off. In general, achieving good health is not satisfactory if the inequality remains high because the improvement accrues disproportionately to those already enjoying better health whereas the disadvantaged groups may not benefit from these achievements.

The level of maternal mortality (MMR) will be used as an indicator in the study to assess the health status of mothers in Sudan in order to judge **goodness**: how well the objective of a good maternal health system is being achieved. The maternal mortality ratio across the states of Sudan will be used to identify the **fairness** of the system. However, it is important to mention that disparity in MMR levels among states may not be only due to a defect in health system but also other factors such as inequalities in socioeconomic classes, which is significantly associated with it. Therefore, the assessment of maternal health system is an integrated and complemented set of procedures rather than simple measurement.

Assessing the responsiveness of the system involves more than the assessment of people's satisfaction with the medical care they obtain. For example, health providers' rudeness and arrogance in relations with patients (disrespect and abuse) as well as waiting time for non-emergency surgery are very common complaints in unresponsive health systems (WHO, 2014). Population expectations of how they should be treated by health providers also form a key dimension of responsiveness.

Therefore, responsiveness can be defined in two key dimensions; **subjective factors** that largely rely on patients' perceptions such as respecting dignity of patients (e.g., locking up infected patients with communicable disease, and refusing to deliver HIV-infected mothers who need caesarean section, confidentiality (e.g., protecting medical records of the patients), and autonomy (e.g., giving the right to the patients to participate in choices about their health); and **objective factors** which are related to how the health systems meet the patients' and their families' concerns, some of which can be directly observed at health facilities. This may include prompt attention (e.g., reasonable waiting time for non-emergencies and immediate attention in emergencies), amenities of adequate quality (e.g., cleanliness, privacy and space), access to social support networks for people receiving care, and the people's right to choose the health provider and health organisation from which they want to receive

healthcare. Furthermore, the responsiveness is varied in practice according to population characteristics, such as that as poor or/and less educated women may expect less thus be more satisfied comparing to rich or/and higher educated women. A similar case may be applied to low and middle-income countries compared with high-income countries with respect to comparing the responsiveness of health system performance on the international level.

Goodness and fairness are applied also in the responsiveness, where the health system is expected to perform well on the average for responding to all non-health aspects as well as equally respond to all population groups.

Assessing the fair financing means ensuring fair distribution of the costs of the health system according to household's or individual's ability to pay in order to protect them from the cost of illness. Goodness related to financing is not applicable; alternatively, there are good and bad ways to raise the resources for the health systems but they are more or less good primarily as they affect how fairly the financial burden is shared. Fair financing is concerned only with distribution. It is not related to the total resource bill, nor to how the funds are used. Furthermore, the WHO identified two areas where paying for health services can be unfair: large unexpected expenses that family should pay immediately out of pocket to receive the health services rather than being covered by some kind of pre-payment and imposing regressive payments, in which those least able to contribute pay proportionately more than the better-off (WHO, 2000).

Some critical points should be taken into consideration in the assessment procedure; **firstly**, the attainment of the goals is related to the actual resources allocated to the health system in a sense that high level of overall population health is usually associated with countries whose resources are higher. However, as discussed, this does not mean at all the performance is better but may reflect other factors. Therefore, assessment of the performance should be done in relation with resources; i.e., the worst and the best boundaries that can be accomplished for given circumstances. For example, two countries with different level of goal attainment associated with different levels of resources may have similar health performance (Donabedian, 1982; Murray, 2000). **Secondly**, as discussed in the first part of this chapter, it is argued that there are other factors that are not controlled, or partially controlled, by the health system but affect population health such as nutrition level, availability level of essential imported medications, availability of a network of roads and transportation. The counter argument suggests that good systems should pay attention to such factors and intervene or interact with other systems to alleviate the negative impact of these factors on population health. However, it is important to determine the boundaries that the health system is considered responsible for before starting the assessment (Murray, 2000). **Lastly**, it is argued that under scarce resources, societies regularly prioritise the three goals and make their own policy choices and this affects the extent to which each of the three goals including the

goodness and fairness are attained ultimately; thus, the relative importance of the objectives are varied across health systems, particularly objectives related to equity which reflect political choice made by individual countries. Eventually, it is only one fixed health budget and trade-offs are made in attaining the three intrinsic goals at least cost, although Murray (2000) believed that there will not be great variance in the importance attached to different goals for most societies in the world. Accordingly, I assess the objectives of the maternal health system in Sudan as indicated in table 3.1 (see chapters 6, 7, and 10).

Table (3.1): the framework for assessing the performance of maternal health systems: the system objectives

objective	Indicator	Assessment level		Data used
		The Goodness (Average level)	Fairness (Distribution)	
Good health	Maternal mortality	The overall maternal mortality ratio	The distribution of maternal mortality ratios across the states	Quantitative data: SHHS 2006 and 2010
Responsiveness	Women's satisfaction	on Khartoum level		Quantitative data SARH 2008: Exit interviews with women who received antenatal care services - Qualitative data MHSS 2012 : FGDs with users of maternal health services and non-users
Financing fairness	- Rules and criteria of health resources (government-donors) allocation - Health insurance - Procurement System	On the national level	Identify gaps among states	- Qualitative data MHSS2012: - in-depth interviews with decision maker group and stakeholder group

b) Assessing the functions of the health System

A well-functioning health system involves aspects related to equitable access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use (WHO, 2007)

“Good health service delivery” is defined as those which deliver effective, safe, quality, personal and non-personal health interventions to those that need them, when and where needed, with minimum waste of resources (WHO, 2007, p. vi); while a well-performing health workforce is defined as ‘one that works in ways that are responsive, fair and efficient

to achieve the best health outcomes possible, given available resources and circumstances (i.e. there are sufficient staff, skill mix of the health workforce, fairly distributed; they are competent, responsive and productive)’ (WHO, 2007, p.vi). Also, a good health financing function is determined as raising adequate funds for health, in ways that ensure people can use needed services, and are protected from financial catastrophe or impoverishment associated with having to pay for them. It provides incentives for providers and users to be efficient. Lastly, a good stewardship function is identified as ensuring strategic policy frameworks exist, effective oversight, coalition building, regulation, attention to system-design, and accountability. In addition, a good stewardship function is associated with a well-functioning health information system, which involves reliable and timely information on health determinants, health system performance and health status (WHO, 2007).

It is important to clarify that having better health and higher level of responsiveness is not necessarily associated with spending more on health in a sense that at high levels of expenditure, there may be little additional health gain from more resources; the WHO (2000) mentioned in this regard that ‘The objectives of the health system do not include any particular level of total spending, either absolutely or relative to income. This is because, at all levels of spending, the resources devoted to health have competing uses, and it is a social choice – with no correct answer – how much to allocate to the health system. Nonetheless there is probably a minimum level of expenditure required to provide a whole population with a handful of the most cost-effective services, and many poor countries are currently spending too little even to assure that.’ (WHO, 2000, p.26). Only high income countries, where the public expenditure has significant contribution to health, spending and allocating budget is determined by policies and budgets of public entities as well as insurance funds whereas in low-income countries, most of the health financing is private and largely out of pocket, thus there is no obvious public policy that can determine completely the allocating of health expenditure.

Fair financing is, however, associated with a good performance of the health systems. Fair financing refers to health systems where ‘the risks each household faced due to the cost of the health system are distributed according to the ability to pay rather than to the risk of illness’ (WHO, 2000, p.35). In other words, the contribution to the health system should reflect the income differences among households. However, most low- and middle-income countries do not protect a large number of people from financial risk and vulnerability that may deter poorer people from buying these services. Consequently, financial fairness depends on progressive prepayment in place of out of pocket expenditure, which should represent a small percentage of the overall immediate health expenditure on the aggregate level as well as a manageable percentage of a household’s income (WHO, 2000). A wide range of indicators have been used to measure financial fairness on the macro- or micro-level.

In the study described in this thesis, I assess the performance of the four functions of the maternal health system in Sudan using qualitative data (see chapters 8 to 10). In addition, maternal health service utilisation (antenatal and delivery care services) is studied using both qualitative and quantitative data in order to understand the impact of the overall health system performance on utilisation ultimately the overall maternal health (see chapter 7).

3.5 Maternal health care services

Studies provide strong evidence of an association between receiving effective perinatal care and lower maternal mortality risk (WHO, 2007b). Effective antenatal care can alleviate or prevent pregnancy complications, provide women with information in pregnancy, newborn care, and breastfeeding as well as delivery plan. There is an argument about the optimal number of antenatal visits in which there is a tendency to limit these visits to a small number at specific critical times during the pregnancy period (Carroli, 2001; Langer, 1998; Hofmeyr, 2011). The WHO (2007) recommended four antenatal visits for women with no underlying medical problems for countries with limited resources, with the 1st antenatal care visit highly recommended to take place as early as possible during pregnancy, preferably during the 1st trimester, in order to diagnose any complication in very early stage of its development. Carroli (2001) highlighted the importance of conducting a general assessment of the women's health in the first antenatal care visit in order to ensure that women are as healthy as possible during pregnancy and delivery. Also, it is important to discuss and prepare birth and emergency plans with pregnant women in order to ensure that an appropriate action will be taken to prevent the development of maternal complications in the right time as most of the obstetric complications are not be able to be identified in an early stage of the pregnancy. Such delivery plan should include advice on avoiding post maturity, the identification of malpresentations, and hypertensive problems that may lead to eclampsia (WHO, 2007b). In addition, keeping a health record for each pregnant woman is advocated as crucial in order to facilitate decision-making or intervention and it is recommended to keep this record card with the pregnant woman rather than leave it at the health facilities. Studies have shown that women who hold their own records are more likely to keep follow-up appointments, to ask questions about their health, and to feel control over the pregnancy and less likely to misplace the records than health facilities (Homer, 1999; Brown, 2004).

The WHO (2007) suggested specific essential requirements that must be fulfilled by maternal health care providers: ensure accessibility of antenatal care, work with communities to raise awareness of the value of antenatal care, provide entire antenatal care components of the national antenatal care model, document care, provide appropriate health education, ensure privacy and suitable environment during provide antenatal care service, provide information and counselling to both partners, ensure women have opportunity to discuss their pregnancy and personal concerns confidentially, refer all needy pregnant women requiring specialised

medical care, refer women with social and/or psychological problems to advice/ service agency, and record findings on the maternal card (WHO, 2007b).

Furthermore, the WHO (2006) presented an approach to promote antenatal care as early detection of problems during pregnancy leads to timely treatment (WHO, 2006b) in order to achieve safe delivery. The term “safe delivery” was defined as delivery conducted either in a medical institution or home delivery assisted by a doctor/nurse/ midwife/auxiliary nurse (WHO, 2006b).

The application of these standards varies widely between countries. In some low and intermediate income countries, the majority of pregnant women rely on receiving perinatal care from community health workers, particularly home-based village midwives where the supervision system is weak; thus, it is very difficult to control or measure the quality of ANC services. I will use the WHO **essential elements of antenatal care services** as a benchmark to assess health birth care services in Sudan and how these can be improved. The basic elements of antenatal care services includes: pregnancy surveillance, preventive measures and screening for potential complications or infections, immunisation of pregnant women, recognition and management of pregnancy-related complications, recognition and treatment of underlying or concurrent illness or disease, advice and support in developing the childbirth and emergency preparedness plan, and health education and promotion for the woman and her family.

Although childbirth is a normal physiological process that the majority of women pass through and is usually associated with happy expectations, most maternal deaths occur immediately before and after birth. Unfortunately, maternal complications that expose women to the risk of death may be unpredictable and the onset may occur suddenly and severely (WHO, 2007b). The WHO introduced two types of delivery plans; one is directed to wealthier countries in which it emphasises aspects relating to the psychological and physical comfort of women in labour whereas delivery plan in poor countries emphasises aspects related to safe birth with the appropriate attendant and prepare for what it is called a birth and emergency preparedness plan. Nevertheless, recently many governments and international organisations including WHO, which altered its perspective, have highlighted the women’s right to the highest attainable standard of health. This constitutes the right to dignified, respectful health care throughout pregnancy and childbirth, as well as the right to be free from violence and discrimination (WHO, 2014, p. 1). Accordingly, several actions have been proposed by WHO that should be considered in order to eliminate disrespect and abuse during facility-based childbirth: 1) greater support from governments and development partners for research and action on disrespect and abuse; 2) initiate, support and sustain programmes designed to improve the quality of maternal health care, with a strong focus on respectful care as an essential component of quality care;) emphasising the rights of women

to dignified, respectful health care throughout pregnancy and childbirth; 4) generating data related to respectful and disrespectful care practices, systems of accountability and meaningful professional support are required; 5) involve all stakeholders, including women, in efforts to improve quality of care and eliminate disrespectfully and abusive practices (WHO, 2014).

Birth and emergency preparedness in antenatal care plan includes the following items: the desired place of birth, the preferred birth attendant, the location of the closest appropriate care facility, funds for birth related and emergency expenses, a birth companion, support in looking after the home and children while the woman is away, transport to a health facility for the birth, transport in the case of an obstetric emergency, and identification of compatible blood donors in case of emergency (WHO, 2003; Moore, 2000; Santarelli, 2003). Nevertheless, it is difficult to develop such plans because people who live in poor economic conditions are less likely to keep some money aside for a possible obstetric emergency. Additionally, preparing birth /emergency preparedness plans is more difficult among women who are living in remote or rural areas where maternal health services are scarce (WHO, 2007b).

I will utilise the WHO childbirth and emergency standards as a base to compare delivery service in Sudan and consider how they can be improved up to the WHO standards. The antenatal care elements relating to birth are: provide information to women, family and community on the signs of labour and when to seek care if danger signs appear during pregnancy, disseminate information in the community on danger signs during pregnancy, birth and the postnatal period birth and the postnatal period, support women in developing and reviewing the birth and emergency preparedness plan, ensure that all pregnant women have access to appropriate pregnancy, birth or postnatal care, work with community to find possible plans for the emergency transfer of women and newborn infants with pregnancy- or birth-related complications and possible community action and/or plans to mobilize local assets and participate in local efforts for the emergency transfer (WHO, 2007b).

3.6 Maternity referral system

Identifying maternal complications earlier can significantly reduce the maternal mortality levels, particularly problems related to haemorrhage, sepsis, eclampsia, and obstructed labour which together have the capacity to avert half of the maternal deaths in the global south where more than 90% of maternal deaths worldwide occur (Wagstaff, 2004; Murray, 2005). Strengthening access to emergency obstetric care (EmOC) through an efficient referral system for women with complications or who are more vulnerable to complications from basic to more specialised levels of care by health providers is important to improve women's health outcome.

The referral process starts when a service provider acknowledges its inability to provide the necessary type of care. Referral process takes place from community health providers to clinic staff and also from clinic staff to clinical specialists, or institutionally when a health provider advises the transfer, or by self-referral, when the patient or her family makes the decision. Referrals can be elective or emergency, depending on the urgency to reach the facility. Accordingly, it is essential to train frontline maternity care providers on recognition of obstetric complications and instigation of appropriate emergency referral procedures and skills as well as to establish a system of communication, such as the use of radios or cell phones, to communicate with more qualified personnel for medical guidance and support (Working Group (IAWG) on Reproductive Health in Crises, 2010).

Jahn and De Brouwere (2003) identified the referral chain to be composed of three links (family, PHC facilities, and referral hospital), which assume the function of sender and receiver. The family (or village where there is a community-based health worker) originates the referral process by assessing the perceived risk attached to the condition and the quality of care at the available facilities, as well as issues like cultural traditions, costs and availability of means of transport. Also it is important to develop protocols or referral guidelines which should be held by providers in order to guide them in determining at what point in the course of a complication or what level of risk they should refer women to a higher level of care (Jahn et al., 2001). Similarly, protocols at the receiving facilities need more attention. The absence of providers' and receiving facilities may result in referred patients with emergencies queuing along with other outpatients. These protocols are not standards that can be used worldwide but should be country or state level as they should take into account the local epidemiological and geographical conditions, organisational capacity, and community preferences (Murray, 2005).

Active collaboration between referral levels and across sectors is a major challenge facing the performance of maternity referral systems, particularly failure in coordination between government, not-for-profit, and non-governmental organisations (Murray, 2005). The expansion and diversity of types of non-government maternity care provision constitute a problem as, for instance, small-scale private maternity clinics as well as private midwives may rely on public sector facilities whenever emergencies occur. Therefore, it has been argued that health systems should give more attention to referral mechanisms in order to obtain an effective referral (Okafor, 1994; Obuobi, 1999).

Referral system for comprehensive emergency obstetric care (EmOC) and a decentralised provision of 24-hour care are recommended to be well settled in low- income countries or countries with high maternal mortality levels (Belghiti, 1998; De Groof, 2003; Jahn, 2000). However, Miller (2002) argued that conducting the majority of deliveries in “referral-Level hospitals” does not guarantee a reduction in maternal mortality levels because hospitals will

provide poor quality of services as a result of overloading (Miller, 2002). Thus triage in referral systems is important to efficient and safe system functioning

3.6.1 The requirements of an effective referral system

In order to establish an effective referral system, population needs (including cultural and ethnic diversity), capability of community and health system resources to meet these needs (e.g. identifying the full range of providers and facilities providing relevant care and ambulance services), and estimated number of pregnant women at risk who are likely need for emergency services (Murray, 2005). In addition, the community resources and problems related to communication and transportations should be identified. The WHO recommend essential requirements that should be secured in referral systems in humanitarian contexts, yet it can be adopted as the requirements needed to establish an effective maternity referral system in other resource-constrained settings: the referral system must support the management of obstetric and newborn complications 24 hours a day, seven days a week; it should ensure the availability of basic EmOC and newborn care at a health centre where women are referred; ensure that patients with obstetric complications and newborn emergencies that cannot be managed at the health centre can be stabilized and transported to a hospital with comprehensive EmOC and newborn care services; determine policies, procedures and practices to be followed in health centres and hospitals to ensure efficient referral; inform communities when and where to seek emergency care for complications of pregnancy and childbirth as soon as possible as well as coordinate with country authorities to ensure a referral system (including means of communication and transport) (Working Group (IAWG) on Reproductive Health in Crises, 2010, p.42-43).

3.7 Human resources for health

The health work force is one of the main components of a health system that has a direct influence on efficiency on health service provision and eventually population health. The World Health Organisation defines the health workforce as ‘all people engaged in actions whose primary intent is to enhance health’ (WHO, 2006c, p 1). This definition is consistent with the broad definition of the health system introduced by the WHO as cited above. According to this definition various groups of workers could be classified as health workers such as family members looking after the sick child and volunteers who contribute to the improvement of health. The operational definition of health worker that I use in this study identifies health workers as working people who received training in health and who are employed in a health occupation and working in a health facility or self-employed as in the case of village midwives in Sudan who provide community health services. Only health providers who primarily provide maternal healthcare are considered in the study.

Human resources for health (HRH) in low-income countries are characterised to be in crisis (McPake, 2012). Shortage of health workers, retention and migration issues, poor

competencies and lack of technical training, low job and working environment satisfaction, and mal-distribution are the major challenges that HRH in low-income countries are facing. Hongoro and colleagues argued that the way that a health system performs its functions affects health workers in different ways with respect to retention, supply and performance (Hongoro et al., 2004).

Assessing the HRH performance and overcoming workforce challenges is a crucial process to enhance the overall health system performance and enable it to achieve the intrinsic goals of the system. The World Health Organisation indicated the well-performing workforce to be ‘the one that works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances’ (WHO, 2006, p. 67). The evaluation of health workforce performance is a very complicated process because the HRH performance is widely varied according to many criteria such as gender, professional group. In addition, components of different systems such as economic system, education system, environment system contribute to HRH, making the process of providing the necessary data required to measure the HRH performance very complicated.

However, WHO (2006) introduced a framework to assess the health workforce constituted from four dimensions: **availability**: in terms of space and time, encompassing distribution and attendance; **competence**: including the combination of technical knowledge, skills and behaviours; **responsiveness**: indicates treating people in a decent way, regardless of whether or not their health improves or who they are; and **productivity**: involving producing the maximum effective health services and health outcomes possible given the existing stock of health workers, reducing waste of staff time or skills.

Unlike what was believed for many years with respect to poor performance of health workforce attributed only to a lack of knowledge and skills, the world health organisation (2006) identified three major determinants that significantly affect the HRH performance: **1) characteristics of the population being served** where population have resources and motives to seek health services; **2) characteristics of health workers themselves** which include socio-demographic characteristics, experiences, motivations, knowledge and skills; **3) characteristics of the health system, and the wider environment** which associated with the conditions and circumstances of the health workforce such as the workplace, personal safety, salaries, management and supervision and how the health system is organised. All these factors are interrelated and together affect the performance of health workers (WHO, 2006).

Migration of health workforce and retention is one of the major challenges that severely affect the health performance and health equity particularly in low- and middle-income countries. Most health workforce prefers to work and live in a capital of the country and cities rather than rural and remote deprived areas; accordingly people living in such places have little access to essential healthcare services. In response to this common challenge among health

systems, WHO introduced 16 recommendations grouped into four main categories: education, regulation, financial incentives, and personal and professional support. The recommendations apply to all types of health workers enrolled in a health system.

Education recommendations include: targeting students with a rural background because they are most likely to choose to practise in rural areas; select rural and remote areas to establish health professional schools and family medicine residency programmes, accordingly increase the probability of the graduates to work in these areas or nearby after graduation; expose undergraduate students of various health disciplines to rural community experiences and clinical rotations; include rural health topics accordingly improve the competencies of health professionals working in rural areas; design continuing education and professional development programmes that meet the needs of rural health workers.

The second group of recommendation is **regulations** which includes: increase the job satisfaction through regulating enhanced scopes of practice in rural and remote areas; introduce different types of health workers with appropriate training and regulation for rural practice in order to increase the number of health workers practising in rural and remote areas; ensure compulsory service requirements in rural and remote areas are accompanied with appropriate support and incentives so as to increase recruitment and subsequent retention of health professionals in these areas; provide scholarships, bursaries or other education subsidies with enforceable agreements of return of service in rural or remote areas to increase recruitment of health workers in these areas.

The third category of recommendation is related to **financial incentives** which include introducing a combination of fiscally sustainable financial incentives in order to compensate the opportunity costs associated with working in rural areas (e.g., hardship allowances, grants for housing, free transportation, paid vacations, etc.). The last category is personal and professional recommendations which include improve living conditions for health workers and their families and invest in infrastructure and services; provide a good and safe working environment, including appropriate equipment and supplies, supportive supervision and mentoring; identify and implement appropriate outreach activities to facilitate cooperation between health workers from better served areas and those in underserved areas, and, where feasible, use tele-health to provide additional support to health workers in remote and rural areas; develop and support career development programmes and provide senior posts in rural areas; support the development of professional networks, rural health professional associations, rural health journals, etc., in order to improve the morale and status of rural providers and reduce feelings of professional isolation; adopt public recognition measures such as rural health days, awards and titles at local, national and international levels to lift the profile of working in rural areas as thus create the conditions to improve intrinsic motivation and thereby contribute to the retention of rural health workers (WHO, 2010c, p. 3-4).

As it may not be necessary or feasible to implement the entire bundle of the recommendations, planners may alternately select the important the most relevant recommendations to the nature of the communities and health system of each country after studying which have a positive influence on attracting and recruiting health workers to their own rural areas as well as retaining them there. Nevertheless, in order to achieve the best results from implementing the interventions, WHO recommended an evaluation to understand whether an intervention works or not (effectiveness) and also why it works and how as the context of each system may be responsible for different outcomes or results from the same intervention. Thus, such issues need to be better captured in the research on these interventions. Furthermore, it is difficult to evaluate the impact of implementing the recommendations as the interventions and their context are complex; everyone may have more than one outcome or effect and no outcome can be attained through only one intervention.

Chapter 4

Conceptual framework and literature review

This chapter gives an overview of health seeking behaviour in low- and middle-income countries. It is divided into three sections. The first section sets out the factors that existing studies argue have an influence on health seeking behaviours among women in their maternity period. The second section discusses several models that aim at explaining health behaviours with a special focus on the Andersen Behavioural Model - phase 5 which is adopted in the study and the rationale for this is explained. Lastly, the conceptual framework consequently utilised in the study is introduced.

4.1 Health seeking behaviour

Maternity care in low-income countries suffers from poorly developed medical infrastructure along with low coverage of perinatal care by professional health providers as well as the disparity in health services distributions. A large body of literature has addressed factors associated with women's utilisation of maternal health services continues to influence the shaping of maternal health behaviours (see section 1.5 for more details about the literature search strategy). These factors can be categorised into two components: population component and health system. Generally, the impact of each component - population (i.e., women and community and households) and health system (i.e., stewardship, financing, HRH, health services delivery including referral system) - varies according to the type of community, cultural aspects, and the health system that a country adopts.

4.1.1 Population component

Numerous studies have been conducted to examine women's utilisation of reproductive healthcare services. Most of them focused on maternal health care with respect to prenatal and childbirth (see Celik et al., 2002; Gleit et al., 2003; Navaneetham et al., 2002; Obermeyer et al., 1991; Bloom et al., 2001). The majority of studies have addressed the quality and accessibility of healthcare as well as its socio-demographic and socio-economic impacts rather than the social and cultural context, including gender issues.

After the ICPD-1994 conference, there have been an increasing number of studies that considered gender issues as a new dimension and focused on its influence in most population and social settings. The majority of studies have linked women's autonomy with use of family planning methods and fertility (see El-Zeini et al., 2002; Govindasamy et al., 1996; Kishor, 1998; Morgan et al., 1995; Morgan et al., 2002; Steele et al., 1998). However, little

research has addressed factors related to population component and utilisation of reproductive health services, in particular, women's utilisation of postnatal healthcare services. Population component includes women's factors and household and community factors.

a) Women's factors

Women's factors can be perceived as predisposing factors, which refer to the propensity of a woman to use reproductive healthcare services (Glei et al., 2003). It includes the **demographic and socio-economic factors** that have persistent influences on shaping health beliefs. These include attitudes, values, and knowledge that people have acquired (Celik et al., 2002; Chakraborty et al., 2002; Glei et al., 2003; Navaneetham et al., 2002; Obermeyer et al., 1991; Bloom et al., 2001; Khattab et al., 1999; Nielsen et al., 2001; Bloom et al., 1999; Miles-Doan et al., 1998; Khattab et al., 1999; Nielsen et al., 2001). Consequently, beliefs may have direct impacts on the human's perceptions of health needs and use.

Several demographic and socio-economic factors associated with women's utilisation of maternal health services have been addressed in the literature which includes women's age, parity, stillbirth/ abortion, education, work status, women's autonomy, the experience of health complications during pregnancy and delivery period, and wanted status of pregnancy.

Women's current age has been frequently used in the literature in order to capture the influence of the level and the kind of knowledge held by different cohorts. In most studies, women's age appears to be one of the most significant factors affecting their utilisation of reproductive health services (Celik et al., 2002; Chakraborty et al., 2002; Glei et al., 2003; Obermeyer et al., 1991; Bloom et al., 2001; Khattab et al., 1999). Chakraborty et al. (2002) used in their analyses in Bangladesh "age of respondents" and "mother's age at marriage"; the two variables showed highly significant associations with utilisation of postnatal care in the bivariate analyses, yet only mother's age at marriage was entered in the logistic regression and also had a significant effect. In another study carried out in Turkey, Celik et al. (2002) considered "age at the time of the last child's birth" in their analyses concerning the utilisation of prenatal and delivery healthcare services. However, this variable was not significantly associated with utilisation of both prenatal and delivery healthcare.

Nevertheless, Miles-Doan et al. (1998) and Obermeyer et al. (1991) concluded from their analyses of Filipino and Jordanian data that age has a nonlinear association with the likelihood of seeking prenatal care. Miles-Doan et al. (1998) found that young women in the age group 24 to 34 years are more likely to seek prenatal health care than both older women and women aged below 24 years; whereas Obermeyer et al. (1991) found that there is no significant relationship between mother's age and utilisation of prenatal health care services with the exception of younger mothers who are less likely to use these services compared to women aged 35 years and more.

Another important factor in health service use is parity (Celik et al., 2002; Glei et al., 2003). Studies suggested that women with a small number of children are more likely to seek maternal healthcare since they lack enough experience in this regard, along with the increasing risk associated with the first pregnancy (Bloom et al., 1999; Celik et al., 2002; Glei et al., 2003; Obermeyer et al., 1991). Due to a notable collinearity between the mother's age and her parity, mother's age is eliminated from the models of some studies (Bloom et al., 1999). Celik & Hotchkiss (2002) in Turkey and Bloom et al. (1999) in north India provided strong evidence that women with low parity are more likely to use delivery healthcare services or use trained practitioners in their home. Likewise, Nielsen et al. (2001) in south India provided evidence to support the previous literature by suggesting that there is a negative association between the level of women's utilisation of prenatal care and the number of their previous deliveries; yet this association was not significant in the multivariate analyses of their study. By examining the relationship between women's parity and their likelihood of accessing prenatal healthcare, Glei et al. (2003) in rural Guatemala showed that women expecting their first child are more likely to utilise prenatal healthcare services than women with high parity. Nevertheless, the results of Navaneetham et al. study (2002) carried out in southern India indicated that there is no significant difference of utilisation of maternal health services among women who have low parity. However, this relationship turned to be significant among women who have high parity (at least 4 children) with respect to receiving antenatal care services.

From a different perspective, Miles-Doan & Brewster (1998) argued in their study that having pre-school children to take care of is significantly and negatively associated with the use of prenatal healthcare services due to the fact that pre-school children may restrict the freedom of movement of their mothers.

With respect to stillbirth/abortion before the last birth, Navaneetham & Dharmalingam (2002) argued based on their study in southern India that women who experienced stillbirth or abortion are more likely to be cautious in the following pregnancy. Consequently, they are more likely to use maternal health services in their following pregnancy. In contrast, Nielsen (2001) confirmed according to the findings obtained from bivariate and multivariate analyses that stillbirth or abortion before the last birth is significantly associated with the utilisation of prenatal healthcare among women in one community in south India while this relationship appeared to be non-significant in the other community considered in the same study (Nielsen et al., 2001).

Studies that addressed the association between socio-demographic factors and women's pattern of uptake of maternal care services identified women's education, women's work, and husband's education as significantly associated with service use (see Khan et al., 1994; Bender et al., 2000; LeVine et al., 2004; Falkingham, 2003; Obermeyer et al., 1991; Dharmalingam et al., 1999; Rani and Bonu, 2003; Bhatia et al., 1995; Filippi, 2006;

Vissandjee et al., 1997; Desai et al., 1994; Miles-Doan et al., 1998; Navaneetham et al., 2002; Nielsen et al., 2001).

The influence of women's education on the utilisation of healthcare services has been demonstrated frequently in relevant studies, showing that women's education is significantly associated with their utilisation of health services (see Khan et al., 1994; Bender et al., 2000; LeVine et al., 2004; Falkingham, 2003; Obermeyer et al., 1991; Dharmalingam et al., 1999; Rani et al., 2003; Bhatia et al., 1995). LeVine et al. (2004) suggested from their study findings in Nepal that literacy and language skills for mothers, who attend schools for some years during their childhood and adolescence, help them to understand comprehensively the health messages in various media; consequently, it is reflected on their utilisation of health services, (i.e., prenatal care, immunisation, contraceptives use, and domestic health practice). Moreover, the study examined the narrative skills among women concerning health issues; it is found that there is a clear significant relationship between women's education and these skills. As a result of that, educated women are more likely to influence their peers.

Three studies in Pakistan, Tajikistan and India suggested that educated women are more likely to use modern maternal health services in terms of antenatal and delivery than their illiterate counterparts. This relationship is more pronounced among women who have a middle and high level of education (Khan et al., 1994; Falkingham, 2003; Nielsen et al., 2001). Also, a study carried out in India (Rani et al., 2003) showed that there is a positive association between education and utilisation of gynaecological healthcare services in a sense that women with high level of education are more likely to use reproductive health care services as compared to women with no education.

On the contrary, logistic regression estimates from a study in Bangladesh did not show any significant impact of education on the use of maternal healthcare (Chakraborty et al., 2002). Another community-based cross-sectional study conducted in the rural area in south India confirmed that women who attended school for 5 years or more are more likely to seek antenatal care services than illiterate women (Nielsen et al., 2001). Similarly, in another study implemented in the Philippines (1998), findings showed that the relationship between education and utilisation of prenatal healthcare services is non-linear; that is, women who complete secondary school are more likely to use prenatal healthcare as compared to women with no or elementary education as well as women with university or higher education (Miles-Doan et al., 1998).

From another perspective, Celik et al. (2002) argued that woman's education in Turkey may enable them to increase their autonomy, consequently their ability to make decisions concerning their own health. Thus, they would be more likely to be aware of the benefits of health services.

Broadly speaking, it is considered that women's education enhances their perception towards the seriousness of maternal morbidity as well as the importance of perinatal healthcare services, and helps them to increase their knowledge about the availability of healthcare services, which constitute as a good motive to make a decision of seeking health services. Educated women can use these services more efficiently to acquire and/or maintain good health status. However, in some cases particularly in poor communities, women may have a slight or modest contribution to the decision of healthcare use; alternatively, the head of households and/ or husbands are responsible for taking these decisions. Therefore, the education of head of households and/ or husbands may become more important as compared to women's education.

Looking at the influence of women's work on their pattern of using maternal health services, the literature has provided clear evidence for the importance of women's paid work as a significant factor (see Vissandjee et al., 1997; Desai et al. , 1994; Miles-Doan et al., 1998). This may be due to two explanations. The first explanation is related to increasing self-confidence among paid working women as compared to non-working women or women involved in unpaid work; thus, the use of health service would be increased if there is a need among this group (paid working women). The second explanation is related to increasing women's financial abilities; therefore, increasing their use of healthcare service, in particular modern services (Miles-Doan et al., 1998). In addition to that, working women may have more autonomy than their counterparts who have not been involved in a regular paid work whether full time or part time; that is, women's participation in the labour force brings about changes in awareness and attitudes towards the world outside the household (Miles-Doan et al., 1998). Thus, their decision-making ability would be increased. Also, working women may have relatively more freedom; therefore, they are more likely to seek health care services (Chakraborty et al., 2002; Vissandjee et al., 1997).

Most studies have dealt with women's work as a dichotomous variable, i.e., paid work vs. unpaid, domestic vs. outside home, and manual vs. non manual work; yet a few of them have addressed the differences between job contexts and their influences. Some jobs increase women's autonomy while others do not. In a study focused on the context of work among urban Philippino women and its relation to utilising maternal health services, the results showed that working women are more likely to use prenatal healthcare services than women who do not have work.

Also, there is a notable positive association between the highest work-related autonomy and women's utilisation of maternal healthcare. Expectedly, the study findings did not show any significant difference between women who do not work and women who have a lowest work-related autonomy in relation to maternal healthcare utilisation (Miles-Doan et al., 1998). Moreover, Miles-Doan et al. (1998) and Chakraborty et al. (2002) in both Philippines and Bangladesh provided evidence showing no significant difference between women who are

involved in paid work as compared to women who are not involved in any paid work in the use of postnatal care.

Some literature conversely revealed that women's work can have negative consequences on their utilisation of reproductive healthcare services (Desai et al., 1994). Desai et al. (1994) argued in their study in rural India that working women in these communities are most likely poor and do not have enough time to take care of their children; thus their work has negative influences on their child health and welfare. Therefore, they are less likely to use reproductive healthcare services. One limitation mentioned in the study is that, it is important to take into account the social context of the study since the communities under investigation were poor and rural communities (Desai et al., 1994).

With respect to women's autonomy factor, some literature has highlighted the role of women's autonomy in her health status and her decision regarding maternal healthcare utilisation (Bloom et al., 2001), although some studies failed to support the strength of this relation especially when the other variables are adjusted for (Kishor, 1998). The significance of this relationship is largely based on the type of this community under investigation, its family system, and to what extent culture, kinship, religion and traditions affected this community (Kishor, 2000; Jejeebhoy, 2000).

However, women's autonomy is a general and abstract concept; therefore, it needs to be defined differently in each setting based on the nature of the society and its culture. That is, women's autonomy in the Arab context is very different from European and American settings. The Arab and Islamic settings are perhaps more conservative than in Europe. Moreover, because of the way of raising females in the Arab context and the rigid social rules, Arab women may be found less autonomous if one follows the western concept of autonomy although they may have the potential abilities to increase their autonomous level (i.e. more educated and participated in paid labour markets). However, the majority of these traditional communities oblige women to be economically dependent on male kin. Consequently, women may have access to the household's resources rather than control over them. In addition, Arab family members may be more supportive for each other instead of the individualism distinguishing the western countries. However, controlling instead of accessing household resources provides a woman with some power inside her family although not precisely equivalent to her husband. Very few studies have highlighted the role of autonomy, or lack of women's autonomy, particularly in relation to maternal health services utilisation in the Arab context. Furthermore, in Sudanese culture, understanding women's behaviours in relation to utilisation of maternal health services is not a straightforward matter because the kinship structure that affects women's autonomy has its own attributes.

Some studies have examined the association between women's experiencing health complications during pregnancy and birth and the pattern and level of reproductive and maternal healthcare utilisation. Bloom et al. (1999) suggested from their study in India that

experiencing health complications during pregnancy is significantly associated with the utilisation of maternal health services. Thus, using trained practitioners in delivery is widely prevalent among women who experienced maternal complications during pregnancy as compared to women who did not have any pregnancy complications in Uttar Pradesh, India after controlling for all variables in their model.

Wanted status of pregnancy is another variable which Chakraborty et al. (2002) investigated in their analyses in Bangladesh; however, they found no significant relationship between a desired birth and healthcare seeking behaviour among women needing prenatal healthcare services.

b) Community and household factors

Societal and household factors can be perceived as enabling resources available for women to access healthcare services (Glei et al., 2003). Community and household factors that have been addressed in relation to women's utilisation of maternal health services include Husband's education, Husband's work, ethnicity and religion, current place of residence, household income.

With respect to the role of Husband's education in relation to women's utilisation of maternal health services, Miles-Doan & Brewster (1998) provided strong evidence that Filipino women who have husbands with some education are more likely to utilise maternal health services than women who have husbands with no education. Moreover, they suggested that the effect of the level of the husband's education is stronger than the level of women's education in relation to women's utilisation of maternal health services. Similarly, in the Giza study carried out in Egypt (1999), it was reported that women more often consulted with their husbands when they experienced any health complications; this counselling being more prevalent among younger women than older women. Thus, husbands play a critical role concerning the decision of the use of health services for their spouses (63%) compared to women's decision (25%) (Khattab et al., 1999). In another recent study conducted in India, the findings demonstrated a positive association between increasing utilisation of maternal healthcare among women who have husbands that attended school for more than 5 school years as compared to women who have husbands with less than 5 school years (Nielsen et al., 2001). Significantly, the findings of the Navaneetham et al. study supported the other literature where husband's education contributes as an explanatory variable to the maternal healthcare utilisation of their wives (Navaneetham et al., 2002).

Regarding the husband's work factor, some studies provide evidence that there is a significant association between the maternal health seeking behaviours among women and their

husband's work where women who have husbands working in business or services are being likely to use maternal healthcare services, if there is a need (see Chakraborty et al., 2002; Navaneetham et al., 2002; Obermeyer et al., 1991). Moreover, the type of healthcare services used is also varied depending on husband's work where women who have husbands working in business or services fields are more likely to use professional healthcare services generally (Chakraborty et al., 2002). From another point of view, Obermeyer et al. (1991) argued based on their study findings in Jordan that there is no significant relationship between prenatal healthcare services utilisation and the economic activity of the household head in Jordan.

However, Ahmad-Nia (2002) in her study in Iran considered husband's work as a confounding variable if it is found with women's work in the same regression model due to the fact that this variable showed a high correlation with women's work (Ahmad- Nia, 2002). Generally, there is a discrepancy in the literature regarding the importance of the husband's work variable. However, this variable may have a strong association with husband's education and with his wife's education.

Regarding the ethnicity and religion factors, some studies investigate the impact of ethnicity and religion on women's utilisation of maternal health services. Ethnicity and religion factors may have distinctive impacts on women in relation to reproductive healthcare seeking behaviours in which women that belong to a certain ethnic group or religion may be affected by its attributes and beliefs. It is argued that under-utilisation is, in some cases, can be partially explained by these variables (Navaneetham et al., 2002; Celik et al., 2002; Gleit et al., 2003; Bloom et al., 2001; Bhatia et al., 1995). The findings of two studies, which took place in Turkey (Celik et al., 2002) and Guatemala (Gleit et al., 2003) demonstrated that ethnicity is a significant predictor of women's selection of modern vs. traditional maternal healthcare services; yet cultural and economic factors could not be controlled in the model of the first study. Consistently, Bhatia et al. (1995) showed from the findings of their study in India that religion is a significant predictor in utilising reproductive healthcare services among their study sample in India in a sense that all Hindu castes are more likely to seek healthcare than are Muslims. et al. (2002) considered ethnicity and religion in their model that was applied to southern India. Religion did not show any unified, significant associations with the use of maternal healthcare services; the significance varied across the four investigated areas and related to the kind of maternal healthcare.

Studies frequently consider the influence of the current place of residence on women's utilisation of maternal health services. It is argued that place of residence has a notable impact on the pattern of utilisation due to the fact that people may be influenced by the accessibility and quality of modern healthcare services (Celik et al., 2002; Obermeyer et al., 1991). In addition, demographic characteristics of the urban residents may be more developed in a way that reflects on their attitudes and behaviours towards modern healthcare (Celik et

al., 2002). A study carried out in Turkey revealed that urban women are more likely to choose healthcare facilities concerning labour and a skilled birth attendant at home vs. traditional ones as compared to rural women (Celik et al., 2002). Also, living in urban areas had a significant, positive association with the utilisation of prenatal healthcare among Jordanian women as compared to women who live in rural areas (Obermeyer et al., 1991).

However, current place of residence appeared to be non-significant in both Navaneetham et al. (2002) and Khan et al. (1994) studies; that is, there is no difference between urban and rural women concerning utilisation of maternal healthcare services. This finding was attributed to the active role played by multipurpose health workers who prevail in rural areas in South India to provide women in need with maternal healthcare services (Navaneetham et al., 2002; Khan et al., 1994). By and large, it can be argued that accessibility and affordability as well as increasing health awareness and modern perceptions among urban people compared to rural people may combine to be important potential factors behind high levels of utilisation among urban populations.

Furthermore, studies show that geographical accessibility has a direct bearing on maternal health services utilisation (Arcury et al., 2005; Baume et al., 2000; Buor, 2003; Gething et al., 2004). That is, distance to the facility is significantly associated with maternal services utilisation and increasing frequency of use of health care facilities (Reyes et al, 1998; van den Broek et al., 2003; Tanser, 2006). In order to measure the geographical accessibility, several measurements have been used in the studies to quantify how far the nearest health facilities to women is, for instance, physical separation that impedes contact, travel time, travel cost, distance along a road network. Furthermore, transportation and remote health facilities constitute essential community obstacles that affect women's decisions in prenatal and birth care services use in comparable countries such as Mali (Gage, 2007).

However, Tanser (2006) addressed the difficulties in measuring the geographical access in low-income countries where people use walking as their primary means of transport as well as public transport which is irregular or unreliable. In a study in South Africa, it was observed that the majority of people walk to their nearest facility but public transportation still influences the outer boundaries of the clinic catchments; variations in the mode of travel to the clinic should be considered in quantifying geographical access factors (Tanser et al., 2001). Nevertheless, Duong (2004) in his study in rural Vietnam provided evidence that client-perceived quality of services and socio-cultural and economic factors rather than geographical access can affect the utilisation of delivery services.

Household income is a major factor that has an impact on the pattern of health seeking behaviours not only for women but also for all family members. Financial barriers frequently appear to be significantly affecting the decision of a pregnant woman or her family about whether to utilise maternal health services to the extent that the decisions of the maternal

service use sometimes have been taken very late or have not even been taken in emergency cases. Unfortunately, quite a number of those women are exposed to obstetric disorders or even lose their lives and those of their fetuses; thus, interventions such as reduction of user fees and health insurance may increase the probability of women's utilisation of maternal health services and secure equitable access to health services (Matuoka et al., 2010; Harrison et al., 2001; Gleit et al., 2003; Gage, 2007; Sepehri et al., 2008; De Allegri et al., 2010; Onah et al., 2006; Dao, 2008).

Consistently, there is clear evidence provided by the majority of the literature that there is a positive association between the household income and the pattern of utilisation of the reproductive healthcare services particularly modern healthcare services (see Chakraborty et al., 2002; Navaneetham et al., 2002; Celik et al., 2002; Bloom et al., 1999; Miles-Doan et al., 1998; Obermeyer et al., 1991; Bhatia et al., 1995). Moreover, in three studies, it was found that women who enjoy high living standards are more likely to use maternal healthcare in India (Navaneetham et al., 2002; Bloom et al., 1999) and Turkey (Celik et al., 2002). Consistently, Bhatia et al. (1995) found in their study in India that there is a significant positive association between women's utilisation of reproductive health services and their standard of living.

However, in Gleit et al. study (2003), vehicle ownership as an indicator of family consumption had no significant association with women's utilisation of prenatal healthcare services in rural Guatemala. Also, Falkingham (2003) suggested from his study conducted in Tajikistan that prenatal healthcare utilisation had deteriorated during the last decade among all women due to the Soviet Union economic problems, which have great and direct impacts on household income.

Other studies argued that providing poor quality of maternal health services that is free of charge or subsidized services does not significantly increase the women's access to these services or help women who are suffering from serious obstetric complications; thus poor quality of care can also be an important barrier, which will be discussed in the health system factors (see chapters 7 and 10 for further discussion).

Indeed, household income becomes significant if a family needs to pay for health service or any required expenses to enable them to obtain the services such as travelling expenses. However, if the services are covered through health insurance or provided for free of charge to the poor communities (not all communities) (i.e., the door-to-door or the doorstep delivery strategy of providing maternal health services, or any other community intervention to avail the maternal healthcare to women), the household income is becoming insignificant in explaining the women's pattern of maternal health services utilisation.

In conclusion, the literature demonstrates that there are relationships with socio-economic and geographical factors, although these can be varied depending on context. However, it is not always entirely clear how far some of these factors overlap or are independent (such as education and occupation). Nonetheless, despite contextual and cultural variations, studies do seem to show a broad pattern of socio-economic factors influencing healthcare utilisation, with wealthier and more highly educated people more likely to access services, this also being compounded by place of residence. Age seems possibly mixed – partly related to socio-economic and educational influences on issues such as the age of marriage and partly parity-related – women with more children less likely to use for a combination of reasons.

4.1.2 Health system factors

The decision of choosing maternal health care among women is not only subject to women's and households' characters but also factors related to affordability and other health system related factors. The components of the health system are examined in literature in relation to maternal health seeking behaviours. Studies emphasised the significant impact of availability, affordability, and quality aspects in women's health behaviour as well as the patient-health provider relationship and women's health awareness (Kiwanuka et al., 2008; Wild et al., 2015; Kruk et al., 2008; Matsuoka et al., 2010; Tlebere et al., 2007; Yoshida et al., 2014).

Looking at the health system, there is no consensus among literature about the exact meaning of the health system, its focus, and component (for further discussion, see chapter 3). In addition, relatively few studies linked consideration of women's and household factors to assessing the health system performance and how it meets the maternal health needs. Consequently, as will be discussed in chapter 6, this study examines the role of the health system, in terms of its four main components: stewardship, financing, human resources for health and health services delivery including the referral system *in addition* to studying women's and household influences on health care seeking.

4.2 Conceptual framework of the determinants of maternal health services utilisation

Health seeking behaviour is a complex behaviour in which several factors are involved. It is a matter of interaction between the environment (i.e., external environment and the health system of the society) and population characteristics (i.e. their culture, socio-demographic) as well as their needs. These interrelated factors have shaped individuals' beliefs, in particular women's beliefs about utilisation of health services. However, there is no accepted explanation for understanding the potential determinants of health service utilisation among women worldwide. It differs from one society to another and from time to time.

Indeed, there is no simple model so far that allows causal relationships between well-defined factors and health behaviours to be established. However, since the 1950s, several models and

theories have been developed to better understand and facilitate individual behaviours related to the health outcome. Health behaviour theories have been extended recently to enhance our understanding of the behaviour changes as well. This section covers five theories and models that have been applied in explaining health behaviours and then moves to the model that will be adopted in the study. The first three models can be seen as continuum accounts of behaviour. That is, each takes one or more perceptions or beliefs and tries to predict from their combined effect where the individual will lie on an outcome continuum such as intention or behaviour (Rutter et al., 2002). According to that, any intervention aiming at changing those perceptions or beliefs should focus on moving the person up or down the outcome continuum, without paying any attention to external factors that have also impact on the individual perceptions or beliefs. The last two theories considered take into account the community and other environment factors as well as individual factors in predicting the people's health behaviours.

The Risk perception and Optimistic Bias model developed by Neil Weinstein (1980) was considered first. In this approach, the term “popular belief” was introduced to indicate that people tend to think that they are invulnerable. That is, people expect misfortunes to occur to others only. Thus, a person may believe that he is less likely than the average to suffer the bad things in life and more likely than the average to experience the good things. The model argues that this ‘unrealistic optimism’ or bias is can be used to predict health seeking behaviours among people, if there is a need, whether a trivial need such as being ill in bed for one or two days or life threatening need such as having a heart attack (Rutter et al., 2002). There was a considerable literature on the Unrealistic Optimism model particularly the theoretical issues related to its origins in people's motives and cognitions as well as the ways in which it may be mediated by experience. However, Otten and Van der Pligt argued that prior behaviour is more powerful predictor than unrealistic optimism because prior behaviour affects subsequent behaviour directly and perceptions of risk are themselves a product of prior behaviour and their role is always to mediate its effects; hence, prior behaviour absorbs any effect of risk perception to be less effect of perceived risk than an indirect effect of prior behaviour (Otten et al., 1992).

The Health belief Model (HBM) was frequently applied in the literature. It was introduced by Hochbaum in the 1950s. In this model it is assumed that people's health behaviours are motivated by their perceptions toward what threatens their health. The HBM considers two groups of variables; one reflects the psychological state of readiness to take a specific action, which is determined by perceptions of personal susceptibility to a particular health threat, and perceptions of the severity with which that threat might affect their life. In addition, the second group reflects the extent to which a particular course of action is believed to be beneficial in reducing the threat, which is the result of beliefs about the benefits to be gained by a particular action weighted against the cost of or barriers to action. Although the HBM

has been used widely and obtained sustainable empirical support, the model has faced conceptual obstacles in a sense that there was not any clarification about how different beliefs influence one another. Also, there were not operational definitions of the variables and concepts of HBM; thus researchers use different methods. Therefore, several revisions to the model have been suggested (see Becker et al., 1977). Mullen (1987) assessed the HBM application and found that the support for the HBM come primarily from studies in which data on individual beliefs about health behaviour were gathered simultaneously, although Janz and his colleagues (1984) in their revision concluded that findings from prospective studies were “at least as favourable as those obtained from retrospective research.

Indeed, the criticism of the HBM and the risk perception and optimistic bias model is that it is highly individualistic, or rather culturally deterministic – people’s beliefs are assumed to be the main cause of their actions and to be relatively unaffected by the environment. It is a curious mixture of individual psychology and a rather static idea of cultural determinism derived from more old-fashioned anthropology. Faulty beliefs are assumed to be at the root of ‘unhealthy’ health behaviours, and the empirical evidence for this being the primary issue is very limited and disputed.

The theory of planned behaviour (TPB) was extended from the Theory of Reasoned Action (Fishbin, 1975; Ajzen et al., 1980). The theory introduced a theoretical account of the ways in which attitudes, subjective norms and behavioural intentions combine to predict behaviour. According to the theory, the best predictor of behaviour is the person’s intention to perform the behaviour. Intention summarises the individual’s motivation to behave in a particular way and indicates how hard the person is willing to try and how much time and effort they are prepared to expend in order to perform the behaviour (Ajzen, 1991, p. 199). In turn, intention is determined by three factors: attitude towards the behaviour, subjective norm or perceived social pressure to perform (or not perform) the behaviour, and perceived behavioural control, which refers to people’s appraisals of their ability to perform the behaviour (Rutter et al., 2002).

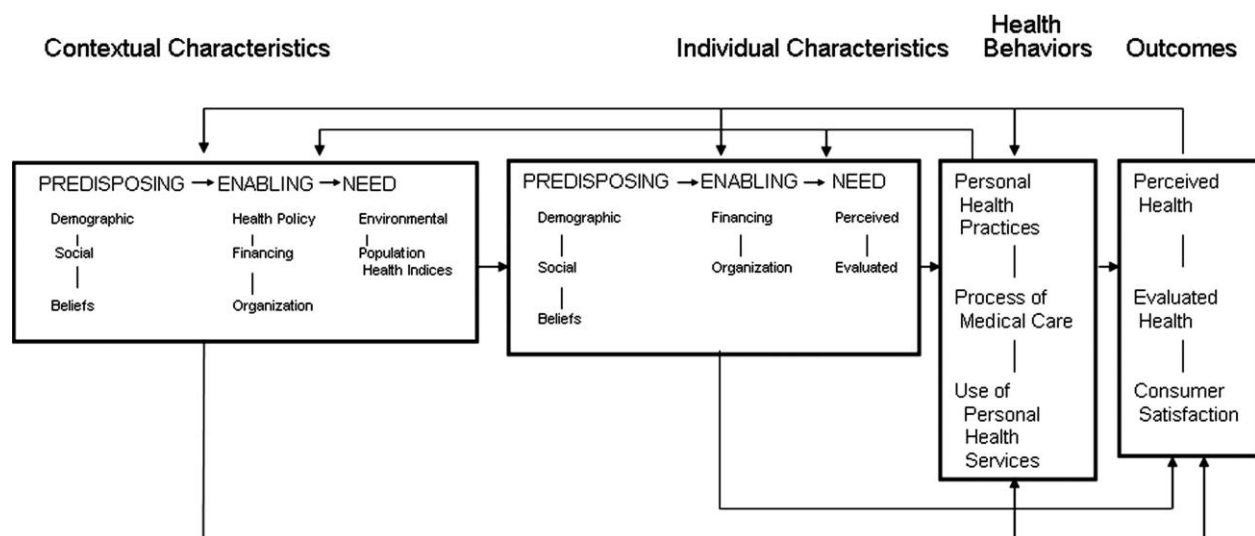
Nevertheless, The TPB has a narrow scope and doesn’t take into sufficient account the power of the social context, beyond just social norms. In a review of the theory of planning behaviour application to health behaviours (TPB), Godin and Kok (1996) found that the TPB explain on average only 41 percent of the variance in intention. Similarly, in another review of a wider range of behaviours, Armitage and Conner found that the TPB accounted for 39 percent of the variance (Rutter et al., 2002, p. 13). Therefore, due to a large amount of unexplained variance which could be traced back to measurement error, it is suggested to develop this model and add new factors that may enhance the ability of the model to predict the behaviour.

The PRECEDE framework is an acronym for Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation. It is developed initially by Green (Green, 1974) based on Andersen's behavioural model. The purpose of developing this framework was to evaluate health education and health promotion programmes. The framework distinguishes between three categories of behavioural factors: ***predisposing factors*** which reflects prior motives that people bring to an educational experience, including knowledge, attitudes, beliefs, values, and perceptions that either support or inhibit behaviour; ***enabling factors*** which refers to objective characteristics of an individual, community, and environment that facilitate action on behaviour; ***reinforcing factors*** refers to social support following a behaviour or anticipated as a consequences of it. Perceived barriers are included in the predisposing factors whereas the perceived need is included in the reinforcing factors. Mullen and her colleagues (1987) argued that there were limited tests of PRECEDE because it is largely a heuristic framework not presented formally as a theory but as an overall model encompassing interventions and health outcomes. However, studies provided evidence that a combination of factors from each of the three PRECEDE categories formed a powerful equation to predict counselling activities (Mullen et al., 1987; Mullen et al., 1978; Morisky et al., 198; Eriksen et al.,198).

Moreover, literature provides several theoretical frameworks that have been applied in studying health behaviours in order to illustrate the differential use of health services. Sheper-Hughes and Lock introduced a theoretical tool "three bodies" that can be applied to analyse different layers of influence on individuals and medical systems. The individual body is the lived experience of health and sickness and is highly variable between individuals and groups. The social body refers to the constant exchange of meanings between the natural and social worlds. The third layer is the body politic which examines regulation, surveillance and control (Scheper-Hughes et al., 1987). Donabedian introduced a model in which both demand characteristics (patient) and supply characteristics (health system) have been integrated to explain the differences in utilisation; he provided evidence that patients used health services when there was "correspondence" between their assessment of their health need and the ability of the available medical services to meet it (Donabedian, 1973). McIntyre introduced a new framework that considers the concept "access to health care" as a multidimensional concept based on the interaction (or degree of fit) between health care systems and individuals, households, and communities; thus, access includes three dimensions: availability, affordability, accessibility (McIntyre, 2009). However, there is no universal definition of access to health care. Peters and his colleagues considered four dimensions for measuring the access to health which are geographic accessibility, availability, financial accessibility, acceptability (Peters et. al., 2008) whereas in some studies, researchers provide five dimensions to quantify access to health care: availability, accessibility, affordability, adequacy, and acceptability (Obrist, 2007).

The Andersen Behavioural Model (ABM): According to the above review, many theories focused mainly on one dimension (mostly individualistic dimension) in explaining any human behaviour rather than taking in to consideration the societal and cultural dimensions. That leads to incomplete or even imprecise understandings of the human behaviour regarding their health. Indeed, most of these theories fail to explain an acceptable percent of the variance in the intention of any human behaviour because of neglect of the external factors that have a significant influence on human behaviour as well. It is essential to consider contextual as well as individualistic factors in studying human behaviour in order to achieve the best understanding of the potential motives that influence people’s behaviours.

Figure (4.1): The behavioural model of the contextual and individual characteristics influences on health services’ use (Emerging Model-Phase 5)



Source: Andersen, 2008

With the above critiques in mind, Andersen’s behavioural model of health service use was developed in order to investigate the multidimensional nature of health services utilisation (Spark et al., 2013). Researchers have used the model also to examine correlates of other outcomes, including the quality of the patient-provider relationship, perceived unmet needs for health care, patient satisfaction, health outcomes (Faith et. al., 2013). The model considers societal context and individual characteristics, recognising that the societal and environmental context in which people live can influence health services utilisation (Spark et al., 2013). Andersen introduced the model originally in 1968 in order to help in understanding the health behaviour of the family (as a unit of analysis) which was shifted to be on the individual level later. Furthermore, Andersen defined the concept “equitable access” as occurring when predisposing demographic and need variables account for most of the variance in utilisation,

whereas “inequitable access” occurs when the social structure, health beliefs, and enabling resources determine who gets medical care (Andersen, 2008). It is suggested that ‘people’s use of health services is a function of their predisposition to use services, factors which enable or impede use and need for care’ (Andersen, 2008, p. 651). Since 1968, the behavioural model has been revised and updated in order to provide a more comprehensive conceptual framework that helps to better understand the health care utilisation. Phase two of the model was introduced in the 1970s in which the health care system and consumer satisfaction were explicitly included in the model. No significant change occurred in the third phase of the model, which was introduced in the 1980s. In the fourth phase of evolving the model (1990s), the dynamic and recursive nature of health services use was included in a sense that it illustrates the multiple determinants of health services use. In addition, the model includes feedback loops that show the interplay between the health outcomes and predisposing, enabling, and need characteristics of populations and their use of health services. The last improvement introduced in this behavioural model was in the 2000s: phase five, as shown in figure 4.1. The model primarily aims to achieve the best understanding of health services utilisation behaviours. The model focuses on four components: contextual characteristics, individual characteristics, health behaviour, and outcomes, in interaction with each other.

The contextual characteristics are divided into predisposing, enabling, and need characteristics in a similar way to individual characteristics but they are quantified at an aggregate rather than individual level. The contextual characteristics may include health organisation, health- provider-related factors, and community characteristics (Andersen, 2008; Spark et al., 2013).

With respect to the individual characteristics, as shown in figure 4.1, these are also divided into predisposing, enabling, and need characteristics. Predisposing characteristics factors refer to the propensity of a person use healthcare services (Glei et al., 2003). These exist prior to the onset of illness and could be expected to make health service use more likely; they are not directly related to use. Enabling characteristics refer to means available for a person (e.g., economic resources whether for a woman or her family and health insurance coverage) to achieve healthcare services use (Glei et al., 2003). Need characteristics include both perceived need (symptoms, not feeling well) and evaluated need (physical examination or tests that show there is a need) (Spark et al., 2013). These measures may include patient counselling, prescriptions, and quality of provider- patient communication.

Furthermore, as shown in figure 4.1, the outcome component constitutes from perceived health, evaluated health, consumer satisfaction; Anderson’s model investigates how the outcomes interact among each other such as the health provider-patient relationship and its influence on the use of health services (Andersen, 1995; Andersen, 2008).

Due to its multidimensional approach, including several components related to people, communities, health system and needs as well as their interaction with outcomes, it has become increasingly popular over the last two decades. Most of the authors who have applied Anderson's model have not applied the entire model, particularly the latest update of the Anderson model (Anderson, 2008) which replaced the environment component with a broader and comprehensive concept - contextual component. A large number of studies using Anderson's model focused on the individual characteristics, whereas others used only some of the factors related to contextual components or community variables. Teng et al. (2013) applied the Anderson behavioural model in studying the emergency medical utilisation among the elderly population; however, they only focused on individual characteristics rather than applying the entire model. Similarly, the Andersen model was applied in another study to examine the relationships among predisposing, enabling, and need factors and ratings of perceived patient- provider communication among women with depression in USA. The study focused only on the individual characteristics and needs whereas the contextual characteristics were not considered in applying the model (Keller et. al., 2013). Elhai et al. (2008) investigated the association between predisposing characteristics (socio-demographic), enabling characteristics (access resources), and needs (illness) of the outpatients completed the national survey of veterans (2001) in the USA and mental healthcare utilisation (Elhai et al., 2008).

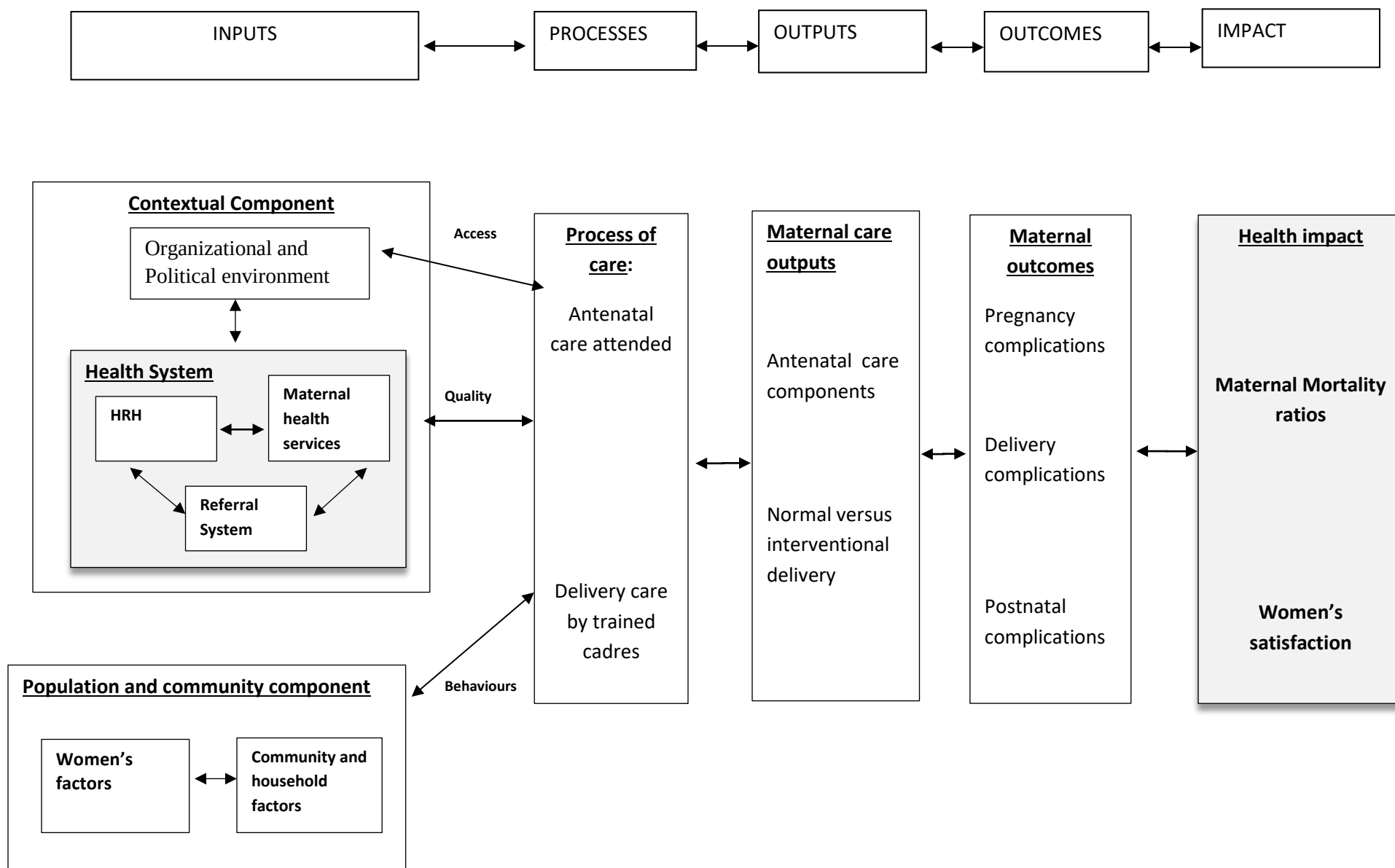
Nevertheless, a few studies have applied the entire latest version of Andersen's behavioural model although they did not precise and comprehensive in measuring the contextual component. Spark et al. (2013), for example, used the contextual characteristics constituted from three components: the predisposing contextual characteristics, which include the values of health practitioners; the enabling contextual characteristics, which include health policy, financing and organisation; and the need characteristics, which include environmental factors such as the promotion of natural products within the community (Spark et al., 2013). In another application Faith (2013) included contextual characteristics constituted from two variables: rurality factor (urban, suburban, rural) and Census region Factor (northeast, Midwest, South, west) (Faith et. al., 2013).

The empiric work on utilisation has not reflected the growing theoretical emphasis on the fit between people, their communities, and health system (Kruk et. al., 2010). Furthermore, no studies have been applied the latest Andersen model in maternal health use in low- income countries context (see the search strategy in section 4.1 for more details about the databases that have been used in the search).

4.3 Conceptual framework of the Study

The conceptual framework of the study is largely built on the Andersen behavioural model since, as explained in the previous section, I found it to be a more comprehensive and multidimensional model that addressed the key limitations of the other models reviewed. It assumes that there are three major components that affect the health behaviours and health service utilisation: a) the contextual characteristics, particularly the health system, b) population characteristics component, c) the interaction between health professional and patient in recognition of its influence on the use of health services (i.e., the behaviour of health providers interacting with patients in the delivery of medical care) (see figure 4.2).

Figure (4.2): The Conceptual Model proposed for the study



Two innovative things are accomplished by applying this conceptual model (see figure 4.2) ; **first**, it combines qualitative and quantitative data in its application in order to provide a comprehensive and holistic analysis of the health outcomes as well as to understand the main determinants of health behaviour use and how the health behaviour changes can be achieved. I will argue that quantitative data analysis cannot achieve this complete and extensive picture alone; **Second**, the model considers a comprehensive list of potential determinants of the contextual characteristics component which enable us to investigate the effect of the contextual characteristics as compared to only focusing on population characteristics; thus more precise interventions can be developed to support and change the women's health behaviours in poor communities with limited resources.

The factors within the three components which represent the input of the conceptual framework have been chosen according to two main criteria; firstly, their importance in shaping the maternal health impact according to the literature; and secondly, the availability of the data for secondary analysis of the quantitative data.

Regarding the **contextual component**, this includes the political environment related to health aspects and health system elements. The importance of this component is to figure out the extent to which organisational and political environmental as well as health system factors together influence the accessibility and availability of health facility as well as quality of health services. In addition, the model implies that maternal mortality has a direct mutual impact on the environmental component particularly the organisational factors; that is, levels of maternal mortality may lead to the issuing of declarations or political decisions or any other interventions that help to reduce maternal mortality in specific areas, for instance and vice versa.

Organisational and political environment factors cover the availability of the health services through a set of indicators such as the availability of primary and secondary levels of the health services, availability of specific types of services that have direct influence in reducing the levels of maternal mortality, maternal health declarations, administrations, and health expenditure distribution. The health system component highlights three health system elements human resources for health, maternal health services, and referral system.

The second input component of the model is population and community. It includes two main sets of factors, women's factors and community and household factors. Women's factors comprise factors such as socio- demographic characteristics and maternal health knowledge and previous experiences, satisfaction levels according to previous experiences in maternal health services utilisation, while community and household factors include factors such as economic resources of the households, health insurance coverage, husband's education, place of residence. Clearly, these factors have a direct effect on women's decision in seeking healthcare, as outlined in section 4.1.1 of this chapter.

As for the process of care in the model, it covers indicators related to conventional maternal health care services utilisation, the service components of maternal health service provided to

users, and the availability of services regardless of quality. In the context of maternal care, conventional health care refers to the health services provided by doctors, nurses, and midwives/ health visitors. The process of care component is considered in this model as a mediator component; that is, the significance of the component is largely based on the quality and availability of the inputs used in the model.

The output component focuses on the direct results of care; e.g., completeness of the care delivered (obtaining the entire set of maternal care services during ANC period and mode of delivery).

Maternal health outcomes have been derived as measures of complications during pregnancy and delivery, and these are the two main indicators that have been included in the outcome component.

The main maternal health impact in the model is highlighted through two main indicators which are maternal death (described in terms of indicators as the mortality ratio) and women's satisfaction with maternal health services.

However, after starting the field work and data analysis, I shifted my assumptions regarding the relative importance of the three basic components. This led me to exclude some factors and others have been entered to the framework. The new framework that was developed through the course of this study will be introduced in chapter 11 (see figure 11.1). The major change in the new framework is shifting the focus from the patient-side factors to health system factors in explaining the women's behaviour in maternal health services utilisation.

Chapter 5

Methodology and research design

This chapter provides an overview of the research design and methodology of the study. It starts with literature review strategy for the methodological work, then presents the concept of mixed methods and methodology, the main advantages and challenges in applying mixed methods, and rationale for adopting a mixed methods approach. The underpinning philosophy and worldview and philosophical assumptions relating to evidence are also discussed. This is followed by an exploration of the range of mixed methods research designs and explanation of the research design of the study. Lastly, the ethical considerations and research ethics of the study as well as validity issues are discussed.

5.1 Literature search strategy

As mentioned in chapter three, the literature review was conducted in several iterations throughout the development of the study. The search strategy for the methodological work depended primarily on searching in the textbooks and reference books in the libraries and online books such as SEAG online books. Some methodological articles published in electronic databases were also used. Furthermore, particularly relevant journals were used such as the Journal of Mixed Methods Research. The search was limited to the English language. Several keywords were used in the search, including: mixed methods, research methods, study design, worldview, philosophical assumptions, and validation. Boolean commands such as “AND”, and “OR” were applied to narrow and specify the search.

Additionally, the final reference lists of particularly relevant books and papers were scanned for further details with respect to particular aspects.

5.2 The concept of mixed Methods and Methodology

The philosophical development of mixed methods was introduced in 1959 by Campbell and Fiske, in which they suggested using more than one type of data source for the purpose of validation of psychological traits. Other researchers advocated and applied mixed methods in the 1970s in their research (Denzin, 1974; Campbell, 1974; Sieber, 1973). Furthermore, Patton introduced mixed methods in the evaluation field in 1980. At the beginning of the 1990s the concept of mixed methods was being increasingly employed in several disciplines and become more consolidated through publication of literature concerned with identifying the reasons for using these, ways of integration between qualitative and quantitative data, and its research designs (Creswell et al., 2007; Morse, 1991; Reichardt et al., 1994).

Using different methods in a research project gives an advantage of drawing on the strengths of each method, thus a better understanding of the research problems. Furthermore, it provides more comprehensive evidence for studying a research problem and helps to answer

more research questions than either quantitative or qualitative techniques alone (Bowling, 2009). The idea of mixing methods is seeking actual integration between qualitative and quantitative data rather than merely conversions (Creswell, 2009).

Several definitions have been introduced in the literature in the last four decades. It has been tackled in the literature from two different perspectives, methodology and method. Generally, the term “method” refers to technical rules that guide the research procedure such as constructing a hypothesis, methods of data collection, methods of data analysis whereas the term “methodology” is the theoretical and philosophical framework in which the procedural rules fit (Brewer, 2000).

The contemporary concept of mixed research was introduced in the early 1990s as a “method” which includes at least one quantitative method and one qualitative method that relates to data collection. Thus, the literature that adopts this approach highlights the techniques of collecting, analysing data and mixing both quantitative and qualitative data in a single study or series of studies (Cresswell et al., 2011; Cresswell et al., 2003; Green et al., 1989). Eventually, this concept was developed and become more comprehensive and sophisticated to include more facets of research. It has been viewed as a “methodology”; thus it is identified in the recent literature as a research design with philosophical assumptions and method of inquiry (Cresswell et al., 2011; Cresswell et al., 2007).

Therefore, mixed methodology or mixed research involves philosophical assumptions that guide the direction of the entire research process with respect to designing the research hypotheses, data collection, analysis, and the ways of mixing the qualitative and quantitative approaches. Accordingly, some studies were incorporated in the definitions as the methods and philosophy (see Greene, et al., 1989; Creswell et al., 2007) and other definitions added research design beside methods and philosophy (see Creswell et al., 2011). Tashakkori et al. (1998) highlighted only the methodological aspect in the definition (Tashakkori et al., 1998).

However, in the 1970s and 1980s, and also in recent literature, there are scientific debates about the validity of using both qualitative and quantitative methodology together since both tend to be driven from different philosophical backgrounds, primarily positivism and constructivism; thus using mixed methodology is considered by some as invalid. On the contrary, it is argued that although each approach developed from different epistemological positions, they achieved some independence from their roots. Accordingly, qualitative and quantitative methods can complement each other; therefore, pragmatist philosophy maybe the best principle in dealing with mixed research (Bowling, 2009; Creswell et al., 2007; Giddings, 2006, Holmes, 2006); philosophical assumptions will be discussed in the following section.

Indeed, both qualitative and quantitative data have their own scope and rationale in which the approach can be fitted according to the research interest. The interest of exploring phenomena or detailed understanding of the cultural groups is best fitted with qualitative approach whereas quantifying phenomena or general understanding of it is suited with quantitative

approach. Mixed methods usually comes whenever there is a limitation in the findings from either approach and there is a need for further explanation or to validate the results of one method by using the second approach and compare the findings (Creswell et al., 2011; Bryman, 1988).

To conclude, methods differ from methodology in which methods focused on the procedures of data collection, data analysis, and interpretation, while methodology involved everything from the worldview at the start of the research process to the last procedures of inquiry (Guba et al., 1989; Creswell, 2010). With regards to this study, mixed methods research is viewed as the type of research that combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purposes of breadth and depth of understanding and corroboration (Johnson et al., 2007; p.123).

5.3 Advantages and challenges of using mixed methods research

Each qualitative and quantitative approach provides different perspective with some limitation in which quantitative methodology focuses quantifying dependent variables or testing their significance. It is also easier to generalise the results derived from quantitative methods, as large and representative samples can be used, whereas qualitative methodology focuses on understanding the backgrounds and the context of the participants; thus integrating both approaches can provide better understanding and reduce the number of limitations.

A single data source maybe insufficient or unable to answer all of the research questions; therefore integrating more than one data source or collecting a new type of data enables the researcher to find answers and study the research problem from different perspectives. Another advantage of using the mixed methods is providing guidance; in a sense that one method as a first research phase can help in giving more explanation that can help guide the second research phase with respect to understanding the study population, developing the study tools, hypotheses, and sampling. However, it is not always necessary to start with qualitative study in order to provide information that helps the quantitative survey. In some cases, the reverse order can be applied, such as where the quantitative analysis gives findings that could not be understood and need more investigation; thus qualitative approach can play a role in completing the picture as to what happened in the study. Mixed methods can also overcome one of the well-known drawbacks of the qualitative approach, which is the bias error. That is, qualitative results sometimes provide biased findings because it relies on the researchers to some extent in explaining the data, which potentially leads to a certain degree of bias. Similarly, the quantitative finding can mislead and cause a bias error due to the wrong interpretation or misuse of data or running improper statistical tests. However, this bias can be diminished when researchers use multiple sources of data in mixed methods (Creswell et al., 2011; Tashakkori, 2010).

Inability to generalise the qualitative results except on a theoretical level is one reason that directs the researcher to adopt the mixed method rather than qualitative method alone in order to overcome this challenge.

Cost and time resources are the main challenges that mixed methods approaches are faced with in comparison with the use of either method alone. In addition, the research design should be developed carefully in order to obtain the integrated data to understand the research problem rather than obtaining replication of the data although it comes from different types of data sources. The last challenge can occur due to selecting mixed method research design to be applied in researches that need either qualitative or quantitative method. Therefore, to avoid this problematic issue, more time and investigation should be exerted in order to obtain the right research design.

Another challenge was raised by Foss (2002) in terms of the limitations due to potential incompatibility of research paradigms. However, in order to overcome such limitations, the use of clear, well-focused, appropriate research questions should be considered. Also, the way in which triangulation was implemented and the account of how triangulation was achieved or promoted confirmation/completeness of findings should be clearly elaborated (Foss, 2002; Johnson, 2001).

5.4 Rationale of applying mixed methods research in the study

The rationale behind selecting this methodology is **triangulation**. That is, triangulating the analysis obtaining from both forms of data to provide the most complete vision of the research problem and answer all research questions.

Completeness is the second main reason for adopting mixed method research for this project. That is, quantitative data sets, SHHS2010 and SARH2008, are merely revealing some of the factors behind women's decision of health seeking behaviours which frequently appeared in the relevant literature (e.g., education, work, parity, economic status). However, there are some other factors that need to be investigated (see the conceptual framework of the study), which are not available in the quantitative data. Also, some explanations that quantitative data cannot support and that are needed to complement the picture, as well as answer part of the research questions are posed in the study. Furthermore, quantitative data analysis significantly helps in **developing the instruments** that have been used in the in-depth interviews and focus group discussions; in a sense that the knowledge gaps and unexpected results that concluded from the quantitative data analysis were explored in the qualitative parts. For instance, SHHS 2010 revealed that there are no significant differences between women who received ANC services and women who had not received these with respect to exposure to the maternal complication during delivery; that is against the similar study findings. Therefore, it was essential to conduct further investigation to understand this inverse relation which could deceive if one relied only on this finding and concluded that antenatal care is not important for pregnant women in avoiding delivery complications. However,

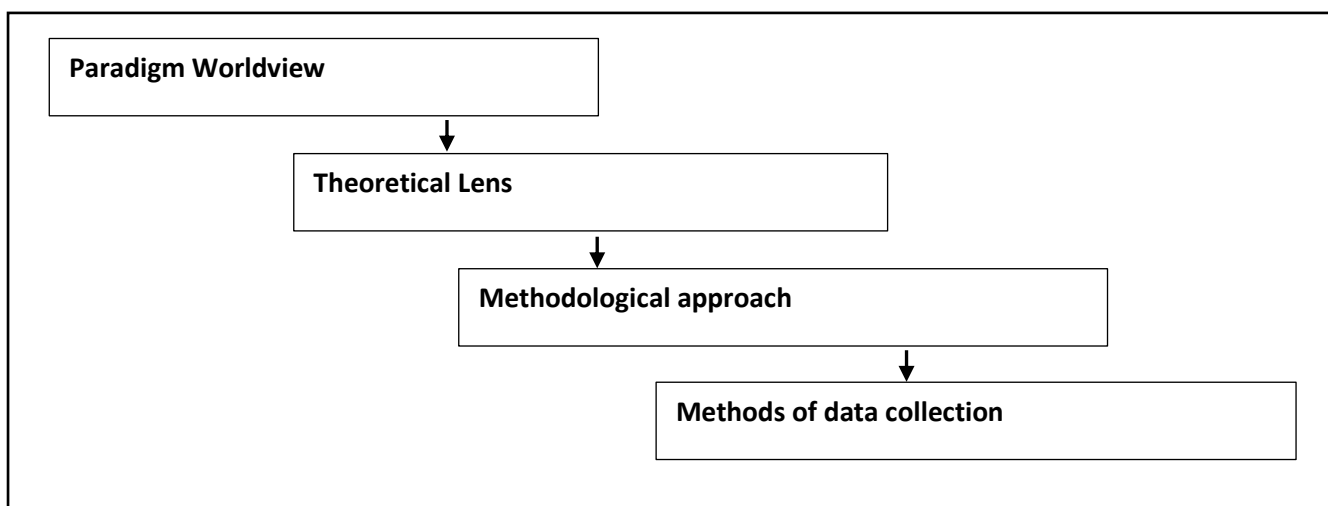
antenatal care includes screening for major complications like pre-eclampsia and breech position, so that it might expect some birth complications to be prevented, the survey analysis didn't find such a relationship.

One of my concerns in the study is confirmation and validation. That is, the reasons for not using maternal health services and their relation to the performance of the health system can be identified and compared through within multiple sources. Indeed, this comparison will help not only in measuring the degree of precision of the finding, but also can be very helpful in designing interventions that have holistic approach that targeted the real and major obstacles that hinder women from utilisation and not merely the stereotype or better known obstacles such as women's education, parity, husbands' education.

5.5 Philosophy and worldview

Research commonly relies on a framework that shapes the thinking of the researcher, so it was important to consider how philosophy fits into the design of the mixed methods research. Crotty (1998) provided a framework for thinking about how philosophy fits into the design of a mixed methods study as shown in figure 5.1. The Crotty framework constitutes four main elements: philosophical assumptions, theoretical lens, methodological approach, and methods of data collection (Creswell et al., 2011). The first level of the framework is the paradigm (worldview) which represents the broadest level of the framework. It relates to philosophical assumptions such as the epistemology behind the research and the ways that one can follow to gain knowledge about the particular issue and how the 'facts' are known. Selecting the theoretical lens is based on determining the philosophical assumptions informing the use of methodology and research design. Methods are identified according to identifying the type of methodology. (Creswell et al., 2011).

Figure (5.1): Four levels for developing a research Study



Source: adopted from Crotty, 1998

5.6 Philosophical Assumptions

The term ‘philosophical assumptions’ in mixed methods research denotes a basic set of beliefs or worldviews that guide inquiries. Sometimes the term ‘paradigm’ is used interchangeably with the term ‘worldviews’ to indicate a set of generalizations, beliefs, and values of a community of specialists (Kuhn, 1970). The term “paradigm” is traced back into 1970 in Kuhn’s work that related the word “paradigm” with the set of beliefs, procedures and working practices that inform the dominant world view and which shape the context of modern sciences (Crook, 2005). Babbie (2001) defined paradigms as general frameworks or viewpoints that provide ways of looking at life and are grounded in sets of assumptions about the nature of reality (Babbie, 2001, p.51). It was perceived also as a shared set of rules and beliefs about how a discipline functions, including what counts as knowledge, how it can be generated and how and by whom it can be generated (Rolfe, 1996; Morgan, 2007). Several paradigms have been developed in the social sciences in order to understand the social behaviours. Paradigms propose a variety of views each of which provides insights the others lack while ignoring aspects of social life that others reveal; eventually, paradigms are not a matter of false or true but it is a matter of less or more useful instead (Babbie, 2001). Indeed, two things should be considered in this context; firstly, a fact or reality could be explained by more than one paradigm due to the multiplicity and complexity of phenomena; secondly, social rules are not like science rules – they are changeable; therefore, assumptions need to be revised within the social context which is varied from community to another and across time (Creswell, 2010).

Creswell (2011) discussed four types of worldviews that can provide a good starting point: positivism, constructivism, participatory, and pragmatist (Creswell et al., 2011).

Positivism is associated mostly with quantitative approaches and gains knowledge based on: deterministic thinking, narrowing and focusing on selected variables to interrelated, detailed observations and measures of variables, and testing of theories (Slife et al., 1995). The nature of reality “ontology” with respect to positivism tends to be singular; that is, positivist tendency to reject or fail to reject study hypotheses. The second worldview is **constructivism**. It is associated mostly with qualitative approaches where the understanding of the research problem is based on the subjective views of the participants. The perception of the participants towards the phenomenon under investigation is indubitably affected by their own personal history and social interaction with others. Accordingly, research is shaped in this inquiry “from the bottom up”; that is, from participants’ perspectives to broad understanding. The ontology of the constructivist worldview is multiple as it is developed according to the multiple points of views of the study participants. The third type is the **participatory worldview**. It is suitable to be applied in issues related to social disparities (e.g., marginalisation, empowerment). It is more associated with qualitative approaches where participatory researchers collaborate with participants experiencing these injustices in order to improve the situation by developing plans to eliminate the social problem and improve the situation thus those people feel better. The ontology of the participatory worldview is negotiated and cast within a political context. The fourth worldview is

pragmatism. It is associated particularly with mixed methods approaches. Green (2008) defined pragmatism as a leading contender for the philosophical champion of the mixed methods arena (Green, 2008, p.8). Pragmatism focuses on the outcomes of the research, situation, and consequences of inquiry instead of antecedent conditions as in positivism (Patton, 1990, p.22). Therefore, “pluralistic” and “what works in practice” are two key attributes that characterise pragmatism. The pragmatist views reality as potentially functioning as a singular or multiple. Moreover, it is not affiliated with to a particular system of philosophy and reality therefore choosing the methods and procedures of research is according to the purpose of research (Cherryholmes, 1992; Murphy, 1990; Creswell et al., 2011). This study adopts the Pragmatist worldview.

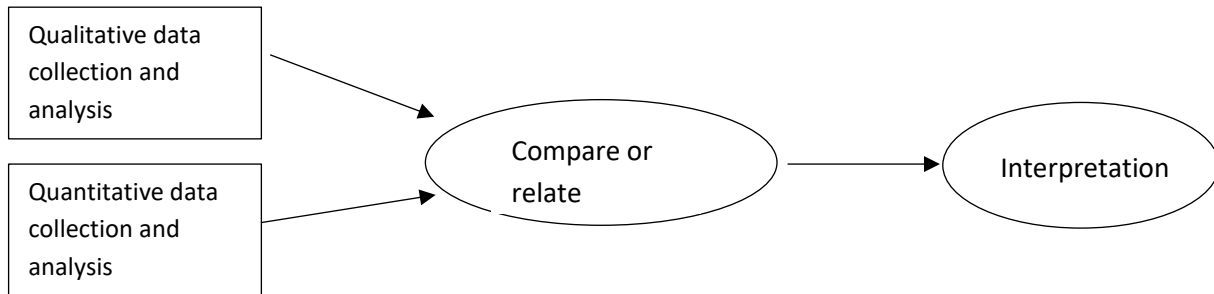
5.7 Mixed methods research designs

Literature has discussed a large number of research designs associated with the increasing interest in using and developing the mixed methods approach (Tashakkori et al., 1998; Morse, 1991; Greene, 2007, Creswell et al., 2011). Creswell et al. (2007) argued that although these designs have different features and represent diverse disciplines, there are in fact more similarities as compared with differences. The majority of these designs fall into four major typologies: the convergent parallel design, the explanatory sequential design, the exploratory sequential design, and the embedded design.

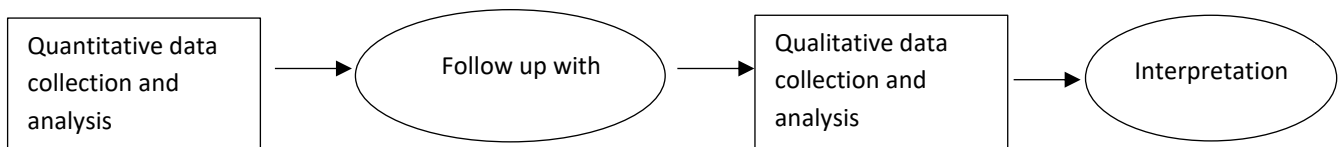
The **convergent design** is applied when the quantitative and qualitative data are collected concurrently, the two methods have the same weight in the research, same priority, the analysis of qualitative and quantitative are conducted independently and then mixing the both results in the interpretation phase. The main purpose of this design is to obtain two complementary qualitative and quantitative data sets for a better understanding of the research problem. The second type is the **explanatory design** where the quantitative and qualitative data are collected sequentially in timing. That is, the research started by collecting and analysing quantitative data which has the priority in answering the research questions followed by the subsequent qualitative data collection and analysis to fulfil some gaps in the knowledge and further explanations that quantitative data would not be able to cover. The third type is the **exploratory design**. Under this design qualitative and quantitative are collected sequentially in timing as the previous typology. It is started with qualitative data collection and obtaining exploratory results that need to be generalised or used to build new tools for the quantitative phase. The last type is the **embedded design** where the qualitative and quantitative data are collected within a traditional quantitative or qualitative design. The purpose of adding supplementary data is to enhance the overall research design (Creswell et al., 2011; Morse, 1991). The following figure 5.2 illustrates the four prototypes of the research designs:

Figure (5.2): Prototypical versions of the major mixed methods research designs

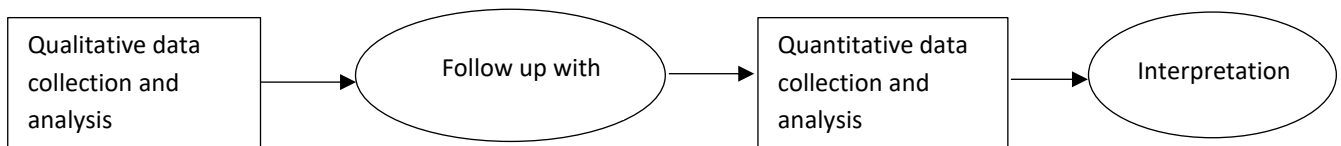
(a) The convergent parallel design



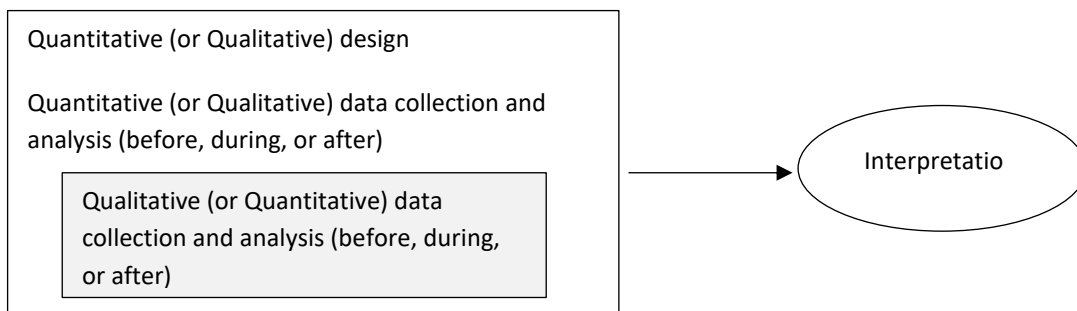
(b) The explanatory sequential design



(c) The Explanatory sequential design



(d) The embedded design



Source: Creswell and Plano Clark, 2011 (p. 69-70)

Furthermore, four determinants have been considered in choosing the appropriate mixed methods design. Firstly is the level of **interaction between the qualitative and quantitative strands** (Green, 2007). It refers to the degree of independence or interaction between the two strands. The independent level of interaction happens when the quantitative and qualitative research procedures are kept separately until drawing the conclusion whereas the interactive level occurs when the two strands are mixed in the research the research procedures (e.g., data collection, data analysis, and conclusion). The second determinant is **the priority of the quantitative and qualitative strands**. Priority is defined as the relevance importance or weighting of the quantitative and qualitative methods for answering the study's questions (Cresswell et al., 2011, p. 65). Equal priority, quantitative priority, and qualitative priority are the three options that need to be determined in the research. The third determinant is the timing of the quantitative and qualitative strands. Timing refers to the temporal relationship between quantitative and qualitative strands within the study (Cresswell et al., 2011, p. 65). The time discussed here not only refers to the time in relation to the data collection of the field, but also it refers to the time in relation to a chronological order in the analysis phase as well. There are three options: **concurrent timing** in which both qualitative and quantitative data collection and analysis phases have been implemented at the same time; **sequential timing** where there is one of the strands headed whereas the data collection and analysis of the second approach come after in the second phase; lastly, **multiphase combination timing** where multiple phases that include sequential and/or concurrent timing over a study. Finally, the fourth determinant is **how to mix the qualitative and quantitative strands** according to four mixing strategies: mixing qualitative and quantitative data sets, linking the outcomes coming out from a data set into data collection of the second data set, embedding the first data set within the larger data set, and using a Maternal Health System Performance framework (MHSP) to blend the two data sets together (see chapters 5 and 11 for further details). The mixing could be occurring at the interpretation stage of the research or any other stage such as data analysis or data collection.

This study has an Explanatory Sequential Design. This was initially planned to be a two-phase sequential design, where a quantitative phase of higher priority was followed by a qualitative phase which is built upon the findings that come out from the initial phase. In this model, the second qualitative phase is applied for the purposes of explaining the quantitative results as well as to cover the knowledge gap that the quantitative phase has not covered and it shows importance in answering some of the research questions. However, in the light of experience of the conducting the study, a three-phase sequential design emerged as likely to be more valuable and was adopted. According to the findings obtained from the second, qualitative phase, some key factors emerged as likely to be important and worth inclusion in the quantitative analysis; therefore, a third phase was applied in which the quantitative analysis was re-run after adding new variables that had emerged empirically from the qualitative phase. This included a new module based on the work of village midwives. The phases were, therefore:

Phase1: Three representative surveys were used to obtain information regarding women's utilisation of maternal health services during perinatal period and their satisfaction levels as

well as the availability of health providers: the Sudan Household Health Surveys in 2006 and 2010 (SHHS 2006 and SHHS 2010), which are national representative surveys, and Situation Analysis of Reproductive Health 2008 (SARH2008), which is conducted in seven states (although the analysis was restricted only to Khartoum state).

I started by running both descriptive and multilevel analysis using Sudan Household Health Survey (SHHS 2006) data in order to identify the factors that significantly affected the women's utilisation of maternal health services taking into consideration the Andersen behavioural model that had been used in developing the conceptual framework of the study (see Figure 4.2). The findings were then used to develop the in-depth interview schedules and FGD guides for the qualitative part of the study (see figure 5.4 for the research design of the study).

The SHHS 2010 then became available shortly before entering the field for data collection. Therefore, I decided to re-run the analysis with the SHHS 2010 data in order to recognise if any significant changes had occurred between 2006 and 2010 with respect to maternal health services use factors. Findings indicated that there were no significant changes occurring between 2006 and 2010 with respect to women's utilisation factors as shown in table 5.1 and table 5.2. As a result, there were no required changes in the data collection tools of the qualitative study (see figure 5.4 for further details about the study design). In addition, the Situation Analysis of Reproductive Health services survey 2008 (SARH) was analysed in order to identify the factors associated with women's satisfaction with maternal health services use.

There is a difference in the survey timing and also the survey geographic domain (see data section for more detailed information about the two surveys).

Table (5.1): Percent distribution of ever-married women age 15-49 who were pregnant during the last two years preceding the survey by Number of ANC visits and Antenatal Care received (ANC), Sudan 2006, 2010

	2006		2010	
	Number	%	Number	%
ANC visits				
Less than 4 visits	1930	41.4	1640	37.7
4 visits or more	2729	58.6	2715	62.3
Total	4659	100	4354	100
Type of ANC service providers				
NONE/Traditional HC	1491	24.6	1790	29.5
Prof Health care: VMW&HV	1148	18.9	1377	22.7
Prof Health care: Doctors& Nurses	3430	56.5	2898	47.8
Total	6069	100	6065	100

Source: Sudan Household Health Survey, 2006 and 2010

Table (5.2): Percent distribution of ever-married women age 15-49 who were pregnant during the last two years preceding the survey by type of personnel assisting at birth and place of delivery, Sudan 2006, 2010

	2006		2010	
	Number	%	Number	%
Assistance at birth				
NONE/Traditional delivery care	1938	31.9	1506	26.5
Prof Delivery care: Doctors& Nurses	2154	35.5	1165	20.5
Prof Delivery care: VMW&HV	1976	32.6	3009	53.0
Total	6069	100	5680	100
Place of delivery				
Home	4621	78.2	4395	77.6
Hospital/PHCF	1259	21.3	1191	21.0
Other	31	0.5	77	1.4
Total	5910	100	5664	100

Source: Sudan Household Health Survey, 2006 and 2010

Phase 2: Qualitative data collection and analysis of in-depth interviews with decision makers in the Federal Ministry of Health (FMOH) and the State Ministry of Health (SMOH), stakeholders in the International and local organisations, experts, and health providers as well as focus group discussion (FGDs) with women and village midwives (VMWs).

Phase 3: Data gathered from field greatly assisted in understanding comprehensively the circumstances surrounding woman's decision of maternal health services use and helped in explaining unclear associations that had been identified from quantitative analysis. Therefore, bivariate and the multilevel models were re-run again. Also, qualitative findings revealed the vital role of the village midwives as the main maternal health services providers; thus I decided to include the village midwives module from SARH 2008 in the quantitative analysis. Indeed, the decision of including some variables into the analysis was not only because of the importance of these variables in explaining the outcome variables, but also because of the validation purpose by comparing the findings of the quantitative with qualitative with respect to certain aspects (see chapter 9).

It is also important to mention that, although the data were collected in 2012, the information that have been collected in these surveys reflected a cumulative experience of people for the last 5 years before conducting the survey up to 10 years with respect to health system whereas the information of the women's experiences in utilisation and satisfaction and health providers' working conditions and their satisfactions was two years before conducting the survey.

Furthermore it was planned to mix the qualitative and quantitative approaches in the data collection stage where the results of the quantitative data were an essential tool used to build the data collection tools of the second phase. Also, mixing occurs in the interpretation phases

of the study in which triangulation technique is applied to integrate the findings from the two sources of quantitative and qualitative data; also, results of both approaches are synthesized in the discussion taking into consideration the behavioural model of the contextual and individual influences on health services' use developed by Andersen (Andersen, 2008; Creswell, 1999).

Figures 5.3 and 5.4 show the research design that has been applied in the study. Along with this design, there is a notational system used in the research design that has been developed by Morse (1991). The notation uses pluses “+” to indicate methods that were applied in the same time; notation arrows “→” to indicate methods that happened in a sequence; the primary method is indicated with uppercase letters, such as “QUAL” and “QUAN” whereas the secondary method is indicated with lowercase letters, such as “quan” and “qual” (Morse, 1991). Furthermore, Plano Clark (2005) added another feature to Morse’s notational system which is parentheses “()” to indicate methods embedded within other methods.

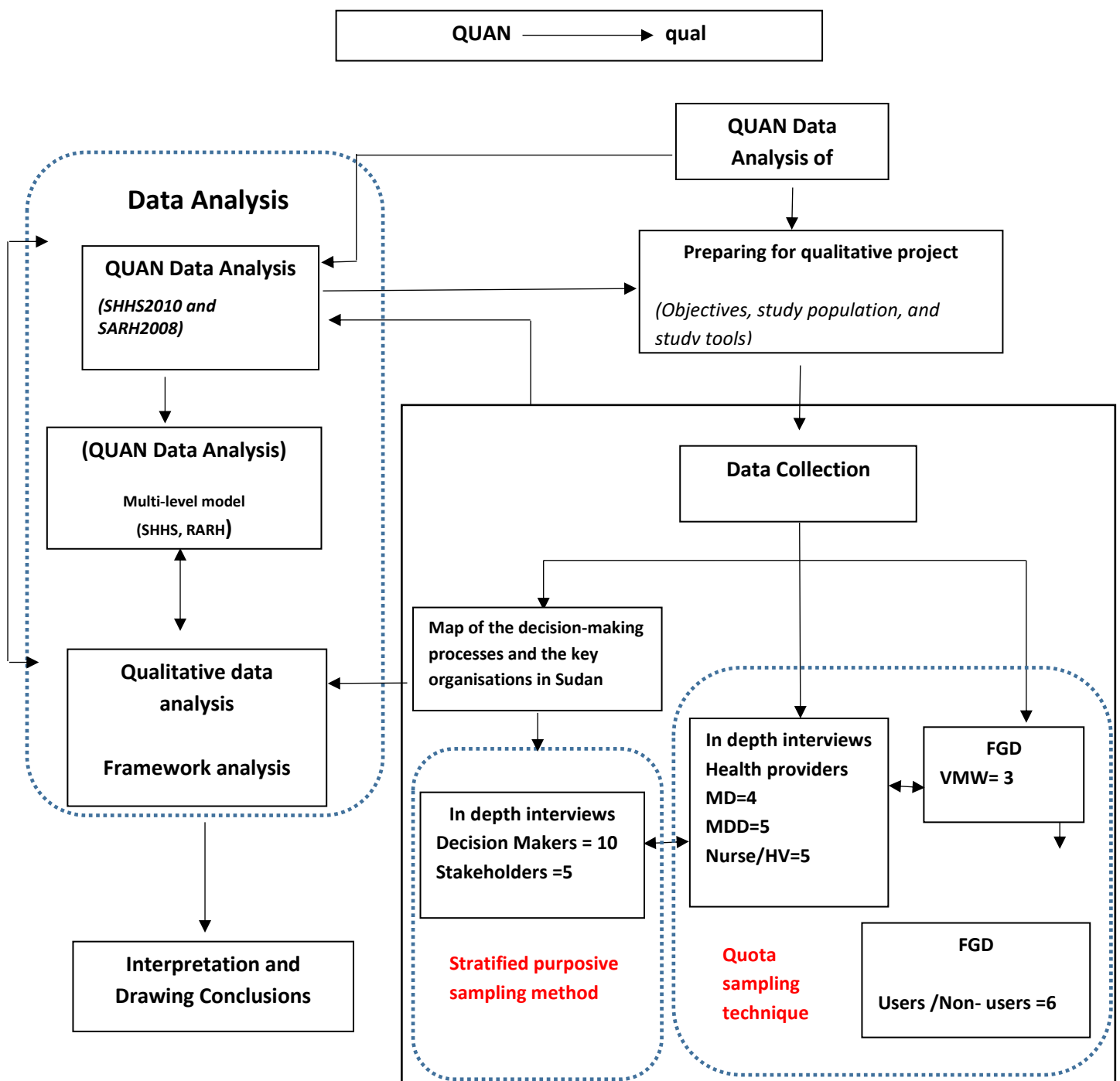
Figure (5.3): Mixed Methods typologies

		Time order decision	
Paradigm emphasis decision		Concurrent	Sequential
	Equal Status	QUAL + QUAN	QUAL → QUAN QUAN → QUAL
	Dominant Status	QUAL + quan QUAN + qual	QUAL → quan qual → QUAN QUAN → qual quan → QUAL

Source: Johnson and Onwuegbuzie, 2004

The Typology used in this research shown in the following figure:

Figure (5.4): The research design of the study



5.8 Ethical considerations

The word “ethics” is associated with morality, which is a set of agreed codes of behaviour among a group of people; yet these rules may be varied across groups. Webster’s new world dictionary defined the term “ethical” as conforming to the standards of conduct of a given profession or group” (Babbie, 2001). Therefore, there are research ethical principles in social sciences that have been agreed to be respected (Ali, 2012; Babbie, 2001)

5.8.1 Voluntary participation

Participation in studies must be voluntary. Participants should be informed that the participation is completely voluntary and also should not expect special direct rewards. Babbie (2001) argued that the generalizability as scientific concern may be violated if the voluntary participation principle has not been respected in the research work. That is, incentives may affect the population representation in the sample due to the fact that incentives may attract a particular group of people rather than the entire population.

5.8.2 No harm to the participants

No one who participates in a research study should be harmed or injured due to participation. Psychological harm could occur in social studies, for example through forcing participants to reveal deviant behaviour or disclose personal characteristics that make them uncomfortable. Also, some research questions are sensitive and may remind participants of bad or immoral experiences that they do not want to remember or talk about. It is important that researchers should not compel participants to answer them. Therefore, assuring that there is no harm and the participation is completely voluntary should be stated clearly in the consent and information sheet and before starting the interview (Babbie, 2001). However, it is difficult to avoid some possibility of psychological harm because the objective of some social research is to study sensitive issues; thus recalling negative experiences may be part of the research. Therefore, it is highly recommended to clarify the objectives of the study and the kind of questions that will be asked before starting the interview course and to ensure the anonymity and confidentiality principles (Flick, 2009; Babbie, 2001).

5.8.3 Anonymity and confidentiality

Protection of the participants is an essential concern in social research. Therefore anonymity or confidentiality should be guaranteed for all study participants. Anonymity goes to the extent that the researchers, not only readers, cannot identify a given response with a given respondent (Babbie, 2001). However, from my point of view it is difficult to achieve Babbie’s argument because researchers usually live with the data for a long time during the data collection and/or analysis; thus, it is difficult or sometimes impossible to achieve this level of anonymity; yet assuring the confidentiality in all research process is satisfied; so that no one else can identify any of the respondents in the study participants.

Several techniques that can be used to guarantee confidentiality have been discussed in the literature (Babbie, 2001; Flick, 2009). Removing identifying information as soon as it's no longer necessary or replace it by identification codes, providing ethical training for researchers who have access to the respondents' material are two main techniques that can be used for the confidentiality purpose. Yet, removing the respondents' identifications may not lead to sufficient protection because in some cases the content of the responses may indicate the participants' identification. Therefore, protecting the respondents' material is also fundamental even if the identifiers' sheets were removed (Babbie, 2001).

5.8.4 Ethical issues in Data analysis

Issues related to producing knowledge and to questions of epistemology are strongly linked to research ethics. That is, the data analysis process involves decisions related to which lines of analysis to pursue and which to keep aside and not to go down a particular route; making these kinds of decisions undoubtedly has ethical implications. (Code, 1991). Objectivity and ethics in research are linked in a complex relationship which requires identifying who and what the researcher can know (Ali, 2004). In addition, Mauthner (2002) argued that epistemic responsibility should be held and it is not enough that researchers need to maintain good research relationship but should also be clear that reflexivity and ethical practice require a strong engagement with social, institutional and political contexts as well as intellectual frameworks (Mauthner, 2002)

Also, there is another possible source of harm where some quotes are included in the analysis that could disclose the participant's identity. Therefore, researchers should be very careful when they use quotes from the transcriptions. It is possible to ask permission first from a participant whether they feel these quotes may threaten their anonymity (Ali, 2004). To conclude, procedures of deciding the analysis tracks and choosing supportive examples may violate the ethical considerations; thus it should be handled apart from any personal preferences or other external biases.

5.9 Research ethics implemented in the Maternal Health System Study (MHSS)

According to the City, University of London policy, ethical approval should be issued from the university and the country in which data collection will be performed. Therefore I started by applying for the ethical approval from the research ethics committee of the university. After submitting the form and get a preliminary approval as the final one it supposes to obtain when receiving the national one. I travelled to Sudan, worked on another application, and submitted to the national research ethics review committee at the Federal Ministry of Health. After getting their ethical clearance certificate (appendix III) I got the final approval from the university to start collecting my data. Appendix III also includes all the tools that I applied in the field: 3 FGD guides and 2 semi-structured interview schedules (see data collection tools at 6.1.2 for further discussion).

In addition, several arrangements were taken in order to obtain informed consent from the potential participants (appendix III). Information sheets were provided to all participants, which explain that the participation is not obligatory (voluntary) and that they can withdraw at any time with no negative consequences, assure confidentiality, clarify estimated length of the interviews, and that there are no financial benefits (appendix III). Also, phone calls were made and face to face meetings in order to illustrate the objectives and other related issues as well as highlight the voluntary participation.

I took care to ensure the consent to participate in the study was voluntary and free from any element of manipulation or inducement. People were asked to participate in their free time rather than disturb them during their busy time, particularly professional health workers and decision makers. That was guaranteed by asking potential participants for an appointment for the interview and proposing another appointment in case there are any unexpected situations or emergencies where the participants should leave the interview (for more details, see the recruitment section).

In the case of interviewing midwives, health visitors who supervise the midwives were only asked to identify the midwives under their supervision; they were not asked to be involved in any procedures of recruiting those midwives into the study in order to avoid the pressure among midwives of taking part of the research or any kinds of selection bias. Only the research team contacted those women and asked them to voluntarily participate. Similarly, in the case of interviewing the health professionals in the health facilities, the health facility director and the head of the maternal health department did not intervene in any part of the recruitment process.

Study participant's compensation for the purpose of encouragement is considered unethical. However, most of the village midwives are engaging in daily working activities in order to maintain their daily basic needs; thus spending part of their time with interviewers may affect their daily income, on which most of those women are reliant. This was resolved by compensating them, by providing around 30 Sudanese pounds (6 US dollars) as honoraria after conducting the FGDs. This amount of money is nearly the midwife's daily income, on the average, considering that she would lose a day's work to participate in the discussion. Also, participants in the FGDs and their children were compensated by providing refreshments and snacks while conducting the meeting and transportation means were provided for the village midwives as the FGDs were conducted in a place far from their local communities.

Some of the potential interviewees were village midwives and mothers. The majority of these two groups are illiterate (i.e., 80% of midwives and more than 60 % of women in reproductive age in Khartoum state are illiterate); therefore, seeking a signed informed consent from the participants may be embarrassing; consequently, audio-recording consent was taken from all participants in the FGDs and village midwives before the interviews rather than a signed consent. This was after explaining the purpose of the study, ethical issues and other relevant information in a simple way and ensuring that every participant understood it.

Several steps were taken in order to create an environment assuring confidentiality. This includes the following procedures, which are categorised into three groups:

a) Procedures related to interviewers

- During the training activity, interviewers were trained on the importance of maintaining confidentiality during and after the data collection process.
- In all research activities, participants were asked to reveal their full names only on an optional basis.
- For in-depth and FGD interviews, researchers made sure to provide a setting conducive to privacy and assured and maintained confidentiality. Also, I did not proceed with any interview if any of the relatives/ or colleagues come and express their interests to attend even if the interviewee accepted this kind of privacy invasion particularly there were some topics were covered related to the interviewee's perception regarding to their work or personal aspects, for which privacy needed to be guaranteed.

b) Procedures related to interviewees

- ***Focus Group Discussions (FGDs):***

- Participants were asked to maintain the privacy of the entire discussions and did not mention any names associated with the other participants' personal opinion/experience to outsiders.

- ***In-depth interviews with decision makers and stakeholders group:***

Special arrangements were provided for this particular group of participants due to their critical position, as they could be easily disclosed from what they mentioned or even their voices in the recordings.

- All in-depth interviews and transcribing work were conducted by me only.
- No other persons can view transcripts except the supervisors.
- During the drafting and analysis I contacted respondents about any quotes that I planned to use in the findings,, to give them the planned quotes and ask if they are satisfied and agree about inclusion.

- ***In-depth interviews with professional health providers:***

- All identifier data that might indicate the participants are removed from the recordings; instead, a coding system was used.
- None of the information obtained from the participants was discussed with their supervisors.

c) Procedures related to the data

City University's Data Protection Policy was followed in dealing with data processing of the study.

Chapter 6

Data and Methods

This chapter discusses the qualitative and quantitative data used in this study. Quantitative data are provided by two surveys; Sudan Household Health Survey (SHHS) in 2010, which is a national survey, and Situation Analysis of Reproductive Health Services Survey (SARH) in 2008 which is conducted in Khartoum state. The qualitative data were collected in the Maternal Health System Study (MHSS) in 2012 in Khartoum using both focus group discussions (FGDs) and in-depth interviews. The first section discusses the sample design, data collection tools, and objectives of the three surveys. Section two describes the statistical method applied, multilevel models, as well as the framework analysis technique that was applied in analysing the qualitative data. The last section discusses the data limitations of the three surveys.

6.1 Data Collection Methods

Multiple sources of data were used in the study described in this thesis to represent the perspectives of different target groups and different types of data, although the data were not collected in the same period of time. Quantitative data were collected in 2008 and 2010 as two representative data sets on the Khartoum state and national level respectively whereas the qualitative data were collected in 2012. These different data sources involved in the study constitute a distinct opportunity not only for achieving completeness of data, but also for more holistic and contextually informed portrayal of the determinants that affect the lack of utilisation of maternal health services among women in Sudan. However, literature highlighted the importance of many socio-economic and health system factors that both SHHS and SARH surveys have not included (see sections 4.1.1 and 4.1.2 for further details about the factors influencing that maternal health services utilization). Therefore, I decided to use mixed method technique and collect qualitative data to cover mainly health system information as well as some cultural aspects from different groups for relevant people.

With respect to the qualitative data, The MHSS was carried out between May and September 2012. The data were collected mainly on the Khartoum state level although the data concerning the health system were collected on the national level. I collected this data in order to fill the gap in the information related to the health system in Sudan, particularly maternal health provider, maternal health care services, and referral system as well as collecting information regarding women's experiences in the utilisation of maternal health services and health providers.

The overall study objectives were twofold, *firstly*, to identify the social, cultural, and women's characteristics' barriers to the use of maternal health services in Sudan during pregnancy, delivery and the immediate postpartum – when most deaths and serious morbidities occur; *secondly*, to study the different ways in which health system functions (i.e., stewardship, financing, maternal health services including referral system of maternal

morbidities, and maternal health providers) can shape maternal health and the pattern of utilisation of maternal health services. Evidently, the objectives of the Maternal Health System study (MHSS) were designed to answer the research questions of the study, I was responsible for designing the data collection tools and data collection. The national level survey data were designed for wider purposes but the analysis described here was designed to meet these study objectives.

The following section will describe the sampling strategies, data collection tools and some ethical considerations for both quantitative and qualitative approach.

6.1.1 Quantitative data

Two data sets were used in the study: Sudan Household Health Survey (SHHS) which was conducted in 2010 on the national level and Situation Analysis of Reproductive Health Service (SARH) which was conducted in 7 states in Sudan in 2008; only Khartoum state, the capital of Sudan, will be considered in this study because of two reasons: limited data quality of the other 6 states and to be comparable with the qualitative data.

As discussed in the previous chapter, the analysis of the quantitative data answer some of the research questions raised in the study which were then linked to the qualitative analysis in order to complete the picture of the main determinants of women's utilisation of antenatal health care service and birth care service in Sudan as the SHHS2010 does not include any data related to postnatal services. Thus, it was dropped from the analysis. However, after the qualitative analysis, it was found that the postnatal services is not included in the maternal health services package. That may be a reasonable explanation for the missing data of the postnatal service utilisation in the survey. (The issues arising from this are discussed in chapters: 9,10,11.) In addition, SARH2010 was used to measure women's satisfaction and the factors affecting it. Moreover, SARH2008 provides information regarding health providers with respect to working conditions, training, and women's satisfaction.

6.1.1.1 Sudan Household Health Survey (SHHS) 2010

The Sudan Household Health Survey (SHHS) was carried out in 2010 in 14 states in Sudan. The survey was funded by Federal Ministry of Health, States of Arab League, USAID, UNICEF, UNFPA, and WHO. The main objective of the survey was to provide information for assessing the situation of children and women in Sudan as well as for monitoring the progress achieved in the Millennium Development Goals (MDGs). Accordingly, the survey covered the following modules: households, ever married women in reproductive age, children under five, community, and food security. Only the household and women's modules of the SHHS are used in this study.

The household module covered a number of topics such as education, work, household characteristics, female genital mutilation/ cutting (FGM/C), water and sanitation, household income and resources, use of insecticide-treated nets, salt iodization, and maternal mortality. The Women's module covered the following topics: women's characteristics, women's marriage, reproduction and child survival, live birth history/ child mortality, maternal and newborn health and maternal morbidity, which includes maternal complication, antenatal healthcare, delivery, postpartum healthcare and tetanus vaccination, contraception, FGM/C, and knowledge of HIV/AIDS.

a) Sample design

The sample of the SHHS 2010 was designed to provide estimates on some key indicators on the situation of the children and women at the national level and for the 15 states of Sudan. The states constituted the main sampling domains and in each state a two-stage cluster sampling design was employed to draw the sample for the SHHS 2010. The villages (in the rural areas) and quarters (in the urban areas) constituted the primary sampling units (PSUs), which represent the smallest administrative unit in the sample. The SHHS sample was not self-weighted; thus in order to obtain unbiased estimates, all statistical analysis work will be performed after using calculated weighting variables.

A stratified multi-stage random sample was used to draw a sample of 18,614 households. Of these, 17,174 households were successfully interviewed (92.3%). Furthermore, 6,065 ever married women aged 15-49 years and who were pregnant during the last 2 years preceding the survey identified in the selected households and successfully interviewed were included.

b) The aim of carrying out this analysis of data from the SHHS 2010 was to identify the most significant factors associated with maternal health services utilisation, and the main measurable barriers affecting women's decision with respect to maternal health services. Also, the main common complications that occurred during pregnancy, delivery and postpartum periods and poverty and women's autonomy aspects were investigated.

6.1.1.2 Situation Analysis of Reproductive Health Service (SARH) 2008

The Situation Analysis of Reproductive Health Services was conducted in 2008 by the Population Council- WANA regional office in seven states of Sudan. The objective of the survey was to better understand the underlying factors of service provision which contribute to the reproductive health status of women in seven states as a first step towards identifying future interventions. The survey covered the following modules: locality health team, health facility, exit interview, providers of reproductive health services (RH), village midwives, records of service delivery, and under-five child health services. However, this study considers only the exit interview, health facility, RH team, and village midwives (VMWs) modules as well as the data set of Khartoum state in the analysis.

The **exit interview module** covered the client satisfaction with different aspects of the service. **The health facility module** includes sections on all facility systems/service components, workforce, staffing, infrastructure, and availability of resources. **The providers of reproductive health (RH)** services module covers the RH services they provided, assessed their practices, skills, perceived competence, and job satisfaction. Lastly, the village midwives module covers the VMWs' professional training, work experience, knowledge of warning signs and linkages with the health facility.

a) Sample design

A stratified random sampling technique was applied in seven states to draw samples of 348 health facilities, 909 health providers, 1029 village midwives, and 1313 clients seeking care at the facilities. Of the overall sample, there are 100 health facilities, 408 clients, 288 staff providing reproductive health services, and 176 village midwives in Khartoum state. The analysis considers Khartoum state only for the comparability purpose with the Qualitative data.

The sample frame includes all functioning public facilities affiliated with Federal and State Ministries of Health. Health facilities in this study include dispensaries, dressing stations, basic health units, and health centres (urban or rural), secondary and tertiary hospitals. Health Facilities were stratified by locality, where the number of units selected was proportional to their total number in each locality (probability proportional to size).

Regarding the sampling selection of health providers, the strategy was to select up to a maximum of 7 in each category (nurses, doctors, etc.) randomly selected to be interviewed from all RH service providers available on the day of data collection within each health facility whereas up to maximum of 5 in health centres, dispensaries and dressing stations.

With respect to the village midwives' sample, since all village midwives are registered in the locality of the area where they practise, lists of village midwives were organised by locality. Village midwives (VMWs) were then randomly selected from each locality, with probability proportionate to size. Furthermore, for each health facility in the study sample, two village midwives affiliated with that facility were selected at random.

Finally, clients were randomly selected from women who came to receive RH services on the day of data collection. The maximum number of women who were recruited was 10 participants per facility.

b) The aim of the analysis of SARH in this study is to assess the health facilities where the reproductive health (RH) component is provided with respect to availability and accessibility of RH services and their quality as well as the obstacles that prevent people from receiving proper services. In addition, to study the environment of services, for instance, service provider privacy and confidentiality, service components, and women's satisfaction after using RH services.

Furthermore, only data of Khartoum state has been included in the analysis to enable a comparison with the qualitative data as both surveys, SHHS 2010 and MHSS 2012, are investigating similar issues. Some aspects related to human resource for health and village midwives were investigated in both surveys (e.g., training and job satisfaction, working conditions) and women's satisfaction with maternal services.

6.1.2 Qualitative Data

Information extracted from the comprehensive analysis of SHHS 2006, SHHS 2010 and SARH 2008 allows establishing a structured and large-scale base of understanding of the interrelated factors that affect women's decision of health seeking behaviour with respect to enabling and predisposing factors. However, structured approaches may be limited by the questions asked. There are some other crucial factors that may have influence particularly health system, accessibility and affordability. The following section demonstrates in detail the Maternal Health System study (MHSS) by which the qualitative data were obtained.

6.1.2.1 Maternal Health System Study (MHSS) 2012

This project is primary data that was particularly designed in order to meet the objectives of this study and to answer part of the research questions of the study. The fieldwork for the data collection was funded by the Public health Institute in Sudan and British Sociological Association through the Phil Strong Memorial Prize.

a) Objectives

The Maternal Health System study (MHSS) was carried out between May and September 2012 in Khartoum State, Sudan. The overall aims of the MHSS are, to assess the role of health system functions (i.e., stewardship, financing, maternal health services including referral system of maternal morbidities, and maternal health providers) on women's utilisation of maternal health services; also, to identify the social, cultural, and women's characteristics' barriers of the maternal health services utilisation (e.g., personal, household, community barriers).

The specific objectives of the MHSS were to:

- Analyse and assess deficiencies/obstacles in the health care system and identify required changes in policy with respect to health providers, referral system of maternal morbidities, and maternal health services delivery;
- Identify barriers to the use of maternal health care service focusing on health system and population factors including women's status;
- Identify maternal healthcare needs and barriers at the community level; and
- Identify potential low-cost models to improve maternal health system functions under scarce resources in Sudan.

b) Study Populations

In order to uncover and understand the health system functions from different perspectives, all main stakeholder groups were considered in the study in order to be able to articulate the research problem from different and complementary points of view. Five groups were identified to be sampled, which represents all parties of the maternal health services: decision makers (senior managerial staff), stakeholders, health providers, village midwives and women (users/ non-users).

In order to identify the key persons among the decision makers and stakeholders, it was important to start with studying and understanding the health planning and decision making procedures and then to develop a map of the decision-making processes and the key organisations (i.e., governmental, local, international). The main purpose of constructing the map was to identify all key stakeholders who have significant contributions in planning, performing, and evaluating maternal health policies and programmes in the national and Khartoum state levels. Accordingly, I was able to allocate the responsible people in each node in the map and ask them to participate in in-depth interviews.

Decision making processes and the key organisations map:

The following steps were followed to develop the map of the decision-making processes and the key organisations:

1. Constructing the map relies mainly on interviewing relevant experts. They were contacted and asked two questions: how are the health plans formulated on the national and Khartoum levels? Who are the main people responsible for formulating and approving the maternal health plan in the national and Khartoum levels?
2. The answers were used to draw a decision-making map and allocate names in each node or decision-making process. Lastly, I prioritised the people are responsible for taking decisions in each process according to their power in taking the decision in order to use this list as the sample frame of the decision making. Only those who were working in the Federal Ministry of Health (FMOH) and the State Ministry of Health (SMOH) were considered in the sample frame. Also, only people who are responsible for the plans that are related to the maternal health system with a special focus on the three elements that have been considered in the overall study sample frame. For instance, people who are responsible for the health plans of the tropical illnesses eradication and health insurance were not considered in the frame.

A map was also developed for the stakeholders responsible for organisations that are running significant maternal health interventions in Khartoum following the same steps as for the decision-makers map. This process found that there are hundreds of national, international, and UN organisations working on different development fields across all states or a specific region or regions. The map of the decision-making processes and key organisations showed that the leading international organisation that work on providing maternal health services or training to health providers working in the women's or reproductive health fields are: United

Nations Population Fund (UNFPA) , World Health Organization (WHO), United Nations Children's Emergency Fund (UNICEF), Japan International Cooperation Agency (JICA) , while the Sudanese Association of Family Planning and the health centre of the Ahfad University are the main organisations providing RH services particularly maternal health services in Sudan. Three criteria were adopted in order to define the main organisations: the number of the maternal health services (MHS) provided by the organisation, the project's sustainability, and the number of beneficiaries using the MHS of the organisation's projects. The Sustainability criterion is perceived in the study as the organisations that have at least 5 years' experience in working in the maternal health projects and have sustainable resources to be able to continue working in the Maternal health services for the next two years in the normal conditions. Organisations that previously were running major maternal health services projects and recently decided to shrink their services across country or remove Khartoum state from the states that have activities in due to the shortage of fund or alteration in the activities or location interests in the Organisation's agenda, are excluded from the map of the decision-making processes and the key organisations. As a result, a list of 6 national and international organisations was prepared, including the contacts of the maternal health programs/divisions of those organisations.

Moreover, some experts were identified in the map as reference people that were strongly advisable to be interviewed because of their long experience and significant role in establishing the health system in Sudan. However, they are not eligible as they are no longer in this role due to retirement or moved to different positions. Of the 7 experts, only two were interviewed and the rest of them were not available in Sudan or Khartoum during my fieldwork.

c) Inclusion and exclusion criteria

The overall criterion which was considered for all participants is their willingness and consent to participate in the research whether by providing written/oral consent. However, there are additional criteria that were considered in the sample selection procedure based on the participant groups.

- *Participants in the FGD:*

1. Women who gave birth in the last 2 years preceding the data collection phase
 - Living in Khartoum state.
 - Ever and never used perinatal healthcare services
 - Have not been involved in such activities in any other similar research in the last year.
2. Village midwives who are officially registered in the localities
 - Currently work.
 - Have not been involved in such activities in any other similar research in the last year.

- ***Participants in the In-depth interviews***

- Currently working (i.e., Decision Makers who are currently working in the Federal Ministry of health (FMOH) and the State Ministry of health (SMOH) in high managerial posts, health workers in health facilities at maternal health departments, and local/ and International organisation and health authorities).
- Have experience more than 2 years in their current position; yet excluded from this condition potential participants who are working in some unique positions mainly in the Ministry of health.
- Working in high managerial position with the ability to issue or participate in issuing maternal health-related decisions within their organisations (this is applied only to the decision makers and stakeholder group).
- Have not been involved in such activities in any other similar research in the last 6 months. However, the key persons in the health authorities that cannot be replaced will not be excluded from the study on this basis.

Potential participants were asked to approve using a tape recorder to record the FGD and in-depth interview. Potential participants in the FGD who refused the recording were *excluded* from the study whereas for potential participants in the in-depth interviews who refused the tape recording during the interview, the interviewers took notes during the interviews. However, none of the participants refused to record the entire interview but a few of them asked to not recording parts from the interviews due to the sensitive answers they intended to give.

d) Recruitment

Each group of the study populations was selected and recruited according to criteria that will be discussed as follows:

- **Decision Makers and Stakeholders Groups:**

After identifying the key persons in the main health authorities (i.e., the State Ministry of Health in Khartoum, and Federal Ministry of health) through the map, the nominated persons were asked to be interviewed. I started by giving them a brief explanation about the study objectives and sent them the information sheet as well as official letter from Public health institute (PHI), the sponsor of the study information sheet; after a few days, I called them again to make an appointment, emphasising that I can accept any cancellations with short notice because I was aware that they always worried about their working conditions and may need to cancel the appointment because of work demands. I clarified that I would also accept any interruption during the interview due to ad hoc tasks or meetings. However, I learnt from my field work experience that late interviews (e.g., after working hours) worked well, particularly with the highest managerial level persons; also, patiently accepting several stops

or postponements during the interviews works efficiently towards gaining a complete and comprehensive interview. Before starting any interview, the consent form was signed and I reminded the interviewee that the interview would be recorded, and discussed the objectives and the expected outcomes of the study.

- Health Providers Group:

Health providers considered in the study described in this thesis are physicians and health visitors (HVs) who provide maternal health services. The majority of physicians and health visitors provide maternal health care through primary health centres (PHCs) and hospitals. After identifying the sample, I started to contact the 3 PHCs and two maternity hospitals through phone calls, and asked for an appointment with the health facility director. The objective of this meeting was to present the study objectives, the types of questions, and the expected outcomes from the study. All of the five health facilities asked for another letter from the Federal Ministry of Health (FMOH) to be presented to them along with the PHI letter in order to accept to let me do the interviews with their staff (they mentioned this is due to the instruction came from FMOH). I issued the letter and I submitted this with the PHI letter and the information sheet to the director of each health facility. The director let me contact the eligible health providers in the health facility in order to arrange for the interview after presenting the study objectives to the providers, giving them the information sheet and obtaining their consent for recording the interview. Most declined to do the interviews after the working hours and preferred to do it during their working times. However, because of the clinical overcrowding I stopped several times to give the health providers an opportunity to do some medical examinations and then resume the interviews.

- Village Midwives Group

Village midwives are the main maternal health providers in Sudan. They work from home although they are supposed to attend regular meetings at PHCs with their supervisors, health visitors. Most of the village midwives have mobile phones even if it is costly for them as it is the easiest way to reach the customers. Thus, I did not find any problems to contact the identified village midwives in the sample. There were no refusal cases for various reasons: I arranged for transportation to transfer village midwives from the PHCs where they were affiliated with the place where I did the FGDs; I provided a small amount of money as an incentive because they would not be able to work on the day of the interview and most of them rely on their daily work to survive, and lastly, they found it an excellent opportunity to express their opinion regarding the midwifery career and their problems that they face every day. However, I started at the beginning to highlight that the FGD would have no direct impact in solving their problems although the information would be used in a study which *may* contribute to improving the health system in Sudan.

- Women's Group

Village midwives who are involved in the FGDs were asked at the end of the FGD to nominate women in their neighbourhood who had used maternal health services and not used;

we informed them that their time would be paid if they continued with us to arrange for the FGDs with users and non-users. All village midwives were willing to provide us with a list of eligible women (i.e., women who gave birth during the last three years). However, very few village midwives provided me with contacts. Among those village midwives who called me back, I recruited 3 of them in the three cities; they contacted eligible women and illustrated the study objectives to them. Also, they arranged for the FGDs with them and provided the place to do the FGDs in the local communities of the women because there was no chance to bring them outside of their community.

e) Procedures of Data Collection

It was initially planned to approach decision makers and stakeholder's groups at the beginning of the field work due to their working conditions, which make them not available all the time; thus a lot of postponements was expected. Potential interviewees were contacted after obtaining the second research ethical approval from the Federal Ministry of health in Sudan (see recruitment section in this chapter). The complete interviews with 15 decision makers and stakeholders took more than 3 months in time and 23 interview appointments because of the unplanned interruptions occurred during the interviews thus took another appointment to complete the interview. Furthermore, there were demonstrations and political instability during this period, which forced me to stop my fieldwork with these two groups due to the emergency in the Sudanese government as well as the risk that I may face if I go to particular areas where protesters were concentrated. Most of my initial appointments were postponed (for further details, see section 6.3 about the data limitations). Lastly, it is important to know that patience and showing understanding are two key factors to complete successful interviews with this group.

After conducting about 5 interviews with decision makers and stakeholders, I started the in-depth interviews with health providers. I did that because felt that the decision makers and stakeholders will take more time than I had put in my time plan. Unlike the decision makers and stakeholders groups, no problems occurred during the interviews with health providers. All interviews were completed in the same appointments that I took before going except one interview where I had to go two times to meet the physician. However, one ethical problem I faced with all health providers was that they did not wish to conduct the interviews before or after the working hours but it was not possible to spend such a long time with health providers during working hours, particularly as some health centres have a lot of patients. I dealt with this situation by conducting part of the interview and stopping to allow the interviewee to meet some patients and then continue another part of the interview as was practical until it was completed. In this way, I did not cause significant delay to a health provider needing to examine patients, yet this meant an interview with a health provider often took a full working day.

After completing all interviews of health providers, I started the FGDs. All Focus Group Discussions were run by my two assistants in order to provide a normal environment for women and let them feel comfortable during the discussions. I was observing during the

FGDs with minimum intervention with the moderator if I need some illustration in a specific point raised by a participant. I started with village midwives group first because I was planning to recruit some of them to help me in organising the FGDs with women and recruit women to them, including users/non-users of services. For further details about village midwives and women recruitment, see section 6.1.2.1 about recruitment.

Focus Group Discussions with users and non-users were the last stage in data collection. Inclusion criteria were reviewed with all women before starting the focus group. Women who were not eligible were thanked and given some refreshments before leaving. Women were allowed to bring their children to the FGDs because the majority of them could not attend the FGDs without their children. Running the FGD in schools or nurseries gave us the advantage to keep children in a safe place to play while their mothers were busy with the discussions. Midwives informed women that the discussions were completely voluntary and would be on their experience in their last pregnancies, and that it will be recorded.

After completing any FGD, a brief close-ended questionnaire (biographical sheet) was applied with each participant of the 9 FGDs in order to know the demographic characteristics of women and village midwives participating. The biographical sheet constituted two parts; the first part contained demographic questions, asked to both women and village midwives. Additionally, village midwives were asked in the second part questions related to their sources of income, job satisfaction, whether it is hired in ministry of health or not, supervision system, and training whereas, the second part that were asked to a woman was related to the maternal health service utilisation in last pregnancy, questions related to her perception towards women's autonomy, and whether she is covered by health insurance.

One important thing that helped in the success of the discussions was the place used in running the FGDs - a school or nursery - as well as the timing of the FGD during late morning (9 or 10 am) when women can leave the home for a while. All of the in-depth interviews and FGDs were conducted in Arabic because it is the participants' native language.

There are some procedural steps that I followed in conducting my field work: *a)* the research purposes were explained orally through phone calls when arranging for the interview meeting and before start each interview or focus group discussion. In addition, the purpose was explained in writing in the information sheet which were sent to the potential participants a few days before conducting the interviews; *b)* The participants' consent was obtained before starting the interview by signing a written consent form whereas women and village midwives were obtained orally by asking them their permission which is recorded at the beginning of each FGD as many of them are illiterate and cannot read and sign a written consent; *c)* ensuring the anonymity and confidentiality was mentioned before starting each interview and during the interview whenever the interviewer started to be cautious and hesitated in order to encourage him/her to continue. However, requests of some participants to write their answers for some questions instead of recording these were respected.

f) Research assistant recruitment and training

Two Sudanese research assistants were recruited to help in data collection and transcribing the interviews. **They were selected based on** two criteria: at least 5 years working experience in doing similar activities and have at least BSc in health sciences or social work or other equivalent educational certificates.

An intensive training for 3 days before the focus group discussions was given by myself and another 2 days before implementing the in-depth interviews. This covered: **a)** ethical issues relating to conducting field work and data processing such as confidentiality and data protection **b)** how to identify the eligible people to be enrolled into the study; **c)** How to identify and respond to any concerns or distress raised by participants; **d)** how to introduce and illustrate the study objectives and expected benefits as well as the other ethical issues related to the participant's enrolment and the course of interview or focus group discussions with proper language that people can understand; **e)** how to address issues related to culture and religious beliefs and other social issues without creating any objections or embarrassment among participants; **f)** how to introduce the questions and probes in a way that all people can understand in the same way. Before starting the work on the project, I asked the two research assistants to sign a confidentiality agreement letter.

At the beginning of the fieldwork, I asked each of the research assistants to conduct an interview with a health provider from the study sample under my observation in order to ensure that they followed training guidance precisely. After ensuring that they conducted the interview in accordance with the training, we started to conduct three parallel interviews with health providers (physician, medical director, and village midwife) in each of the 5 health facilities of the study sample. Of the 14 in-depth interviews, I conducted 6 interviews whereas the research assistants conducted the rest.

Following the ethical protocol with respect to increasing the confidentiality level of the decision makers and stakeholders groups due to their sensitive positions, I was responsible for conducting the entire set of in-depth interviews with decision makers, experts, stakeholders groups without input from the research assistants. Indeed, my being non-Sudanese was encouraging for decision makers to discuss freely the topics of the interview schedule as often being an outsider can actually be a real advantage in these kind of situations as I don't appear to belong to a particular group and people may have more trust in the confidentiality than when it is a local person.

Due to the difficulties to understand the colloquial language which is common among the majority of illiterate or older people in Sudan, the two research assistants were mainly responsible for conducting the 9 focus group discussions in order to guarantee effective and interactive discussions among women; however, I attended all FGDs as observer and intervened by giving my research assistants some prompts to be asked in order to clarify some points and intervened with some probing questions if there was a need. Most of these

interventions occurred during the breaks in the discussion, in order to not disturb the flow of the discussions.

During the data collection phase, there were regular meetings with research assistants in order to discuss all fieldwork problems and concerns. Indeed, the regular meeting was a very good opportunity to discuss and ensure that the concepts are unified among us as well as exchanging experiences which greatly helped in unifying our behaviours if we were exposed to the same situation in different interviews.

During the data collection, I was also collecting relevant official documents and studies. Most were not published and some of them even disappeared as the Sudanese health system has a very weak archiving system and high turnover among employees (see chapter 8 for more details about the findings of the health system in Sudan). I added a few questions about relevant documents at the beginning of the questionnaire (e.g., strategies, plans, guidelines, studies) and I kept a note of all studies, reports, and official documents mentioned by any of the interviewees; then I asked my all interviewees if they could provide a copy of these documents and also asked permission to use these as data sources, as most of them are not published.

Identifying and collecting relevant documents by asking decision makers and stakeholders significantly helped me in creating a good local literature base that assisted me in writing about the Sudanese health system and also helped me in assessing this system. Obviously, other employees outside the decision makers group may not have an idea about some essential documents mentioned by my interviewees due to the turnover and lack of archiving system. Most of the decision makers interviewed spent most of their careers inside the ministries (the Federal Ministry of health and the State Ministry of health); therefore, they knew most of the history and documents prepared by or for the ministries.

g) Data collection tools

The diversity of the participants, who were coming from different backgrounds and also from different professional levels, and of the data collection methods enabled us to apply the entire behavioural model and then develop a solid and comprehensive base of understanding of the contextual and individual influences on health services' use in Sudan. Some topics were repeated in the village midwives', women's, and health providers' guidelines as well as between health providers, decision makers, and stakeholders in order to explore their perception of similar topics. The topic guides were developed using the findings of the quantitative analysis of Sudan Household Health Survey 2010 and Situation Analysis of Reproductive Health Survey 2008 as well as scientific literature review and research questions of the study. In this section, both tools will be presented (see the tools in the Arabic language, which is the language that have been used in collecting the data, in Appendix III:

1) Focus group discussions (FGDs):

Three FGD guides were developed to be used with women who used maternal health services during their last pregnancy, women who did not use the services and with village midwives.

- **Women (users/non-users)**

In order to identify the main reasons of use/not use of the maternal health services based on women's experiences, women were asked about the components of maternal health services that they received during antenatal, delivery, postnatal periods, what are the health complications that makes them seek health care, the role of customs and traditions in utilising/or not utilising the maternal health services, who is the person taking the decisions of seeking maternal health services, their opinions regarding the maternal health services and also their experiences with health providers. Finally, they were asked for their suggestions to improve the services.

- **Village Midwives**

The guide used with village midwives discussed the following themes:

- Maternal health services: description of what they regularly do with women during the perinatal period, the procedures that they follow in the maternal emergency cases, procedures they follow if the women/women's family refuse to transfer women in need to hospitals (in the emergency cases), whether they follow any guidelines in providing the services, and their suggestions to improve the services.
- Working conditions: workload, problems/obstacles affecting their performance, in-service training, job satisfaction, the supervision system, and their suggestions to develop the village midwives' career.
- Capacity building: criteria of selection to attend training, impact of training on their performance, and perceived need for training.
- Supervision system: description of the system, usefulness of the supervision system, system problems, and the procedures they regularly take if they face any problems/ obstacles during the work, and their suggestions to improve the supervision system.

2) In-depth interviews:

Two semi-structured interview schedules were developed to be applied with decision makers, stakeholders, health providers, and expert groups. Indeed, decision makers, stakeholders and experts are almost similar whereas the interview schedule of the health providers was different. However, some detailed questions were not asked to the interviewees for whom they were not relevant. The following section presents the themes of each schedule:

- **The semi-structured interview schedule used with decision makers, stakeholders and experts**

-Description of the current situation of health system and planning: the main health plans and strategies with a special focus on maternal/ reproductive health in the last 10 years, the impact of the plans/strategy on maternal health in Sudan, reasons for any failure in achieving their objectives, steps of developing and issuing maternal/ reproductive health plans, how maternal health needs have been identified, the prioritising system of maternal health needs in the health plans, the revision system for the long term plans/strategies “to what extent the health plans are flexible”, monitoring and evaluation (M&E) system in the implementation of the health plans, and challenges facing developing the planning procedure and M&E in ministry of health.

- Financing the health plans: main source of funding, the sufficiency and sustainability of the funding, main financing problems, equitability in financing the maternal health activities across Sudan, which activities are more affected by any deficiency of funding, coordination among donors and between donors and ministry of health, and main challenges the ministry is facing with the donor’s agendas.

- Health sector reform: decrees and policies aiming to reform and improve the maternal health system in Sudan since 1990s with respect to referral system, maternal health service, and health providers, on what basis the reform policies have been declared, challenges that face the implementation health sector reform program, and impact (positive/negative) of health sector reform.

- Maternal health services (MHS): lack of utilisation of MHS, how to improve the utilisation rate among women, coordination between parties providing maternal health services and how it can be improved, challenges that hinder the performance maternal health projects and their sustainability, applying any standards with respect to quality of maternal health service, alternatives for women who need maternity services and cannot access maternal health services, suggestions to improve MHS.

- Referral system of maternal morbidities: the policies applied to establish/ improve referral system with respect to maternal morbidity, on what basis these policies have been declared, challenges facing the operation of the referral system, the main reasons for the delay in referring the maternal cases, and suggestions to improve the referral system in order to increase the efficiency of the system.

- Maternal health providers: perception towards the level of health providers and what are the skills they lack; alternatives to cover the lack of health providers and the unequitable distribution in /outside Khartoum state, to improve the health provider sector under limited

resources, challenges facing VMW sector and its integration to health system, and how it can be improved.

- **Training and capacity building for health providers:** bodies responsible for providing in-job training for health providers, training needs assessment and capacity building plans, announcements and nomination procedures to attend training and the selection criteria, equitability concern among health providers across the country, financing resources of the training plans, challenges facing the financing plans, assessment of the training outcome and measure the training impact on health providers performance, and training incentives.

- **Work challenges:** administrative challenges facing interviewees in the work, supervision system applied in the work, and suggestions of how to improve to working environment.

- **The semi-structured interview schedule used with health providers**

- **Maternal health services:** ANC, delivery, postnatal components provided to women in the health facility, potential reasons that women do not obtain the perinatal services regularly, problems associated with accessing and using the perinatal services, quality standards of maternal health services, suggestions to improve the quality, and availability of maternal health services.

- **Referral system of maternal morbidities:** delays in transferring women in need, procedures of referring that the facility follows, the impact of the referring procedures on the women's health conditions, main problems health providers face when referring women who are in need for higher level care, and suggestions to improve the referral system.

- **Maternal health providers:** lack of the availability of health providers, workload, working obstacles that affect the performance of the health providers, convenient working conditions, job satisfaction, and suggestions to improve and solve problems in the health providers sector.

- **Capacity building and training:** selection criteria for attending training courses, the principle of equity in distributing the training opportunities, influence of the training on the work performance, methods to identifying the training needs of the health providers, the health providers attitudes towards the need to attend training courses, and availability of any types of assessment in order to evaluate the knowledge acquired in the course and its impact on their performance.

- **Work challenges:** administrative challenges facing interviewees in the work, supervision system applied in the work, and suggestions of how to improve to working environment.

h) Sample

It is very difficult to determine the exact sample size of the qualitative research in advance (Bowling, 2009); thus, the size of the study sample was planned to rely on the principle of theoretical saturation in determining the proper sample. Theoretical saturation is achieved through a process of continuing data collection and coding until no new categories can be identified, and until new instances of variation for existing categories have ceased to emerge. McGraw-Hill (2013) argued that ‘theoretical saturation functions as a goal rather than a reality. This is because even though we may (and ought to) strive for saturation of our categories, modification of categories or changes in perspective are always possible’ (McGraw-Hill, 2013, P71). In this study, although prior plans were made for numbers of people to interview and focus groups to conduct in each participant group, it was felt that stopping data collection should be when there is almost no new substantial information coming from the field and ensuring that there is no manifestations of categories, negative cases and opposites; thus, it gives us confidence that theoretical saturation is being achieved. This meant that the numbers estimated in original study plans could be amended in accordance with this principle.

Among non-probability sampling techniques, two sampling techniques were applied in the qualitative study: stratified purposive sampling and quota sampling techniques. The stratified purposive sampling was implemented as the study participants were selected intentionally in order to obtain detailed and comprehensive information from specific groups of people who had knowledge or experiences relevant to the study objectives. The stratified purposive sample is defined as “a deliberately non- random method of sampling, which aims to sample a group of people, or settings, with particular characteristics, usually in qualitative research designs” (Bowling, 2009).

Three independent samples were drawn from decision-makers, stakeholders, and experts. The sample of decision-makers was drawn according to the results of the health decision-making map described above, to include all key players directly involved in taking health decisions in the Federal Ministry of health and the State Ministry of health in Khartoum. Similarly, the stakeholder sample was prepared according to the map by selecting the local and international organisations running significant maternal health interventions in Khartoum. Furthermore, a sample of experts that they have both relevant academic and previous working experience as decision makers had been drawn using the same technique. All of them were asked to participate in the in-depth interviews.

The quota sampling technique is the second type of non-probability sampling technique that was applied to draw three samples: village midwife sample, health providers and women sample. This has been defined as “a method of stratified sampling in which the selection within geographical strata is non-random,” (Bowling, 2009). Bowling argues that this non-random element is its key weakness. However, I treated this weakness in the quota sampling technique by replacing the intentional selection to randomization selection within each quota

when I was designing and applying the technique in drawing the samples of village midwives and Women.

With respect to village midwives sample, the sample design considered the diversity in the geographical areas and type of the facilities. As mentioned before, Greater Khartoum is a very large state; it includes three major cities: Khartoum, Omdorman, and Bahry. Unfortunately, Khartoum as all other states in Sudan suffers from inequitable distribution of the functioning health facilities that provide maternal health services and human resources for health across the state. That is, places located outskirts of the state or far from the Khartoum centre or are characterised to be deprived not only of health service but also other infrastructure services. Moreover, Khartoum state consists of seven localities. Each village midwife (VMW) should register herself in the locality where she practices. In addition, village midwives are supervised by health visitors in primary health centres (PHCs) located in the area in which each village midwife works. Each locality was asked to provide us with a complete list of affiliated village midwives and their contacts. Three quotas were formulated to represent the three major cities of Khartoum state (i.e., Khartoum, Om Dorman, and Bahary cities) and then a random sample of 8 village midwives in each quota was drawn from the lists of the localities of each city (two localities for each city except Khartoum city has 3 localities) in order to constitute three focus group discussions based on the city.

Regarding the health providers sample, the study considered health providers as those who are working as physicians, nurse/ village midwife/ health visitors and provide maternal health services in governmental sector in both primary health centres (PHCs) and specialised hospitals. In addition, medical directors of the health facilities that health providers are working were interviewed.

The national health system in Sudan categorises PHCs into 4 groups: A, B, C, and D where the 'D' category is the lowest level and the 'A' category is the highest. The criteria used for the classification of PHCs included facility's infrastructure, package of service provided in the PHC, size of population served, type of health cadres (i.e., medical assistant, physicians, registrar, consultant, and/or village midwife).

The geographical and categories of PHC are the two strata that were considered in the designing of the sample where three quotas were identified with respect to the three cities of Khartoum in the first stage of the sampling design. Then, a random sample of health facilities (3 PHCs and 2 Hospitals) was drawn from three lists of health facilities in the three cities of Khartoum. In order to guarantee the variability with respect to health facility's categories, the mechanism of sampling was: I started by drawing the first facility from the first list, all PHCs that were similar to the category of the first drawn facility were excluded from the other two lists. Thus, the second PHC drawn from the second list was belonging to different category from the first selected one and so on. The specialised hospitals as well as rural hospitals were drawn randomly from two lists of hospitals of specialised and rural hospitals. In each PHC, physicians and nurses/health visitors who are responsible for providing maternal health services and medical director were asked to be interviewed. With respect to

the two hospitals, the medical director of the facility nominated a doctor and a village midwife from the staff of the hospitals that attended on the day of the interview and they have some time free to be interviewed within their shifts.

With respect to the women's sample, there is notable diversity in the characteristics of the geographical areas and their association with infrastructure and service provision in each area within Khartoum state. Indeed, the geographical dimension is considered as a sensitive proxy for the living standards and economic level of the women. Moreover, there is no equitable distribution of health services within the same state. Therefore, the categories of the problems that women encounter in seeking maternal health services differ among women according to place of residence. Therefore, the sampling considered all these differences by formulating six quotas (i.e., two per city) in which one was allocated to maternity service users and one to non-users in each city. Women were selected intentionally by assistance from the village midwives who are working in these areas and participated in the FGDs of the project. Overall, 64 women were selected in the sample and asked to participate in FGDs.

Two criteria were considered in the sampling selection: place of residence and Maternal health services utilisation status whereas other effective factors namely women's age and women's education could not be controlled when the women's FGDs were constituted due to the difficulties in obtaining eligible women; thus any eligible woman who agreed to participate was included directly into the FGD. However, there was no significant variation in the women's education to the extent that obstructed the flow of the discussions in the focus group (see appendix I for further details about the demographic characteristics of the participants). According to above discussion the overall sample that has been drawn in the study is 9 FGDs and 36 in-depth interviews. The details of the sample size are presented in Table 6.1.

All of the 9 FGDs previously determined were successfully completed whereas 10 out of 12 in-depth interviews with decision makers were successfully completed; for the stakeholders, 5 out of 6 planned interviews; for the health providers, 14 out of 15 were interviewed. Lastly, the two in-depth interviews with experts were completed. The overall actual sample size, therefore was 9 FGDs and 29 in-depth interviews (acceptance rate 93.2%). The total number of participants in both focus group discussions and in-depth interviews was 72 participants.

Table (6.1): Distribution of the planned and actual MHSS Sample

	Planned sample				Actual sample				Total number of participants
	KH	BH	OmD	Total	KH	BH	OmD	Total	
FGD									
Users	1	1	1	3	1	1	1	3	17
Non users	1	1	1	3	1	1	1	3	11
Village midwives	1	1	1	3	1	1	1	3	15
In-depth interviews									
Decision makers (FMOH, SMOH)				12				10	10
Stakeholders				6				5	5
Health providers (Nurse/ health visitors, physicians, medical directors)				15				14	14
Total				42				39	72

*KH=Khartoum city, BH= Bahary city, OmD= Omdorman city

6.2 Data Analysis

In order to achieve the objectives of the study as shown in table 1.3, qualitative and quantitative methods will be used in order to be able to fully address the research questions using several data sets: quantitative data (SHHS 2010 and SARH2008) and qualitative data (MHSS 2012). Table 6.2 show the methods that are applied in the plan of analysis in order to address each research question; thus accomplish all of the study objectives.

Table (6.2): Main and specific objectives of the study, research questions, and methods of analysis

MAIN OBJECTIVES	SPECIFIC OBJECTIVES	RESEARCH QUESTIONS	QUAN.	QUAL.
To identify the social, cultural, and services barriers, to the use of maternal health services in Sudan during pregnancy, delivery and the immediate postpartum – when most deaths and serious morbidities occur;	Analyse and assess deficiencies/obstacles in the health care system and identify required changes in policy with respect to health providers, referral system of maternal morbidities, and maternal health services delivery.	What are the main barriers to use of maternal health services among women in need?	√	√
		Are the women satisfied with the maternal services?; how can women's satisfactory level be increased?	√	√
	Identify barriers to the use of maternal health care service focusing on population factors including women's status.	How is maternal morbidity treated in a facility setting and does this vary by women's characteristics?	√	√
To study the different ways in which health system functions can shape maternal health and the pattern of utilisation of maternal health services.	Identify maternal healthcare needs on the community level.	What are the maternal needs from women's perspectives and all other participants in the study?		√
	Identify barriers to the use of maternal health care service focusing on health system (maternal health services delivery, referral system for poor women with pregnancy-related morbidities, and health providers)	What are the health system resources available for ante-, intra-, and post- natal women in Khartoum and, What is the quality of maternal health services provided both for routine cases and complications?		√

MAIN OBJECTIVES	SPECIFIC OBJECTIVES	RESEARCH QUESTIONS	QUAN.	QUAL.
	Identify potentially low cost models to improve maternal health system functions under scarce resources in Sudan.	What are the main challenges that hinder the health system with respect to health providers, referral system of maternal morbidities, and maternal health services delivery to perform in an efficient way in Sudan;		√
		How can health system functions be improved to be more responsive to the poor?		√
		What elements of an equitable strategy for improving access to maternal health care in Khartoum can be implemented to reduce the extent of morbidity while maintaining and improving care that is attuned to women's needs in a context of limited existing health facilities?		√

Bivariate and multilevel models are applied to the quantitative data sets whereas framework analysis technique is applied to qualitative data. Furthermore, it is used in mixing part of quantitative indicators with qualitative data as an innovative contribution in applying framework analyses in order to view the entire picture and validate the findings coming from different data sources. Quantitative analysis was carried out using Statistical Package for the Social Sciences (SPSS version 19) and MLwiN program (MLwiN version 2.1) whereas the qualitative data will be analysed manually because there is no software compatible with the Arabic language which is the language used in the interviews.

In the following section, both quantitative and qualitative techniques used in the analysis are presented:

6.2.1 Multilevel methods

The multilevel modelling has become a standard approach and widely applied in social sciences (Goldstein, 2003). The majority of the data obtained from surveys are clustered and have a hierarchical structure by nature because they are gathered according to multistage sampling design, which surveys frequently depend on in drawing their samples.

Multilevel method is used to analyse data from and across different levels (Tarling, 2009). The rationale of use of this technique in the study is to correct the inferences by considering the hierarchical structures variation in the analysis instead of only dealing with the variation

between the units of analysis as independent observations. That is, standard errors for the coefficients of higher-level predictor variables will be the most affected by ignoring grouping. Furthermore, there is also substantive interest in group effect; multilevel technique helps to understand to what extent the grouping impacts on the women's utilisation or satisfaction of maternal health services.

The main objectives of the use of multilevel model in the study are to assess the influence of the community impact on the pattern of utilisation of maternal health services (antenatal and delivery services) among women. The SHHS 2010 used in the study has two levels: at level one (the lowest level) women and at level two (the higher) is Primary Sampling Units (PSUs) That is, the multilevel data structure for the SHHS 2010 is according to the geographical dimension (i.e., localities)

The response variables "Ys" are women's behaviour in seeking antenatal and delivery health care services, which are categorical variables. Explanatory variables are categorised into two levels: the first level applied to individual women such as education level, age, work status, characteristics of the place of residence and household characteristics. The first level is seeking the impact of the women's characteristics on their maternal health behaviours with respect to utilisation of health services whereas the second level is concerned with assessing the impact of clusters (geographic areas) on women's utilisation, controlling for the effect of other predictors. The multilevel analysis will include estimations of intra-class correlation which is a measure of group homogeneity and indicates the extent to which individual share common experiences due to closeness in space or time' (Tarling, 2009, p. 110; Rasbash, 2009).

Ever use prenatal health services is constructed from the responses of women aged 15-49 years who gave a live birth in the two years preceding the survey. It is a dichotomous variable distinguishing between those who utilised the prenatal health services (once or more) and those who did not utilise it. It is constructed from the following questions: "***Before you gave birth to this child did you see anyone for antenatal care?***", "***Whom did you see?***". The last question constitutes from a multiple of 9 alternative health providers. Women who answered: Traditional birth attendant or Community health worker, No One was coded "0" to indicate Non/ Traditional health providers (THP) users whereas women who answered village midwife or health visitor were coded "1"; women who answered Doctor or nurse or Medical assistant were coded "2". However, in the model the second category and third one were merged to represent a professional health provider category.

The second dependent variable assistance at birth, is constructed from the responses of eligible women to the question: "***who assisted with the delivery of your last completed pregnancy?***". The question constitutes from a multiple 9 alternative health providers and it is categorised as the previous dependent variable

The explanatory variables that were entered into the models were: women's age, education level, number of children, domestic violence index (see section 7.2.1 for further details about

variable construction), the education level of household head, urban/rural residence, wealth index. Three further explanatory variables were entered into the delivery service utilisation: received antenatal care, discussed with health provider the place and mode of delivery, and number of antenatal visits. There were another two variables related to health complications during pregnancy period and childbirth available in the dataset but I did not use these owing to the poor quality of the data of these two variables (see section 6.3 for further discussion about data limitations).

As described in chapter 4 (section 4.1) , relevant literature has discussed other explanatory variables considered to have significant impact on maternal health seeking behaviour among women. Unfortunately, however, the SHHS2010 collected only the variables that I used in the model while other important variables that have a significant potential influence such as cultural variables were not collected in the survey (see section 6.3 for further discussion about data limitations). However, the important factors that affect the women's health behaviour were consequently considered in the qualitative data collection and analysis (see section 6.1.2 for further details).

Multilevel modelling

In the Multilevel regression, if the units of the level -1 (which denotes women) are nested within level-2 units, the level-2 groups are treated as a random sample from the population which denotes communities or health facilities in the study.

Generally, wherever, an item has two subscripts “ ij ” it varies from unit to another one in the first level and within the level-2 units. That is, if we apply the subscripts “ ij ” in this study “ i ” represents a woman and “ j ” represents a community; so, if an item has two subscripts “ ij ”, it varies from woman to woman within a community. If the item has a subscript “ j ”, it varies across communities but it has the same value for all women within each community. In the case that the item has no subscript it is constant across all women of the communities.

i) Random intercept model:

In the following model we let only the intercept vary but the slopes remain constant; it means in my study I assume that there is a difference in utilisation pattern among women in different communities. However, the effect of explanatory variables is constant across communities.

In the Random intercept model, it is assumed that the parameter “ β_{0j} ” become random variable and

$$\beta_{0j} = \beta_0 + u_{0j}$$

Thus, random intercept model,

$$y_{ij} = \beta_0 + \beta_1 x_{ij} + u_{0j} + \varepsilon_{ij} \quad (5.1)$$

Where:

y_{ij}	Is the response variable for the i^{th} level one-1 unit within j^{th} level-2 unit
β_0	Is the intercept applied into the all units in the group “j”
x_{ij}	Is the matrix of covariates corresponding the i^{th} level one-1 unit within j^{th} level-2 unit
β_1	Is the associated vector of fixed predicted parameter
u_{0j}	Is a vector of level-2 random effects
ε_{ij}	Is the random effect corresponding to the level one-1 units

ii) Random coefficient model:

In this model, we let the slope vary and the intercept vary as well. It means in our study that the pattern of utilisation not only differs across the groups but also differs among women within each group (i.e., the effect of an explanatory variable is allowed to vary across groups and within each group).

We will assume that the parameters “ β_{0j} ” and “ β_{1j} ” become random variables and postulate that:

$\beta_{0j} = \beta_0 + u_{0j}$ and $\beta_{1j} = \beta_1 + u_{1j}$. The “ u_{0j} ” and “ u_{1j} ” are random variables with parameters:

$$E(u_{0j}) = E(u_{1j}) = 0, \text{ and}$$

$$Var(u_{0j}) = \sigma_{u0}^2, Var(u_{1j}) = \sigma_{u1}^2, Cov(u_{0j}, u_{1j}) = \sigma_{u01}$$

Thus the Random coefficient model is,

$$y_{ij} = \beta_0 + \beta_{1j}x_{1ij} + u_{0j} + u_{0j} + \varepsilon_{ij} \quad (5.2)$$

Where:

y_{ij}	Is the response variable for the i^{th} level one-1 unit within j^{th} level-2 unit
β_0	Is the intercept applied into the all units in the group “j”
x_{ij}	Is the matrix of covariates corresponding the i^{th} level one-1 unit within j^{th} level-2 unit

β_1	Is the associated vector of fixed predicted parameter
u_{0j} and u_{1j}	Are the covariances between the intercepts and the slopes
ε_{ij}	Is the random effect corresponding to the level one-1 units

With respect to both SARH 2008 and SHHS 2010, this study assumes that women who belong to same community (or use the same health facilities) are more likely to share the similar characteristics. Thus, Random intercept models are first applied using MLwiN in analysing the women's satisfaction level and women's pattern of maternal health services utilisation. This is followed by random coefficient models to allow the effect of explanatory variables to vary across communities or health facilities.

A multilevel model was not applied in analysing the data of the Situation Analysis of Reproductive Health Services (SARH 2008) as the limited size of the data set. Therefore, logistic regression model is fitted for the outcome to assess the impact of women's satisfaction after adjusting for the remaining independent variables.

Women's satisfaction in this study was constructed from the women's responses to three questions: "Overall, would you say you were satisfied with your visit to the facility today, or were you dissatisfied?", "Do you feel that the time you spent with the clinical staff was too short, too long, or about the right amount of time?", and "If a friend of yours wanted the services that you came here for today, would you encourage her to come to this facility, or would you encourage her to go somewhere else?". If a woman reported that she is satisfied with the first two questions and recommend the services to her friend in the last questions, it is considered as satisfied in the women's satisfaction variables, others are considered as unsatisfied.

6.2.2 Framework methods

Framework method was introduced in the 1980s by the national centre for social research in the UK. This method is used frequently in applied social policy research (Ritchie et al., 1993). 'Framework' is defined as an analytical process which involves a number of distinct through highly interconnected stages' (Ritchie et al., 2002). Also, it is most suitable to be applied on structured and well organised data associated with a prior conceptual framework.

In order to apply framework analysis, five successive steps should be performed although it is not necessary to strictly follow the same order: familiarisation, identifying a thematic framework, indexing, charting, mapping and interpretation. Indeed, Ritchie discussed that researchers frequently move back and forth between the steps within the data until they have reached the satisfactory answers for all research questions. **Familiarisation** has involved the process of reviewing entire material coming from the field work. At this stage, sifting and sorting processes are applied as well as starting the abstraction and conceptualisation. The second step is **identifying a thematic framework**. It involves the process of identifying the

key issues and themes that have been emerged from the data in order to construct the framework. Importantly to ensure that the entire research questions of the study have been addressed eventually. Therefore, this method allows for emerging new concepts and themes that can serve eventually the overall research objectives. It is important to mention that several frameworks should be developed according to the number of population groups have undergone in the study whereby every population group has its own conceptual framework although there are many themes emerging across all or some groups. This study started with establishing five frameworks for decision makers, stakeholders, health providers, village midwives, and women groups. **Indexing** is the third step of the framework analysis. It indicates the process of applying the thematic framework or index is systematically applied to the qualitative data. The fourth step in the analysis is **charting**. It helps in building the complete picture of the data by rearranging the data according to the thematic reference based on many criteria. However, in my study, I will rearrange the themes and subthemes according to the study conceptual framework. The final step is **mapping and interpretation**. It refers to the process whereby key characteristics of the data that appear in the chart were pulled together as well as interpret the entire theism taking into consideration the study conceptual framework (Ritchie et al., 1993; Ritchie et al., 2002).

With respect to MHSS 2012, all of the 9 FGDs and 29 in-depth interviews were transcribed in full for detailed analysis. The findings are presented in chapters 8-10.

6.3 Data limitations

This study applied several data sets; two are quantitative data sets and one is qualitative. Regarding the quantitative data, SHHS 2010 and SARH 2008 are secondary data on the national and state representative levels respectively. The major limitations of these data sets are the reliability and missing data. The SHHS 2010 collected information about the women's and child's health (see section 6.1.1.1 for more details about the objectives and survey description). There are many problems in the data files of the three surveys. Data of the postnatal had not been collected in the SHHS 2010 survey although it is essential for a complete picture, particularly as the maternal mortality survey in Sudan reported that one third of maternal deaths occur in the postpartum period (MMS, 2010). However, I tried to seek information regarding the causes of maternal deaths that published by the Khartoum state Ministry of health; unfortunately it cannot be relied on due to major mistakes in the report as I concluded from the qualitative interviews. Thus, maternal mortality is excluded from the analysis due to the lack of information.

In addition, information on maternal complication during pregnancy and delivery suffer from methodological limitations particularly when they rely on self-reporting of obstetric complications. Studies provide strong evidence that self-reporting is known not to agree sufficiently with medical diagnoses to estimate prevalence. In particular, studies validating retrospective interview surveys have found that women without medical diagnoses of

complications during labour frequently reported symptoms of morbidity during surveys, a phenomenon which can lead to an over-estimation of prevalence (Ronsmans et al, 1997).

That is, data lack internal consistency responses among variables related to perinatal complications as well as there is a considerable percentage of missing in these variables. However, nothing has been published on the methodology of the SHHS 2010 until now except brief information declared by the principal investigator (PI) of the project. Thus, it is difficult to judge the quality of survey with respect to data processing, data management, the qualifications of the data collectors, and the field training guidance, which eventually affected the quality of data and the responses of the interviewees. Accordingly, I could neither calculate maternal morbidity rates nor consider the complications variables in the analysis to test their impact on utilisation patterns even though I considered these variables to be important to be entered in the models. However, I considered these issues in the qualitative project, which enabled me to obtain information regarding whether the maternal complications can be considered as an important motive to seek care or not (see section 7.4 for further details).

In addition, there is no information published about the methodology of calculating the wealth quintiles variable in the SHHS 2010 and whether the urban/ rural impact and the weight of the states have been considered in calculating this variable. However, I use it in the analysis as the only variable that reflects the household income level and there is no other alternative variable I found in the file. Indeed, considering wealth index as an ambiguous variable in the analysis would violate accuracy the findings.

One of the aims of this study to investigate the responsiveness through women's satisfaction after receiving the services. However, the SHHS 2010 does not include any variables to indicate the women's satisfaction and what the significant determinants affecting the levels of satisfaction might be. As an alternative, therefore, I used SARH 2008 on Khartoum level rather than national level as SHHS 2010, which was based on exit interviews rather than a household survey like SHHS2010. However, women's satisfaction and obstacles of maternal health service utilisation have been investigated also in the qualitative study with women in the focus group discussions.

Moreover, most of the culture and religion variables were poorly covered in the SHHS2010 and SARH 2008 survey data; therefore, I could not consider their impact on the pattern of utilisation as well as women's satisfaction. Consequently, I followed two strategies: the first was to construct an index from a series of short questions regarding women's acceptance of domestic violence and used women's education, place of residence variables as a proxy to reflect some of the impact of culture and community on the pattern of utilisation of maternity services; the second was collecting qualitative data regarding the culture and religious beliefs in relation to women's utilisation.

Another limitation in the SHHS 2010 is the coverage bias in some states that suffer from conflict problems, such as Darfur states. The data obtained from the governorates affected by

conflict are unreliable since many PSUs in the sample were not covered due to the difficulties in reaching many of these places. However, in order to reduce the coverage bias, the states were aggregated to regions.

Lastly, the SHHS 2010 was not self-weighted. That is, the sample distribution was not similar to the actual population distribution with respect to the place of residence; thus a weighting variable was calculated to correct for this differences in the sample before running any analysis in order to be able to generalise the findings. Accordingly, due to the fact that multilevel models do not consider weighting variables while running the analysis, obtaining the finding which could lead to a biased results (Tarling, 2009). Therefore, in order to minimise this sampling bias, I controlled the impact of the place of residence by entering into the model and testing its significance.

Moreover, in the SARH 2008 survey, there are crucial problems with respect to completeness and reliability in the all 7 states of the study, except Khartoum state. However, only data for Khartoum are used in the analysis; variables that have a high rate of missing have not been considered in the analysis in my study (for more details about the survey description and its objectives, see section 6.1.1.2).

However, despite the data limitations mentioned in this section, SHHS 2010 is considered the main data source in Sudan in obtaining maternal and child health indicators on the national and state levels. It is still valuable and worth to using it particularly on the aggregate level because the data problems may appear on particular state due to their poor quality of the data. Furthermore, all variables that have high percentages of missing were not considered in the analysis. Similarly, SARH 2008 is still worth to analyse it particularly only Khartoum state data will be considered in the study as its data are more consistent and have low missing value rate.

With respect to the qualitative data as primary data collection, there are three main limitations that need to be highlighted. Firstly, a major limitation of qualitative data used in this study is the political instability that started two years before the fieldwork due to the separation between north and south Sudan. The north-south separation has had notable consequences not only on the Sudan economy, thus cutting all allocated budgets for governmental expenditure including the health sector but also the inflation in the economy has a crucial impact on the Sudanese people, decreasing the levels of wellbeing and satisfaction. During the data collection period, a dramatic escalation of the political situation was occurring. As a result of that, the questions related to satisfaction are contaminated with the political situation and the deteriorating economic situation and it was important to consider this in the analysis. Furthermore, demonstrations were taking place, which forced the president of Sudan and prime minister to make some changes among lead staff in all ministries. Thus, in the middle of the data collection phase new staff had been hired in the posts that were included in the study sample. Because some of those people are new so they do not have experience about particular issues that this study was seeking to explore, one of the following strategies were followed in order to continue my field work : 1) agreed with the new managers to conduct the

interview with their deputies as they have better experiences with respect to the post and other related work matters; 2) keep the appointment with the previous manager and conduct with him the interview as he just left and I have already agreed with him about an appointment, particularly all those leaders still working in the Ministry but managing different departments.

In addition, there are no documents published on the exact size of the international funding and donors that are financing the reproductive health programmes in Sudan. I got several promises from decision makers to give me written documents but I did not receive any. All data I was able to obtain and analyse were from the interviews with decision makers and stakeholders. This covered in some detail the types of funding, challenges, their pathways from the sources to users, so I assessed this function based on this analysis.

Cancelling the appointments frequently with decision makers and stakeholders' groups due to the political instability was a major challenge that presented challenges in my entire interviews' schedule particularly deciding appointments that contradicted with other ones which caused a lot of problems in organising my field work schedule.

Secondly, lack of institutional records is a challenge that I faced during the field work. Indeed, both ministries are lacking archiving systems, which has had a severe impact on all work they have been producing. Many documents that the interviewees referred to had disappeared due to the high turnover among the staff that left their jobs without proper handover. Accordingly, many essential documents could not be found. Also, there is a lack of official and technical documentation for projects, activities, conventions. Officials in the ministries, therefore, were mainly relying on their memories, but because of the recall-bias and the high staff turnover problems, I could not get an exact or reliable answer on some questions or service details from any or some of the interviewers.

Such issues were also impacting on the reliability of the quantitative data because the methodology that had been used in collecting the data was not documented, even though data were collected in 2010, and the final version of the survey tools was not readily available. This problem took a lot of my time to ensure the tools and the data files as well as the methodology are the final versions and start the data analysis.

Chapter 7

Determinants of perinatal health service utilisation in Sudan

This chapter presents an analysis of the three health outcomes of the health system: levels of maternal mortality, women's satisfaction with maternal health services, and women's utilisation of maternal health services. The first section discusses the maternal mortality levels during the period between 2006 and 2010, which has clear implication regarding the maternal health status in Sudan during this period. The second section aims to empirically assess the influence of individual- and community- level characteristics on women's utilisation of antenatal and delivery services. The third section discusses the determinants of women's satisfaction of antenatal service utilisation. The last section presents findings on women's perceptions of utilisation of maternal health services with special focus on barriers to utilisation; in addition, the chapter explores the views of health providers and decision makers regarding the most significant factors affecting the pattern of utilisation.

The findings are drawn from three different surveys: Sudan Household Health Survey (SHHS) in 2010, situation analysis of reproductive health Survey (SARS) in 2008 (see chapter 6) and the analysis of 6 FGDs with women (users and non-users) with respect to their experience of maternal health services utilisation in the last childbirth and in-depth interviews with decision makers and health providers.

7.1 Maternal mortality in Sudan

The national Maternal Mortality Ratio (MMR) was estimated at 1,107 in 2006 and 216 per 100,000 live births in 2010 as shown in table 7.1. This difference is largely due to the fact that the MMR in 2006 was calculated based on both northern and southern states whereas the ratio was calculated in 2010 after excluding the southern states as the south Sudan separated to constitute a new country. The maternal mortality estimates in 2006 have been calculated using direct estimation methods. Data were collected during the listing process of the PSUs which were designed to have an average number of household of 80 to 120. It was estimated that the listing phase would provide the opportunity of covering an average of 80,000 to 100,000 households and thus giving an adequate sample size for the MMR estimations (FMOH, 2006). Unfortunately, no report has been published for SHHS 2010. Therefore, there is very patchy information regarding the sampling design of SHHS 2010; direct estimation methods were used to calculate the maternal mortality ratio in 2010 with the different methodology in drawing the sample of SHHS2006. No details have been mentioned in this regard. In addition, no sampling error or confidence intervals have been published with the MMR estimates.

In 2010, six states had MMR higher than the national average, four of which are in the conflict affected areas as presented in table 7.1.

Indeed, although maternal mortality ratios suggest huge improvement occurred in women's health status between 2006 and 2010, this should be viewed with caution partially due to methodological concerns of the surveys' designs where they used a direct technique in collecting of maternal mortality in 2010 and calculating maternal mortality ratio while indirect technique was used in 2006, sisterhood technique; beside changing the technique in drawing the sample itself. Furthermore, excluding the southern states in the 2010 survey where the worst maternal health has a significant impact in dropping the level of maternal mortality on the national level. Therefore, it is more reasonable to infer that more limited real improvement occurred across states achieved between 2006 and 2010. Thus, maternal mortality ratios on the national level are not comparable.

Table (7.1): Maternal mortality ratio, Sudan 2006 and 2010

State	MMR (per 100,000 live births)	
	2006	2010
<u>Northern States</u>		
South Darfur	1581	335
West Darfur	1056	322
North Darfur	346	178
North Kordofan	213	208
South Kordofan	503	112
White Nile	366	169
Kassala	1414	245
Gadarif	609	267
Red Sea	166	280
Blue Nile	515	258
Sinnar	320	106
River Nile	161	147
Gezira	355	186
Northern	94	127
Khartoum	311	175
<u>Southern states</u>		
Northern Bahr el Ghazal	2182	
Western Bahr el Ghazal	2216	
Lakes	2243	
Warrap	2173	
Western Equatoria	2327	
Central Equatoria	1867	
Eastern Equatoria	1844	
Jonglei	1861	
Unity	1732	
Upper Nile	2094	
Sudan*	1107	216

Source: Sudan Household Health Survey 2006, 2010

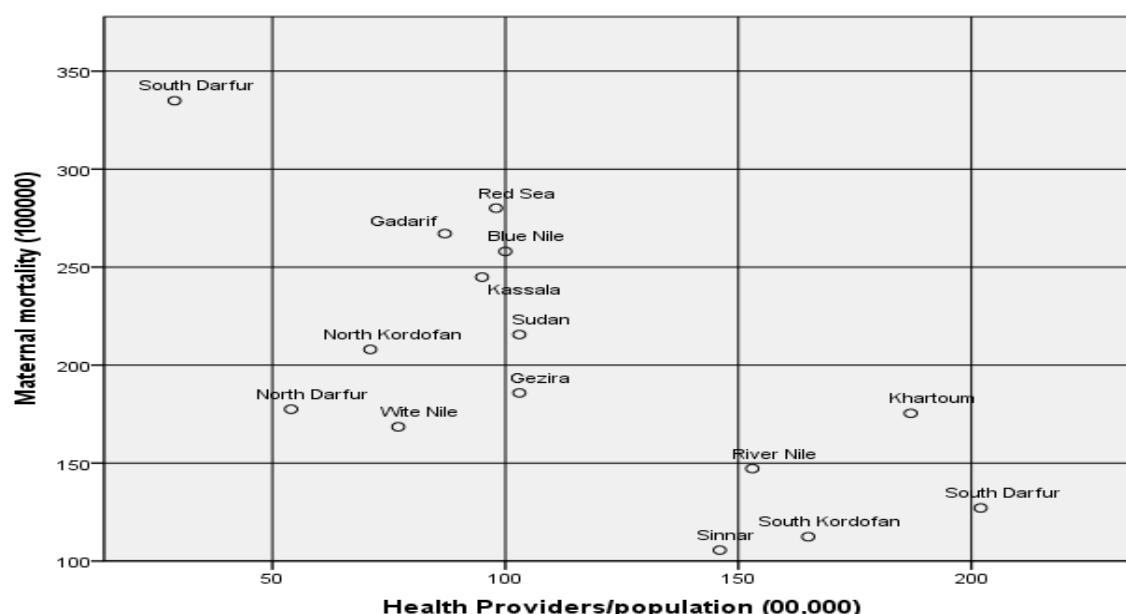
* The MMR 2006 was calculated based on both south and north Sudan, while MMR 2010 was calculated based on only northern states.

Women die due to complications during pregnancy, delivery or following pregnancy and childbirth. Most of the complications are developed during pregnancy. Other complications may exist before pregnancy but are worsened during pregnancy. Findings of a representative sample of maternal mortality survey in 2010 revealed that the highest deaths occur during delivery accounting for 39.2% of deaths followed by a postnatal period (36.1%) as indicated in table 1.2. Qualitative findings revealed that there is no postnatal service provided within the health system in Sudan; only irregular visit(s) by village midwives in order to receive mainly the delivery incentive (see more detailed discussion in chapter 8) while all government health facilities give women only 2 hours after delivery before discharge. Women can visit a health facility or village midwives in the community if they experience post-delivery complications and decide to seek maternal health services (see chapter 9).

The association of maternal mortality with availability of health services (i.e., functioning facilities and health providers) will be discussed in more detail in chapter 8.

Figure 7.1 presents the association between the maternal mortality ratios across the states and availability of health workforce (ratio of health providers per 100,000 population). There was an apparent negative association between availability of health workers and level of maternal mortality (Ibrahim, 2014) as would be expected. Further discussions about the impact of health providers and its challenges are addressed in chapter 9. In addition, issues related to the quality and accessibility of care and women's ability to seek care as well as mortality as well as the strategies that can be adopted to maximise the benefits of the health staff with respect to maternal mortality reduction are addressed in details in the qualitative studies in the second part of this chapter and chapter 10.

Figure (7.1): Maternal mortality ratios by health workforce ratios to 100,000 population, Sudan 2010



7.2 Maternal health services utilisation

The following section demonstrates the findings of bivariate and multilevel regression models of the SHHS-2010 data in order to identify the significant factors influencing the pattern of both antenatal and delivery healthcare services use on the national level

7.2.1 Characteristics of the study participants

Table 7.2 shows the distribution of women who reported that they were pregnant during the last 2 years preceding the survey by background characteristics. Of 6065 women, more than 50% were aged 20 to 29 years and 42.1% of women had at least 3 children. Domestic violence index was constructed in order to detect the women's perceptions towards accepting violence; it is constructed based on the women's responses to specific questions related to accepting domestic violence throughout their daily life activities. Five strata are identified, ranging from completely accepting to highly critical. The findings also show that more than 48.5 % of women have a critical attitude towards domestic violence as compared to 18.7% of their counterparts who completely accept domestic violence. More than two thirds of the study population (72.6%) live in rural areas. About 24% of women belong to the lowest wealth quintile comparing to 13.6% of women belong to the richest wealth index group.

Table (7.2): Distribution of ever-married women age 15-49 years, who were pregnant in the last two years preceding the survey, by selected characteristics, Sudan 2010

Background Characteristics	Number of women	Percent distribution of women
Women's Age		
15-19	436	7.2
20-24	1351	22.3
25-29	1764	29.1
30-34	1043	17.2
35-39	1017	16.8
40-44	362	6.0
45-49	92	1.5
Women's Education		
No formal education	2966	48.9
Primary	2074	34.2
Secondary+	1025	16.9
Number of children		
1	1157	19.2
2-3	2109	35.1
4-5	1420	23.6
6+	1329	22.1

Background Characteristics	Number of women	Percent distribution of women
Ever had child who later died		
Yes	1497	24.7
No	4568	75.3
Domestic violence Index		
0 (accepting)	1135	18.7
1	474	7.8
2	418	6.9
3	529	8.7
4	566	9.3
5 (highly critical)	2943	48.5
Education of household head		
No formal Education	3059	50.8
Primary	1882	31.2
Secondary +	1085	18.0
Urban-Rural residence		
Rural	4400	72.6
Urban	1664	27.4
State		
Northern	88	1.4
River Nile	188	3.1
Red Sea	140	2.3
Kassala	325	5.4
Gadarif	305	5.0
Khartoum	820	13.5
Gezira	794	13.1
White Nile	323	5.3
Sinnar	236	3.9
Blue Nile	283	4.7
North Kordofan	633	10.4
South Kordofan	324	5.3
North Darfur	410	6.8
West Darfur	320	5.3
South Darfur	877	14.5
Wealth index quintiles		
Poorest	1449	23.9
Second	1327	21.9
Middle	1336	22.0
Fourth	1127	18.6
Richest	826	13.6
All women	6065	100.0

Regular checkups by trained health providers are considered essential in monitoring women's and fetuses health status during pregnancy in order to detect any complications occurring at an early stage (UNFPA, 2014). Table 7.3 indicates the levels of conventional antenatal utilisation among women in reproductive age in the last two years preceding the survey. Of all 6065 women, 75.4% received conventional antenatal care; yet, almost half of them reported that they attended less than four visits (51.8%). Tetanus injections are given during pregnancy to prevent deaths from neonatal tetanus, which can result when sterile procedures are not followed in cutting the umbilical cord after delivery. However, only 57.4% of women reported that they received at least one dose of tetanus toxoid injection in all previous pregnancies although women should receive 5 injections during their entire maternity period as the environment is highly polluted in Sudan and the majority of women deliver at home where the sterilisation precautions are not available. Although the high prevalence of anaemia among women in reproductive age found in Sudan constitutes a serious risk to women's life during the maternity period (MHSP, 2012), only 60% of the participants took iron supplements during their last pregnancy. Additionally, table 7.3 highlights the percent of women who reported that they were suffering from one or more of the following complications during the last pregnancy: excessive vaginal bleeding, high blood pressure, convulsions, high fever, jaundice, foul smelling vaginal discharge. About 46.3% of women stated that they were complaining from at least one of the previous complications, even taking into consideration that awareness of some symptoms could be low. According to women's responses, 47.4% of women stated that health providers never discussed with them the plan of delivery.

Hygienic conditions and midwifery assistance for women who don't have medical complications at the time of delivery from a skilled attendant have significant influence in reducing the risk of complications and infection for both mothers and children; ultimately, better health for mother and children can be attained (Lancet, 2014). Looking at delivery service utilisation, the majority of women (79%) reported that they gave last birth at home comparing to only 21% of their counterparts who reported that they gave last birth at hospitals or primary health centres (PHCs). Regarding assistance at delivery, more than half of the respondents were assisted at birth by village midwives whereas 18.5% of women were assisted by physicians.

Table (7.3): Distribution of ever-married women age 15-49 years, who reported that they were pregnant in the last two years preceding the survey by health indicators, Sudan 2010

	Number of women	% distribution of women
Antenatal Care		
Traditional Birth Attendant / None	1400	24.7
Village midwives/ health visitors	1377	24.3
Doctor/Nurse	2898	51.1
Number of antenatal visits		
Less than 4 visits/None	2915	51.8
4 visits or more	2715	48.2
Ever had complications during last pregnancy		
No	3036	53.7
Yes	2617	46.3
Receiving antenatal services *		
Did not receive	1275	22.5
Partial	1434	25.3
Complete	2965	52.3
Discussion with health provider the place and the mode of delivery		
Never	2667	47.4
Yes	2959	52.6
Any tetanus toxoid injection during last pregnancy		
No	2408	42.6
Yes	3240	57.4
Received Iron or fefol Tablets		
No	2230	39.8
Yes	3373	60.2
Assistance at delivery		
Traditional Birth Attendants/ None	1506	26.5
Village midwives/ health visitors	3124	55.0
Doctors/Nurses	1050	18.5
Ever had complications during last delivery		
No	3579	63.3
Yes	2076	36.7
Place of Delivery		
Home	4473	79.0
Hospital/PHC**	1191	21.0
All women	6065	100.0

* Blood test taken, blood pressure taken, and urine specimen taken

** PHCs are not equipped to provide labour and birth care except in remote areas where hospitals are not available

7.2.2 Women's utilisation of maternal health services

Table 7.4 shows the pattern of antenatal and birth care services utilisation for the most recent birth during the 2 years prior to the survey. Three quarters of mothers (75.3 %) attended at least one antenatal care visit with trained health provider while skilled birth attendants assisted 73.5% of women. Both women's age and parity are negatively associated with utilisation of antenatal and birth care services whereas women's education and education of head of household are positively associated with both maternal health services utilisation.

Table 7.4 highlights the great disparity between states where women living in Northern and Khartoum states are more likely to use maternal health services as compared to women living in Blue-Nile and West-Darfur states. Qualitative research revealed that this could be mainly attributed to accessibility and affordability obstacles, as discussed in section 7.4 in this chapter and further in chapter 9. Consistently, women in the highest wealth quintile were most likely to receive professional antenatal service and had delivered with skilled birth attendants (95.1% and 98.7% respectively) comparing to their counterpart in the lowest wealth quintile where only 62.6% and 48.5% of women used antenatal and delivery services.

Table (7.4): Pattern of antenatal and birth care services utilisation among ever-married women age 15-49 years, who reported that they were pregnant in the last two years preceding the survey by selected characteristics, Sudan 2010

Background Characteristics	Percentage of women who used skilled antenatal service	chi-square	Percentage of women who used skilled birth attendant	chi-square
Women's Age				
15-19	78.5	0.000	70.5	0.019
20-24	76.4		74.6	
25-29	75.2		72.1	
30-34	77.9		74.4	
35-39	74.1		76.0	
40-44	66.7		73.1	
45-49	66.3		60.5	
Women's Education				
No formal education	63.1	0.000	53.7	0.000
Primary	83.4		89.2	
Secondary+	93.8		97.8	
Number of children				
1	81.1	0.000	80.1	0.000
2-3	77.7		75.5	
4-5	71.8		70.2	
6+	70.2		68.4	

Background Characteristics	Percentage of women who used skilled antenatal service	chi-square	Percentage of women who used skilled birth attendant	chi-square
Domestic violence Index				
0	68.8	0.000	56.0	0.000
1	77.4		69.7	
2	71.3		62.1	
3	71.0		75.4	
4	80.1		83.3	
5	78.0		80.2	
Education of household head				
No formal Education	67.9	0.000	62.2	0.000
Primary	80.4		81.5	
Secondary +	87.5		91.4	
Urban-Rural residence				
Rural	71.0	0.000	66.6	0.000
Urban	86.8		91.9	
State				
Northern	90.5	0.000	98.8	0.000
River Nile	77.2		91.6	
Red Sea	65.2		73.3	
Kassala	75.8		70.5	
Gadarif	72.5		64.1	
Khartoum	89.6		95.2	
Gezira	79.5		90.8	
White Nile	81.6		88.4	
Sinnar	69.9		83.9	
Blue Nile	52.5		46.3	
North Kordofan	83.2		82.5	
South Kordofan	74.4		62.8	
North Darfur	67.8		66.2	
West Darfur	58.2		33.9	
South Darfur	69.5		50.4	
Wealth index quintiles				
Poorest	62.6	0.000	48.5	0.000
Second	68.4		60.7	
Middle	74.4		79.2	
Fourth	86.6		95.4	
Richest	95.1		98.7	
All women	75.3		73.5	

Experiencing health complications during pregnancy had no significant impact on women's utilisation of antenatal health service whereas they are more likely to use professional birth care services but the influence works in an unexpected direction as demonstrated in Table 7.5. That may be attributed to confounding factors that are likely to be associated with both the experience of complications and skilled delivery care that are not controlled for. Moreover, it may be a problem in the way of asking the questions of women's experiences on maternal complications in the SHHS- the women's questionnaire or lack of understanding among data collectors; thus this module should be reviewed for the next round of SHHS. The qualitative findings contributed to understanding better the motives of service utilisation in section 7.4 in this chapter.

Table (7.5): pattern of utilisation of maternal services among ever-married women age 15-49 years according their experience of health complications during last pregnancy and delivery, Sudan 2010

	Percentage of women who used professional services	Percentage of women who did not use professional services	chi-square
women who ever had complications during last pregnancy	76.4	74.7	0.148
women who ever had complications during last pregnancy	69.5	77.4	0.000
women who ever had complications during last delivery	69.5	76.2	0.000

Using professional antenatal service has a significant association with women's utilisation of birth care services although it is not a clear linear relationship. Table 7.6 shows that women who received antenatal care from doctors or village midwives are likely to deliver using assistance from skilled birth attendants. Moreover, discussion with the health provider about the place and the mode of delivery has a clear impact on delivery service utilisation. Of the total sample, 89.2% of women who reported that the health provider discussed the delivery plan with them delivered using assistance from skilled birth attendants as compared to only 56.1% of their counterparts who reported that the health providers did not discuss that issue.

Table (7.6): Pattern of birth care services utilisation among ever-married women age 15-49 years, who reported that they were pregnant in the last two years preceding the survey by health indicators, Sudan 2010

	Percentage of women who used skilled birth attendants	chi-square
Antenatal health provider		
Traditional Birth Attendant / None	44.6	0.000
Village midwives/ health visitors	73.6	
Doctor/Nurse	87.5	
Number of antenatal visits		
Less than 4 visits/None	60.4	0.000
4 visits or more	87.5	
Discussion with health provider the place and the mode of delivery		
Never	56.1	0.000
Yes	89.2	
All women	73.5	

7.2.3 Determinants of utilisation of maternal health services

The patterns of utilisation of maternal health services are strongly influenced by locations. There is a clear disparity among states in Sudan and even within the same state as comprehensively discussed in the qualitative findings (see chapters 8, 9, 10). Therefore, applying standard binary regression models leads to bias. Alternatively, two-level random intercept models are applied to estimate the overall association between utilisation of antenatal and birth care services and other individual, household, community and health predictors (“fixed effects”); in addition, the variation in maternal health care utilisation outcomes among clusters (geographic areas) are examined (“random effects”). Table 7.7 presents three models; **model (1)** indicates the determinants of women’s utilisation of antenatal health service utilisation; **model (2)** presents the determinants of delivery service utilisation while **model (3)** is the same as model 2 with the addition of the variables of antenatal health service utilisation.

The findings of the fixed effect aspect of the three models suggested that education level, whether women’s education or education of head of household, is significantly associated with utilisation of both antenatal and delivery health service after controlling for other confounding factors as presented in table 7.7. Women who have at least secondary education are 3.9 times more likely to attend for antenatal service compared to their counterparts who have no formal education, while they are 7.7 times more likely to use formal delivery care

services. Similarly, the education level of head of household was significantly associated with the women's decision of maternal health service utilisation; women who belong to a household headed by persons who have secondary education are 1.6 times more likely to use antenatal and birth care services as compared to women who are living in households headed by people who have no formal education.

Moreover, maternal experience is significantly associated with the pattern of maternal utilisation among women in a sense that woman who has a child are 1.4 and 2 times more likely to use antenatal and birth care services respectively as compared to a woman who has at least six children. Unexpectedly, women's status has no significant influence on maternal health behaviour in a sense that women who accepting domestic violence are nearly 20 % more likely to use antenatal services whereas are 20 % less likely to use birth care services as compared to their counterparts who showed high refusal of domestic violence; the results were not significant.

The place of residence is significantly associated with utilisation in which women living in urban areas are 1.6 times more likely to use maternal services as compared to their counterparts living in rural areas, indicating an accessibility problem in rural and remote areas.

This result is consistent with the findings coming from the qualitative data where the vast majority of study participants identified the shortage of health providers particularly outside Khartoum in rural areas as a serious challenge as well as the notable disparity of the distribution of functioning health facilities (see chapters 9 and 10 for more details).

In addition, the findings show the importance of the household income level (based on household wealth index) on the women's utilisation of health services, even though several presidential and ministerial decrees have been issued in order to provide these services free of charge as indicated by the qualitative findings; yet more illustration of this particular point is covered in section 7.6 in this chapter and chapters 8 and 9. The odds of using antenatal and birth care services are significantly increased by wealth index as compared to the poorest women (OR of the richest = 5.2 and 7.2 respectively).

Lastly, the findings provide evidence that receiving some antenatal services is significantly associated with the women's decision of using delivery care service. Women who received antenatal care from village midwives, health visitors, or physicians are two times more likely to deliver with assistance from skilled birth attendants as compared to women who received antenatal services from traditional birth attendants only. Moreover, the odds of using delivery service are increased by discussing their delivery plan with a health provider and receiving at least four antenatal visits (OR = 1.98 and 1.4, respectively).

In conclusion, the findings of the fixed effect part of the three models suggested that the most important determinants in women's utilisation of antenatal and birth care services are: the

education of both women and head of household; and household wealth. Additionally, receiving antenatal care increases the likelihood of the utilisation of delivery service.

Table (7.7): Determinants of the use of antenatal and birth care services among ever-married women age 15-49 years, who reported that they were pregnant in the last two years preceding the survey, Sudan 2010; results for two-level logistic models

Parameters	Antenatal Service Utilisation		Delivery service utilisation			
	Model 1		Model 2		Model 3	
	Odds Ratio	S. E	Odds Ratio	S. E	Odds Ratio	S. E
women's Age						
15-19	1.373	0.222	1		1	
20-29	1.263	0.158	0.833	0.289	0.746	0.299
30-39	1.301	0.143	0.771	0.213	0.722	0.221
40-49	1		1.066	0.193	1.007	0.201
women's education						
No formal education	1		1		1	
Primary	1.796***	0.097	3.463***	0.131	3.043***	0.134
Secondary+	3.854***	0.199	10.014***	0.384	7.668***	0.386
Number of children						
1	1.407**	0.153	1.969***	0.205	1.873***	0.213
2-3	1.247	0.121	1.382**	0.159	1.297	0.164
4-5	0.945	0.110	0.992	0.144	0.999	0.148
6+	1		1		1	
Domestic violence						
Low autonomy	1		1		1	
Moderate autonomy	0.800**	0.111	0.961	0.141	1.013	0.144
High autonomy	0.875	0.095	1.152	0.123	1.196	0.126
Education of head of household						
No formal education	1		1		1	
Primary	1.357***	0.091	1.607***	0.121	1.514***	0.125
Secondary+	1.562***	0.134	1.667***	0.188	1.553***	0.193
U/R residence						
Rural	1		1		1	
Urban	1.627***	0.151	3.241***	0.282	2.838***	0.269
state of residence						
Khartoum	1.325	0.330	4.071**	0.671	3.241	0.631
Northern region	1.163	0.239	18.174***	0.586	16.511***	0.553
Eastern region	1.300	0.181	2.735***	0.307	2.807***	0.295
Southern region	1.199	0.152	3.777***	0.261	3.589***	0.250

Parameters	Antenatal Service Utilisation		Delivery service utilisation			
	Model 1		Model 2		Model 3	
	Odds Ratio	S. E	Odds Ratio	S. E	Odds Ratio	S. E
western region	1		1		1	
wealth index						
Poorest	1		1		1	
Second	1.126	0.106	1.209	0.130	1.170	0.133
Middle	1.246	0.127	1.784***	0.166	1.688***	0.170
Fourth	2.138***	0.170	4.968***	0.278	4.137***	0.283
Richest	5.150***	0.271	9.478***	0.589	7.207***	0.576
Received Antenatal						
None/traditional birth attendant					1	
Village midwives/ health visitors					2.222***	0.148
Doctor/Nurse					2.310***	0.148
Discussed with health provider the place and mode of delivery						
Never					1	
Yes					1.982***	0.125
number of antenatal visits						
less than 4 visits					1	
4 visits or more					1.425***	0.125

***p < .01; **p < .05

As discussed in chapter 6, clusters variable was used as the second level the multilevel models in order to assess the impact of geographic areas on women's utilisation, controlling for the effect of other predictors. The number of clusters is 600; minimum number of women in a cluster is 2 whereas the maximum is 20. The findings of the random effect analysis revealed that the Z-ratios were calculated and compared with a standard normal distribution in order to carry out the significance tests as shown in table 7.8 in order to test the significance of applying the multilevel models. Moreover, the estimates of intra area correlation for the three multilevel models have been calculated.

The significance tests suggested that the differences between areas are highly significant for the two outcomes after controlling for the effects of individual level factors. In addition, the results of intra-area correlation imply that more than 22.4% (antenatal Model), 50% (Model1) and 47% (Model 2) of the total unexplained variation in the odds of pattern of maternal health services utilisation (antenatal and delivery) are attributed to cluster level factors. That has a significant implication in terms of the role of mal-distribution of health facilities and health providers across states in Sudan. Accordingly, the analysis highlights the importance of unobserved community-level factors in service utilisation, especially delivery care.

Table (7.8): Intra-area correlation for antenatal and delivery services, Sudan 2010

	Estimates	S.E	Z-value	Sig.	Intra- area correlation (%)
Antenatal Service Utilisation Model	0.951	0.104	9.144	***	22.4
Delivery service utilisation (Model 1)	3.312	0.325	10.206	***	50.2
Delivery service utilisation (Model 2)	2.924	0.295	9.922	***	47.1

***p < .01

7.3 Women's satisfaction with maternal health services

The following section demonstrates the findings of bivariate and logistic regression of the situation analysis of reproductive health services (SARH-2008) data in order to identify the significant factors influencing the women's satisfaction with antenatal care services provided at primary health centres (PHCs) and hospitals in Khartoum.

7.3.1 Characteristics of the study participants

Although the sample of health facilities in the SARH-2008 survey was representative, women in the study sample were not representative of all socio-demographic characteristics of Khartoum as the sample is exit interviews with 302 women immediately following attendance for antenatal care at surveyed facilities during the period of data collection; Table 7.9 presents the background characteristics of the interviewed women. Of 302 women, 69.9% were aged 15 to 29 years; nearly two thirds of women (64.5%) reported that they have no formal education while only 19.3 % have secondary education or above. The vast majority of respondents (92.1%) are not working for cash. More than half of the women had one child or they were currently pregnant with their first child. Women were mostly paying out of pocket for maternity care, as only 7.9 % of clients had health insurance coverage.

Table (7.9): Distribution of clients who received antenatal service in the surveyed health facilities during the period of the data collection by background characteristics, Khartoum 2008

Background Characteristics	Number of women	%
Women's Age		
15-19	31	10.3
20-29	180	59.6
30-39	84	27.8
40-49	7	2.3
Women's Education		
No formal education	194	64.5
Primary	49	16.3
Secondary+	58	19.3
Husbands' Education		
No formal education	63	20.9
Primary	90	29.8
Secondary+	149	49.3
Women's work status		
not working	278	92.1
working	24	7.9
Number of children		
0-1	159	52.6
2-4	102	33.8
5+	41	13.6
Have health insurance		
Yes	49	16.2
No	253	83.8
Type of place of residence		
Settled without legal documents	11	3.6
Rented	90	29.8
Owned	201	66.6
All women	302	100

Women were asked several questions regarding their experience of the last antenatal visit (that they had just completed) as shown in Table 7.10. More than two thirds of women (70.3%) received the antenatal services from village midwives. The majority of the women (78.5%) were interviewed after receiving the service from PHCs. About 64.9% reported that the health provider explained medical examination/ procedures before doing them. Furthermore, 33.3% of women indicated that the health provider gave them a chance to voice their questions / concerns and he/she sufficiently answered their questions whereas 62% of them reported that they did not have any questions to ask. More than three-quarters of women

(77.5%) believed that there was enough privacy during consultation with the health provider and 75.5 % of women considered the length of time the provider spent with them was sufficient. About two thirds (60.9%) believed the service is not expensive. Furthermore, 68.5% of women reported that health providers have not advised them to deliver at a health facility. That is consistent with the health policy in Sudan, which is encouraging women to deliver at home as long as they are not in high-risk pregnancy. However, women who participated in the study were in different trimesters of pregnancy and doctors usually discuss the delivery plan in the later stage of pregnancy. The analysis also indicated that the majority of women (92.7%) found the working hours of the health facility convenient.

Table (7.10): Distribution of clients who received antenatal service in the surveyed health facilities during the period of the data collection by their current experiences of antenatal service utilisation, Khartoum 2008

	Number of women	Percent distribution of women
Current health provider		
Village midwives/ Health visitors	211	70.3
Physician	89	29.7
Facility Type		
Primary Health Care	237	78.5
Secondary Health Care	23	7.6
Tertiary Health care	42	13.9
Women's perception regarding the length of time the provider spent with the client		
Not proper	74	24.5
About Right	228	75.5
Health providers answered women's questions		
Women's questions were not answered	14	4.7
Women's questions were answered	100	33.3
Women did not have questions	186	62.0
Health provider explained medical examination/ procedures before doing them		
Poor/Moderate	106	35.1
comprehensive	196	64.9
Waiting		
Not proper	74	24.5
About the right	228	75.5
Enough privacy during consultation with the provider		
Less privacy/None	68	22.5
privacy observed fully	234	77.5

	Number of women	Percent distribution of women
Cost of services in the facility		
Expensive	66	21.9
Not Expensive	184	60.9
DK	52	17.2
Advised to deliver at a health facility		
Yes	95	31.5
No	207	68.5
Facility working hours		
Convenient	280	92.7
Not Convenient	22	7.3
Total	302	100.0

7.3.2 Women's satisfaction with maternal health services

Patient satisfaction has been increasingly recognised as an important aspect in attaining one of the intrinsic goals of health systems, which is responsiveness (see chapter 2 for more details). The concept of satisfaction is complex and has a multidimensional nature. There is a major challenge in conceptualising women's satisfaction with health care because it is strongly influenced by several factors such as local culture, women's expectations, attitudes, and specific healthcare systems. All these factors are largely varied from one community to another and even among same community. However, Sawyer et al. (2013) argued that the women's satisfaction can be determined by the difference between what is expected and what actually happens (Sawyer et al., 2013). The definition of satisfaction for the purposes of this survey was described in chapter 2, section 2.2. Table 7.11 demonstrates the levels of women's satisfaction according to their background characteristics. Women with higher education are less likely to be satisfied with health care (64.9%) as compared with illiterate women (77.7%). Similarly, working women have higher expectations than women who are not working; thus 60% of working women are satisfied as compared to 76.4% of not working women but these are not significant given the high p-values, presumably due to low statistical power as the sample size is limited. Satisfaction is also negatively associated with the number of children that a woman has in a sense that the longer her previous experience with antenatal service utilisation, the higher probability of developing dissatisfaction. Women who are covered by health insurance are more likely to be satisfied (79.2%) as compared to 73.2% of uncovered women who were satisfied with the antenatal service they received.

Table (7.11): women's satisfaction with last antenatal services received in the surveyed health facilities during the period of the data collection by background characteristics, Khartoum 2008

Background Characteristics	% of women who are satisfied with the antenatal services	chi-square p-value
Women's Age		
15-19	83.9	0.045
20-29	77.0	
30-39	65.5	
40-49	100	
Women's Education		
No formal education	77.7	0.146
Primary	75.5	
Secondary+	64.9	
Husbands' Education		
No formal education	66.1	0.166
Primary	75.3	
Secondary+	78.5	
Women's work status		
not working	76.1	0.140
working	62.5	
Number of children		
0-1	81.1	0.008
2-4	72.0	
5+	58.5	
Have health insurance		
Yes	79.2	0.531
No	73.2	
Type of place of residence		
Settled without legal documents	80.0	0.077
Rented	66.3	
Owned	78.6	
All women	74.5	

Moreover, the findings indicate that women prefer to receive antenatal care from village midwives; 78.7% of women who received antenatal care from village midwives or health visitors were satisfied whereas 67.8% of women who received antenatal care from physicians were satisfied as indicated in table 7.12. Furthermore, women who got answers from health

providers for all of their concerns were more satisfied (78.8%) as compared to only 35.7% of women who did not get answers to their questions. Findings also provide evidence that the more health providers give some time to explain medical examination procedures before starting, the more the women are satisfied. There was no evidence of a significant difference in satisfaction with respect to the privacy during the consultation: about 79% of women who reported there was less privacy were satisfied as compared to 73.8% of women who reported that privacy was fully observed. The insignificant difference may be attributed to the low expectation of having privacy among women or the antenatal care is mostly discussion in a certain aspects related to women's diet during pregnancy, and breastfeeding thus the privacy concern is not essential for women as the clinical examination is not occurring in every antenatal visits (see chapter 9 for more details about the antenatal services). The cost of the services is associated with the level of women's satisfaction in a sense that women who found the service was expensive were less likely to be satisfied (60.9%) as compared to their counterparts who found the cost of the service was reasonable (78.8%). Of women who reported that the facility working hours are convenient, 75.9% were satisfied as compared with 63.6% of women who reported that the hours were not convenient, although the association is not significant. The level of health provider's satisfaction with their salaries has some impact on their performance with clients; however, the difference is not significant. 73.4% of women who received the antenatal services from health facilities whose health providers are not satisfied with salaries (below average) were satisfied comparing to 79.2% of women received antenatal care from facilities whose staff are satisfied with salary (over average). In addition, 68.7% of women were satisfied after receiving the service from health facilities whose staff dissatisfied with the job as compared to 76.7% of women received service from facilities whose staff are satisfied with the job (over average). The lack of significance despite some of these notable differences may be attributed to lack of statistical power due to limited sample size. For instance, only 22 of the overall sample of 302 women viewed facility working hours as not convenient.

Table (7.12): Women's satisfaction with last antenatal services received in the surveyed health facilities during the period of the data collection by their current experiences of antenatal service utilisation, Khartoum 2008

	% of women who are satisfied with the antenatal services	chi-square p-value
Current health provider		
HV/MW	78.7	0.048
Physician	67.8	
Facility Type		
Primary Health Care	78.0	0.068
Secondary Health Care	60.9	
Tertiary Health care	65.9	
Health providers answered women's questions		
Women's questions were not answered	35.7	0.002
Women's questions were answered	78.8	
women did not have questions	76.2	
Health provider explained medical examination/ procedures before doing them		
Poor/Moderate	64.4	0.002
comprehensive	80.6	
Women's perception regarding the length of time the provider spent with the client		
Not proper	75.7	0.877
About Right	74.8	
Enough privacy during consultation with the provider		
Less privacy/No	79.1	0.379
privacy observed fully	73.8	
Cost of services in the facility		
Expensive	60.9	0.014
Not Expensive	78.8	
DK	78.8	
Facility working hours		
Convenient	75.9	0.201
Not Convenient	63.6	
receiving maternal care from health provider who satisfied with salary		
Below Av.	73.4	0.312
Over Av.	79.2	
receiving maternal care from health provider who satisfied with job		
Below Av.	68.7	0.180
Over Av.	76.7	
All women	74.5	

Table 7.13 shows the women's perceptions and preferences towards antenatal services offered at health facilities. The findings of binary logistic regression revealed that lack of previous maternal experience increases the likelihood of satisfaction levels among women (OR= 2.9) after controlling for all other predictors. Similarly, women who are not working are 2.5 times more satisfied as compared to their counterparts who are working; however, this is not significant at 5%.

Findings provide evidence that education increases the expectation of women with respect to maternal health services in a sense that illiterate women are 1.8 times more likely to be satisfied with the services as compared to women who have at least secondary education; yet, the women's education level showed to be insignificant in this model. In addition, type of place of residence is used in the analysis to reflect the poverty level of the household to which a woman belongs. The odds of satisfaction increase among women belonging to a poor household (OR=6.0) indicating that the expectations of poor women are significantly lower comparing to middle-income and rich women. Nevertheless, the number of cases belonging to a poor household are too limited (n=11) which explained the lack of significance ($p>0.05$), despite large effect size (OR=6).

Women showed a higher level of satisfaction after receiving antenatal services from village midwives and health visitors as compared to women who received the similar services from physicians (OR=1.7), although the association is not significant ($p = 0.199$), which may be attributed to the small sample size. This finding is consistent with the qualitative data in which women clarified that they preferred to deal with village midwives rather than physicians even though many of them stated that physicians are more qualified. Indeed, both qualitative and quantitative analysis indicated that good professional communication reflecting responsiveness rather than the quality of services per se is the preferred choice among women who are not suffering from serious complications (see also section 7.3 in this chapter).

The behaviour of health providers in the examination room is likely to be significantly important to increasing the satisfaction level among clients. Explaining medical examination and procedures before doing them, and answering women's questions significantly increased the odds of women's satisfaction (OR= 2.2 and 7.9 respectively). However, neither the levels of health providers' satisfaction with job nor salaries appeared to significantly influence their performance at work with clients; ultimately women's satisfaction. These findings are consistent with the analysis of in-depth interviews with health providers and village midwives in focus group discussions regarding the challenges they face at work, which they argue severely influences their own satisfaction but they do not allow this to affect their work and clients (see chapter 8 and 9 for more details).

Interestingly, neither privacy during consultations nor waiting time before receiving the antenatal service significantly influenced the level of satisfaction. Lack of privacy during the consultation and long waiting time before receiving services have a weak association with

women's satisfaction whereas having been turned away from a facility during working hours without receiving the service and the high cost of service are significantly associated with women's satisfaction (OR= 2.7 and 2.2, respectively). However, the qualitative findings showed evidence that one of the challenges that users face is the long waiting time before receiving the maternal health services.

In conclusion, among the most important factors affecting the level of satisfaction are explaining medical examination procedures before carrying them out, answering women's questions and minimising the rate of returning cases without receiving the services. In other words, showing respect and giving the care providers time to explain and answer women's questions, and improve the client-health provider professional relationship are low-cost interventions that clearly increase the responsiveness among women. However, further research is needed in order to measure the cost-effectiveness of these interventions, as it requires more time from health providers while there is a shortage in health providers and they are overloaded.

Table (7.13): Determinants of women satisfaction with last antenatal services received in the surveyed health facilities Khartoum 2008; results of logistic regression

Women's Characteristics	OR (95 % CI)	P-Value
Women's Education		
No formal education	1.802 (0.796 - 4.079)	0.158
Primary	1.390 (0.520 - 3.716)	0.512
Secondary+	1	
Women's work status		
not working	2.503 (0.903 - 6.938)	0.078
working	1	
Number of children		
0-1	2.932 ** (1.174 – 7.322)	0.021
2-4	1.475 (0.596- 3.649)	0.401
5+	1	
Have health insurance		
Yes	1	
No	.843 (0.343 - 2.071)	0.710
Type of place of residence		
Settled without legal documents	6.036 (0.780 - 46.699)	0.085
Rented	1	
Owned	1.972** (1.023 - 3.800)	.043
Current health provider		
Village midwives/ health visitors	1.697 (0.758 - 3.800)	0.199
Physician	1	

Women's Characteristics	OR (95 % CI)	P-Value
Facility Type		
Primary Health Care	1	
Secondary Health Care	1.715 (0.643 - 4.577)	0.281
Tertiary Health care	.811 (0.223 - 2.953)	0.751
Ever been turned away from the facility during official working hours		
Yes	1	
NO	2.705** (1.050 - 6.966)	0.039
No previous experience with facility	1.476 (0.470 - 4.638)	0.505
Health providers answered women's questions		
Women's questions were not answered	1	
Women's questions were answered	7.890*** (1.780 - 34.973)	0.007
women did not have questions	5.849** (1.387 - 24.662)	0.016
Health provider explained medical examination/ procedures before doing them		
Poor/Moderate	1	
comprehensive	2.223** (1.168 - 4.233)	0.015
Women's perception regarding the length of time the provider spent with the client		
Not proper	1.494 (0.687 - 3.246)	0.311
About Right	1	
Enough privacy during consultation with the provider		
Less privacy/No	2.057 (0.890 - 4.755)	0.092
privacy observed fully	1	
Cost of services in the facility		
Expensive	1	
Not Expensive	2.156** (1.037 - 4.482)	0.040
DK	1.995 (0.720 - 5.524)	0.184
receiving maternal care from health provider who satisfied with salary		
Below Av.	1	
Over Av.	1.232 (0.550 - 2.759)	0.611
receiving maternal care from health provider who satisfied with job		
Below Av.	1	
Over Av.	1.292 (0.621 - 2.687)	0.494

***p < .01; **p < .05

Indeed, qualitative analysis of the FGDs with women support most of the quantitative findings and complement them in other points. Showing respect and giving the care providers time to explain and answer women's questions, and improve the client-health provider

professional relationship are highlighted by women in both qualitative and quantitative findings as important motives for utilisation. Thus, women prefer village midwives' care for mild health conditions whereas they seek medical care for acute conditions.

Both analysis of qualitative and quantitative data indicated that women usually do not seek health services unless they perceived their conditions as severe. Thus, the pain that women can tolerate or the mild bleeding are not considered motives for them to seek services. This may not only be a matter of cultural attitudes towards need for care but also availability, affordability and other health system aspects that force women to be selective about which health conditions make them seek health services.

In addition, both analyses provide assurance that although poor working environment and low salaries are affecting the work satisfaction of the health providers, they do not believe this affects their work with patients. However, it is possible that these aspects may influence their work on the medium or long term through the level of care or indirectly through staff retention problems: staff leaving the work if there is a better opportunity available.

Other important aspects emerged from the thematic analysis that complemented the quantitative analysis. These helped in deepening the knowledge of the factors influencing the women's satisfaction and utilisation of services such as hospitals' hygiene level, hospital congestion, and some medical malpractice. These factors will be discussed in detail in the following chapters.

7.4 Perceived barriers of maternal health services utilisation

This section aims to identify the underlying barriers to utilisation of maternal health services provided by village midwives at community level and professional health staff at health facility level in Khartoum through qualitative analysis of focus group discussions (FGDs) with 29 reproductive-age women in Khartoum (service users/ and non-users) as well as in-depth interviews with decision makers and health providers.

Except in a few cases, the majority of women claimed that the main two motives for using the antenatal service during previous pregnancies were, feeling acute pain and haemorrhage, suggesting that regular attendance is not prioritised unless acute problems arise. In contrast to this, however, most also stated that antenatal service is important for their and foetus' health and that women should attend regular antenatal visits.

Consistent with the quantitative findings in this chapter, table 7.7 revealed that the association between experiencing maternal complications during pregnancy and antenatal service utilisation is not significant. The focus group discussions revealed that women do not consider suffering from maternal complications, including pain and haemorrhage, as a serious motive for seeking health services unless the symptoms are severe. This delay in taking the decision of utilisation is exposing women to morbidity or mortality risk as there is no referral

system in Sudan and this delay may be followed by other delays such as in transportations, meeting the health provider, and so forth.

Women who were non-users argued that even when they felt pain or light to moderate haemorrhage they did not seek health services. Instead, they took medicine recommended by relatives or they went to pharmacy; some women highlighted the important role of pharmacy in treating their health problems to the extent that they prefer going to a pharmacy rather than health facilities if they experience a health problem. A woman said:

'When I had light bleeding I went to pharmacy... I do not like to go to the hospital ... the man gave me medicine and advised me to rest and do not do any domestic work... I could not because I have children and husband... I had to keep working ... the bleeding was stopped for a short period after taking medicine but continue whenever I start working at home... I carried sponge with me when I saw blood on my legs I clean it and keep working'

Moreover, women argued that some women took the prescription from the physicians and failed to use it because they do not have enough money to buy medicine. This has severe implications for women's health and exposes them to greater risk in pregnancy. This argument is consistent with the arguments of health providers, which will be discussed in chapters 8 and 9.

Some users who attended the antenatal visits at PHCs referred to changing the health providers during pregnancy period if they felt serious complications as the village midwives or health visitors at PHCs could not help; hence they would visit a consultant at a private clinic or travel to a higher-level health facility. None of the women stated that the initial health provider referred her to the higher level in the case of complications; also the women's responses indicated that they did not trust PHCs to refer and therefore they decided on their own initiative to visit a private doctor or consultant at the hospital in the case of serious health problems. Usually, health providers give each woman a new appointment for the next visit; this procedure has a significant impact on the regularity of women in attaining antenatal visits.

The majority of users and non-users of antenatal services who took part in the focus group discussions gave birth with assistance from health providers, consistent with the SARH 2008 survey findings. Only a few women (2 non-users) preferred to deliver by themselves with some help from relatives or traditional midwives; the reasons they mentioned were previous very bad experience such as losing their foetus before/during labour due to health providers' mistakes, and they were accustomed to not use an external help. According to the women's FGDs, selecting the type of delivery service was usually determined by three key criteria: the delivery expenses, availability, and previous experience.

Regarding seeking postnatal services, no women reported that they seek postnatal services as far as they do not suffer from post-delivery complication. Women who delivered at health

facilities are checked by someone after delivery whereas most of the women delivered by midwives received at least one visit after the birth from the village midwife in order to check the stitches and wash the lower part of the woman besides receiving the delivery incentive from women as will be discussed in detail in chapters 8 and 9. Some women argued that they took an appointment from physicians at hospitals after 40 days for the contraception purpose.

Women users and non-users identified the challenges that they faced in utilising maternal health services according to their previous experience; some of these barriers have been highlighted by health providers and village midwives and some acknowledged by decision makers (see chapter 9). The most important barriers the women reported as contributing to the low utilisation among women are accessibility, financial barriers, bad experience at facilities and with health providers, and cognitive barriers.

1) Accessibility

Distance to the health facility and inadequate means of transportation were commonly cited reasons for not utilising maternal health services at health facilities. It is a major barrier that prevents or reduces the chance of utilisation among women living in remote areas. A woman argued that the long way to the clinic made her decline to go for regular antenatal visits particularly as the transportation is not regular in her neighbourhood and she has to walk a long distance before finding any mean of transportation. Her counterparts agreed with her and one participant added:

'I went one time when they told me I am pregnant and I could not go again because the long way make me very tired but usually I go if I feel sick or suffer from severe pain'

Furthermore, the cost of transportation and long waiting time at a facility before meeting health providers were identified by many women. Two women commented:

'I decided to not go to the hospital anymore because every time I go there I spend a long time waiting and sometimes I returned back without meeting him. Even when I meet him, he does not spend sufficient time with me.... Therefore, I decided to not go unless there is a severe health problem'

2) Lack of money

Lack of money was the most frequently cited barrier to utilisation of antenatal and delivery services. The majority of women claimed that they had decided not to receive the services or attended irregular antenatal visits because they could not afford it. Some women mentioned that they changed the health provider or facility and seek low price services regardless of their perception of quality if there is a shortage in money:

'Usually I attend the antenatal visits at midwives hospitals... they provide high quality services but when my husband did not have the money he asked me to postpone the visit or cancel it this month... I decided to go to the near PHC because the fee is lower and there is no transportation fee.. I know the centre provide low quality service but at least they check my foetus ... it is better than staying home.'

On the contrary, some women stated that the PHCs provide acceptable antenatal services and they are satisfied although the majority of them complained of the high expenses of fefol (iron supplement) and vitamins as well as the expenses of the monthly tests of urine and blood, and ultrasound-scan. Therefore, a considerable number of women decided to not follow the physician's instructions, particularly among poor women. Shortage in supplies at PHCs and unavailability of lab tests and ultrasound scan free of charge contribute significantly to declining number of users who received more than one visit (see also table 7.4):

'Why I should pay for all these tests every month it is ranged between 50,000 to 60,000 Sudanese pounds... this is too much. I cannot afford it... I could not save all this amount of money from the home budget every month. Therefore, I decided to go before delivery... particularly I do not feel pain'

Another woman stated as a response to the reason of not using antenatal service:

'I felt okay and my foetus was okay as well ... there was not a reason to go to PHC and spend money ... when I needed help I asked the midwife at our community... she does not ask for a lot of money'

Consistent with women's opinions, many decision makers, stakeholders and the majority of health providers attributed the interrupted or irregular antenatal follow-up visits to the affordability reason where women should pay for the antenatal service at primary health centres (PHCs), such as lab tests, ultrasound scan, and buy iron supplement every visit.

The majority of non- users complained from the high expenses of maternal health services; they were not able to pay for regular antenatal visits. The vast majority of women consented that there is no need to pay all this money particularly with the expenses of tests and ultrasound scan that health providers asked for every month. Their argument was why they have to pay all this amount of money if they feel good and antenatal service is not useful. Even though there are some complications, many non-users added, they take medicine or seek advice from relatives. This statement was typical: *"It is much better and useful as compared to seeking antenatal service at health facilities"*.

However, some women mentioned that they paid less at hospital comparing to village midwives incentives with respect to delivery service. Indeed, the government hospitals are notably varied in the overall cost of the service due to the hidden expenses namely the transportation fees, the supplies and the obligatory tips for health staff while the incentive of the village midwife is varied according to the market. There are no obvious rules at the health system applied to govern the expenses of maternal health services whether government or private health sectors and the hidden cost constitutes a significant factor that increases the actual expenses of maternal health services at health facilities. One woman mentioned, with support from all women in the group:

'Every step at the hospital I need to pay ... if they put me on the bed I should pay for them baksheesh (tips) ... transferring me to the birth room I should pay ... even transfer me to the theatre table they want money... if I refused they ignore me and leave me alone to others who accept to pay... at the end I paid a lot of money although they told us delivery at hospitals is free of charge. It is very expensive as compared to home delivery.'

Additionally, the discussions identified a considerable gap between formally free of charge services and actual costs to women.

In order to encourage pregnant women who stopped coming for antenatal care to continue the monthly follow-up visits, increasing health awareness, distribute supplements, were suggestions raised by health providers according to their experiences in dealing with clients. Some health providers argued the significant impact of fefol in keeping women receiving regular antenatal care when it was distributed free of charge at PHCs. However, it had been stopped; a health provider mentioned:

'Anaemia is widespread among pregnant women in Sudan and it is considered as a challenge.... fefol (iron supplement) was provided to all pregnant women through PHCs for free. It was a UNFPA intervention in order to eradicate the high prevalence of anaemia among pregnant women. Unfortunately this intervention was stopped.'

No clear reason came out from my fieldwork for stopping the UNFPA project of distributing fefol although it was an important project and needed because of high levels of anaemia in pregnant women in poor countries like Sudan. This intervention was also effective because it worked as an incentive to keep women attending antenatal visits, in addition to eradicating anaemia among women, which constitutes a life-threatening problem.

Additionally, inflexible payment plans that health facilities offer do not encourage women to use the maternal service, particularly among poor women who prefer more flexible payment plans such as what village midwives provide. Women can negotiate the price with village

midwives and postpone the payment or even make it as instalments, thus increasing their accessibility.

3) Health facility and health providers' barriers

The **quality of service was identified by all study participants as a challenge in utilising maternal health service** in a sense that receiving poor quality of service encourages women to stop attending any further antenatal visits. Indeed, many women who had previous experience in health complications during pregnancy period claimed that they were not aware completely or partially about their exact health problems, cases and how they can avoid such problems in the future. Most of the issues highlighted by study participants were concentrated in the following points

a) Lack of supplies

Users identified lack of supplies as a barrier in using health services provided at hospitals. Women would buy most of the supplies at hospitals from the health staff at double or triple of their actual price. Sometimes, women brought their supplies with them but health staff refused to use these and ask women to buy from them. That constitutes a financial burden on patients. One woman mentioned:

'I brought my cotton, oil ... everything... the nurse came to me and told me this is not enough you should buy from the table [a table they put all supplies on at the hospital]... I am sure what I brought was enough but I did not know what I have to do ... no one with me by that time because they refused to let my family to be with me... I told her I accept to buy ... I was not in a situation that I can refuse or even negotiate the price... I was in labour... at the end I paid a lot of money... from this time I decided to deliver at home- it is much better'

Indeed, both women and village midwives addressed the hidden costs and fees where some staff make use of the possibility of the problem of supplies to obtain additional financial incentives for providing care. This constitutes a burden on patients, particularly poor women.

b) Hospital congestion

Congestion and high workload at hospitals leads health providers to devote less time for each patient and sometimes they neglect to answer all/some patients' questions and concerns; finding revealed also that some physicians do not illustrate the health complication to patients. That has very negative implication on women's satisfaction, ultimately the level of the patients' responsiveness and health awareness. A non-user mentioned:

'I had bleeding and pain at belly... I did not know what it is supposed to do... I was very scared to lose my fetus... I did not know whether this is normal or not ... I went to the doctor. He checked me and wrote a prescription. I became better and my pregnancy period passed safely but he did not explain the diagnosis of my complications and the reasons in order to avoid it in the future... there were many patients outside and he was very busy.'

c) Companionship and support in labour

Many women raised the issue of mainstream professionals not accepting village midwives (who are skilled birth attendants but not employed directly in the mainstream service, as explained in chapter 2) to accompany them at the hospital and some mentioned that even the relatives are not allowed to enter to the hospital with them during labour. A woman said:

'...I needed my village midwife or sister to be with me during labour ... people at emergency entrance refused to let them or even my sister enter ... when I was in the room waiting my turn to deliver, I needed several things... no one was there to help me... all staff were busy ... it was very difficult to go to the bathroom by myself independently.. I needed help in a lot of things but no one was there to help ... I hate this situation ... and I decided to not repeat this experience again'

d) Patient- health provider relationship

Several women claimed that health providers are not friendly and treat them in bad ways and did not respect their dignity. Indeed, this finding is consistent with the quantitative analysis with respect to determinants of women's satisfaction in which both users and non-users were not satisfied with the lack of communication between them and physicians. They preferred to deal with village midwives at in their local communities rather than going to health facilities and deal with unfriendly health providers because village midwives can understand them better and were more willing to talk and answer women's questions, even though users acknowledged that village midwives are less qualified as compared to physicians. Non-users also argued that village midwives are nonetheless qualified and they can meet all their maternal needs during pregnancy and delivery.

e) Hygiene levels at health facilities

Another concern cited by many users and non-users was the level of hygiene and cleanliness at health facilities. Many women mentioned their experiences and concerns with respect to the use of unsterilized instruments by health providers in labour operations, stained beds, bad smells in delivery rooms and lack of safe water. Health providers similarly highlighted the poor working conditions at facilities, as will be discussed in chapter 8.

As a justification for not using the health facility, a woman mentioned her first experience at the hospital when she delivered her first child:

'I saw the midwife use the same surgical needle that her colleague used to stitch another woman delivered beside me... when I saw the needle with blood I feel shaking... I could not ask her to change or clean it because I was young and that was my first experience ... I had a fever when I delivered and went home ... I refused to return to the hospital... my family took me to 'El-SHeekh' he treated me using some herbals and read from holy Quraan in front of me... from that time I refused to go to any hospital.. I used traditional midwife ... they are good'

Another woman stated:

'I went to deliver at the hospital and I asked for hot water. The health staff mentioned that there is no hot water ... I brought my Gas cooker to the hospital and I used it during my labour... also many women used it until I went out from hospital. The problem I found is the way that they store the water at hospital... I am sure this water is not clean. However, I could not bring my water to use it at delivery and I used this stored water'

Looking at the previous woman's quote, the existence of **another parallel informal health system came out from FGDs of women which are the 'Islamic/ traditional therapy' provided at Islamic clinics where people seek health services from people called El-sheekh'** (not formal health providers). They are also not formal religious people but they provide traditional therapy and treat people by reading Quraan, the Muslims' holy book, in front of the ill person. Health providers and decision makers know about these unlicensed clinics; yet no governmental interventions have been taken towards these clinics. However, I did not focus in depth on this issue as it beyond the scope of my research work, which focused only on services provided by government (facility based services) and village midwives services (community based services).

Literature suggested that some people seek traditional therapy for several reasons – not just because they are more consistent with traditional cultural beliefs and practices but also when formal care doesn't meet people's needs in various ways. Researchers have also discussed the fact that they may have genuine benefits for patients, even if only through a 'placebo' affect, reducing anxiety and worry. There are debates about whether this is a problem or not, with views tending to be that if they are not offered as an alternative so much as a complement (or substitute when no formal service available) then they may be very helpful, but if offered as an alternative for profit by other types of healers they could be a problem if they deter people from accessing life saving treatment that is available. I will not go further at this particular point because it is out of the scope of the research. However, it is important to conduct further research on this issue.

f) Medical malpractice

Medical mistakes at the hospital were cited by several women. Many women become afraid of going to the hospital to deliver due to previous experiences with health providers' mistakes that led to health complications. A woman stated:

'During my first delivery the midwife inserted rectal bulb syringe in the wrong opening... that caused piles and I suffered a long time from this problem... I decided from that time to not going to any hospital'

Another woman complained of the insistence of the midwife at the hospital to deliver her before the proper time of delivery by making episiotomy:

The midwife wanted to do surgical cut at the opening of the vagina... I tried to tell her to wait a few hours... I was very scared at that time... did not want to have more pain ... the labour pain is enough for me but she refused ... thank God the doctor came and refused to deliver me and asked her to wait because it was not my time to deliver... I decided to not to go again to deliver at hospitals'

g) Cognitive barriers (awareness of pregnancy complications)

Many women who are dealing only with village midwives did not trust the services provided by PHCs and preferred to receive the service from village midwives; they mentioned many anecdotes about the problems resulting from episiotomy and infected wound, which was later treated by village midwives. That is very much consistent with the opinions of village midwives and many decision makers as they addressed the problems of health facilities and their quality of services (see chapter 10 for more details). Accordingly, many women prefer to deliver at home rather than deliver at 'unsafe' hospitals. On the other hand, non-users don't trust the hospitals – like many women – and also don't trust the village midwives. Many of them stated that village midwives are not qualified and that they treated the pregnant women in such a way as to lose the foetus. Therefore they prefer ask help from relatives with experience.

Analysis of the FGDs with women revealed that there is a gap between women's knowledge and their behaviours with respect to the importance of antenatal health services. That is, many women acknowledged the importance of attending antenatal visits on a regular basis for the sake of their health and their child health whereas the pattern of their antenatal service utilisation indicates that many women do not feel antenatal care utilisation is vital as long as a woman eats well, takes vitamins and has no severe pain. Most of the women reported that their husbands never prevent them from going to a health facility (hospital/PHCs) for receiving antenatal care unless there is not enough money for the visit, in which case they asked her to postpone or cancel the visit. Very few of non-users (only two women) argued that their husbands prevented them from seeking any maternal health care due to previous negative experiences with health providers. All women stated that there is no need for

postnatal services if there are not post-delivery complications (i.e., bleeding, severe pain). Indeed this belief is consistent with formal health providers' and village midwives perspectives.

Consistent with quantitative findings, women in the focus group discussions identified the lack of maternal health knowledge among women, particularly the initial symptoms which may be signs of developing severe health complications; only extensive haemorrhage and severe pain are the common identified dangerous symptoms that trigger women to seek health services. This indicates the importance of incorporating a health knowledge component that includes the maternal complication signs for which women should immediately seek health care and to discuss with them the birth and emergency preparedness plan. In addition, both women and village midwives should know where, how, and when women should be referred, particularly as one third of pregnant women do not seek antenatal services in Sudan and the majority of village midwives, the main maternal health providers in Sudan, do not have EMoC training and did not formally study provision of antenatal and postnatal care.

Furthermore, health providers highlighted the importance of increasing the health awareness among women and families through health promotion and advocacy, and they attributed the main reason for the shortfall of utilisation to the lack of health knowledge. However, many decision makers admitted that increasing health awareness activities have almost disappeared from the health plans not only because of insufficient resources to conduct such activities but also because a lack of specialised staff in this field. For example, a physician mentioned:

'Usually women visit the clinic when feeling sick and after telling her that she is pregnant... we do not see many of them again until approaching the labour when some of them come asking for the transfer card to deliver at the hospital... I tried several times to convince them... sometimes I called the health visitor working with me at the clinic to help in convincing women but it did not work'

Another health provider added:

'I spent much of my time trying to convince women which I can invest with other patients... I failed many times ... they believe if they do not suffer from serious complications like haemorrhage and intake vitamins regularly, there is no necessity to seek antenatal services'

A health visitor mentioned:

'Awareness campaigns are essential as many of non-users thought antenatal is not important as far as they do not feel any complications... even if they feel some pain or complications their relatives or neighbour advise them to wait because these things are normal in pregnancy... that leads to late referral and emergencies'

Conclusion

Both quantitative and qualitative analysis highlighted specific complementary factors that have significant influences on women's utilisation of maternal health services.

Accessibility and affordability are the most significant factors that have been supported by both types of analysis. First, services are not equally available in all states and second there is variation in accessibility within the states, especially between rural and urban areas and on a socio-demographic basis. Women take the decision of utilisation carefully as they know the high expenses associated with the decision. Therefore, women take non- health alternatives in order to reduce the expected cost of health service utilisations such as relatives' advices and pharmacy and use of traditional healers in some cases.

Moreover, quality of services, quality of health facilities and patient-health provider relationship are other major constraints in utilisation, particularly as village midwives are not trained to provide antenatal services and EMoC and the majority of hospitals are not equipped to provide EMoC services. Additionally, postnatal services are not included in the health system in Sudan although more than one third of maternal mortality occurred in the postpartum period. These two constraints have affected the women's satisfaction level that leads inevitably to achieving poor responsiveness of the health system. Also, the limited time assigned to the patient, medical mistakes in practice due to poor competence or performance of health providers, and the uncaring and disrespectful manner of many health providers toward patients are key obstacles that impede women to take the decision of utilising formal health services.

Indeed, an important finding in this analysis is shifting the focus from the patient-side factors in low utilisation to health system factors. Much of the relevant research has highlighted the impact of women's characteristics in low-income settings such as Sudan in utilisation of maternal health services such as parity, work status, education, autonomy and exaggerate their roles on women's decision of utilisations whereas in the reality they conceal the fact that many health systems and maternity healthcare facilities in are still chronically under-resourced and incapable of effectively providing an acceptable minimum quality of care. This indicates that in order to increase the utilisation, health system should focus on these factors rather than simply focusing on the need to improve women's characteristics.

The next three chapters will address the four interrelated functions of the health systems (i.e., stewardship, financing, health service delivery, human resources for health) and understand the interchanged effects of each other, in order to understand the most efficient ways to enhance these functions and ultimately the overall performance of the system. This requires looking at the women's health behaviour from a different lens, which is health system rather than patient-side factors and thus introduce new effective interventions that could improve the maternal health service utilisation and maternal health.

Chapter 8

Health System in Sudan: Stewardship and financing

This chapter presents the findings of framework analysis of the Maternal Health Service study (refer to chapter 6 for more details about MHSS 2012). The main objective of this chapter is to explore the performance of the stewardship and financing functions of the Sudanese health system, focusing particularly on the interviews with decision makers and stakeholders interviewed. The experiences and perspectives of the women and frontline health workers will be presented in the following chapter. The first section of this chapter describes the study participants of two groups: decision makers group and stakeholder group. The second section presents the oversight function in the health system according to the responses of both decision makers and stakeholders, discussed in terms of key themes identified in the analysis. It includes the procedure of designing the health plans, the method of identifying women's needs, prioritising the needs, implementation and supervision, and the challenges facing designing and implementation health plans. The last section sets out the financing functions and highlights the main challenges that my respondents considered affect the financing of the health system.

It is worthwhile to mention that most of the participants could not talk about the maternal health aspect in isolation from the entire system of health. I tried always to keep them focused on maternal health and I succeeded to some extent. However, as discussed in chapter 3, there are many aspects that should be discussed in the context of primary health care (PHC) or within the entire health system.

8.1 Health system oversight (Stewardship)

Stewardship implies the role of government in creating a vision, proposing the policy framework, regulation of health system, designing responsive services, and monitoring results. In addition, it deals with the organisation of all the other functions of a health system. However, it is a neglected function in most health systems (Christopher, 2000). The following sections discuss the main aspects of stewardship function of Sudanese health system.

8.1.1 Health planning

The scarce level of resources is a significant challenge facing low and middle-income countries as well as high-income countries, although it has the worst impact on the low-income countries. Health systems cannot meet all the healthcare needs of its population; therefore, prioritising the needs has to be made with a consequent rationing of resources. That is arguably the hardest and most challenging aspect of health planning.

Health planning in Sudan started officially at the beginning of the 1990s. From 1992-2002 there was a 10-year health plan named ‘The National Comprehensive Strategy’; one respondent mentioned:

‘The methodology of designing health plans in Sudan has been significantly improved. In designing our first plan (1991-2002), people were just sitting together and wrote the plan; even the targets that they suggested, were unrealistic. They did not give any attention to the inputs or process indicators or any scientific evidence that usually are used to help in identifying the targets. Also the timeframe of the plan was nonsense.’

Later, in 2002 the 25-year plan ‘The Quarter Century Plan’ was issued. The major priorities of the plan were to embark on an effective health system reform based on fair financing options to reduce the burden of diseases, to promote healthy life styles, to develop and retain human resources, and introduce advanced technology while assuring equity, quality, and accessibility. It is considered as a master plan or strategy and it is distributed into five 5-year plans. The 25-year plan was designed based on the MDGs. Most of the decision makers did not perceive a need to make substantial changes in this plan after approving and issuing it because it is a comprehensive plan; although one respondent mentioned that review and updating can be made in the future 5 year plans within this framework. However, several respondents pointed to a lack of assessment conducted to identify the challenges encountered in the first 5-year plan that helped in developing the second plan.

The methodology that FMOH followed in preparing the annual and 5-year health plans was to constitute a taskforce from all directorates of the FMOH, general directors of SMOHs, representatives from UN organisations (i.e., WHO, UNECIF, UNDP, GAVI, Global Fund), and the most significant donors working in Sudan (i.e., JAICA, Multi-Donors Trust Fund ‘MDTF’). In addition, many independent consultants participated in order to prepare specific tasks in the plans. The taskforce team started by carrying out a situation analysis (SA) on the national and state levels with assistance from FMOH and SMOH in each state. Many decision makers mentioned that both bottom-up and top-down approaches have been adopted in formulating the recent health plans. All SMOHs were expected to prepare their health plans in line with needs and objectives set out in FMOH guidelines. Such a process requires a high level of co-ordination, yet a number of decision makers identified that this is often not translated into practice owing to pragmatic and structural difficulties:

‘In reality, due to the poor qualification of employees who are working in local authorities, it is too difficult to ask them to prepare such task; thus, SMOH prepares the health plan without getting feedback from local authorities.’

Similarly, many decision makers argued:

'Even many states cannot prepare their annual plans independently due to the poor capacity or they are not committed to deadlines; so eventually FMOH prepare the state plans of those who have not submit it.'

At the FMOH level, the health plans focus on activities related to developing protocols, policies and guidelines as well as monitoring and supervision of the performance of SMOH. They also cover training of trainers (TOT) who will cascade training at state, international cooperation and partnership levels, and they advocate on the implementation of national public policies. At the SMOH level, planners are responsible for implementation of health programmes. Nevertheless, in some cases FMOH train people working in the health field in the states and help them in conducting their work because of the poor capacity in the SMOH. Both SMOH and FMOH plans are discussed together at the federal level and compiled into one national health plan after including the national disease-specific health programmes like the national tuberculosis (TB) programme.

Focussing on the maternal health planning, reducing the maternal mortality levels across Sudan has been the core objective of the maternal health plan since 2006 after the dissemination of the Sudan Household Health Survey (SHHS) which indicated a very high maternal mortality ratio (1017 per 100 000 live births). Therefore, a reproductive health (RH) strategy (2007-2015) and the road map of maternal mortality reduction were issued in order to accelerate the reduction of maternal deaths. According to all decision makers, the RH strategy and the road map are developed based on the MDGs and scientific evidence and they become the main resource in developing the RH plans.

8.1.2 Maternal health needs

Decision makers perceived that identifying maternal health needs accurately is a main step toward obtaining effective health plans. Respondents mentioned that the main source of information in identifying the women's health needs are: **first**) the annual statistical report for health which is developed based on compiling the statistical reports coming from the states; **Second**) the state performance report which every SMOH should present to the FMOH quarterly; **Third**) surveys which are mainly Sudan Household Health Survey, Health Facility Mapping Survey, and HRH Census.

The state reports are based on local authorities' reports and other reports prepared by health visitors according to the regular data obtained from village midwives for their monthly registrations of the cases they follow. The VMW's report includes all information of her patients with respect to personal, medical condition and interventions undertaken. The importance of obtaining these reports is to identify the number of women who are getting health services from community health workers, particularly as many women do not obtain any institutional services.

However, according to the majority of the decision makers, village midwives reports are not accurate, not only because of more than 80% of them are illiterate but also because they do not attend the supervision meeting with health visitors regularly (see chapter 9). Similarly, not all local authorities are committed to submitting the statistical reports. Because the VMW's registration is the only source of data on women who received maternal health services from community health workers, the ministry is obliged to accept inaccurate and inadequate registration data rather than no data. Consequently, the national statistical report is of limited reliability since it has a severe problem of under registrations. The state performance report includes the state's needs, weaknesses, problems, and performance assessment. However, decision makers also indicated that it is not a reliable source of data.

8.1.3 Identifying the priorities

Before 2008, the priority-setting process was conducted by donors with minor intervention from ministries of health as the ministries lacked planning capacity and there was no clear vision about specific health objectives on the national level. Therefore, they accepted all donors' suggestions and incorporated to the health plan despite the diversity and contradictions in the donors' priorities, as there were no alternatives. However, FMOH now takes a bigger role in setting the health priorities.

In terms of the prioritising process, all respondents agreed that there are no obvious criteria followed in identifying the priorities. Instead, the maternal health needs were prioritised according to discussions between people on the state level to identify the health problems and then rate these. However, the decision maker respondents described a range of approaches that have been used: extracting priorities from the road map for maternal mortality reduction, MDGs, published studies worldwide that investigate the reasons of maternal mortality reduction (e.g., Expansion of VMWs, cover all Sudan with basic package of ANC, EMoC (comprehensive, basic).

A decision maker said:

'The priorities setting are not well developed. We are not using the scientific techniques in order to set our health priorities although we considered the following criteria when we organised the priorities: whether it is public health problem, caused more deaths and morbidities, the cost of the solution, and whether it is solved within health system only or need coordination from others; yet the health problems are very clear according to the studies and situation analysis that ministry performed.'

Likewise, another decision maker mentioned:

‘The ministry is giving attention to safe motherhood aspects which are consider a significant contributor to reducing maternal mortality... therefore we are improving the safe motherhood services which includes family planning, postnatal care, antenatal care, expand maternal health services provision to cover all Sudan. Also, we consider equity in our maternal health programs thus any maternal health intervention should be accessible to all women in Sudan and affordable.’

Most of the stakeholders described their own method of identifying the maternal health priorities as commencing with receiving broad guidelines from their own organisation headquarters (for example, WHO or EMRO in Egypt) besides looking at relevant research studies conducted in Sudan and other official documents. They referred mainly to the road map of maternal mortality reduction; then they conceptualised the specific objectives and prioritised them. Following this procedure, conducting consultative meetings with FMOH in order to discuss the donor’s priorities and then send it to headquarter to get final approval before endorsing the activities. Sometimes they receive modifications, which are discussed again with FMOH. The process was perceived by most as collaborative:

‘FMOH usually does not oppose our decisions because our mandates are obvious for them. However, we discuss our plan with FMOH’

However, some pointed out the disagreement that sometimes occurred with FMOH:

‘Sometimes we faced difficulties in agreeing with FMOH on particular priorities. For instance, our reports indicated that there is a particular area that needs to be intervened whereas FMOH disagreed with us and they wanted to direct the fund to other projects’

With respect to the criteria that are applied in geographic prioritisation, some of the participants said that the SHHS indicators of maternal health, and annual health statistics reports are used to identify the priority areas as well as recently health facility mapping survey is used to judge which the neediest states need.

8.1.4 Monitoring and evaluation (M&E) framework

Many decision makers addressed the M&E framework as an integrated part of the annual health plan. The framework includes process, impact, and outcome indicators, which are routinely calculated to measure the objectives’ attainment at the end of the plan. However, of the 10 decision makers interviewed, four admitted that this component is very weak in the

plan; that is one of the main reasons of the poor performance of the health system. They attributed the poor performance mainly to the insufficient data and impression of the data; accordingly, the process, outcome and impact indicators cannot be calculated properly or even some indicators cannot be quantified because of the missing data.

Supervision and frequent meetings are the techniques used in M&E implementation through three different levels. *Firstly*, the federal level where FMOH conducted field visits to a few random health facilities in some states in order to monitor the work in these facilities. Also, there are monthly routine visits to SMOHs. *Secondly*, the state level where a SMOH receives monthly follow-up reports from the RH supervisor in each locality. *Thirdly*, the community level where locality team ‘the health team’ supervise and monitor through regular visits to the health facilities located within the borders of the locality and monthly supervision meetings with health visitors working in the PHC at the locality. Moreover, there are inspection visits by health visitors to village midwives’ homes to check their delivery toolkit bags.

Furthermore, the state monthly report of the maternal death review is used in order to follow up the maternal health in the states. Some of the decision makers referred to this report as an important tool to identify the main causes of death. Some of these causes need immediate interventions, thus unplanned activities can be inserted in the plan throughout the year.

While the decision makers expressed their dissatisfaction with attending a lot of meetings, which took a considerable part of their working time, they stated very clearly that the meeting are very useful in solving work problems efficiently and give a chance to monitor all activities of the plan on different level (federal, state, locality). However, a few decision makers suggested using a health information system aligned with applying a monitoring system will assist in reducing the number of meetings and accordingly save the staff time, particularly since there is a shortage of staff.

In order to strengthen the supervision system on the community level, recently FMOH has started a training programme for the staff working in the local authorities, along with developing a manual for this purpose, and providing them with cars in order to facilitate supervision visits to the health facilities.

On the other hand, many stakeholders reported that they rely on themselves to monitor all activities that they financed through several tools: field visits, health officers working closely with FMOH and SMOH, and carrying out assessment studies; yet a few stakeholders mentioned that they usually depend on reports provided by FMOH. Moreover, the majority of stakeholders clearly stated that one of the challenges is the weak monitoring conducted by the FMOH and SMOHs; therefore they intervene in this procedure to ensure the quality of the performance even though it is among of the ministries’ responsibilities.

8.1.5 Challenges in developing and implementing the maternal health plan

Several challenges were highlighted by study participants. The key challenges confronting implementation that have significant impact on the performance of the function are discussed in this section.

a) Lack of coordination in developing health plans

Unlike other ministries in Sudan, there is good coordination between SMOH and FMOH even though SMOHs are not legally committed to FMOH on the administration level as the technical and financial support from FMOH to SMOH contribute significantly to strengthening the collaboration. Nevertheless, there is a notable variation in the level of the collaboration among the states which has potentially negative consequences particularly in the health planning commitments. For example, where some states did not submit the state health plan before the planning meetings the FMOH couldn't consider their actual needs in the national health plans and also reflect these in the implementation phase of the activities of the health plan. However, in critical cases, the FMOH escalates problems to the prime minister or Sudanese president. Responses from decision-makers appeared to reflect a theory-practice gap, with some arguing that co-ordination is very clear, while others questioned its practical operation. For example, one argued:

'There is an annual meeting to discuss the final version of the ministries' plans before getting the approval. In this meeting, everyone knows what other is doing in all ministries; thus there is a complete sort of coordination with respect to the activities of all health plans and all people know about each other work.'

While another was more sceptical:

'Coordination in the vertical level between FMOH and other ministries is a significant challenge. Convincing other federal ministries is too difficult a job as every federal ministry prefers to work within its mandate and do not prefer to collaborate with us in health projects according to our supervision since these projects are health projects initiated by us'

b) Insufficient and lack of data accuracy

The majority of decision makers and stakeholders participants highlighted insufficient and unreliable data as a major obstacle in developing and monitoring the health plans. One decision maker mentioned, for example:

Surveys couldn't provide comprehensive information needed in order to design the plans... It is difficult to ensure whether a particular village has a VMW or not and also the exact number of VMW in these communities. There is no registration system that can inform FMOH about the availability of VMW and their distribution across the local authorities

Another decision maker said:

‘Still you can read besides some objectives in our health plans the statements like ‘to be determined’....and ‘the indicator will be increased by 10 %’ ... of course without knowing the current level of it (the baseline)... in order to design a good plan, it should be evidence-passed plan, we are trying to implement this approach but the lack of information is a long-lasting problem...’

Additionally, the FMOH picture of the entire health projects running in the states is limited by the degree to which these are run by NGOs, particularly those that NGOs implemented directly with SMOH. That has negative impact on the planning process and budget allocation management.

c) Unrealistic targets

As a result of the above problems, there is a lack of information on which to base targets. A decision maker said:

‘Always keep saying in the planning meetings ... “we can do it” as if a miracle will occur ... these targets indeed are beyond their capacity ... very optimistic and unrealistic; thus they fail always to achieve targets although they accomplish them partially... also, there is another associated problem which is they cannot judge precisely the time needed for activities; thus always they put unrealistic time plans’

Furthermore, the data of health services provided by non-ministries of health (i.e., military, police, university hospitals sector, health insurance, and private sectors) are not available to FMOH. That constitutes a serious obstacle in developing health plans particularly as these sectors represent about 10% of health service provision in Sudan. As mentioned previously this challenge is related to the very weak collaboration between these sectors.

d) ‘Brain Drain’ and poor capacity of the Staff:

Almost all interviewees addressed the problem of the high rate of turnover among qualified staff at FMOH, which severely affects the workflow of all parts of the health system. Generally, FMOH recruits people with long experience and a good level of education. However, well-qualified people, particularly physicians and middle career staff, receive better offers from international organisations or other countries; which has a particularly severe impact on health service provision.

A decision maker mentioned:

'The high turnover occurring among middle career level causes a serious problem particularly we do not have a good institutional archiving system in FMOH and SMOHs; thus a lot of important documents have been lost... we train people and as soon as they become well qualified they leave us to different well paid jobs'

Additionally, a stakeholder raised another important disadvantage of the high turnover:

'This year we did not get any contribution from the focal point of the FMOH because he left the ministry before completing the discussion and there was not replacement'

Also...

'In order to proceed the activities and transfer the money on time we need to receive their progress reports but due to the high level of turnover and lack of institutional memory, there is always delay in receiving these reports thus delaying in transferring money to the ministries.. Sometimes because of this delay, money goes back to the main office'

This particular challenge is discussed further in chapter 9, in presenting the challenges facing the human resource for health.

e) Lack of institutional memory and health information system:

The majority of decision makers and stakeholders addressed the issue of lack of institutional memory as knowledge still exists outside the formal records systems and archives; alternatively, staff rely on their own memories; thus recall problems and moving staff from one position to another or turnover are affecting severely the flow of the work and losing important documents and data. This compounds the impact of high staff turnover. Similarly occurring with health information system, as there is severe shortage in the information system although there are many initiatives such as health observatory and a lot of effort has been exerted in collecting data in several health aspects; yet the data are not complete or accurate.

f) Financing of health system

There are many obstacles under the financing challenges, which affect not only the health plan procedure and performing the activities but all parts of the health system, (see section 8.2 for further details).

g) Donors' interests

Many challenges have been encountered in the health system in relation to the heavy reliance on donor aid. Donors have not aligned their plans with the national/state health plans and

addressing the actual health needs because most of them direct the budgets according to their own mandates regardless of the needs or activities identified in the health plan. Therefore, various national needs like establishing new health facilities, improving midwifery training programmes, working in particular regions or running certain maternal health activities or renovating ones cannot be done using the donor aid.

Consequently, maternal health needs and setting the priorities are guided by donors' interests. Similarly, the health plans have been controlled also by donors' visions rather than a national one. All these aspects lead the health plan to be a fragmented plan which lacks clear and integrated objectives.

One decision maker mentioned strategies through which goals could be aligned with system planning in some degree:

'Donors are fixable to some extent. That is, if they propose to finance particular activities in a particular state and there is no need to run these activities in this state, we can agree with them to change the state or change the activities but in the same field. For example, a particular UN-donor wanted to train village midwives and we did not need to conduct more training in this area we suggested to train health visitors and they accepted to do that.

.....

We have budgeted road map since 2009. We ask donors that wanted to work in reproductive health arena to select activities from the plan... the things are now becoming more organised and clearer than before'

A donor stakeholder mentioned:

We do not impose our perspective on FMOH and vice versa... it is a consultative process ... they know our limited budget and the organisation's regulations and our mandate... also they agreed upon the states that we selected to work in'

8.1.6 Maternal policies and ministerial decrees

Decision makers were asked about the most effective policies or ministerial decrees in improving maternal health in Sudan. The majority mentioned several policies and decrees. Two principal actions were perceived as very powerful in reducing maternal mortality levels: The National Road Map for Accelerating the Attainment of the Millennium Development Goals (MDGs) Related to Maternal and Newborn Health and its associated costed implementation action plan as well as the presidential decree of providing ANC and caesarean section delivery for free of charge in 2009. The decree was issued after a study reported that a large number of women cannot pay for caesarean section, thus women wait until their conditions become an emergency in order to benefit from the emergency service.

Unfortunately, despite the importance of these two policies there are notable discrepancies among states in providing these two services for free of charge due to insufficient funds allocated to these services.

Another potentially effective strategy is the National Health Insurance system although it covered less than 37% of families on the national level by the end of 2012 (mainly covered people who are working in the formal sector or their families) according to the national statistical report. The coverage is slowly expanding year by year due to financing obstacles.

In 2010 there was a decree to establish the surveillance system of maternal mortality in all states. The majority of the DM group regarded it as very helpful in identifying the causes of maternal deaths although a few mentioned that the people who are responsible for conducting the verbal autopsy are not very qualified to detect precisely the main reasons for death; therefore the usefulness of the reports is questionable, particularly since they do not cover all maternal deaths across the country; consequently the ministry is not highly dependent on these monthly reports.

During the data collection of my project, there was a decree, issued in late 2012, initiating a new national project for Expansion of Primary Healthcare. This aimed to cover Sudan entirely with a basic package of primary health care, which includes ANC, child growth monitoring, child immunisation and provision of an essential drugs list that treats the common diseases in Sudan. This project is a very promising project, particularly as the parliament allocated the budget of this project.

Also, another recent decree mentioned by many decision makers as a potentially effective decree that has been taken by FMOH in order to enhance the midwifery services through introducing a new 2-year midwifery training programme. However, many decision makers reported that this programme has been facing a serious obstacle during the implementation where the admission of the programme requires women with secondary education, which are rarely found, particularly in remote areas. Even though educated women are identified, most of them prefer to continue their studies in the university rather than enrol in a 2-year midwifery programme, as having a midwifery certificate does not guarantee a well-paid job in the health system in Sudan. Another challenge facing application of this initiative is a severe lack of village midwives, particularly in remote areas, since the 2- year programme will delay village midwives' graduation as compared with the current one-year programme. Also, inevitable financial obstacles associated with the expansion of the programme were highlighted by the majority of decision makers. One commented:

'Although there are many decrees and policies issued to reduce maternal mortality and enhance maternal health in Sudan, they have not been implemented properly because there are not enough resources to maintain continuous implementation. Also, other facilities are insufficient to support like inadequate facilities, poor equipment and labs, and no proper referral system as well as the

insufficient number and quality of health workforce. Unfortunately, we do not have all of that.'

Decision makers also identified a continuing barrier of lack of awareness of the key role of maternal health care in public health overall:

'We need to increase the awareness of the importance of maternal health services and primary health care among the population in order to maximise the benefit of these decrees ... community leaders and ministries of health should take the lead in organising health awareness campaigns.'

To conclude, because the primary health care is largely funded by external aid, most of the primary health activities and identifying the places where the activities will be implemented are controlled by donors, particularly the multilateral donors as the major donors.

Unfortunately, there is a weak coordination among them and between the donors and ministries of health. That inevitably has a negative influence on the management regime of primary health care and eventually on the maternal health outcome, poor responsiveness level among women, and the clear mal-distribution of resources and maternal health services provision.

Indeed, many decision makers emphasised the importance of guiding the primary healthcare plan by the national vision and national policy rather than disputed among many cooperated donors manage the plan according to their views which at the end to the very poor health outcomes and malfunction in the health system. The road map of maternal mortality reduction is considered a good base to lead the PHC planning.

Accordingly, almost all decision makers know very well the rules of health planning; however due to the challenges particularly the four main challenges: data, capacity, and poor coordination as well as imposing donors' interests, there are critical drawbacks in designing and implementing the health plans.

8.2 Financing function

Sudan is following the federal system where every state has its own public budget and legislations organising the work and services. According to the findings of the Sudanese National Health Account in 2010, the financing of the health system was constituted from the following sources: 10% paid by SMOH, 15% paid by FMOH; 4% by donors; 4% by health insurance and 10% paid by individuals covered by health insurance; 4% paid by both local authorities and the charitable fund; 64% is out-of-pocket payments. Indeed, the high percentage of the patients' contribution in purchasing the health services in a low-income and high prevalence of poverty, constitutes a serious problem of the health services accessibility. The major bulk of the government's budget for health goes to salaries as health system is labour intensive, then secondary and tertiary healthcare services.

The WHO in 2012 indicated that the minimum acceptable package for primary health services in 2012 should be about US\$50–60 per capita (Sachs, 2012). This amount covers the main interventions at the primary level: diarrhoea, pneumonia, vaccinations, malaria control, malnutrition, perinatal deaths, and maternal deaths (related to pregnancy and childbirth). A decision maker reported that the total expenditure on health per capita (including the three levels of healthcare) is **\$111** in 2012; yet there are two major problems: **firstly**, Health expenditure distribution is unfairly skewed towards secondary and tertiary care while primary and first-referral services are underfunded and face resource shortfalls, particularly in the poorer and remote states. **Secondly**, most of the out-of-pocket expenditure is spent in the private health sector, which is largely not regulated or controlled by FMOH; accordingly, the fees are very high, constituting a serious burden on low- and middle-income families. The private sector has been a rapidly growing proportion of health care since the 1990s without any control or supervision from the government. A decision maker mentioned:

‘Private hospitals or clinics can be opened anywhere and no standard configurations required before giving them the licence except the licence fee that the owners should pay to the ministry. There is a Committee from FMOH sometimes visit the new health facility in order to ensure whether it is suitable and maintain particular specifications; yet it is not reliable as we lack technical staff for that purpose.’

Clearly the resources are not sufficient and do not meet all health needs in Sudan. All decision makers emphasised the importance of this aspect and its drawbacks on the health plan implementation to the extent that it is really a crucial challenge not only for the planning process but also the entire health system. One of the drawbacks of the poor resources mentioned frequently by both decision makers and stakeholders is retention of the well-qualified people working in the SMOH or local authorities. That heavily influences the quality of work. A decision maker said:

‘The authorities of the local authorities are responsible for the largest part of the field work in the communities, for instance community health activities, environmental work, and monitoring of the entire facilities located in their borders. Due to the very poor resources that allocated to each locality, they hardly do part of their duties also because of the low salaries, qualified people’

Retention challenges and poor competences are among other aspects related to human resources for health (HRH) discussed comprehensively in chapter 9.

8.2.1 Government financing of the system

The two main sources of government health expenditure in each state are the state resources and the national resources. All states in Sudan (17 states) receive 30% of the overall national resources whereas federal ministries receive 70 % annually. The 30 % of the national

resources is insufficient particularly among the states that have poor resources so they are not able to cover all public expenditure commitments.

Responses of decision makers highlighted a challenge that violated the fairness principle, which is, the lack of clear rules governing the resources allocation process. Instead the political power of the state and personal relation of the state governors are playing a significant role in securing more resources. Thus the 30% of national resources is distributed inequitably among states and between urban and rural areas. Additionally, there is poor coordination between all health services providers (i.e., FMOH, SMOH, military, police, health insurance, and private sector). Hence, the resources are used inefficiently. Decision makers also argued linked to this, poor resources management leads to misuse of the limited resources. Some states are not applying clear regulations in organising procurement procedure; accordingly several defects have been encountered leading to waste of resources. A decision maker suggested that:

'Public funds can be used more efficiently if there is one national system for purchasing supplies, equipment and even in constructing infrastructure but unfortunately every state works individually, for instance a state can spend money on less important matters whereas other states lack crucial things because insufficient budget .. Also, there is an obvious misuse of the public funding'

Spending and allocating budget are determined by policies and budgets of public policy, which is supposed to be controlled by the government. According to the previous analysis, it can be identified that most of the health financing is private and mostly out of pocket, while much is also donor controlled (see following section); therefore, there is no obvious public policy that can determine completely the allocation of health expenditure. Eventually, financing fairness is not accomplished on the macro level; however, there are attempts from FMOH to correct this inequality through redistributing the federal resource by financing some states' projects in favour to deprived states in order to narrow the clear inequality gap among states. Eventually FMOH contribution in this regard is not very helpful although it is essential. Lastly, sustainability of the government fund is guaranteed despite that it is not sufficient.

8.2.2 Donors' financing of the health system

Sudan is one of the low-income countries that receives aid from the international community. The international health aid constituted 4% from the overall health budget in 2012, yet the external aid funds are vital for maternal services and other primary health care services because it is contributing 80% of primary health care sector in Sudan.

Donors in Sudan can be categorised into three main groups; **firstly**, multilateral donors (e.g., UN organisations, EU, GAVI); **Secondly**, bilateral donors (e.g., agreements between Sudanese government and other governments or its representatives in Sudan like JAICA); **thirdly**, international NGOs which are only active in emergency and early recovery and local NGOs. The multilateral donors are the most important because of the size and sustainability of the aid, particularly UN agencies where they together signed a cooperation agreement with the Sudanese government named United Nations Development Assistance Framework (UNDAF). It is working through a renewable 4-year framework in order to regulate the work between UN agencies and government.

More than 61 international organisations registered with diverse nature and numerous numbers of domestic NGOs are working in the reproductive health area in Sudan although maternal health is not among the issues that donors give attention to nowadays in Sudan.

Many stakeholder participants reported that the funding of the reproductive health (RH) programs is decreasing every year; therefore, reproductive health programmes are shrinking. For example, the UNFPA, the main donor of RH programmes is planning to limit its maternal health programmes in particular local authorities in selected states. With donor funding forming 80% of the primary care funding, the likely impact is considerable.

Another related point contributing to the inequality in the distribution of resources is, establishing special funds to cover many purposes including health allocated directly from the donors to particular states through agreements by donors with the government. That fund goes directly to the states while FMOH does not know about the exact amount of the fund allocated to health and how it is expended. Unfortunately, blackout policies and bypassing of the FMOH can lead to worsening the resource distribution policies, particularly as there is no legislation obliging every state's government to declare its annual resources accurately. Accordingly, mal-distribution of national resources is the likely result. One decision maker pointed out, for example:

'Some states have external aid from donors for reconstructing the states such as Qatar fund in Darfur state. These special funds include various health activities and the FMOH do not know anything about them. Because of that reason the FMOH does not allocate health resources equally among states... I suggest that FMOH should be informed about the size of all these special funds or establish one financing system in the country to be under its monitoring.'

8.2.2.1 Challenges facing financing the health system Looking at the challenges facing financing the health system, most of the decision makers and stakeholders addressed five main challenges: the impact of political environment on financing the health system, funding modality, establishing new parallel procurement systems rather than using the national procurement systems, lacking the predictability and sustainability of aid, and poor coordination amongst donors and between the donors and ministries of health.

- a) ***The impact of political environment on financing the health system*** where Sudan has been under economic and political sanctions. The Treasury Department's Office of Foreign Assets Control (OFAC) issued the Sudanese Sanctions Regulations in response to several actions started in 1997 in response to the Sudanese policies and actions including continued support for international terrorism, ongoing efforts to destabilize neighbouring governments, and the prevalence of human rights violations as OFAC's accusation. That was supported by the United Nations Security Council resolution in 2005. The sanctions include a comprehensive trade embargo on Sudan and blocked the assets of the Government of Sudan (U.S. department of the treasury, 2015). Population in Sudan were affected by sanctions, therefore the global community decided to allow the humanitarian aid because it maintains the population survival but the aid related to the development has been prohibited as it goes directly to support the government roles which they do not want to support. Accordingly, the health system has been affected severely because of the restrictions of the health aid and its types in a sense that only the humanitarian aid (e.g., food aid, child vaccination, short-term courses to health providers) is allowed through a safeguard policy whereas any aid allocated to development activities (i.e., infrastructure activities, establishing new health facilities, long-term-courses for health) has not been allowed according to the international sanctions although it is equally important. A decision maker pointed out:

'I need to extend the 2-year training midwifery programme in order to increase the number of skilled village midwives thus enhance the midwifery services in Sudan but I cannot do that because the donors' money cannot be allocated to such long-term training programmes ... the ministry with its limited resources is trying dispiritedly to increase the number of the graduates of the one year midwifery training programme to fill the critical shortage'

- b) ***External funding modalities through Safeguard Policy*** was addressed by many decision makers as a challenge impeding the flow of aid to the health system. Accordingly, that has a negative impact on the accomplishment of the health activities. Among the conditions that the global donors' communities impose is the safeguard policy due to the political and economic sanctions in Sudan as mentioned in the previous point. According to this policy, all recipient countries covered by this

policy receive the donations through mediators (i.e., principal recipient and then sub-recipient organisations); for example, the global fund finances programmes in Sudan through sending the donation to UNDP, which is acting as a principal recipient. In turn, UNDP send this money to WHO-Sudan office as a sub-recipient. The WHO in Sudan takes the monitoring and evaluation (M&E) responsibility and ensures that the donations have been spent in the right places as the Global fund planned. The drawbacks of imposing the safeguard policy are: **1)** cut down of 25% of the donations as operational cost to the principal recipient and sub-recipient organisations which can be avoided in favour to increasing the expenditure on health interventions in Sudan; **2)** severe delay occurs in receiving the aid due to the long administrative processes. Accordingly, the performance rates of the national and state health plans have been affected. A decision maker mentioned

'We receive frequently the money after 5 or even 6 months of initiating the annual health plans. We have been asked to accomplish all activities in 6 months rather than 12 months. We need to spend the entire money in this limited period as if we do not, we will receive next year same amount that we spent in the current year... donors assumed that we do not need the whole amount... we know that will affect the quality of the performance thus the outcomes'.

- c) Establishing new parallel procurement systems** rather than using the national one is another challenge mentioned by many of the decision makers. That leads to more delays and increasing the expenditure

A decision maker said:

'Donors often use global procurement system rather than our system therefore a lot of delays usually occur; for instance in the health system strengthening project, Global fund purchased stethoscopes, pressure devices, and other medical equipment through international tender. That led to a severe delay in the project as well as higher cost due to the shipping, the price difference as compared to the domestic counterparts.'

Another decision maker added:

'Donors told us you should change your system to be compatible with our US system... but indeed they are in Sudan and they should adopt the Sudanese system ... it is not good to just follow his US system just to take his money...'

- d) Lacking the predictability and sustainability of aid** is one of the obstacles that hinder health planning and performance. The majority of decision makers

complained from the **uncertainty** of the exact amount to finance the plan's activities. Therefore, most of the times plans are designed without ensuring to what extent the activities will be performed since 80% of primary health care (PHC) activities are funded by donors. Accordingly, planners design ideal plans **as if they have open budget** 'as a decision maker mentioned' in the interview and when it comes to the implementation they encounter the scarce resources that enforce them to cancel the majority of the activities. Alongside, **the mistiming of financing** health plans in a sense that the ministries of health frequently receive the funds very late due to the bureaucracy of the donors' systems or other reasons as previously mentioned. This delay affects the commencement of the activities associated with this funds, thus officials do not spend enough time in work preparation whether logistics or technical; accordingly the work is accomplished less effectively. That can be observed clearly by tracing the activities' performance where most of them are conducted in the last half of the year instead of running through the whole year. When I asked for more clarification as to why they conduct these activities in the same year once the money is transferred late rather than postponed until the next year, a decision maker answered:

'If we do not carry out the activities in the same year we will lose the money as we should return the aid to the donor if it is not spent in the same year as planned.'

Trying to explain the delay occurring in receiving the aid, another decision maker had a different opinion:

'The major problem is not the submission of the reports because donors usually do the narrative part of the report and only they need some information, the problem is liquidating the money in order to be able to receive the money for the following year. This is a very long process. We can reduce the time if the liquidate procedure is performed directly through SMOH not central through FMOH since FMOH receive the aid and distribute it to the SMOHs and that takes time particularly under the limited staff constraints.'

In contrast, many stakeholders argued that:

'There is always delay from FMOH in submitting the documents like proposals and reports in order to be able to give them the money of the projects. We are following with them to submit the documents but always there is a problem in finding enough staff to do this paper work and even the staff who responsible for carrying out this job are always changed due to the high turnover in FMOH thus we are compelled to teach the new ones how to do it..'

Also..

Sometimes we break the rules in order to keep the money for the project and not lose it due to the delay in the paper work as there is a maximum time we can keep the aid if the recipient does not receive it, we should return to the main office.'

Another stakeholder added:

'We have two kinds of fund; regular fund which is available at the beginning of every year and it is sustained and predictable whereas there is part of our fund is irregular fund and sometimes it occurs delay before receiving it as well as this fund is unpredictable because it needs to write proposals to other agencies and other long processes before receiving it ... We fund the essential activities from the regular fund while other activities are waiting and maybe incur delay or shortage in financing these activities '

Indeed, three forms of non-sustainability in aid were addressed by participants; **first**, continuous decline in aid along with shifts in its focus. **Secondly**, where there are prior agreements between government and donors to finance projects for a certain period of time and then hand them over gradually to the government; the challenge is the government sometimes cannot substitute the organisations in funding these projects because of the limited resources. Thus, these projects are closed or continued but run ineffectively. In the light of such issues, some donors asked the government to contribute from the beginning of the project by a low percent such as 20% of the overall cost of each project for the sake of ownership, thus hoping to guarantee the project sustainability.

Decision makers admitted that:

'Donors have the right to ask for the government contribution in order to guarantee the sustainability of the projects after phasing out. However, providing the 20% of the project cost sometimes is a challenge facing the government. So, government provide part of its commitment to the project because it does not have the money that it should to pay. Accordingly, donor refused to provide all of the cost that supposed to pay based on the agreement because the government did not respect it and paid its portion. Accordingly, the project performance is affected and sometimes is terminated because both sides did not pay their financial commitments.'

The last form is the sudden cut off aid where some international organisations stop financing health projects in communities. Eventually, after one or two years the projects stumble or suspend due to NGOs have not become financially committed to these projects. This is further complicated if these projects are the only sources of health provision in the communities.

e) Lack of coordination or harmonisation in financing health system

Many partners (governmental organisations, SMOH, NGOs) work in the same region and related activities have weak coordination; that has a negative impact on the quality of the services and waste of resources. A decision maker suggested:

'Establishing an effective coordination body on the national and state levels and this body should be involved in all activities starting from the planning process and so on.'

Another decision maker said:

'We have in Sudan more than 70 donors and NGOs working only in reproductive health programmes. Every one of them has its own system in working and reporting style...also the coordination between them is very poor because every one of them wants to be highlighted in front of international and national communities...'

Regarding the coordination mechanisms that have been implemented in Sudan in order to secure satisfactory level of coordination among all donors working in the maternal health field, many stakeholders mentioned the reproductive health (RH)-partners forum which is chaired by FMOH and all donors and partners working in the RH field are members. It was established 2 years ago and it was planned to conduct a regular monthly meeting. Unfortunately, according to the responses of many decision makers and stakeholders, these meetings have not been conducted regularly.

A stakeholder mentioned:

'We do meet regularly in the coordination meetings and we coordinated to produce a service mapping in some states in the past... so we knew who is doing what and where; it helped in doing some coordination. Nevertheless, services mapping was conducted once and in limited regions in Sudan and we did not update. The coordination activities cannot be implemented without supervision and management role from the ministry which, in reality, contributes little in this regard ... we cannot do a lot as individuals in the monthly meetings.'

Another stakeholder mentioned:

'RH partner forum is a good mechanism but still need to be more effective... the problem is people are very busy and they do not have the time and effort to coordinate with other counterparts... sometimes irrelevant people attend these meetings as representatives of their organisations but they are not useful in these meetings because they cannot take decisions'

Many decision makers added another coordination mechanism which is ‘**Work plan Sudan**’, which falls under the supervision of the ministry of social affairs. The Work Plan Sudan is divided into clusters. The health cluster is led by the World Health Organization in Sudan and the Federal Ministry of Health (FMOH). According to the regulations of the health cluster, the NGOs have the right to deal directly with a SMOH after signing an agreement with it; thus the project fund can be transferred directly to the SMOH rather than transferred through FMOH, which is the case in all other international funds. Normally, the FMOH controls all external aid; correspondingly all international donors working in Sudan should sign an agreement with the FMOH and the fund go to projects in the states through the FMOH. Clearly, although this mechanism has cons and pros; the main advantage is that the FMOH is aware of and can co-ordinate all donors activities as the reporting and the coordination systems are weak, whereas the main disadvantage is the delays occurring in receiving the project funds and a greater workload for the FMOH.

Another coordination mechanism is the **Sudanese Coordinating Voluntary Association (SCOVA)** in which all NGOs (local and international) are members. The SCOVA is also invited to all health plan meetings. Furthermore, during my data collection in 2012, Sudanese government in collaboration with donors were working in developing a new initiative named ‘**International Health Partnerships**’ to strengthen the coordination between and among ministries of health and donors as well as enhance the organisation of the work in the health field. According to this initiative there will be one national comprehensive health plan, one budget, and one system. So after applying this initiative, there will not be any fragmented initiatives. Unfortunately, to date, this initiative is not applied or prepared.

Even though there are various coordination mechanisms that bring together all NGOs and donors to sit in the same table in regular meetings with SMOH on the state level and with the FMOH on the national level, the obvious shortfall of coordination can be observed in practice. That is, tracing the donors’ projects working in RH aspects, one can find surplus interventions in particular area whereas others suffered from insufficient health services or even total lack of maternal health interventions. Furthermore, donors particularly non-UN organisations do not know about each other work although they may work in the same state and in the RH field. Hence, integration and coordination are very difficult to be established; whereas other health services need to be improved and no donors pay any attention to them because it is out of their mandates. One decision maker mentioned:

‘These NGOs are not flexible to accept any suggested changes in the geographical areas that they target or even the activates of their plans in order to be corresponding to our real needs... this is because they are just implementers of projects that funded by other non-UN donors such as governments. They are very stiff in negotiations with FMOH and always refuse to reallocate money to fit with our needs ... in other words ‘take it or leave it’.

Another decision maker added:

'The duplication in the activities can be also due to the rigidity of the agendas of the bilateral donors as well; in a sense that we can find two non-UN donors running the same activities in the same area and they do not accept to coordinate or shift some of their activities... they just want to accomplish their plans regardless the health outcomes and whether the communities get use of it or not'

Some of the decision makers mentioned although the coordination is getting improved recently because the ministries have developed national health plan:

'The Federal Ministry of Health (FMOH) developed one comprehensive plan and invited donors to fund parts from it. Nevertheless, it failed to get acceptance from the donors because every agency has its own plan and specific time to negotiate it with the ministry which differs from UN agency to another and from other international donors. At the end FMOH has planned with UNICEF, with WHO, with Global fund ...etc. Of course these plans are summarised in one unified plan but when you look at it feels fragmentation inside it'

One decision maker mentioned:

'In the past donors annually came with their projects which may be not a priority in the ministry but it could not be changed ... always we confront a situation "accepting or rejecting their initiatives" but recently this thing is decreasing as now we have we have a national plan for health in Sudan now'

Another decision maker mentioned:

'Gathering all donors in one table is very ... very difficult in real life although from theoretical perspective it is an ideal ... and all organisation talk about that solution ... but they do not do it. The major reason behind that is, every organisation interested to know the impact of its fund ... not interested to know about others ... they are not interested in working with others.... Ideally, FMOH should meet all donors and discuss with them the national comprehensive plan of health and every donor decide which part of the plan will fund it. We tried to do this but we have not succeeded.'

Another decision maker mentioned:

'We did not succeed to integrate all donors' plans in one plan.'

Additionally, this poor coordination is extended to include also FMOH and SMOH; many of decision makers and stakeholders attributed the contradiction in the donors' activities to the poor coordination between the general directorates inside FMOH or between ministries with each other in a sense that the multilateral donors, which constitute the major source of international aid, cannot give aid without submitting proposals. Actually, general directorates submit same proposal to many organisations or sometimes many directorates, in the same ministry, submit different proposals but they include similar activities. That leads eventually to the same activities from different programmes running simultaneously in the same place if these proposals were accepted and got fund.

A decision maker said:

'People working in FMOH or/and SMOH should coordinate the intersected activities in order to prevent the duplication. For example, you can find more than two training courses for village midwives coming from 2 different projects in a particular region while this region cannot accommodate more than one training programme. The problem is although these two projects are performed by Ministries of health but they do not know about each other. However, the duplication of the activities can be also attributed to the rigidity of the agendas of the bilateral donors'

Lack of both, coordination and rigid systems of donors have obvious drawbacks in the performance of health plans in a sense that it is common to find certain activities in a health programme are financed by one or more of donors because they are interested in such activities whereas the rest of the activities in the same health programme are not funded due to shortage of the governmental budget. As a result of that these health programmes cannot be executed and the donor fund cannot be used or benefited by redirecting it to other health projects or other activities in the same health programme. There were many cases mentioned by decision makers in this regards – for example:

'Nowadays we want to expand particular health services in order to meet our targets in the health plan. WHO gave us the technical support, UNICEF gave us the supplies ... GAVI will give us the vaccines whereas the running cost needed to expand the services and the new infrastructure are supposed to be provided by FMOH ... yet the government currently has no budget for these new activities ... therefore we will not be able to execute the expansion programme now although many of its activities are already covered ...'

However, a few of decision makers mentioned that recently the global donors' community has realised that they created complications to all recipient countries because donors are working through a rigid system that do not allow integration with other donors' systems in

the same country. Therefore, there is an increasing interest among them to support national health strategy rather than particular health programmes.

To conclude, two-thirds of health service expenses is out-of-pocket while the health insurance covered less than 40 percent of the population. Many of the decision makers and stakeholders agreed upon two major problems that influence the performance of health system: health expenditure distribution is unfairly skewed towards secondary as well as on the geographical level; donors control the primary health services as they finance around 80% of this sector. However, they play a significant role in distorting the primary health service plan by several visions that each donor tries to impose and they obviously contribute to the mal-distribution of the health services.

Chapter 9

The Health System in Sudan: Human Resources for Health

This chapter discusses the findings in relation to the fourth function of the health system: human resources for health, with a special focus on village midwives sector. It presents the findings drawn from qualitative data of decision makers' and stakeholders' in-depth interviews and focus group discussions with village midwives. The chapter describes the management and planning procedures of human resources (HRH) as well as the significant challenges facing HRH. The second part highlights the role of the village midwives and the quality of maternal health services provided by village midwives. The main challenges facing village midwives' careers are also discussed.

9.1 Health resources for health (HRH)

Healthcare is labour intensive. Thus most of the governmental budget is allocated to pay for the health workforce salaries. The Directorate General of Human Resources for Health Development (DGHRHD) at FMOH is responsible for the health workforce. Among its responsibilities, it develops the human resources for health (HRH) plan on the federal level whereas its counterparts are responsible for HRH planning on the state level; also, it is responsible among others for capacity building and HRH production through three affiliated organisations: Continuing Professional Development centres (CPD), the Academy of Health Sciences (AHS), and the Public Health Institute (PHI). The CPD is responsible for providing in-service training to the entire health workforce whereas AHS is responsible for producing village midwives, the allied health cadres and nurses; the PHI is responsible for training the health workforce through offering some post graduate courses. Each general directorate in the health ministries has a training coordinator who communicates with the DGHRHD and the three entities. However, some decision makers argued that training coordinators do not fulfil their job duties such as identifying training needs at the department, nominating staff but are instead mainly involved in regular department duties, suggesting that training is not treated as a priority.

Regarding the priorities of the HRH plan, taking into consideration the very limited annual resources assigned for HRH, they were reported to be poorly developed focusing on more peripheral issues while the key HRH needs are neglected. Accordingly, in-service training and HRH research activities are severely affected by the limited resource. A decision maker mentioned:

'Other activities have been affected by the insufficient funding such as HRH research ... it is a shame ... I know ... particularly every activity should be conducted based on scientific evidence but the limited resources is a real challenge'

Moreover, decision makers felt that ad hoc activities threaten the quality of the training and the performance of the annual training plan. One argued:

Sometimes I receive some ad hoc tasks which affects my planning activities as it needs to be accomplished first. Therefore, my annual plan is affected and suspended. For example, we have targeted to train 1000 village midwives in the 2012 plan; after issuing the plan the ministry received funds to train 3900 village midwives; thus it asked us to increase the number of trainees. However, the capacity of the training facilities is limited.... Frankly, although it is a very positive thing, it increased our burden... we cannot postpone the training of the extra 2900 village midwives because the governmental fund is allocated for one year and if we did not use it will be returned back to the ministry of finance and it will be very long and difficult process in order to bring it back.

9.2 Challenges facing HRH

The majority of decision makers, stakeholders, and health provider groups identified formidable challenges facing the human resources for health (HRH) component of the health system: **migration, retention and skill mix of the health workforce as well as the production of health providers, improving the working environment and in-service training.**

Moreover, they argued that HRH has a distorted mix of staff in which more than two-thirds of the health workforce is concentrated in urban settings serving less than one-third of the population; most of them are concentrated in Khartoum as well as located in secondary and tertiary care. Indeed, people's perceptions are very consistent with the data presented in chapter 3 where the indicators on the national level describing challenges of HRH identify the same obstacles related to HRH production, in-service training and retention. Furthermore, chapter 7 highlighted a significant negative association with maternal mortality ratios across the states and availability of health providers.

Accordingly, women are completely relying on community health workers in receiving maternal health services to substitute the serious shortage of physicians and qualified midwives or nurses at the health facilities in remote and rural areas. A stakeholder mentioned:

'It is rare outside Khartoum if you find physicians in health facilities. It is usually medical assistants or health workers.'

9.2.1 Migration, retention, and skill mix of the health workforce

The difficulty with staff retention has paralysed the health system particularly in the remote and rural areas in Sudan. About 15 % of the population in Sudan are not covered by any kind of health services. Also, many health facilities are closed because there are no health

providers to run them, since most of the health providers particularly physicians do not prefer to work in remote or rural areas but in Khartoum instead (referring to 9.1). Accordingly, a notable disparity with respect to health service provision occurs in Sudan among states. The majority of decision makers argued that the unbalanced composition of the health team affects the health services provision. One decision maker, for example stated:

'There is no strong retention policy in Sudan and we do not have a clear line for retention interventions... but only ad hoc individual interventions in some states to solve the immediate problems ... in fact the majority of maternal health problems are coming from rural areas and remote areas where there was no / low qualified health providers or/and very poor quality of MCH'

Moreover, according to the findings of HRH census in 2010, there is an imbalanced skill mix with high doctors to nurses ratio which is 4:1 in 2010 and projected to rise to 6:1 taking into account those in the education pipeline.

The decision makers' comments also referred to the theory-practice gap between health planning and services on the ground:

'Retention challenge has been addressed in our strategic plan ... but in terms of actual work is very weak'

Additionally, a decision maker mentioned:

'Frankly, I do not know how we can solve the retention problem... I went through the 17 recommendations for retention of health workforce introduced by WHO ... we almost applied all of them in Sudan but without notable success because all of the retention interventions were not sustainable; for example, there was a compulsory one year that all newly qualified medical graduates should serve (national service) in remote areas but this decree was suspended after a while without any assessment or measuring impacts. Also, we do not have any policy document for retention or any regulations'

Community initiatives contribute to retaining health providers through allocating a monthly bonus when the physicians work in their health facilities. A decision maker said:

'Recently we appointed 15 Obs/Gynae consultants in the remote hospitals in Khartoum in order to allow good maternal health services in deprived areas in Khartoum. They receive incentives besides salaries paid by SMOH at Khartoum and localities... we signed with them contracts to attend five days at the remote rural hospital'.

Indeed, one of these consultants was interviewed among others in health provider group.

Moreover, high turnover rate among admin staff and health providers is a persistent problem highlighted by many of decision makers interviewed. It affects the performance of the entire system and was always mentioned as a problem in designing the health plans, organising activities, health service availability, and obstacles in dealing with donors. Trained people with experience continually leave their work to better jobs with NGOs or outside Sudan. The newly coming staff have no experience and they take time and effort in order to cope with the health system:

'We are continuously trying to enhance working environment and provide non-financial incentives particularly to health providers who are working in remote areas in order to retain them in the system... financing incentives are more important and we cannot increase salaries due to the shortage of the health system resources. Nevertheless, the high rate of turnover is still constituted a significant threat to the performance of the Sudanese health system and ultimately women's health.'

9.2.2 Production of health providers

Many decision makers addressed the **low qualification of the health workforce**. Educating the health cadres and improving competencies were suggested by both decision makers and stakeholders in order to enhance the quality of health services. The main repeated suggestion for HRH improvement was, reviewing the proficiencies in the curricula in order to increase the qualifications of the new graduates. Six years ago, a decree was issued to reform the nursing and midwifery careers; therefore, Academy of Health Sciences (AHS) was established in 2005 to take the responsibility of producing nurses and village midwives with high qualifications (referring to section 8.1 and 2.8 for more details about intervention related to HRH skills development). However, the impact has been limited. A decision maker explained:

'There is no problem in producing health workforce with respect to infrastructure as there are a sufficient number of available institutes, yet the problem is mainly the quality of the health education outcomes which invariably influence the quality of health services. The problems, I think, are the unqualified trainers and curriculum'

Furthermore, the FMOH introduced two new interventions in order to solve the severe shortage of HRH, particularly in remote regions: **a)** a training programme aiming to equip current health workers in remote areas with new skills to be able to provide midwifery services (integrating approach); **b)** recruiting people who have secondary level of education and live in deprived and remote areas in a 9- month training programme in providing

midwifery services, child immunisation, health promotion and health education as well as treating most communicable diseases.

In conclusion, shortage and lack of qualified health providers are the main HRH challenges facing the health system. Health Ministries try to improve the quality of current HRH while producing semi-skilled health providers to work in deprived and remote areas.

However, in order to be able to produce a skilled health workforce, there are key requirements that the Sudan health education system needs: producing a sufficient number of qualified instructors and trainers, securing proper infrastructure that can accommodate a good learning environment, and up to date curricula.

9.2.3 Improving the working environment

All health providers interviewed were very satisfied with their work and they try to cope with the difficulties of the working conditions as they said; but even they went beyond, when many of them referred to helping patients out of their pockets by buying supplies, and transferring the emergency cases by their own cars. However, many of them expressed dissatisfaction with the working environment including supply shortage (e.g., gloves, gauze, pressure device, and stethoscope), which prevent them from working efficiently. Moreover, the very poor infrastructure of the clinics, especially electricity and water, lack of proper waiting areas equipped with seats, hygienic places, fans and air conditioners as the temperature in Sudan become over 50 C° in summer seasons. However, with limited ministry resources, some health providers argued that local communities can contribute to solving such problems (community donations) instead of solving the PHC's infrastructure problems on their expenses. A health provider suggested:

'Ministries of health should inventory all PHCs and register all infrastructure and building problems. This comprehensive list can be publicised in local communities or NGOs in order to get help in accommodating and improve these PHCs. This work should be organised through the ministry... I cannot do by myself for this PHC because that can be perceived as begging from people around.'

9.3 In-service training

A Continuing Professional Development Directorate (CPD) was established in 2006 to be responsible for managing and conducting targeted courses for the health workforce. It is affiliated with the Directorate General of Human Resources for Health Development at FMOH. The CPD was established as a response to the unexpected findings of the human resource for health survey in Sudan where 75% of the health workforce in Sudan did not receive any training during the last 5-years. That created a huge demand for CPD. In each state there is a CPD centre responsible for organising in-service training at the state level.

Qualitative findings revealed that there is, to a great extent, **coordination and collaboration** between CPD centres located in the states and the CPD centre of the FMOH where the last one provides regular technical and financial support as well as training material to all CPD centres at states. Training plans of the CPD centres are developed in collaboration with the CPD centre of the FMOH. However, all CPD centres are in a transitional period; so CPD centres organise their training activities in collaboration with the FMOH.

NGOs contribute to training provision, yet there is weak coordination and communications with CPD centres to the extent that sometimes ministries of health and/or CPDs do not know about these training courses. Indeed, lack of co-ordination and a holistic strategic vision limit the value of this contribution. A stakeholder mentioned:

‘There is overlap in training. For example, sometimes there is a training course for village midwives provided by a certain organisation. After few months or a year, the same course is conducted with the same village midwives by another organisation whereas there are many village midwives have not received any training... there is no criteria to select trainees... also, there is no data base in order to help in excluding people who received courses’.

Moreover, many decision makers added that ministries of health sometimes submit proposals for HRH training which focusses on the donors’ preferences with respect to the topics rather than the actual needs of the HRH in order to increase the chance of getting acceptance. Therefore, the training system lost the aggregate vision while scattered objectives were substituted which are hardly able to identify the interchangeable links among each other. Accordingly, trainees may benefit on the individual level but on the macro level of the health system and attaining its objectives, in-service training effectively has a very trivial contribution.

Furthermore, the main interest in the Sudan health system is in producing the basic health workforce rather than providing in-service training owing to the severe shortage of health providers. Thus, long courses for producing health workforce take the 1st priority and the FMOH invests more in basic training.

9.3.1 Challenges facing in-service training

The following section addressed the most important challenges affecting the training procedure according to study participant point of views: financing, availability of trainers, irrelevant training, shortage of facilitators and trainers.

a) Training management

The target of the HRH plan is to provide a training course for each one of the health workforce in Sudan every year. All decision makers acknowledged that this target has never been attained. Surprisingly, the majority of decision makers and stakeholders argued that no

training needs assessments were conducted in any administrative or professional levels; accordingly, the training plans are usually designed based on the classic courses and repeating courses from previous plans. Moreover, the majority of health providers supported this view. The majority of health providers expressed their needs to attend more courses while all participants who previously attended training courses felt that their performance at work had been improved. However, one stakeholder argued that lack of a supervision system limited the focus of training on actual professional needs:

‘There is no supervision system in order to use its feedback in developing a training needs assessment’

One decision maker mentioned that there is a committee responsible for conducting training needs assessment, constituted from representatives from academic of health sciences (AHS), public health institute (PHI), and CPD, headed by the PHI. However, there was no evidence indicating that this committee is functioning.

Regarding **the assessment of the training outcomes**, many decision makers mentioned that only pre-, post- assessment tests are applied with the trainees whereas impact assessment is not performed. Despite that, many stakeholders highlighted the importance of conducting the impact assessment in order to help in improving the training process and curricula; the main obstacle identified by the majority of participants was the weak monitoring and supervision system. However, all village midwives, health visitors and physicians who previously attended training courses argued that the courses were very useful and improved their performance. Another specified barrier was that attending training courses has no clear impact on the career pathway of the health workforce, except physicians. This reduces incentives to engage in further training.

b) Financing training programmes

The analysis indicated that the funding for health professional training is neither sufficient nor effective. In-service training is financed by both government and UN-agencies, in which the CPD centres across the states develop their annual plans and then receive the fund through the ministries, according to the activities in the plans. Donors finance training programmes through ministries as they are not allowed to finance CPD centres directly. However, all donors and NGOs are permitted to carry out training independently or in collaboration with other local NGOs aside from CPD centres. Some decision makers addressed the insistence of donors to finance training in specific regions which may not need this kind of training whereas other needy regions are neglected (see sections 8.1 and 8.2 for more details about the donors challenges); a decision maker said:

‘Because of the intransigence of the donors to perform the training in particular regions which may not need, sometimes we move health providers from the state to another in order to train those people ... It is difficult to divert the donors’ interests to match with the actual needs of the ministries’

Many UN-stakeholders conversely complained of the bureaucratic system which leads to waste of time and effort as well as delays occurring in submitting reports; they would prefer to finance CPD centres directly rather than dealing with FMOH which distributes the training aid to the states and CPD centres. Responding to this point, one decision maker clarified that:

‘All funding should be central with FMOH instead of CPD centres in order to direct the funds in a way that serve the comprehensive vision of the in-service training and keep it aside from the distortion that may occur due to preferences of each donor’

Delay in receiving both public funds and international aid was addressed by many decision makers. It has negative consequences on course organisation, quality of training and training outcome. A decision maker illustrated:

‘Although government allocates money for HRH activities, they release it late ... thus HRH department receives always the money in the next half of the year and we have to implement all activities of the year in less than 6 months...’

Also, another decision maker addressed the inequality in the distribution of the training opportunities due to the time and/or financial constraints:

‘... we cannot bring health staff for training from remote areas in Khartoum or outside Khartoum because of the cost of transportation and accommodation ... therefore, sometimes bringing staff from nearer work places to attend the training suffices’

Furthermore, many decision makers raised the issue of budget reduction, because the government cut off part of the allocated HRH budget for other ad hoc issues or emergencies. A decision maker said:

‘Sometimes we received less than what was planned to received... we are not considered among the priorities of the government agenda... although the HRH department is better than some other departments in the ministries’

c) Training infrastructure

Many decision makers and stakeholders highlighted the shortfall in the infrastructure needed for the operation of training such as availability of materials, sufficient number of training rooms and equipped with training aids such as white board and projector. Furthermore, many decision makers addressed two challenges: unqualified trainers and insufficient numbers, which have an obvious impact on the quality and the number of courses carried out per year.

Additionally, the periodical review of the **training curricula** is essential in order to ensure including the renewable needs of the health system (e.g., health providers, plans). A stakeholder mentioned:

We designed training curricula and the ministry used it to train health providers for years without any updates although this kind of curricula need to be updated every 3 to 4 years. Sometimes they update the aspects related to scientific disciplines whereas the updates related to the actual needs of the health providers or communities have not been changed since were introduced'

Moreover, the local needs are not considered in preparing most of the training manuals; a stakeholder added:

'We provide standard training curricula of specific maternal health aspects such as ANC and family planning to FMOH in order to use it in the training. Indeed it is developed by our headquarter, not by country office... sometimes they need to be localised and addressed some local aspects rather than adopting the global ones only'

d) Sustainability

Another challenge addressed by many decision makers is the sustainability of the training projects organised by NGOs where some NGOs have not paid enough attention to the issue of handing their projects over to the ministries of health after completing their missions. That is, some NGOs, particularly the international ones, organise courses with exaggerated cost (i.e., paying high incentives to trainees and trainers); thus ministries face serious challenges in keeping these projects running after receiving them because of the limited resources and the high expenses of the training activities. Regrettably, this challenge has severe impact when this kind of project is the only project in the region that provides HRH training. A decision maker mentioned an example from Darfur:

'We received the project from the NGO after completing their mission... we could not keep it running although it was the only project in this area but we could not maintain to pay same rates like NGOs to the trainers nor incentives to trainees... so we decided to reduce expenses As a result of that, trainers who were working in these projects refused to collaborate with us and trainees had not encouraged to attend these courses after reducing the incentives. Eventually, the government closed these projects'

e) Training incentives

The responses of decision makers about training incentives were quite contradictory. Some agreed upon the importance of providing financial incentives in order to encourage health

staff to attend training courses whereas other decision makers denied the value of providing financial incentives. Also, a few commented that the financial incentives paid by ministries are usually trivial amounts and provided for the purpose of transportation.

Most of the decision makers referred to inflation of the training budgets due to providing incentives; thus the sustainability of the training programme is affected. Alternatively, they prefer to provide training with low cost in order to allow more people to enrol in these courses rather than use the training budget in providing incentives. Also, giving high incentives significantly associated with nomination bias, which leads to unequal training opportunities across the health workforce. Furthermore, according to the responses of all health providers and village midwives, attending training courses is vital to improving their knowledge and acquire new skills. It seems doubtful that there is a need to provide financial incentives in order to encourage personnel to attend courses, except providing transportation expenses to village midwives.

In summary, the previous analysis indicated that improving the HRH training needs a comprehensive future vision. There are five main interventions that need to be attained: ensure sufficient number of well qualified trainers and instructors; conduct training needs assessment and identify the real training needs; review the curricula periodically and ensure it is up to date; trainees' assessment and measuring the impact of training, and establish data bases for both trainers and trainees. It is also important to ensure that there is proper training infrastructure as it will very much help in enhancing training procedure. Finally, HRH plan should be designed based on training needs assessment rather than donors' interests, which have distorted the health training system in Sudan.

9.4 Village midwives

Village Midwives are the main maternal health providers in Sudan particularly for birth care as around 80% of deliveries occur outside health facilities. Sudan suffers from a persistent severe shortage and mal-distribution of village midwives. The FMOH planned to produce 12,000 village midwives to overcome the shortage and be able to achieve the target of one village midwife per each village in Sudan. In this regard, ministries of health through localities in all states keep looking for eligible women to be recruited into midwifery training programmes. Recruiting women from villages may help to ensure that they practice midwifery work in the same villages after graduation. According to the FMOH retention policy, a village midwife is not allowed to move to a different village and work as village midwife particularly graduates from remote areas; this is a condition that women are asked to accept before enrolling in the midwifery training programme.

Village midwives undergo periodic supervision by health visitors who have another major role, which is providing antenatal care services at PHCs. There is a severe shortage in the number of health visitors in Sudan due to several reasons; *firstly*, they are not allowed to provide birth care services in the communities nor in the PHC as these centres, in general, do not provide delivery care; as a result of that health visitors have lower income as compared

with village midwives. *Secondly*, to be health visitors, women should spend 6 years studying which is considered too long a study period comparing to village midwife career. Therefore, students prefer being a village midwife rather than being a health visitor. Accordingly, the performance of both supervision system and antenatal care are obviously affected due to the shortage of the number of health visitors; thus, ministries of health recruited a large number of village midwives to provide antenatal services at PHCs and supervise their counterparts working in the communities.

Village midwives received their training through two pathways: theoretical and practical. The midwifery training indeed largely relies on practicum in which trainees attend labours with the trainers during most of the training course, with very limited time assigned for attending classes. Additionally, classes do not utilise written materials as the majority of the village midwife trainees are illiterate (more than 80 percent of them), reflecting limitations in the basic education system for girls.

The village midwives are not qualified to provide antenatal care since it is not among training curricula of the one-year training programme and ultimately the quality of antenatal care provided within the health system is limited by this, although the quantitative findings showed that women are more likely to be satisfied with antenatal services who received antenatal services from village midwives as compared to their counterparts who received from physicians. That may be attributed to village midwives having communications skills and giving more time to women as compared to physicians. However, decision makers argued that the poor quality of antenatal services has been tackled in the 2-year midwifery training programme and that new graduates will be able to provide antenatal services.

9.4.1 Quality of maternal health services provided by village midwives

Both official reports (Abd Gabbar, 2010) and the qualitative analysis indicated that village midwives in Sudan are considered semi-skilled birth attendants with fair midwifery knowledge attributed mainly to the types of training that they received. The training mainly relies on practice with minimum required reading because about two-thirds (62%) of the village midwives are illiterate. Indeed, illiteracy constitutes a major constraint in acquiring training via the one-year midwifery programme. Thus, the chances to improve this programme are very limited. Hence, except normal vaginal birth and episiotomy suture, village midwives are not qualified to intervene in emergency obstetric care and most maternal complications. A decision maker mentioned:

'We are closing the one- year programme of midwifery, and will replace it by the two-year programme ... we took this decision after study evidence showed that village midwives are harmful particularly in EMoC cases because they are the main reasons in the late referral.... Unfortunately we cannot implement this decision and the training programme is still running until now.'

Closing the one year programme will severely affect the ambitious plan of the government to cover all Sudan with midwifery services; alternatively, some decision makers proposed another training year to the village midwives (one-year graduates) in order to enhance their competence and acquire new skills; a decision maker said:

‘We submitted a proposal for a training program targeting midwives who graduated from the one-year programme to study another complementary year in order to be skilled birth attendants and become equal to the village midwives who completed the 2-year programme’

This alternative could be more pragmatic particularly as there is a critical shortage in the midwifery services; thus, the government will not be able to close the one-year programme, even though it is under qualified, particularly ministries of health face a challenge in a 2-year programme. However, the results of the proposal acceptance were not available during the period of data collection in Sudan.

Many stakeholders and health providers were dissatisfied with the quality of village midwives services and attributed the high maternal mortality and poor maternal health outcomes in the country to the poor competence of village midwives, the main maternal health providers in Sudan. Indeed, they argued that high prevalence of illiteracy among village midwives and older age of the trainees constitute significant obstacles preventing them from learning new essential skills such as measuring blood pressure and EMoC. In addition, they claimed that village midwives lack some basic knowledge related to hygiene and infection control that leads to various maternal morbidities and complications like sepsis, which is the second main cause of maternal deaths in Sudan.

According to the village midwives’ responses, there is no clear protocol to be followed in providing maternity services. Everyone tries her best for the sake of attracting more clients: care about their reputation provides a motivator to give more attention to the job, to be distinguished in the community. Therefore, village midwives were enthusiastic to learn new skills and knowledge to be able to answer all women’s questions and increase their proficiency in clinical skills.

After carrying out the situation analysis for midwifery services, FMOH introduced a 2-year midwifery training programme in 2010 in order to increase the quality of maternal health services as well as to bridge the knowledge gap and produce new generations of skilled birth attendants. The 2-year programme covers several aspects such as normal vaginal birth, providing antenatal care, treating maternal complications, postpartum care, health education, EMoC and referral cases, infection control, child growth monitoring, family planning. The graduates from this programme are considered as skilled birth attendants and decision makers felt they would guarantee a quantum leap for maternal health service quality.

Many decision makers addressed four main challenges facing the 2-year midwifery programme, which may influence the programme outcomes, although the first cohort of

students had not yet graduated during the data collection period. The challenges were perceived to be: **recruitment; insufficient number of teachers & trainers; infrastructure & transportation and financing the programme.**

- a. **Recruitment:** finding suitable applicants to be enrolled in the 2-year midwifery programme is a real challenge particularly in villages and remote areas as the prerequisite for admission is completing the secondary level of education in order to be able to cope with the training curricula. A decision maker mentioned:

'It is rare in remote areas to find educated people particularly women... even if you find a few number, it is difficult to convince them to apply for the new midwifery programme as the majority of them want to study at universities... Frankly ministry will not provide them with a well-paid job after graduation'

- b. **Insufficient number of teachers:** the shortfall of midwifery teachers and qualified trainers constitutes another threat to maintaining the 2-year programme particularly as there is a plan for expansion to produce 12,000 village midwives. However, shortage in trainers applied also to the 1-year programme.
- c. **Infrastructure & transportation:** many midwifery schools were closed for different reasons. Many study participants from different groups suggested that these schools can be opened after renovation as that costs much less rather than build new ones. In addition, there are other regions needing midwifery schools in order to encourage families to send their girls to study there.

Furthermore, almost all village midwives and health visitors described transportation as a challenge that they faced during training, as part of the training is to deliver women and attend labours in the community and health facilities. They mentioned that frequently they were unable to move from the midwifery school and missed practicum because there are no transportation means and they could not walk. Nonetheless, the transportation problem, like other challenges, applies to the 1-year and 2-year programmes.

- d. **Financial problems** were the last challenge highlighted by all decision makers. One mentioned:

'In order to produce all this number of village midwives we need a lot of resources. The ministry budget can finance around 500 every year from the one year programme but I need 12000 village midwives in order to cover all women in Sudan. For the 2-year programme we need even more resources as every village midwife needs 2 years in order to fulfil the training requirements... unfortunately we have very limited resources; that is why we applied the 2-year midwifery programme in very small-scale.'

9.4.2 Challenges facing village midwives' careers

Even though there is a big concern about the quality of midwifery services provided by village midwives, their services are much appreciated in communities and significantly help women in the perinatal period, particularly in rural and remote areas where they are the only maternal health providers. Analysis of the focus group discussions with village midwives brought out the many challenges facing those women who are operating in a challenging cultural and physical environment. The major challenges mentioned by most of the village midwives were: **working outside the health system; lack of regular income; limited in-service training and education; Lack of supplies and equipment Operating in a challenging environment.**

a. Incorporating village midwives into the health system

Working outside the health system was viewed as the most significant challenge threatening the village midwife career. As the village midwives are not affiliated with the health system, ministries of health have very limited opportunities to supervise and regulate village midwives to the extent that they could not identify the exact number and the distribution of village midwives although every village midwife should register her name and contacts in the local authority of the area in which she works. However, there are some mechanisms that ministries of health follow to guarantee some control over the village midwives services: monthly supervision meeting between the health team of the locality and village midwives; ad hoc inspection visits to the village midwives' homes undertaken by health visitors; weekly meetings with the health visitor at the PHC located in the community where the village midwives work. Additionally, ministries of health provide supplies, in-service training, and replace equipment as needed during the FMOH annual meeting.

Nevertheless, many village midwives stated that they could not attend regularly the monthly meeting with the health visitor to review their work at the primary health centre (PHC) due to several reasons such as the far distance between their place of residence and PHC while the ministry did not give them transportation incentives and transportation is expensive. Accordingly, there is no regularity in attending supervision meetings. On the other hand, due to the insufficient transportation incentives paid to health visitors, there is no regularity in inspection visits to village midwives.

Almost all decision makers highlighted the importance of incorporating village midwives in the health system and felt the only way to achieve that is by recruiting them. A decision maker said:

'Linking village midwives to the Sudan health system is a crucial issue because it is the only way to get regular reports from them and we will be able to conduct convenient supervision.. Unfortunately, maternal complications are hidden because of the weak reporting of village midwives. Also, including them in the system will help to ensure that they attended in-service training in regular base and we will be able to provide training to all of them.'

Furthermore, some decision makers referred to the effort exerted by a few state ministries of health with respect to village midwives despite the majority of village midwives at FGDs expressing the anger and dissatisfaction with discrimination based on age in selecting village midwives to be recruited as ministries of health excluded village midwives over 45. In addition, some village midwives who were already recruited addressed the weak salaries that they receive:

'Ministry of health categorise us to old and young women below 45 and older than 45... why!!... we do the same job in the same environment ...suffering from the same problems. Why did they discriminate between us... the majority of us are over this age'

Certainly, immediate recruitment for all village midwives may not suit health systems with limited resources; alternatively, diversification of the techniques according to the community conditions could be very useful in this regards given the recruitment plan is clear and valid. There are other low-cost techniques suggested by village midwives which can link village midwives with the health system such as providing services, training, honouring morale like celebrating a national village midwife day, providing supplies, some of which have been established. Another useful suggestion is establishing a village midwives association aiming at improving and organising this profession as well as issuing the licenses and in-service training as well as formally representing village midwives at the ministries. However, incorporating village midwives in the health system needs first to develop a national plan which includes a set of interventions distributed based on the nature of each community and characteristics of village midwives (e.g., age, education).

b. Lack of regular income

The majority of village midwives have no regular monthly income; they depend on what they receive from women after delivery. There is no financial agreement between a pregnant woman and village midwife or known fee; thus women pay according to their financial ability whether goods, food, or cash. However, the majority of the families refuse to pay if the woman was referred to hospital. Providing services without guaranteeing a regular salary or compensation from the client has a negative influence on the village midwife's self-esteem as well as the attractiveness of the profession among educated girls. A village midwife expressed her feelings towards the embarrassing situation when she went to receive her payment next day after delivery:

'When I arrived at the woman's home I have seen them while they were hiding the meat under the bed ... I felt shame but what it is supposed to do... this is our job... I am looking forward ministry helps us to avoid such embarrassing situations...'

Another village midwife added that they be tolerant with all clients as they need to secure income in order to continue their lives and work:

‘Poor women usually couldn’t pay and ask me for a permission to pay later and I accept of course ... but the problem is, we need income to purchase food... to pay my family needs... we also need to buy supplies in order to keep ourselves working .’

Furthermore, in remote and rural communities with a small population, village midwives often could not find enough pregnant women to secure enough income to survive. Therefore, only a very few women who are permanently living in these areas are willing to work as village midwife.

Some decision makers identified another arrangement to compensate village midwives. It is largely relying on local community’s donations in order to pay for village midwives. However, it is not applied on a wide scale thus a considerable number of village midwives are not benefiting from it:

‘Some SMOH arranged with its local authorities to pay monthly incentives to village midwives... even though we cannot consider it as formal salaries provided by SMOH because its continuation is not guaranteed’

In order to contribute to solving the income problem, one decision maker suggested that government health insurance could pay for village midwives who assessed women that are covered by health insurance.

c. In-service training and skills development

Many decision makers and stakeholders argued that village midwives received in-service training frequently whereas others claimed that the training opportunities outside Khartoum are obviously lesser if the donors’ activities are excluded. In contrary, the responses of the village midwives suggested that the majority had never attended courses since graduation. Village midwives who attended a training course mentioned that they obtained this course based on their request to the health visitor who supervises them.

Similarly, health visitors (health provider group) seldom attended courses and feel they need to attend more. However, some of the village midwives working at PHCs as part-time or full-time HVs and received a training course last year felt it had a positive impact on their performance.

All village midwives interviewed wished to attend training courses in order to help them to polish their skills as well as enhance knowledge and thus be in a better position to answer women’s questions. Many village midwives suggested to work at least one day at hospitals where there is a high workload so they practice delivery (for the village midwives who are not working frequently in the community and they are worried to lose the delivery skills) and

also as working at hospitals helps them to acquire new experiences in dealing with complication cases.

Indeed, localities cannot nominate village midwives working in the communities as there is no complete registration system of village midwives with them and consequently there is also no strong supervision relation and follow up between the localities and village midwives.

d. Lack of supplies and equipment

The majority of village midwives complained of a lack of supplies to the extent that some of them mentioned that they could not work with some new cases and referred them to other colleagues or borrowed supplies from colleagues. Due to this challenge, many of them admitted they buy supplies from staff working at hospitals illegally and they pay 20 times its original price whereas others mentioned that they borrow from the health facilities that they work for. Many village midwives referred to the supplies received from FMOH in the annual meeting, yet it is not sufficient at all and finished in a few days. On the other hand, it is not easy to buy supplies from pharmacies without showing them health staff ID whereas village midwives have no IDs. Similarly, village midwives need to replace some tools throughout the year on their expenses although FMOH inspects the tools kits during the annual meeting and replaces the malfunctioning ones. The challenge is to find some of these tools available in the pharmacies and again as in the supplies case, they are forced to buy them illegally from people working in hospitals with higher prices. In contrast, many decision makers argued that increasing supplies and tools provided to village midwives is not a burden on the health budget and that the FMOH could contribute significantly to this matter.

e. Operating in a challenging environment

All village midwives mentioned that they received TB vaccine and they are careful during deliveries to avoid injury. A few mentioned that they wear three gloves. However, they do not wear any external plastic apron or coat to protect themselves from blood or other liquids that can infect them if women have STDs or AIDS as there is evidence indicated that the HIV/STI epidemic context in Sudan has increased substantially (FMOH, 2014). They only put their headscarves to cover part of the face rather than medical masks. Furthermore, according to a decision maker, only few village midwives committed to wearing gloves during labour due to the lack of supplies. Effectively, therefore village midwives are working in high-risk working conditions.

All village midwives in the FGDs complained about *transportation* and its expenses as the majority of women are living far from paved roads and where very few auto rickshaws can be found beside. Therefore, village midwives have to walk for a long time before arriving at woman's homes sometimes arriving late.

Another challenge the village midwives reported as obstructing their work is *cultural beliefs in particular communities* (e.g., deprived, remote and tribal communities) where people may refuse transfer to receiving care from health facilities in cases where the village midwife feels

it is needed. The village midwives explained that families also considered village midwives who make referrals as unskilled and refused to ask her help again. Therefore, some village midwives hesitate before referring high-risk women and refer them at a late stage.

The last challenge mentioned by all village midwives is the *lack of respect* in the way that village midwives have been treated in health facilities from all health staff. A village midwife said:

'Staff at the hospital do not treat us properly... also they do not allow us to stay with women receiving care... they asked us to leave the hospital in very rude way... We are colleagues why they dealing with us like that!!'

Another village midwife added:

'We want to stay to follow our cases... the hospital is very crowded and we want to make sure that women will receive proper care on time and do not be neglected'

Another village midwife added a new reason for preferring to stay with her case:

'We want to stay to learn how these cases are treated... why they even do not allow us to enter with our clients to the operating theatre ... we are colleagues.'

In conclusion, the analysis shows that the vast majority of health providers who are responsible for providing maternal health care in Sudan are village midwives. The current midwifery services are poor and do not cover all Sudan. Reform of the midwifery sector should consider two main aspects: technical and financial aspect:

- Regarding the technical aspect, the three key interventions:
 - Integrating village midwives at the Sudan health system: Incorporating village midwives in the health system is the first step in the reform procedure through several low cost interventions besides a village midwives recruitment plan which are considered costly and it is recommended to be implemented in the long rather than short-term or intermediate-term plan because of the financing constraints.
 - Regular in-service training based on needs assessment.
 - Enhancing the midwifery training curricula.

That should take absolute attention from ministries of health in order to guarantee tangible and rapid improvement in maternal health services and eventually a notable reduction in maternal mortality.

- Regarding the financial aspect, there are many ways that guarantee a regular salary for village midwives that can help them beside income coming from providing midwifery services, such as helping them in establishing small enterprises by giving them small loans with no interest/ or awards, recruiting village midwives who are working in small villages, establish funds in each local community by regular small donations from local communities dedicated to the village midwives' salaries. However, this aspect needs further investigation in order to identify the most cost-effective way that guarantee a regular income to village midwives. In cases of a small population in remote areas where there is a limited number of pregnant women, ministries can resolve the transportation so that a village midwife can cover a few more villages if the villages are close to each other.

Chapter 10

The Health System in Sudan: Health Services Delivery

This chapter discusses the qualitative findings of the Maternal Health System Study (MHSS, 2012) with respect to maternal health services, including antenatal, birth, and postnatal services. Moreover, maternal health in the context of community- is comprehensively discussed. The second part highlights the three delays of referral in Sudan. The last part of the chapter discusses the health facilities with respect to the distribution pattern, their conditions and the governance and supervision system.

10.1 Health services delivery

UNDAF (2012) indicated that the overall coverage of basic health services (child immunisation, antenatal services, growth monitoring, and availability of drugs) is estimated at only about 45% of the population in Sudan; in addition, another 15% of the population are not completely covered for health services, as decision makers mentioned. Most of the primary healthcare services are provided by government (97%) and 3% provided by NGOs, although 80% is financed by donors. Low maternal health service utilisation is associated with challenges related to the institution and the service provision as well as challenges related to women. A decision maker mentioned:

‘Only 22% of health facilities provide the essential basic package of primary health care.... we are planning to increase the 22 % to be 65% by the end of next year (2013)’

The Majority of study participants in the four groups (i.e., decision makers, stakeholders, health providers, and village midwives) agreed upon particular factors influencing the levels of women’s utilisation of maternal health care services: insufficiency and disparity of the distribution of maternal health service provision, poor quality and availability of the services, affordability, cultural barriers and a lack of health awareness among women. Moreover, decision makers identified another two related factors that have also a significant influence on the level of utilisation among women: poor conditions and mal-distribution of the functioning health services, and unqualified health workforce (mainly poor competence, and retention).

The majority of the decision makers argued that maternal health services are given at primary health units without following any guidelines whereas only hospitals (secondary and tertiary healthcare services) use the guidelines in providing the services, although no one could provide any evidence in this regard. Alongside this, stakeholders argued that the guidelines are available in very few health facilities, but they are not implemented properly. Medical records also do not reflect the components and quality of maternal health services accurately.

However, some health providers mentioned that they attended a training course on using maternal healthcare guidelines and they are applying the guidelines in their work.

10.1.1 Antenatal healthcare services

Antenatal services are mainly provided only at primary health centres (PHCs), by health visitors and village midwives with long experience. Secondary and tertiary health services deal with pregnancy complications. The majority of decision makers and stakeholders agreed that antenatal services are not of a high standard although this is varied based on the facility type and location (inside /outside Khartoum). Nevertheless, the last annual maternal deaths report indicated that the majority of deaths occurred among women who never received antenatal services (FMOH, 2012).

Both decision makers and stakeholders argued that village midwives are not entitled to give antenatal services as the one-year midwifery programme does not include specific antenatal care training. The new 2- year training of midwifery programme includes providing antenatal care among other skills, but as discussed in chapter x, this is not yet comprehensively implemented. However, FGDs with village midwives and in-depth interviews with health providers revealed that village midwives who have experience provide antenatal services through working as part/full timers at primary health centres (PHCs) in order to substitute the severe shortage of health visitors working in the clinics. Some health providers mentioned that there are several antenatal services provided through monthly visits. If the health visitors find a woman has complications, she transfers to the general practitioner ‘GP’ who investigates the case and if the case needs to be seen by a consultant, women are transferred to an obstetric consultant at the higher level of care.

10.1.2 Delivery and postnatal healthcare services

Labour and birth care is mainly provided in community and hospitals, as PHCs do not provide it. Despite the presidential decree with respect to providing caesarean section for free at government hospitals when needed, the majority of women pay for this service due to the shortage of the budget assigned by ministries of health to hospitals to cover the expenses of this service.

The maternal healthcare system in Sudan does not include a postnatal healthcare service component officially, even though the 2010 maternal mortality survey in Sudan indicated that more than one-third of maternal deaths (36.1%) occurred during this period (see table 1.2 in chapter 1). The findings indicate that postnatal services are not officially provided either in private or public sectors. However, all village midwives mentioned that they visit women after delivery in the first week mainly to get the delivery incentive and some of them added beside the incentives they take care of woman such as washing her and check the stitches whereas others mentioned that they do not do anything after getting the incentives unless women feel complications. Furthermore, many health providers mentioned that there are many cases where women suffering from post-delivery complications come to seek treatment

at PHCs, while the complicated cases such as sepsis or excessive bleeding (postpartum haemorrhage) are referred to the hospitals.

Some health providers indicated that health visitors working in the clinic usually spend a day per week visiting pregnant women who stopped attending antenatal visits as well as new mothers in the postpartum period in order to check their health and refer needed cases to the hospital. However, all health visitors complained that they cannot, in one day, undertake follow-up visits for all women registered with her; also sometimes due to the workload at the clinic and/or insufficient transportation incentives, they couldn't do any field visits.

Many stakeholders admitted that the previously mentioned mechanisms have not covered all mothers who have post-delivery complications; hence, there is an intention to include a postnatal component in future training programmes.

10.1.3 Community-based delivery of maternal health services

Village midwives have important social and health roles in communities. Their success is reliant on two bases; first is good reputation, reliability, and integration with the community; the second is clinical skills to manage pregnancy and childbirth. Village midwives usually start providing maternal services one month before delivery as relatives often only called them when the expecting mother is about to give birth. However, many village midwives said that they started to visit pregnant women several months before delivery. In the latter case, they have the opportunity to advise women with respect to diet, personal hygiene, vitamin intake and how to take care of a new-born baby and breastfeeding. They also refer women to measure blood pressure as they don't do blood pressure checks themselves (i.e., most of them are illiterate), conduct blood test to identify the anaemia level and continue follow-up to identify any maternal complication. Village midwives also discuss with women their plan for the birth - whether she will labour at home with her help or at hospital

Furthermore, women are accustomed to discussing with village midwives their personal problems as village midwives are well respected among communities because of their age and experience. Despite this range of roles, the majority of decision makers, as discussed above, stated that village midwives are not qualified to provide antenatal care, as it was not among the skills that they learned in one-year midwifery training.

During the labour, village midwives mentioned that they should refer women to hospitals if any complications occur during labour that they could not solve; in this case, they felt the village midwife should accompany the woman to the hospital. A major problem associated with maternal mortality is the late referral, which will be discussed in the following section. All village midwives mentioned that they visit mothers during the postpartum period although their responses were varied with respect to the number of visits and which days. Some village midwives mentioned the 1st and the 3rd days after delivery whereas others added the 7th day and also the last day in the postpartum period where they take the women to the

PHC in order to vaccinate the new-born. Checking the episiotomy suture, the stitches, whether there any infections, and helping women to wash the lower part of the body with warm water are the main tasks in the postnatal visits, while some added advising women to visit the health visitor at the PHC for contraception use. Another purpose was added by all village midwives: that they seek to obtain the delivery incentives in the 1st visit (in-kind or cash) after delivery. Many of them complained of the unwelcome way that they have been treated at women's homes particularly if the village midwife decided to refer the woman to the hospital in the case of complications. Women believe that village midwives do not have to receive any incentives if she transfers her to the hospital for delivery whereas village midwives assured that they have the right to get incentives as they visited women during pregnancy period and accompanied women to the hospital after suffering from complications during labour. In contrast, some village midwives stated that the families always welcome them although some families are poor and ask village midwives to postpone the incentive or waive it.

Accordingly, associating the postnatal visits with payment creates a resistance among women and relatives to receive postnatal healthcare service. Additionally, the lack of postnatal guidelines and training affects the quality of the service particularly it is not formally included in the health system. A village midwife mentioned:

'Sometimes when I knock the door in my first visit to the woman after delivery, her family do not open the door or open it but do not welcome me... sometimes they do not allow me to see the woman. They told me "we do not have anything to give it to you" although I know that they have ... at that time, I feel despondent'

Another village midwife mentioned:

'When I arrived, her relatives hid everything under the bed... I saw the meat under the bed... they refused to let me check the woman and they told me she is sleeping... I did not visit her again and they did not give me my incentives'

Moreover, village midwives reported that they advise relatives to call them immediately in case the woman experiences any haemorrhage or increase in temperature. In this case, the village midwife goes immediately to give her the first aid and if it is not working she takes her to the hospital.

10.1.4 Referral system

All decision makers agreed that there is no referral system in Sudan. Hospitals usually accept all cases regardless of the women's condition, whether acute or not, which causes work overload and congestion at hospitals and eventually a poor quality of services and low responsiveness. Many decision makers attributed this problem to the health policy in Sudan in which maternal healthcare is provided at hospitals free of charge whereas it is provided for

a user's fee at PHCs. However, some hospitals exempted the acute cases and ask the rest of patients to pay a small fee.

Delivery transfer cards are issued by health providers at PHCs to pregnant women determining whether the case is 'cold' or 'urgent'. Using the card guarantees an immediate free place at the hospital for delivery. Women who do not have the transfer card can also deliver at hospitals free of charge but they have to wait for empty places. Some health providers showed yellow and red transfer cards where the yellow card used in transferring cold cases while the red one used in emergencies. In cold cases, women go by themselves to the hospital whereas emergencies should be accompanied with a health provider. Some health providers complained from the lack of these cards as the ministries stopped sending them. Many decision makers said that these cards were cancelled, yet it seems that health providers have not been informed about that.

On the other hand, a health provider showed me another English form of transfer that he designed and use it in transferring the cases and he mentioned that this form is only used by physicians because village midwives or health visitors do not know English.

Moreover, decision makers addressed two main points that affect the referral system in Sudan: quality of maternal services and working hours of PHCs. Women's trust in the quality of services provided by PHCs is very low. That leads them to seek maternal services during pregnancy period on the secondary and tertiary levels to the extent that more than 70% of the hospital cases could be treated at PHCs. In addition, the short working hours of the majority of PHCs makes people decide to use the hospital as PHCs are not available for much of the day (only until 1:00 p.m. or 2 p.m.). Exit interviews in the SHHS indicated that women are satisfied with the working hours of PHCs and that a low percent of women from the PHCs without receiving the antenatal services. However, as discussed in chapters 6 and 7, this may reflect a limitation of the data collection approach.

Moreover, the majority of decision makers identified another challenge, which is the high cost of establishing the referral system as it includes the cost of buying ambulances, the running costs, capacity building, communication, and limited road networks particularly in rural areas where paved roads are rare.

Additionally, some donors still behave in a way isolated from the Sudanese health system and its conditions, thus do not support it effectively; a decision maker mentioned his experience with donors in this regard:

'A donor awarded a number of ambulances to a remote state. However, this state has no people who can drive and no road network except a few main roads. Accordingly the ambulances have not been used... Indeed, people in rural areas in Sudan, which represents around 60% - 70% of overall Sudanese population, do not know what is the ambulances'

Some decision makers pointed out that a number of ambulances are working efficiently in Khartoum. Nevertheless, most of the health providers argued that they use their personal network, mobiles, and sometimes their own cars in order to transfer emergency cases to the hospitals.

Generally, three broad main challenges facing referral system were addressed by all groups of study participant: *firstly*, late referral which is the main cause of maternal morbidity and mortality; *secondly*, transportation (no transportation means, affordability problem among women and families); *and lastly*, health facilities setups and overloaded work with the shortage in EMoC training. Indeed, these three sequential and interrelated challenges represent the three delays model. Therefore, early and timely, and proper intervention at a health facility reduce the maternal deaths significantly.

a. Late Referral

The majority of decision makers, stakeholders and health providers consented upon three causes that significantly attributed to the late referral, which constitutes the first delay in the three delays model: keeping women with village midwives to deliver at home to obtain incentives from families and they are very reliant on reputation, village midwives' mistakes in diagnosing the maternal complications, and a lack of patient's compliance in which many of the village midwives attributed the late referral to the lack of patient's compliance.

Keeping women at risk during labour with village midwives at home because of the delivery incentives was considered by many decision makers to be the main reason for the late referral from the community to PHC or hospital. They argued that frequently, a village midwife does not take the decision of referral in the proper time as the woman's family refuses to pay incentives if pregnant woman is transferred to health facility although village midwife was following up with this woman during pregnancy, at least, for the last month before the delivery and she should accompany the woman to hospital in the referral. Many village midwives agreed on the role of the financial factor in late referral even though they stated that losing incentives is not the main reason because few of village midwives do this while the majority take the decision in the right time.

The second reason was reported by the health providers and few village midwives was mistake in diagnosing the complications in a timely manner or treating it wrongly, as the one-year maternity training did not address EMoC and the majority of village midwives do not attend in-service training to acquire such skills.

The last reason addressed by many of the health providers and village midwives is the non-compliance of patients and relatives. There are two types of referral: "Early" and "Urgent" referrals; in the case of early referral, women or/and their relatives may refuse to go to hospitals due to several issues like previous negative experience at hospitals, cultural, and economic reasons. Frequently, after a woman's condition deteriorates, relatives call the village midwife again or go directly to a hospital. This is the explanation that many village

midwives introduced as the main reason for the late referral. Village midwives usually do not know about the pregnant woman after referring her to the hospital in the case of early referral and usually, she did not accompany woman.

The vast majority of village midwives reported that they refuse to help women in labour if it is the first time to check her, as they do not know their medical history and assisting such cases may expose village midwives to become legally responsible in case those women died during labour or in the postpartum period due to maternal reasons. Therefore, in such cases, village midwives advise families to transfer women urgently to the hospital to receive proper care. Similarly, if women with maternal complications go to PHCs, health providers advise them to go to the hospital whether in acute or moderate conditions as PHCs do not provide birth care. An early referral occurs in particular cases such as a previous history of haemorrhage, pre-eclampsia, known diabetes or anaemia.

Urgent referral is common during delivery or the immediate period before or after delivery. In this case, a village midwife should accompany the patient to a hospital and transfer her to the doctor on duty. Sometimes, relatives refuse to go to the hospital but village midwife convinces or enforces them to take the women and that takes time. A village midwife mentioned:

'If her family refuses, I call the police or bring a car on my own expenses and ask neighbours to help me in carrying the woman and become witnesses. Thus, if the woman died, no one can accuse me and I will not be legally responsible... it happened to me several times and I did that'

According to the different perspectives from all study participants and the village midwives' anecdotes, late first referral which is considered as the main reason of maternal death or morbidity is mainly due to the poor competences of the village midwives to enable them to identify the complications and deal with them, particularly when a community has high expectation from village midwives. Accordingly, referral means, in the eyes of families, village midwives fail to perform their job and that has a negative impact on their reputations. Village midwives emphasised that they are eager to learn in order to meet the expectation of her community. Learning means more work, hence more money. Studies demonstrate several barriers linked to the first delay such as socio-cultural aspects, economic level, education, women's autonomy, recognition of disease, aetiology, severity of symptoms, and knowledge and attitudes about the use of the health system (Pacagnella et al., 2012).

b. Transportation

All participants stated that transportation is one of the main challenges that leads to delay in referral particularly outside Khartoum where health facilities are very remote and there is a serious problem in transportations which is a key component of the second delay in the three-delay model. One health provider mentioned:

'Sometimes we receive emergency cases that cannot wait for a long time... I took the case in my car and delivered her to the hospital... If I wait she will die so I decide to leave the other clients and go to the hospital.'

Also...

No ambulances come to this place we are far from the centre of Khartoum ... I tried several times and they told me there are no empty cars...'

In other cases, integration with other nearby health facilities, if any, and sharing of each other's services can help to avoid such problems. However, it cannot be applied on a wide level as dependent on ad-hoc arrangements and context; for example, another health provider mentioned:

'We do not have a transportation problem. Our neighbour has a car and whenever we ask them a help in transferring emergency cases, they accept' (Neighbour is non-governmental health facility)

Transport was a particular challenge for village midwives where they face a problem to reach the patient as most of the women live far from the paved roads and not accessible from transportation means; thus they walk long distances before reaching woman's homes. Also, transferring the patient is another challenge as there is the lack of transportation near to woman's home. One mentioned:

'Because we are legally accountable in the late referral and if the woman died, I call the police ... if they will arrive late ... I take the women to the hospital using public transportation... sometimes I face a problem when the woman lives in a place far from public transportation because we walk or bring some relatives to carry her until we arrive at the nearest paved road so we can find a taxi or rickshaw.'

Another village midwife added:

'Ambulances do rarely come. They always say there are no empty cars now... sometimes we call the police (999) it is faster'

Consistent with the previous discussions, studies highlighted several causes of the second delay mainly the transportation particularly among women living in remote areas, facility congestion that makes women moving from health facility to another in order to find an empty place, and lack of supportive social network (Pacagnella et al., 2012).

c. Hospital organisation

All participants acknowledge that the poor conditions of health facilities, lack of training and workload, shortage of supplies, bad conditions of labs, and lack of triage and prioritising the high risk cases are influencing the level of women's and health providers' satisfaction and increasing the risk of maternal mortality; that can be considered as the third delay in the three-delay model. However, still hospitals are more trusted compared with PHCs. However, quantitative findings of women's satisfaction showed that giving attention to the patients and answering all her questions are among other variables that significantly enhance women's satisfaction.

Furthermore, congestion of hospitals and work overload was identified as a common challenge in almost all hospitals in Khartoum state. That has severe implications for women's care. For instance, a woman who is suffering from complications may stay in the queue waiting for her turn whereas her case may be an emergency and need immediate intervention due to a lack of triage system. Although a decision maker stated there is a triage role in the facilities, a village midwife said:

I had a case with early eclampsia. I referred her to the hospital in the morning and left. In the afternoon when I come back to visit her... I discovered that she was not entered to the operating theatre. After checking her I found that she is entered to eclampsia coma... I went directly to the hospital manager... he managed the case and entered her to the operation theatre. However, she died next day... indeed, they forgot her... no one took care of her because doctors were busy.

Also...

'Many women were delivered at bathrooms because their turn did not arrive... the hospital is crowded and staff have no time to help all needy women to deliver ... I have seen a case that the new-born was dropped on the bathroom floor'...

Many village midwives agreed and they started to tell similar stories from experience.

Moreover, overloaded work has obviously affected the levels of cleanliness and sterilisation of the health facilities. Village midwives attributed the women's rejection of hospital maternal health services to the dirtiness of beds, sharing hospital beds, unclean tools, beside the disrespectful way of treating women at hospitals. Supporting the village midwife's claim of the low level of cleanliness and sterilisation, a decision maker mentioned that the findings of a recent case study in Khartoum hospital conducted by FMOH showed that it has a very high level of infection and high rate of sepsis among delivered women at the hospital. Importantly to mention that Khartoum hospital is the largest hospital in Sudan and among the highest in the number of births. Supporting this claim further, focus group discussions with

non-user women showed that one of the main reasons for non-use of maternal service addressed by women is the low level of cleanliness (refer to chapter 7 for more details about the factors affect the level of maternal services utilisation).

Village midwives provided a lot of anecdotes about the complications experienced by women after delivery due to infections and carelessness at hospitals and how village midwives treated and saved women's lives. Clearly, this kind of stories may be used to support their position among women in the communities for the sake of promoting their own roles and potentially to defend themselves against assumptions of providing sub-standard care compared with hospitals. However, there was supporting evidence provided by a decision maker who referred to the causes of maternal mortality in the annual report where the unsuitable hospital settings and doctors untrained in dealing with EMoC cases are among the significant causes of avoidable maternal deaths.

The evidence from different sources supported the argument that quality of birth care services at hospitals is poor due to overcrowding (partly related to lack of triage and prioritising the high-risk cases), and limited staff along with the dirtiness of both tools and environment. Crowding also contributes to infection risk. In addition, lack of triage and prioritising is increasing the risk of maternal death among women who have severe obstetric complications. This contributes to the third delay in the three delays model. Consistent with the above discussion, studies highlight facility crowding, poor quality of services, shortage of health staff and poor system in identifying women suffering from severe obstetric complications as the main causes of the third delay and note the importance of developing and applying a framework to avoid the three delays in order to minimise the maternal death (Pacagnella et al., 2012).

10.1.5 Health facilities

The distribution of functioning health facilities reflects huge disparity among states even within the same state. The FMOH aims to establish a hospital per each 100,000 population, giving a target of 333 local/rural hospitals. There are currently more than 418 hospitals but with a mal-distribution across Sudan in favour of the capital and urban areas. A decision maker mentioned:

'Local communities and the private sector play a significant role in establishing health facilities in their communities and/ or equipping them. However, we (FMOH) should guide these initiatives as you may find a lot of health facilities in a particular village whereas others they do not have at all.'

Many decision makers and all health providers also indicated that a considerable number of health facilities need to be renovated (i.e., infrastructure and/or medical equipment) particularly health facilities located outside Khartoum.

In addition, there are many health facilities that are closed in various areas because of shortage of health providers to run them; a decision maker said:

'Some of the closed health centres were the only facilities providing health services in the area but because there is no health provider we had to close it'

Moreover, the government has a problem to cover nomads (mobile communities) with health facilities. However, some decision makers suggested providing training to a person from each of these communities to be village midwife or health worker thus secure minimal health services providing to those communities.

Another relevant aspect some decision makers pointed out is lack of medicine and supplies at health facilities; thus the only source of medicine is health providers who controlled also the pricing as well; one said:

'With exception of facilities located in Khartoum state, all health facilities in the states do not provide medicine. The only source of providing medicine is through health providers by selling the medicine to their account. Thus, they control the pricing of the medicine...'

Additionally, health providers prefer to sell the medicine with high demand (fast running) not the essential medicine for life that should be available at health centres. There is no control from the ministry on the quality of medicine. Fortunately, the government has the intention to control the provision of medicines procedure in Sudan through expansion of the providing medicine project. However, there is nothing occurred so far regarding this aspect. Selling the medicine outside Khartoum state secures extra income to health providers; however, it obviously affects the price, quality, and availability.

Additionally, some decision makers addressed an important issue related to ethics in medical practice as health providers may prefer to add unneeded medicine in their prescriptions because it is available whereas they fail to prescribe the needed medicine because it is not available with them.

A decision maker added:

'There is an ethical problem associated with selling medicine by health providers because usually they write prescriptions according to what they have rather than the real and necessary medicine to the case... frankly, they want only to sell their medicine.'

In order to reform the disparity of the distribution of health facilities, many decision makers introduced 'The Expansion of PHCs Project'. The FMOH will rely on health facility mapping data in order to attain reasonable distribution of health facilities and identify those in need of renovation as well as assess and accredit the primary health centres (PHCs).

10.1.5.1 Governance and supervision

The need to strengthen the supervision system of PHCs was raised by many decision makers and health providers. Some health providers agreed that SMOH does a few supervision visits to PHCs annually. In addition, there is a monthly supervision meeting where the health team in each locality visit PHCs, located within the locality borders, and meet health staff in the clinics in order to discuss their work and review the reports and the monthly registrations as well as supervision sheets which include items for checking. However, health providers complained that the health team do not have the authority needed to solve any of the work problems or staff problems. Instead, they just registered the problems at every supervision visit and promise to escalate them without any positive intervention occurring.

In conclusion, providing maternal health care is largely depending on village midwives, whether at PHCs or community, although they are considered as under-qualified people. Also, as the one-year training programme does not include antenatal care training nor EMoC and postnatal care, village midwives provide antenatal service at community and PHCs and some postnatal visits to women based on individual diligence (or in the case of some postnatal visits to obtain their labour incentives) rather than their role being recognised and supported by the health system. No guidelines are applied in providing the maternal services, which respondents felt impacted negatively on the quality of services. The findings show that postnatal care is not formally included in the maternal health care system, even though statistics showed that more than one third of maternal mortality occurred during the postnatal period. Also, the health system does not include a referral system and the three delays model is perfectly applied in Sudan where there is frequently late referral, persistent problems in transportation, and delay in obtaining the services in hospitals due to lack of triage system. Other factors related to cleanliness, congestion, low qualification of health providers and poor or disrespectful treatment of women affects the quality of services and women's motivation to utilise them.

Moreover, the mal-distribution of working health facilities is notably affecting the availability of services particularly at remote and rural areas, which are not entirely covered by services. The findings also indicate that there is a weak supervision system for health facilities and poor conditions in many of them.

Accordingly, this affects the quality of maternal service and satisfaction of both women and staff. This was reflected in the negative experience that most of the women described, as discussed in chapter 7.

Chapter 11

Discussion

Healthcare like any other system can be perceived as a ‘sub-system’ from a wider government system that adopts its attribution and follows its political attitudes, rules and legislations. Any health system inherits the government philosophy and tends to adopt its ways of working. Therefore, any shortage or corruptions, or any other kind of failure occurring in sub-systems such as the economy, roads & transportations, and planning will affect the health system whereas any reform or improvement in a sub-system should not be performed in isolation from other sub-systems even-though certain interventions should be implemented at this level.

The main study objectives presented in the thesis are: 1) to analyse the different ways in which health system dimensions (i.e., stewardship, financing, maternal health services including referral system of maternal morbidities, and maternal health providers) can shape maternal health and the pattern of utilisation of maternal health services; 2) to identify the social, cultural, and women’s characteristics’ barriers to the use of maternal health services in Sudan during pregnancy, delivery and the immediate postpartum – when most deaths and serious morbidities occur. The factors influencing the women’s utilisation were investigated in detail using both qualitative and quantitative data. In addition, the influences of each part of the Sudanese health system focusing on maternal health system utilisation were explored using qualitative data that I collected in Sudan in 2012.

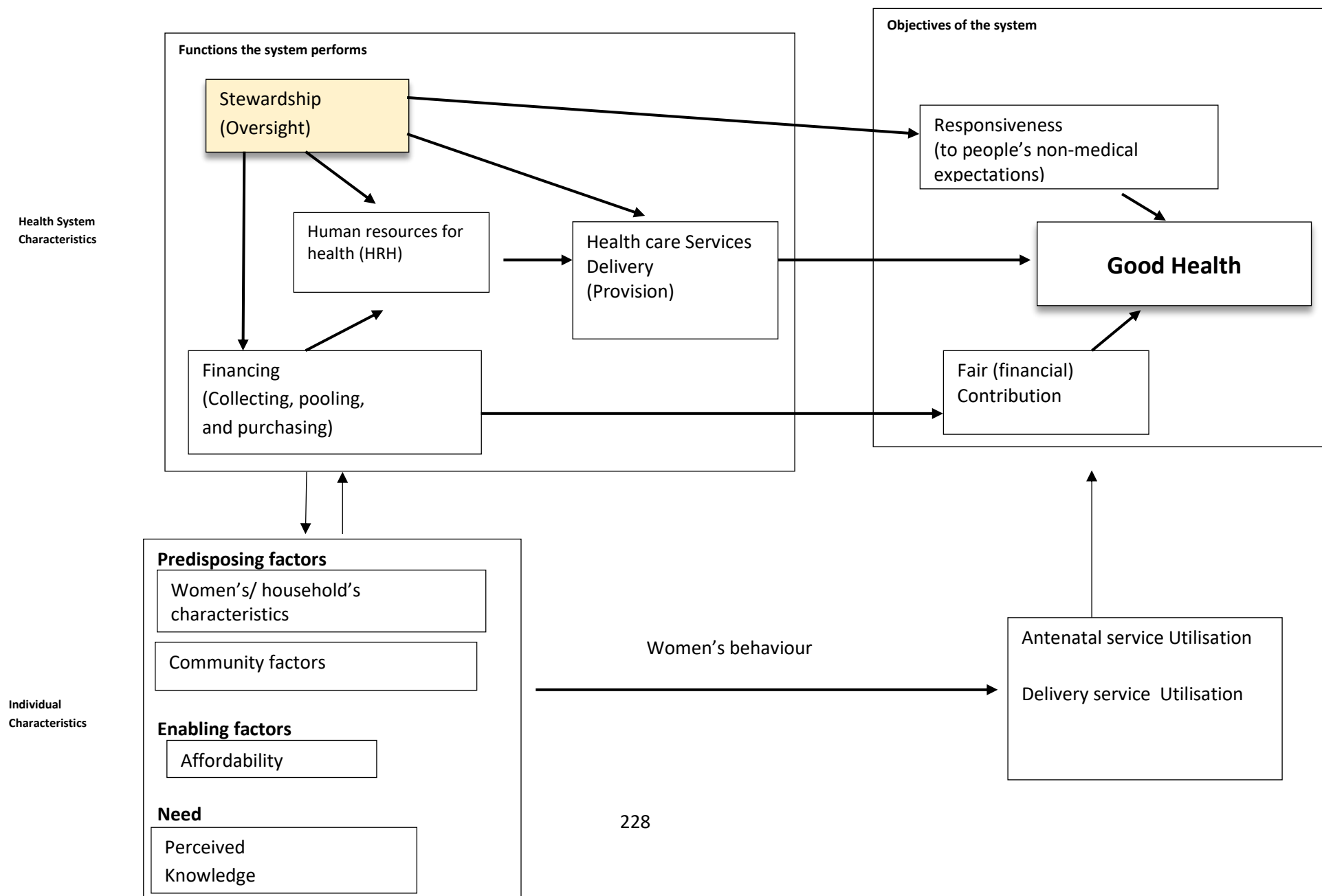
The study used explanatory sequential mixed methods design to address the main and the specific study objectives. The first phase of the study utilised quantitative data in order to determine the principal factors that influence women’s utilisation of both antenatal and delivery care. The second, qualitative phase had two main objectives; first to obtain further explanations that quantitative data would not be able to cover and second to fulfil some gaps in the knowledge relating to maternal health system components in order to assess its performance. This was approached through in-depth interviews with decision makers (senior managerial staff at both FMOH and SMOH in Khartoum), stakeholders (donors), and health providers as well as exploring factors affecting women’s satisfaction with maternal health services through focus group discussions (FGDs) with village midwives and women, both users and non-users of maternity services. The study’s findings are presented in chapters 7 to 10. This chapter integrates the findings from the different data sources to present an assessment of the overall maternal health system performance and its impact on maternal health behaviours, with ultimate implications for the level of women’s health. These findings are then discussed in relation to the wider relevant literature.

The study shifts the focus from the population factors (i.e., women, household, community factors) to health system factors as it was found in the data collection and analysis phases that health system components have a crucial role in women’s utilisation of maternal health services. This shifting is consistent with other literature that assessed both women and health

system factors on utilisation in low-income settings. Alvarez et al. (2009) found a positive relationship with the health care system-related variables as well as educational and economic variables associated with maternal mortality in Sub-Saharan Africa (Alvarez et al., 2009).

The study suggests a new framework, which I have called the Maternal Health System Performance framework (MHSP) (figure 11.1). The MHSP is different, to some extent, from the initial conceptual framework introduced in chapter four (figure 4.2), as it has built on the data analysis in the study described in this thesis. The MHSP framework reflects the health system as a whole and highlights the role of the four functions of the health system in relation to women's utilisation of maternal health services (discussed below), consequently the women's health. In addition, the performance assessment within the MHSP framework is set at two levels: 1) the system level, where measures are set nationally; 2) the state level, where measures contribute towards the system level indicators. The framework applies primarily at the system level, with a focus on services provided through ministries of health, while the second level is only partially covered, as there was a shortage of the data on the state level; thus the disparity and fairness objective could not be analysed fully in the study.

Figure (11.1): The Maternal Health System Performance (MHSP) Framework



In the MHSP framework, financing was added to be the third function as disparity and mal-distribution of resources has crucial influence not only on women's health but also the entire population's health. Population and community component has been reorganised to be more efficient in explaining the maternal health behaviour among Sudanese women. The new framework included a mix of quantitative and qualitative indicators, which facilitates diagnosis of the drawbacks of the maternal health system in Sudan (summarised in figure 11.1), while the improvement of the system performance is at the heart of this assessment framework and it is presented in the recommendations section.

The first section of this chapter brings together the quantitative and qualitative study findings to assess the performance of the health system and examine whether it achieves three intrinsic goals: better health for populations and health equity, responsiveness to community expectations, and financing fairness. This is approached, through assessing the four functions constituting the system: stewardship (see chapter 8), financing (see chapter 8), human resources for health (see chapter 9), and health services delivery (see chapter 10). The second section of the chapter addresses the impact of the health system on maternal health service utilisation.

11.1 The assessment of the Sudanese health system performance

Promoting and restoring health is the core objective for health systems. This means pursuing optimal maternal health status for all women over the whole life cycle. According to the proposed Maternal Health System Performance framework (MHSP) (figure 11.1), four functions have been assessed and their impacts on achieving the three health system goals in the first stage of the assessment studied.

11.1.1 Health system functions

11.1.1.1 Stewardship function

As discussed in chapter 8, this involves oversight of all other functions, attention to system-design, and accountability: proposing or ensuring strategic policy frameworks and regulation of the health system. Different studies that discuss dimensions of the health system stewardship concept highlight varying aspects that reflect stewardship, depending on the study perspective (see Goodwin, 2008; Veillard et al., 2011; Barbazza et al., 2014). However, there is a consensus among them that stewardship is an important function because it is responsible for managing and/or regulating the national health system; also, it should work across the entire elements of the health system to guarantee well-functioning health system and efficient use of resources.

The analysis of decision maker and stakeholder interviews in this study clarified that all established techniques of designing health plans are well known and implemented in developing the health plans. In addition, the majority of the decision makers argued that designing health plans have been notably improved since 1990s. However, a number of challenges are still faced, which will be discussed below.

The MHSP framework for assessing the stewardship function of the health system proposes nine interrelated dimensions: health planning and decrees, priority setting, identifying maternal health needs, health information, monitoring, integration, and coordination. Healthcare ethics is not included in this assessment as there was not enough collected information in this regard.

a. Health planning and decrees

Several plans and strategies have been developed in Sudan since the beginning of 1990s on the national and state levels, as discussed in chapter 8. Most of the relevant partners are involved in developing the health plans through a taskforce and applying both bottom-up and top-down approaches. Although the taskforce follows planning cycle stages (i.e., situation assessment, priority setting, and identifying strategies, costing, resources planning and budgeting, programming and implementation, and monitoring and evaluation), several challenges facing planners lead to developing unrealistic and inefficient health plans. Some of these challenges are due to shortage of qualified staff, lack of and inaccurate data and unrealistic goals while other challenges are related to the deficit in the dimensions of stewardship. Moreover, the analysis shows that even though there were advantages of the decentralisation approach that was applied in the health system, it generated more complex environments for governance and performance management, because of varying capacity, wealth and governance of different states. Therefore, the decentralisation approach applied in Sudan health system needed to be tuned to accommodate the poor conditions and administration challenges; the keys of this tuning are applying decentralisation only in implementation of health planning activities and service provision whereas planning procedure and monitoring and assessment need to be carried out centrally, but with participation of SMOHs in setting the priorities and planning procedures being essential.

Several ministerial and presidential decrees have been issued since the 1990s in order to guarantee free maternal health care and emergency obstetric care for all women. However, these decrees have largely failed to be applied because of the shortage of resources allocated to cover these free services. The following is a summary of the major challenges that were identified by my respondents as having contributed to dysfunction of stewardship in practice.

b. Identifying maternal health needs and priority setting

Identifying maternal health needs is very much related to having comprehensive and reliable data. The health system in Sudan relies on the Sudan Household Health Survey in identifying women's health needs. Although these data are not sufficient, particularly data related to maternal health aspects, it can nonetheless be considered as an acceptable data source in some respects. In order to substitute the challenge of insufficient data, planners used the worldwide maternal need indicators, which do not necessarily reflect the domestic needs; ultimately, this leads to work with a long list of insubstantial maternal health needs, undermining a focus on key priorities for Sudan.

Moreover, prioritising the system of maternal health needs is one of the core duties of stewardship that has technical and political dimensions. There is no obvious system to identify the maternal health priorities in Sudan or geographical priorities. In this absence, MDGs and donors' agendas tend to determine the list of specific objectives whereas the actual priority needs of maternal health, which vary across the states, are given less consideration. Although the donors' agendas certainly are relevant, there is still considerable work needed to identify the key maternal needs in each state and coordinate with donors to prepare a unified agenda in order to avoid disparate efforts leading to failure in accomplishing the most significant maternal health objectives.

c. Health information

Data and information are essential to monitor and guarantee good performance of the health system. Persistent severe lack of and inaccurate data have obvious drawbacks on the performance of all functions and associated dimensions of the health system. Unfortunately, hundreds of thousands of dollars have been spent in collecting data with low quality and with many errors in methodologies.

Additionally, there is a notable shortage in the registration systems of the ministries of health concerning health staff and village midwives, training (i.e., trainees, training needs, and trainers), village midwives' registrations, and health projects and health projects' progress. Along with lack of institutional memory and archiving system, this leads to waste of lot of data, reports, and studies. Accordingly, the workflow and the cumulative knowledge of the health institutions have been affected severely as these are heavily reliant on personal memory as a result.

d. Coordination and integration

Coordination is a key to achieving the planned health outcomes and acceptable health system performance under limited resources (efficient use of these resources). Analysis of quantitative data revealed that there is inequitable resources distribution among health programmes due to the interest of the donors. That is, if the donors are interested in a particular programme, they dedicate a significant fund for this programme; accordingly, some programmes have more than their needs to run activities, while other areas are lacking. Eventually, coordination can save a lot of resources as the same tools can be used in performing many parallel activities. In addition, coordination is useful in avoiding duplication of activities in the same places leading to waste of resources that could be better used elsewhere. Indeed, low- and middle-income countries may need to largely rely on the interventions that adopt the integration between vertical and horizontal approaches in delivery health services but it should be within the health system of the country and support its goals and meet the health needs that the system is identified (see section 3.1 for further discussion about vertical and horizontal programmes).

The qualitative analysis identified that in the Sudan health system, coordination within directorates in ministries, and between ministries is weak. Additionally, there is poor coordination between all health services provision entities (i.e., FMOH, SMOH, military, police, health insurance, and private sector). Hence, the limited resources are used inefficiently.

e. Monitoring the performance of the health programmes

Monitoring procedure largely relies on unqualified people (local authority staff), which can result in monitoring procedures which are superficial and unaccountable. Additionally, the monitoring meetings on both state and federal levels are dependent partially on data coming from unreliable resources whether from local authorities or insufficient or inaccurate registrations of village midwives which, as discussed in chapters 8 and 9 meant these meetings were not very effective, although they are used to solve current work problems that involve several parties.

According to the previous analysis, the stewardship function is ineffective in terms of management, coordination on all levels, monitoring and assessment, and the planning processes are dysfunctional; hence the stewardship function has significant negative impacts on the other three functions and the overall performance of health system.

11.1.1.2 Financing function

A good financing system is determined as raising adequate funds for health, in ways that ensure people can use needed services and are protected from financial catastrophe or impoverishment associated with having to pay for them.

The achievement of the universal maternal health coverage goal in Sudan has been hampered by inequitable health financing. As explained in chapter 8, the health system is financed through two main sources: donors and government. Nevertheless, there is a critical shortage of finance for the health system in Sudan, particularly the primary health care sector, which relies on external aid for 80% of its overall financing. Consistent with Shiffman (1992), this shortage affects the other functions in the system and consequently the overall performance. This section discusses the main challenges facing the financing function, taking into account the two sponsors.

a) International financing

Although the maternal health system in Sudan survives because of donors' funds, the analysis indicated that they contribute to widening the financing disparity gap among states and increase the inequality through controlling the primary healthcare plan in Sudan since they finance 80% of it. Indeed, rigid agendas that have been imposed predominantly from donor headquarter offices or global interests that do not necessarily reflect the needs of the local

community or the other parts of health system reduce significantly the benefits of international aid and contribute to the lack of a unified vision to improve the maternal health in Sudan; it is merely a fragmented vision that aims at enhancing the maternal health but working in different directions, which sometimes contradict each other. That is consistent with other literature that assessed the international aid to low- and middle-income countries. As Spicer (2014) discussed that, there is poor alignment between Global health initiative programmes, such as GAVI and global fund, and country priorities, systems and procedures. Indeed, global health initiative funding may have some damaging effects on recipient countries with fragile health systems (Spicer, 2014). Esser (2011) argued that donor allocations are be informed primarily by concerns about existing needs and the desire to improve health status in recipient countries in the most effective manner. Writing earlier, Sewell (1992) and Walt et al. (1999) claimed that aid allocation for health is often based on ideology, values as well as national and organisational interests; also donors usually manipulate recipient agendas that may result from one party controlling significant resources while the other party is in serious need. This analysis suggests the issue has not diminished over time.

In addition, the impact of external aid is less efficient than it might be due to the lack of coordination among donors working in the reproductive health field in Sudan as they are living in isolated islands, despite the intention to integrate and collaborate together. This applies particularly to donors working in the same state, in order to maximise the expected benefits of their projects. Unfortunately, although the FMOH has achieved good progress in developing national plans and other supported strategies, it cannot impose these plans to be implemented as donors still do not have flexible systems to include the national/ state plans even though there are continuing discussions and consultative meetings. Consistent with qualitative findings of this study, Spicer et al. (2014) and Fryatt et al. (2010) argued that unpredictable aid makes it difficult for recipient countries to budget and implement their planning activities.

Donor funding for health systems financing research is inadequate and often poorly aligned with national priorities (Ranson, 2010). According to Esser's (2011) argument regarding the responsiveness of the global health aid in the form of official development assistance to the recipients' needs, donor allocations could not be informed primarily by concerns about existing needs and the desire to improve health status in recipient countries in the most effective manner.

Consistent with the study findings, there is a lot of research that critically analyses why overseas development and aid activity is not very effective and wastes scarce resources (Kates et al., 2006; MacKellar, 2005; Spicer et al., 2014; Ranson et al., 2010; Esser, 2011; Fryatt et al., 2010). MacKellar (2005), Spicer et al. (2014), and Ranson (2010) identified wide gaps between reproductive health needs in global south developing countries and international funding priorities. In addition, Mercer (2014) added that donor policy direction is determined predominantly by the government of the donor country, which may change at any point in time within a four to six year period.

A related problem facing the performance of the maternal health system is that financing of the primary healthcare sector is largely reliant on international aid rather than government; government allocates most of the health budget to secondary and tertiary healthcare sectors. The low financial contribution to primary health care (PHC) leaves the FMOH/SMOH in a weak position in influencing or implementing PHC plans, which are strongly led by the donors' agendas with minimal contribution to PHC plans including maternal health.

Furthermore, donor disbursements to maternal, newborn, and child health activities in all countries continued to increase, but its rate of increase has been slowing since 2008. Also, the share of multilateral funding continued to decrease although it is still better as compared to bilaterals and global health initiatives. However, aid for health from key donors might soon decrease in the present economic climate (Hsu, 2012). In Sudan, after the economic global crisis, a notable reduction has been made in aid received by both countries and UN- donors (Abd Gabbar, 2009). Therefore, the primary health care activities including maternal health programmes have been affected. Additionally, findings of the qualitative data revealed that donors limit the covered regions. That obviously may threaten the continuation of essential maternal health activities or even the entire primary health care services, as they can be influenced by international donors' desires and other political directions.

In conclusion, international aid failed to build on the inherent strengths of people and communities and recipient governments, thus appearing to provide short-term benefit but actually lacking in long-term benefit. They are not building the health system because they are trying to tackle bits and pieces of it in a un-co-ordinated way. Sometimes aid deals with symptoms but fails to tackle the underlying causes of problems and aid is spent in scattered interventions without a unified and comprehensive health policy that sensitively reflects the local communities' primary needs.

b) Government financing

The quantitative (chapter 7) and qualitative findings (chapters 8 and 10) identified that lack of proper records and weak system leads to reliance on more personal networks of power and influence; accordingly, structural challenges on the macro-level are created. The government has no obvious rules to follow in allocating resources. In such a situation, the political power of the state, individuals and personal relationships step into the gap in terms of securing resources but this is not the ideal way to run a system with clear priorities and goals, especially in a situation of very limited resources. Accordingly, this contributes to deepening the resource gaps and increases the disparities among states, particularly as the states that have poor or no resources largely depend on the government in financing the health programmes. In addition, it was reported that some state governments are not applying clear regulations in organising procurement procedures and other health expenditure; accordingly, several defects have been encountered leading to more waste of resources. There is clear evidence from both the qualitative and quantitative findings that the disparity in the distribution of national resources across the states has significant impact on the availability of health services provision, accordingly the maternal health indicators, even though the FMOH

has tried to narrow the finance gap among states by contributing to the health projects at the state level according to the status of the available health resources in each state. Although the FMOH interventions can be considered essential in deprived states as they completely rely on the FMOH assistance in providing health services, it is far from achieving fairness.

While these factors influence service availability and quality, the limited coverage for health insurance across Sudan contributes to widening the disparity of maternal health service utilisation.

Five main challenges influenced the performance of financing function: the impact of political environment on financing the health system, funding modality, procurement systems as each donor insists on following his procurement system rather than the national one. As a result, the Sudan health system is impelled to deal with several parallel procurement systems rather the national one (see chapter 8), lack of the predictability and sustainability of international aid, and poor coordination amongst donors and between the donors and ministries of health.

Eventually, **financing fairness** is not accomplished on the macro level; indeed, international donors and the government may, however unintentionally and for different reasons widen the gap. Furthermore, although many mechanisms are implemented to guarantee cooperation between government and international donors, lack of the accountability and harmony in working clearly have an influence on maternal health system performance.

11.1.1.3 Health Services Delivery Function

It is a principal function of health systems to deliver health services with affordable, equitable, accessible, sustainable, good quality health services As discussed in chapter 10, many challenges obstruct the performance of the Sudan health system in terms of care delivery: quality of care, shortage in supplies and medicine, lack of accessibility, shortage and unqualified health workforce, lack of clear referral system, limited organisational competence. This section summarises and further discusses the findings of service delivery presented in chapters 7 to 10.

a. Quality of care

Qualitative analysis indicated that the health system does not provide any standards or protocols in providing maternal health services in primary health care. This is likely to directly affect the quality of maternal health care. Although there are some developed guidelines, they are not applied in any of health facilities. Accordingly, there is a notable shortage in the specification of a the desired performance in the form of clinical guidelines, review criteria or clinical policies even though many service guidelines were developed and available. Indeed, providing maternal health services is mainly dependent on practitioners' experience rather than protocols (see chapter 10).

Additionally, several competences that are needed in providing proper maternal health care are missing from the midwifery training programmes such as postnatal care, antenatal care and EMoC as well as identifying maternal health complications in an early stage during pregnancy and labour periods before these complications develop to become severe and life threatening. Findings of both health providers and decision makers suggest that the weak content of the midwifery curricula have a major impact on the quality of maternal health services. Midwives in Sudan are the main maternal health providers in both community- and facility-based delivery services, including antenatal care, yet there was a consensus among study participants (excluding village midwives and health visitors) that village midwives are not entitled to give antenatal services, deal with EMoC, and maternal complications. Furthermore, qualitative analysis (chapter 10) highlighted the disappearance of formal postnatal services from the system although one third of maternal mortality occurred in the postpartum period (see table 1.2). Missing competencies have been added in the new 2-year midwifery programme in order to enhance the quality of services; however, several obstacles hinder the implementation of the new programme on a wide-scale such as lack of suitable candidates, insufficient number of teachers & trainers; infrastructure & transportation and financing the programme (see section 9.1.3.1 for more details).

Findings of the Sudan health expenditure survey in 2010 identified that 64 % of the health service expenses were covered out of the patient's pocket. That constitute a challenge that hinders a considerable number of needy women from accessing services. Qualitative findings revealed that the Sudan health system failed to cover the entire expenses of maternal health services; thus many maternal care services are provided for user's fee such as antenatal preventive measures and screening for potential complications or infections, immunisation of pregnant women, vitamins particularly iron supplement, even though provision of maternity services is formally free to access according to the ministerial decrees and health policies (see section 8.1.6).

Accordingly, a large number of women who are using the government health services (PHCs/public hospitals) did not or only partially received these services because they belong to poor households and cannot afford to pay the fee (see qualitative and quantitative analysis of chapter 7). Although there is an effort by the government to deliver maternal health services free of charge, a large number of women have to pay for the services because the limited resources could not guarantee to provide the maternal health services free of charge for all women. In addition, the qualitative findings revealed the extent of hidden informal payments that can further hinder access to care and affect the quality of the services. Other literature were highlighted the informal payments for health care services particularly in developing and transition countries because the economic and socio-cultural environment is more conducive to "gifts"-exchange as a means to maintain the underfunded health care system (Stepurko, 2015; Stepurko, 2013). Moreover, Mæstad et al. (2011) concluded that informal payments has significant impact on the quality of health care and significantly contributing to health system failure; consistent with this study, health workers are involved in creating artificial shortages and deliberately lowering the quality of service, in order to

extract extra payments from patients or to bargain for a higher share of the payments received by their colleagues.

On the other hand, health insurance could not play a role in alleviating the expenses of the services, as overall coverage was only 35% in 2012.

Both qualitative and quantitative findings identified that the health knowledge received in antenatal visits is concentrated on nutrition and hygiene issues while the women lack knowledge related to recognition and management of pregnancy-related complications, even though some danger signs during pregnancy are addressed. Not all health providers discussed the delivery place and mode of delivery with women while childbirth and emergency preparedness plans and transport to a health facility were not discussed with women during antenatal visits.

b. Accessibility, disparity, and affordability of the services

Insufficiency and clear disparity of the distribution of maternal health service provision plays a significant role in depriving a large number of women from the utilisation of maternal health services, particularly outside Khartoum. That was reflected in the levels of maternal mortality and prevalence of maternal utilisation in remote states and rural areas as discussed in chapter 7. One of the significant factors that contributed to this inequality is the donor's interests as they are the main sponsors of maternal health programmes. Donors show attention to work in particular areas in some states whereas other states are out of their interests, and the quantitative analysis demonstrated that this was not on a needs basis. While government and state resources are attempting to meet the maternal health needs, because of the limited resources many of these needs cannot be fulfilled.

c. Medical supplies and medicine

Supplies and medicine is another obstacle affecting the service provision, particularly in impoverished regions. The analysis highlighted a crucial problem related to lack of supplies at health facilities and community health providers, which affects the performance of health providers and availability of services in the communities and health facilities.

Medicines provision is outside the Sudan health system except in Khartoum state. Thus the prices of medicines are suggested by health providers who sell them for their own benefits inside health facilities and outside the control of the health system. This threatens both the quality of service and medical practice ethics. However, medicines provision was not in the main focus of this study and further investigation needs to be done on this issue.

d. Referral system

A referral system is not applied in Sudan although there have been several attempts to run such a system. The principal challenges facing the health system in applying the referral system are: **1)** the health policy in which maternal healthcare is provided at hospitals free of charge (officially) or lesser than the user's fee applied at PHCs; **2)** people do not trust the quality of services provided at PHCs; **3)** the working hours at primary health centres (PHCs) are short (i.e., most of PHCs are working for one shift until 1 p.m. or 2 p.m.) although quantitative findings indicated that the working hours of the health facilities did not constitute a significant factor that affect the women's satisfaction (see chapter 7, table 7.13); **4)** there is no regular ambulatory care serving the PHCs or hospitals thus some health staff use their own initiative and resources to transfer emergency cases to higher level of care; **5)** the majority of village midwives refer women to hospital rather than PHCs.

Indeed it is important to mention that PHCs provide routine maternal health services (mainly antenatal care) as well as treating mild and moderate maternal complications whereas severe complications are referred to hospital. Labour and birth care services are provided at hospitals and some PHCs in remote areas where there are no hospital services. In reality, due to the limited number of hospitals, the maternal health policy in Sudan encourages pregnant women with low obstetric risk to deliver at home with village midwives in order to reduce the congestion at hospitals. Lack of triage system at hospitals and referral system contribute to the poor quality of services provided at hospitals.

Furthermore, the analysis concluded that the three delays (Pacagnella, 2012) are perfectly applied in the Sudan referral system (i.e., late first referral from community to health facility, transportation obstacles (no transportation means, affordability problem among families), and ineffective triage system with shortage in both service and training of EMoC.

e. Organisational competence

Assessing organisational competence is a significant part of the overall assessment of the health service delivery function, as good health services cannot be delivered without good health facility and environment where the services are provided. The Sudan health system has no control over the quality of maternal health services provided at homes since although village midwives are the main maternal health providers at home; they are not fully included in the health system, which has superficial control over the village midwives' work.

The findings strongly supported the argument that quality of birth care services at hospitals is poor due to overcrowding, and limited staff along with the dirtiness of both tools and environment. Crowding also contributes to increasing the infection risk. Responsiveness level is therefore not up to the expectations of the people that the systems serve, even though their expectations may be limited. Similarly, various PHCs are lacking good infrastructure and cleanliness, medical equipment and instruments, proper waiting areas. Accordingly, a considerable number of health facilities needs to be renovated (i.e., infrastructure and/or medical equipment) particularly health facilities located outside Khartoum.

Looking at the distribution of the health facilities across Sudan, a crucial disparity in favour of the capital and urban areas was identified (see chapter 2, figure 2.1). That has a notable influence on the availability of services particularly at remote and rural areas, some of which are not entirely covered by services. In addition, many health facilities have been closed in various areas outside Khartoum because of the shortage of health providers to run facilities; unfortunately, some of them are the only health facility in their areas. Several interventions have been implemented to correct for the mal-distribution of working health facilities and their poor infrastructure and poor conditions. For example, a commitment to pay monthly incentives for consultants obstetrician and gynaecologist who are working at PHCs in order to retain them working at these centres. Although several community initiatives have contributed to retaining health providers, the local communities' efforts need to be organised and re-directed by the health system through a list of requirements for health centres in each community so that people's donations go to meet these needs. Indeed, qualitative findings revealed that local communities' donations are considered a good source for financing the health system, which suffers from a failure to fulfil some of its requirements especially with regard to the renovation of primary health centres (PHCs). In addition, the Federal Ministry of Health (FMOH) sometimes relies on community's donations to complete the construction and reform of the healthcare centres (chapter 9). On the other hand, findings show that there is a weak supervision system of health facilities, which also contributes negatively to the quality of the services provided in the facilities. Edgar and colleagues' (2015) study which looked at the quality improvement of maternal and child health services suggested that a conventional supervisory model using external supervisors could be the best alternative because it operates intermittently and overcomes other common challenges facing health systems in low-resource settings such as understaffing in management cadres and lack of transportation resources.

Ensuring the privacy of patients in examination rooms is not considered at PHCs because there are a lot of patients as compared to the staff capacity and most of the waiting areas are not properly equipped; therefore, village midwives usually meet more than one woman at the same time. On the other hand, quantitative findings showed that women's satisfaction level is not affected by the level of privacy, which may reflect women's low expectations of privacy on busy services. This finding is consistent with a systematic review of evidence on group antenatal care, which has been trialled as a new model of care in poor neighbourhoods in the US, Malawi and Tanzania (Catling et al. 2015). The research to date suggests that the group care model has been shown to have benefits for women and midwives. Although studies show that although some women worry about the privacy aspect, in practice this is not a problem for them. However, this is a specific model that organises care according to group principles and encourages sharing of information and group support between women and midwives (Patil et al. 2013)

According to the previous analysis, the provision of maternity care services is not guided through guidelines/protocols, whether in institutional services such as PHCs or community services through village midwives, who are the main maternal health providers. Findings also

provide clear evidence that while village midwives are not trained and qualified to provide antenatal care or deal with many maternal complications and EMoC, they are the main providers of such care owing to lack of alternative provision. Additionally, despite being the main providers of care, they are working outside the health system. No postnatal care is included in the maternal health services and no clear referral system exists to support EMoC cases. Therefore, the health system cannot guarantee an acceptable quality and comprehensive maternal health services to women across Sudan.

Furthermore, the Sudan health system does not achieve equitable distribution of the health services provision, which is clearly reflected on the level of maternal mortality and utilisation across the states (this will be discussed further in sections 11.1.2, 11.2).

11.1.1.4 Human resources for health function

A well-performing health workforce is defined as ‘one that works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances (i.e. there is sufficient staff, fairly distributed; they are competent, responsive and productive)’ (WHO, 2007, p.vi). According to the detailed qualitative analysis, several challenges are affecting the performance of this function.

Migration and retention are major chronic challenges affecting the performance of the health system in the sense that several regions in Sudan have a shortage or incomplete coverage of maternal health services as discussed in chapter 9 because health providers refuse to work in remote and rural areas and prefer to work in Khartoum, the capital city.

Imbalanced skill mix and insufficient production of health providers with good qualification also occur, along with mal-distribution. Ministries of health have conducted many initiatives aiming at retaining health providers working in remote and rural areas. However, the expected achievements have not been accomplished due to several challenges, mainly lack of sustainability of these initiatives, which did not reflect the actual need of the health providers in addition to working environment and facilities that are not supportive.

Furthermore, considerable efforts have been made since 2006 to improve the qualification of health workforce through in-service training and to increase the production of a health workforce to meet the needs of the health system. However, these appreciated efforts are dispersed and unorganised for several reasons: the majority of health cadres have no obvious career path, no training needs assessment has been applied to identify the actual training needs, and there is a clear disparity in the distribution of training opportunities among health providers in favour of the health staff working in Khartoum; also poor training setting, training curricula, and shortage in qualified trainers/instructors contribute to weakening the expected training outcomes.

Furthermore, village midwives are responsible for providing 80% of maternal health services in Sudan; yet since they are not incorporated in the Sudan health system except a very few

who are working at PHCs to substitute the shortage of health visitors, they are further excluded from the limited in-service training opportunities. Some village midwives working in the communities have been recruited recently by state ministries of health through scattered governmental initiatives to include village midwives in the health system, but this has not been implemented on a system level. As a result of not being in the system, the exact number and distribution of village midwives cannot be recognised by the system, consequently it is too difficult to identify the villages that are not covered by midwifery services. In addition, this imposes serious challenges for ministries of health to run real assessments or improve the village midwives' skills.

Qualitative analysis identified several challenges facing village midwives affecting the quality of services and the overall performance of the system, including a weak midwifery training programme, lack of in-service training, irregular income, lack of access to transportation, shortage in medical supplies and instruments, and loose supervision system with irregular inspection visits. Accordingly, the health system almost failed to effectively manage or monitor village midwives. Indeed, village midwives who provide community-based services could be a precious and continuous source of maternal health information, care and referral if they are managed effectively, well trained and subject to a good and regular supervision system.

Since health providers do not follow any particular guidelines in providing maternal services, the information provided to women during antenatal care was not complete and it varied according to the village midwife's experience, particularly as they are not trained to provide this service (not included in the one-year midwifery training programme). Antenatal care is nonetheless mainly the responsibility of village midwives in communities and PHCs. Both qualitative (chapter 9) and quantitative findings (table 2.4) identified that the majority of health providers are not satisfied with the working conditions, although there was no evidence that this dissatisfaction significantly reflected on their work, as the level of health provider's satisfaction with their salaries was not considered to influence their performance with clients (see table 7.12). This inference reflects only the perception of health staff working at health facilities in Khartoum where the working conditions, opportunities are relatively more satisfactory than other states. In addition, the staff satisfaction of both salary and working conditions was quantified based on the responses of direct binary questions (one per each); therefore, staff satisfaction variables may not be very precise. Nevertheless, qualitative findings indicate that even though health providers and village midwives face a lot of challenges at work, they have the intention to do their best to provide acceptable health services for women as their lack of satisfaction is due to the system, not the customers. Consistent with the responsiveness literature (Röttger et al., 2014; Valentine, 2003), the qualitative findings underpinning the low responsiveness among women is more likely due to the patient-health provider relationship which may be influenced by the congestion at facilities that do not allow health providers to allocate enough time for each patient at examination room.

According to the overall analysis, the human resource for health function is not functioning well and this has significant negative impacts on the health service delivery function. Furthermore, clear maldistribution of HRH across the states reflects a lack of fairness.

11.1.2 Health system goals

In general, the dysfunction of the performance of the health system functions is likely to lead to failure in accomplishing the health system goals. The following section discusses the second part of the assessment of the health system performance, which is focused on the three intrinsic goals of the system.

11.1.2.1 Good health

The good performance of the health system is more likely to be achieved when it responds fairly to health needs and consequently contributes to good health. Maternal mortality ratio is used to assess the overall maternal health and judge how well the first objective of the health system, good health, is being achieved. Maternal mortality measure is not sufficient for the purpose of summing up the maternal health as MM is like the tip of an iceberg - a lot is hidden below the surface accordingly the levels of maternal morbidity are not captured by this measure. Nevertheless, it can be still a good indicator of fundamental problems as for every woman who dies there are much more 'near-misses' and even greater numbers left with morbidity.

There was some improvement achieved in the level of maternal mortality between 2006 and 2010 (see chapter 7). Arguably, this is as a result of the scattered maternal interventions and some improvement that occurred in the performance of maternal health service delivery and human resources for health functions according to the qualitative results discussed in chapters 9 and 10.

However, the overall maternal health status is not enough to judge the performance of health system and consider it as a perfectly fair health system but it is important to respond to all groups of population and ensure to not treat a particular group in a humiliating or disdainful way. Table 7.1 in chapter 7 presents maternal mortality ratios across states which reflects a notable disparity among states that ranged between 127 per 100 000 live births in Northern state to 335 per 100 000 live births in South Darfur state where maternal health services are scarce.

Accordingly, modest improvement occurred in women's health but it is not satisfactory as the inequality still high. A health system has a persistent responsibility to reduce the inequality levels by adopting multidimensional interventions as will be discussed in the recommendations.

11.1.2.2 Responsiveness

Responsiveness indicates how the health system responds to people's expectations with respect to health or non-health aspects. Measuring the responsiveness is a problematic matter as it is largely subjective. Thus, it might be affected by several features of the system themselves, or of the respondent's characteristics and culture.

The general notion of responsiveness can be broken down in different ways; women's satisfaction is used in this study to assess the responsiveness of the Sudan health system. Ideally, assessing the second intrinsic goal of the system should be examined on the national level to identify the overall achievement and on the state level to identify the fairness which means the system should respond equally well to everyone, without discrimination or differences in how people are treated. However, quantitative data available for the study only enabled me to assess women's satisfaction with the Khartoum level. Health services and health providers are concentrated in Khartoum; thus the results obtained in this regards are likely to be overestimated if generalised on the overall health system; hence the disparity dimension cannot be covered in this assessment even though remote rural areas in Khartoum are suffering from the shortage of services. Quantitative findings highlight the importance of patient- health provider relationship where showing respect and dedicating enough time to explain the health condition and medical examination procedures before carrying them out as well as answer all woman questions and concerns. Also, returning back without receiving services is significantly associated with women's satisfaction. Interestingly the same factors were obtained from the qualitative analysis of the FGDs with women as well as additional factors. The main concerns frequently raised by women were the high expenses of the services and hidden expenses; poor quality of services and lack of supplies; hospital congestion and long waiting queues; poor hospital environment settings (see chapter 7, section 7.4)

In conclusion, women's satisfaction is significantly influenced by the health system functions, as both quantitative and qualitative analysis concluded. Health providers play an essential role in influencing the women's satisfaction, accordingly the responsiveness level of the health system. Findings revealed that respecting women's dignity and giving sufficient time to explain and answer women's questions by health providers, explaining medical examination and procedures before doing them are the principal aspects affecting satisfaction.

The second main area of concern influencing the level of responsiveness is related to health services. Women assured that the high expenses of the services make them dissatisfied with the services particularly the informal expenses that are imposed by health providers at facilities, such as baksheesh and expenses of supplies as well as previous experiences with health providers or facilities has a strong impact on current responsiveness of patients and even work as a significant barrier to use maternal health services. In addition, findings of both the qualitative and quantitative analyses addressed several factors that have significant influences on women's satisfaction and also their future decision of utilising the health services: quality of services, long waiting hours before receiving the service, turning women

away from a facility during working hours without receiving the service, poor facility conditions including hygiene and cleanliness, and hospital congestion. In contrast, the responsiveness towards village midwives, who are providing the services on a community-basis is much better as compared to the responses towards health providers at formal health facilities since village midwives are closer to women in the communities and give full attention and respect to them, but meeting the health needs of women is considered by decision makers to be poor as they are thought to have limited competence. Literature was consistent with this study finding; Valentine et al. (2015) discussed the health systems' responsiveness using data from 64 countries; it was found that dignity and social support, prompt attention, quality of basic amenities and confidentiality, education, health-related experiences are important covariates that have significant impact on the responsiveness. In addition, Kruk and Freedman (2008) suggested 6 principal indicators to quantify the patient satisfaction: being treated with respect, quality of physician-patient communication, administrative simplicity, length of wait for care, perception of access to specialists, and adequacy of time spent with physician.

According to the analysis in this study, the health system is highly unresponsive. However, performing interventions to target human resources for health and health services functions may significantly impact on the responsiveness level.

11.1.2.3 Fair financing

The last intrinsic goal of the health system is ensuring financial protection for all household members and guaranteeing fair distribution of the costs of health system according to ability to pay rather than to the risk of illness. There are not enough data that have been collected regarding this goal in order to be able to assess it precisely and thoroughly. However, according to the qualitative findings, the absence of obvious rules in allocating the government budget of health for states and largely depending on the donors in financing the primary health care in which donors finance only the interested areas that are compatible with their agendas have a major impact. This deepens the inequalities among the states to the extent that some regions are not covered by any formal health services. Furthermore, the health insurance system covered less than 35% of people in 2012 and most of those people are working in the governmental sector. The health services provided under the health insurance system are also concentrated in Khartoum whereas people who have insurance and those living outside Khartoum would travel very long distance to receive the health service from the health insurance facilities. Accordingly, fairness in financing is not achieved and there is no efficient health insurance system that can guarantee the right balance of contributions from households and fair subsidized provision to poor people.

In conclusion, according to the previous assessment of the performance of the Sudan health system (functions and goals), it was clear that the main health system challenge is the limited resource particularly allocated to primary health sector even though the wider evidence shows primary care is more cost-effective; along with weak role of stewardship and lack of health system information. Poor competences of health providers and maldistribution of both

providers and facilities across Sudan is also contribute to the dysfunction of the overall performance. Moreover, the health system relies on village midwives who are outside the health system in providing both antenatal and delivery services. Providing maternal services through village midwives significantly contributes to the poor quality of services particularly as the majority of them lack essential competences related to EMoC and dealing with or identifying maternal complications (moderate to severe), yet there is no organised referral system, or triage system to ensure that higher-risk women or those who develop complications are referred to higher-level care. Consequently, there is clear evidence that the system is not currently capable to achieve an adequate level of attainment of the health goals or equitable distribution, due to dysfunction of the four-health system functions.

Moreover, the stewardship function is the most important function as it is responsible for managing and regulating the entire elements of the health system. Thus improving this function inevitably will enhance the remaining functions of the system particularly many low cost interventions in improving stewardship can be performed while better health management will save waste of resources resulted in the dysfunction of the other three health system functions

11.2 Impact of the health system on maternal health service utilisation

High health system responsiveness is interrelated with the pattern of maternal health services utilisation. The quantitative findings identified the important role of socio-demographic characteristics particularly women's education, education of head of household, women's work, parity, and the income level of the household as factors that significantly influenced the pattern of maternal health services utilisation. Health system related factors were addressed at the qualitative findings as significant factors that also influenced women's decision of utilisation. For years, professionals and policy makers tended to ignore health system issues, instead blaming women for being 'ignorant' or bound by custom, whereas this study confirms the findings of other recent studies that women who do not access services are often mainly responding to the very poor treatment and the lack of quality and overcrowding of the services that exist (Matsuoka, 2010; Parkhurst, 2005). This research contributes to the body of research that highlights the role of health system on the women's utilisation of maternal health services, which is very clear in the entire analysis of the FGDs with women. The qualitative analysis emphasised accessibility, financial barriers, bad experience at facilities and with health providers, and cognitive barriers as the most important barriers contributing to the low utilisation among women (see chapter 7, section 7.4). These barriers whether obtained from qualitative or quantitative are consistent with other relevant literature (Kiwauka et al., 2008; Kruk et al., 2008; Matsuoka et al., 2010; Tlebere et al., 2007); yet this study provides another detailed case illustrating the barriers as well as exploring some context-specific issues of traditional practices such as Islamic/ traditional therapy' provided at Islamic clinics.

Moreover, qualitative findings underpinning the shortage of health awareness with respect to the initial symptoms of maternal complication which may be signs of developing severe

health complications among women contributes negatively in deterring women to use maternal services, as they believe maternal complications are normal during maternity period except severe haemorrhage or severe complication they should seek care. In addition, the cost of services enforces women to be selective about the time of using the maternal health services. That exposes women with complications to poorer outcomes because of the late decision of seeking maternal health service. Wild and his colleagues found in their study that knowledge gap among women in low resource settings constitutes a significant barrier to maternal health services utilisation (Wild et al., 2015). Yoshida and colleagues suggested that effective communication and showing empathy and understanding by providers improve patient knowledge, health literacy, shared decision making, and encouraging return visits. They argue that this can be attained by interpersonal communication training as an integral part of provider education (Yoshida et al., 2014).

In general, availability, affordability, and quality aspects are the principal determinants of utilisation, as there is a significant association between the availability of maternal services and levels of utilisation. Accordingly efforts to encourage the continuation of receiving maternity care services should focus on addressing the negative attributes of the health system (mentioned in the previous analysis) that discourage access and use rather than solely addressing the users' characteristics.

Cultural factors did not show significant influence in this study in obstructing women to take a decision of seeking maternal health services. That partially could be explained by lack of many culture variables (see data limitation in section 6.4 for further discussion). Women's use of alternative services, such as religious healers was complementary to their utilisation of village midwife or medical care. Therefore, the study provides evidence that the women were very happy to use the local care with village midwives and would also seek religious healers in case of community based services through village midwives fail to satisfy them with the services or the maternal care services are not covered in this place, while the majority of women seek medical care if they perceived problems to be severe. Moreover, these findings are in the line with other studies that have found observing customs did not preclude women and families from seeking hospital care for birth in which they moved freely between the forms of health care (traditional and medical) and they were often combined (Wild et al., 2010).

Moreover, Pathirana et al. and Simkhada et al. argued that significant determinants of antenatal service utilisation should be viewed as context- or country-specific where factors which are important in the utilisation of ANC in one country or culture may not be significant in another (Pathirana et al., 2015; Simkhada et al., 2008). This study reflects only women living in Khartoum whereas women living in rural and remote communities where the culture and illiteracy play a significant role in constituting their beliefs and behaviours have not been considered. Nonetheless, these findings countered professionals and policy makers long-standing assumption that cultural traditions were key barriers to accessing care (Navaneetham et al., 2002; Celik et al., 2002; Gleit et al., 2003; Bloom et al., 2001; Bhatia et al., 1995). According to the study findings, culture factors play a relatively limited role in women's

decisions as compared to socio-demographic and other health system related variables such as quality, accessibility, and humanity of service issues and thus it adds to this newly emerging body of knowledge that challenges previous views about what the main barriers are. This has important implications for the approach that decision makers should adopt to alleviate the health system barriers that women encounter in using maternal health services, through reprioritising the significant barriers and giving more attention to health system factors.

Interestingly, quantitative analysis showed that place of residence has a significant influence on the pattern of utilisation. The stereotype explanation is lack of knowledge, poverty, and cultural barriers; consequently, health awareness campaigns and advocacy target these communities while the analysis here suggests that these factors do not play an essential role in discouraging women; alternatively, the qualitative findings revealed that the more significant problem is within health system factors such as availability or quality of services or previous negative experiences as the remote and rural areas are not covered by health services or with very poor quality of services.

On the other hand, qualitative findings pointed out several initiatives in order to increase the levels of maternal health services utilisation and encourage women to attend antenatal visits regularly. The initiatives include add services such as: providing vitamins and iron supplements as well as lab tests for free of charge to pregnant women. However, due to the high expenses of such intervention, it is important at least to distribute vitamins according to the women's needs, particularly the prevalence of anaemia among non-pregnant women (around one third (31.2 %) of women ages 15-49 in Sudan in 2011 were anaemic according to the WHO records (Stevens et al., 2013). In addition, it is important to encourage donors to resume financing such interventions. On the other hand increasing the quality of maternal health service is important for women to continue receiving maternal health care as well as trying to rebalance the system costs away from city and large hospital care and towards the most basic and primary health services, including vitamins, immunisation, PHCs.

Moreover, analysis of the qualitative data suggested that improving the facility's settings (e.g., ensuring that waiting area, the seats are proper, and renovate the building and infrastructure of the PHCs) is encouraging women to continue attending the antenatal visits as well as encouraging health providers to work in a proper working environment. Eventually health system has to ensure that primary health services including maternal health services are available and welcoming to the poorest in the community.

Furthermore, rationalization of the use becomes important due to the limited availability of the maternal health services as well as the health policy in Sudan encouraging women to deliver at home and keep only high-risk deliveries at hospitals due to the limited capacity. In order to achieve that effectively in the absence of a clear referral system, some commentators suggested regular health campaigns targeting both women and village midwives within their communities aiming to illustrate the symptoms of health complications and when women should take the decision to go to health facility, together with a transfer plan based on each community. That could help women to take the decision of utilisation properly, along with

establishing an effective triage system at health facilities in order to not lose the women with high-risk pregnancy when they arrive at the hospitals. Essentially, the health system should put restricted rules at hospitals in order to reduce the hidden expenses which notably contribute to the overall service expenses and monitor the rule implementations.

In conclusion, a dysfunctional health system has a principal influence on women's utilisation of maternal health service, ultimately maternal health in Sudan. Therefore, improving the performance rather than simply targeting women by health awareness campaigns and targeting other user's characteristics is the most efficient intervention in order to enhance the women's health (see the recommendations in section 10.3 for more details).

Table 11.1 summarised the factors through which every function influences the other three functions in the Sudan health system according to the qualitative and quantitative analysis discussed in the research. The notation uses minus between to the brackets “(-)” to indicate a negative impact from the function located on the horizon direction on the function located on the vertical direction. This table could be also a road map that could be used to enhance the performance of the health system in Sudan tacking into consideration starting with the stewardship as a leading function and have a significant impact on enhancing the performance of the other functions. There are many elements in this function that can be improved with low cost, for example, reform the fragmentation in the health plans and prepare a precise list of maternal health priorities, follow a more robust monitoring and assessment system, and develop an accurate and precise health information system. All these interventions are very important to enhance the stewardship and other functions and most of them are low cost interventions.

Table (11.1): Mutual influences between functions in the Sudan health system in the Sudan health system

	Stewardship	Financing	HRH	Health Services
Stewardship		(-) Misuse (-) Donors' funding modality (+) involving donors in all planning procedures	(-) Lack of supervision system (-) Village midwives are outside the health system (-) Imbalanced skill mix (-) Production and retention of sufficient health providers and mal-distribution (-) Unqualified HRH (-) No training needs assessment (-) Clear disparity in the distribution of training opportunities (-) Poor training setting (-) Limited training curricula (-) Shortage in qualified trainers/instructors (+) Establishing Continuing Professional Development centres (CPD), the Academy of Health Sciences (AHS), and the Public Health Institute (PHI) in order to improve HRH(+) (+) initiate the 2-year midwifery training program to enhance the quality of midwifery services	(-) Distribution of services (-) Identifying the real maternal health needs (-) Identifying the priorities (-) Applying clinical guidelines, protocols, and policies (-) Medicines provision is outside the Sudan health system (-) Lack of accessibility (-) No referral system (-) Ineffective triage system (-) Registration system (-) Shortage in health awareness campaigns (+) Start crystallise a comprehensive vision and plans without relying on donors in the formation of National Vision (+) decision makers aware about the drawbacks of the health system (+) Initiate the comprehensive coverage of PHCs in all Sudan Project (+) Ministerial and presidential decrees to avail the maternal health services free of charge at all health facilities

	Stewardship	Financing	HRH	Health Services
			(-) Assessment (-) Information system (-) Transportation	(-) Assessment (-) Information system (-) Transportation
Financing	(-) Fragmentation in health plans (-) Distortion in the maternal health priorities (-) Rigid Donors' agenda (-) No clear regulations for distribution of government funding among states (-) No clear procurement system and other health expenditure		(-) Working environment, low satisfaction at health facilities	(-) Organisational competence (-) 80% of primary health care financing is contributed by donors. (-) Lack of donor projects' sustainability (+) FMOH contribute to the health projects at the states according to the status of the available health resources in each state (-) Shortage in Supplies and medicine
HRH				(-) lack of privacy at examination rooms (-) insufficient time to explain and answer women's questions (-) No explanation of medical examination and procedures before doing them (-) Lack of respect for women's dignity
Health services				

11.3 Reflexivity in Focus Group Discussion

Focus Group Discussion (FGD) as a qualitative technique allows relatively comprehensive discussions to be conducted with a small group of people from the target population on issues important to a particular study and it is offer a time-efficient mean of collecting a reasonably wide range of information (Kahn et al., 1992).

The FGD technique has several advantages that can enrich qualitative research. It can provide comprehensive information as compared to individual interviews since the generated discussion provides useful information regarding personal and group feelings, attitude and opinion. The interaction occurring among participants provides information from different points of view. In addition, if facilitated well, it can encourage some hesitant participants to express their opinion and participate more in the discussions. In addition, it can be considered as a low cost tool as compared to individual interview. However, the FGD technique also has potential disadvantages. Sometimes, there can be disagreements among participants and irrelevant discussions which may distract the main focus of the FGD. Some participants may feel discomfort in discussing particular aspects of a topic. Imbalance may occur in the discussions due to some participants dominating the discussion while others are quiet and it can be challenging for the facilitators to encourage a group of people to participate. In addition, some participants may feel under pressure to agree with the dominant view.

Due to the difficulties to understand the colloquial language which is common among the majority of illiterate or older people in Sudan, I recruited two research assistants to help in moderating the focus group discussions (FGDs) with village midwives and women (for further information about the study participants recruitment, procedures of data collection and research assistants recruitment, see section 6.1.2) . I attended all of the 9 FGDs as observer and I participated in keeping the discussion in line with the topic guides. I also intervened by giving my research assistants some prompts to be asked in order to clarify some points and intervened with some probing questions if there was a need to do so. Most of these interventions occurred during the breaks in the discussion, in order to not disturb the flow of the discussions. At the beginning of each FGD, usually participants considered me a stranger who was watching them although I introduced myself at the beginning of the FGD; yet they continued asking questions about the reasons for attending the FGD; however, after a while people almost forgot me and we interacted easily together and with the two research assistants. Some of the participants tried to engage me in their discussion through asking me my opinion and questions related to similar situations in Egypt (my home country) and others asked some relevant personal questions like my marital status and whether I have children. However, I tried to avoid getting involved in more personal discussions or giving opinions in diplomatic ways.

To help to build rapport and ensure the women and village midwives felt relaxed and welcomed, we provided them with breakfast and snacks and endeavoured to make

them comfortable as well as to prevent any strangers entering the room during the discussion. In addition, some participants brought their neighbours or all their children with them. I asked them to wait for the participants in a different room and served them with snacks and breakfast.

In conclusion, using FGD technique was very useful technique to investigate the health behaviours and factors affecting women decision such as cultural, community, health system. Also, village midwives' discussions were very useful in clarifying aspects raised by decision makers and stakeholder groups. Moreover, the FGD was efficient in collecting data from many participants in less time and cost.

11.4 Limitations and strengths of the study

This study contributes significantly to the body of research that highlights the role of the health system in the utilisation of maternal health services. I developed a new Maternal Health System Performance (MHSP) Framework that uses both qualitative and quantitative indicators to assess the performance of health systems. Indeed, the MHSP framework demonstrates a new methodology in assessing the performance of the health system in a comprehensive way and it should be applicable in any other system on the macro level in order to identify the functional or dysfunctional aspects of the system, and accordingly, to help design a plan of reform.

The study analysis was completely focused on the governmental health services whereas the private health services which are expanding very fast was not included. In addition, medicine and health insurance have critical problems and was not comprehensively covered and considered in the system although they have a significant impact on utilisation and health system outcome.

Furthermore, factors outside the health system that may influence the system (e.g., political instability, national economic situation) have not been considered in the assessment of the health performance in Sudan. Such an undertaking would be too complex for such a study, but the importance of the wider context was borne in mind throughout the analysis.

Another limitation of this study was the insignificance of maternal health complications factors as important factors that stimulate women to use maternal services in the quantitative analysis. This finding contradicted most prior studies (see the quantitative analysis part at chapter 7). Accordingly, the two variables of experiencing complications during pregnancy and during delivery were not entered into the regression models. This may be attributable to a problem in the way the survey (SHHS) asked the questions regarding the women's experiences of maternal complications – either in the wording of the women's questionnaire or through a lack of understanding among data collectors. This important conclusion appears to confirm that an error occurred in collected data of SHHS 2010 and highlight the importance of the way of asking the questions of the maternal health module at SHHS questionnaire (women's questionnaire). Accordingly, the module and the interviewer guidelines

should be reviewed for the next round of SHHS (see section 5.3 for further discussion on the data limitations of the three surveys).

Moreover, the dependent variable of antenatal service utilisation which was calculated based on SHHS 2010 (see section 7.2) may need to be recalculated to distinguish women who received at least 4 visits (according to WHO definition) instead of ‘ever use’ of any antenatal care visits (one visit or more) as in the qualitative study the majority of women and health providers who participated clarified that many women visit PHCs for one visit when they suspect they are pregnant and then do not attend for any further or regular antenatal visits if they do not feel any severe complication during the pregnancy period. Therefore, women who received at least four visits during pregnancy period is more precise to reflect adequate take up of care and can capture the women who actually received the recommended basic level of antenatal healthcare.

Constructing women’s satisfaction of the maternal services as an outcome variable relied on three questions focussing on whether the woman is satisfied with the service, would she recommend it to her friend or friend, and would she come to the same clinic if there is a need for that (see section 6.2.1 for further details). However, the constructed index need to be more precise in order to be sensitive enough to capture the level of women’s satisfaction but the SARH2008 does not include further relevant data. Similarly, the two explanatory variables: the health provider’s satisfaction regarding working environment and payment are driven from the responses of two direct questions in this regard. That also could expose the results to risk of bias.

You don’t seem to have added anything in this section on the strengths and limitations of focus groups. Also on the limitations of these kind of large household surveys. You need to add something on this. The examiners mention a reflexive section. This should not need to be very long but you should say something in response to this – a brief reflection on how well the focus groups worked, your role, any impact of how you (or the RA) were perceived, your ability to understand the discussion etc.

Chapter 12

Conclusions and Recommendations

The first section of this chapter presents the study conclusions and contribution to knowledge. The second section discusses the main recommendations with respect to each key function of the maternal health system in Sudan in order to help to strengthen the system and improve the performance of the system, which can be considered as a road map for health system reform in Sudan. Finally, some recommendations are given for future research.

12.1 Conclusions

This study built on existing knowledge and added to the theoretical body of knowledge and the body of literature with respect to the identification of the main barriers associated with the access to maternal health services in Sudan on the individual, household and community levels. In addition, it assessed the health system in Sudan using a holistic approach that assessed both the overall system functions as well as the three intrinsic objectives of the system. This analysis deepened the understanding of the system performance and drew attention to the main factors contributing to the poor maternal health service performance in Sudan. This study provides robust evidence that dysfunctions of the health system are more important than women's and households' characteristics with respect to maternal health service utilisation although the user's' and families' characteristics do influence the women's decisions of health seeking behaviour.

Accordingly, strengthening health systems should be the primary focus in enhancing maternal health levels in Sudan, rather than improving women's characteristics, in order to effectively improve maternal health. This contribution should alter the decision makers' interests to reorganise their priorities of the maternal health agenda as it is recommended to give more focus to improve the performance of health system functions, particularly the stewardship function. Accordingly, the study extends the current research literature concerning health system reform by providing evidence-based recommendations for policymakers and intervention organisations on how to improve maternal health system elements under scarce resources; hence, it can also be applied in other low-income countries.

Moreover, the study drew attention to the importance of the stewardship function in a health system. Effective stewardship influences overall management of the health system, working across all elements of the system to guarantee well-functioning health system and efficient use of resources.

The study provides evidence that the poor maternal health care services in Sudan was attributed by many decision makers to the situation of village midwives as they are responsible for providing most of the maternal health care in Sudan. Therefore, reforming the midwifery sector has potential for rapid impact on improving the maternal health services taking into consideration that maintaining this improvement and achieving more enhancement needs to work in reforming the health system functions particularly stewardship. The study suggests two main aspects for reforming the village midwives sector: first, technical aspects, which includes three key interventions: 1) integrating village midwives at the Sudan health system through several low cost interventions (rather than a village midwives' recruitment plan which is considered costly and it is recommended to be implemented in the long rather than short-term or intermediate-term plan because of the financing constraints; 2) regular in-service training based on needs assessment; 3) enhancing the midwifery training curricula. The second aspect of village midwives' sector reform is financial reform through many ways that guarantee a regular salary for village midwives, such as helping them in establishing small enterprises by giving them small loans with no interest/ or awards, recruiting village midwives who are working in small villages, establish funds in each local community by regular small donations from local communities dedicated to the village midwives' salaries. In cases of a small population in remote areas where there is a limited number of pregnant women, ministries can resolve the transportation so that a village midwife can cover a few more villages if the villages are close to each other. However, this needs further investigation in order to find the most cost-effective alternatives.

Moreover, using mixed method technique as well as both focus group discussion and in-depth interview techniques in collecting the qualitative data increases the accuracy and the precision of the study findings. Meanwhile, using qualitative and quantitative data deepens the understanding of the research questions and enable me to perform a comprehensive assessment of health system performance and avoiding the disadvantages of using qualitative or quantitative technique (see sections 5.3 and 5.4)

The study also significantly helped in identifying the most important elements of an equitable strategy for improving access to maternal health care in Sudan with a special focus in Khartoum in order to improve maternal health as well as maintaining and enhancing the care that is attuned to women's needs in a context of limited existing health facilities.

Furthermore, data were collected from health providers who helped in providing suggestions that significantly assist in developing plans and interventions that aim at coping with the major problems affecting the system performance such as retention, low satisfaction, and HRH plans (see chapter 9). Also, data that were collected on referral system for women with pregnancy-related morbidities constituted a substantial contribution in developing an efficient referral system that suits the nature of each region in Sudan as a country with limited resources; the study provides

evidence, for example, that ambulances are not the most efficient measure that should be implemented in activating the referral system. There are alternative low-cost methods that suited each local community (see chapter 10).

In addition, SARH 2008 survey under-represents women who never used any maternal health services as Khartoum as the sample was exit interviews with women immediately following attendance for antenatal care at surveyed facilities. The MHSS 2012 filled the gap of knowledge as data were collected from non-users as well as users. This enriched the analysis of the study and significantly contribute to the current knowledge as almost all health research collected data from users while non-users have been neglected.

The study supported the prior assumption that the maternal health services in Sudan are of low quality, particularly antenatal care where village midwives are the main antenatal health providers in both PHCs and local communities, despite a lack of formal recognition of or training for this role. Similarly, postnatal care, which also relies almost entirely on, village midwives is not included in the health system; accordingly, health providers are not trained to provide this kind of services although nearly one third of maternal mortality occurs during the postpartum period. In addition, the findings of the study can also be used to increase the responsiveness levels among women through improving the satisfaction level of the services.

This study proposed a new conceptual framework based on the WHO framework of health system performance and the most recent Andersen model (phase 5). Accordingly, the new conceptual framework is able to study the impact of health system performance on women's behaviour in accessing services using mixed data sets to produce qualitative and quantitative indicators in order to maintain the multifaceted needs data.

Data collected from different relevant groups significantly added to the accumulation of data and knowledge of the health system in Sudan as it is a pioneer field study in this regard. In addition, the different sources and types of data used enabled me to implement the entire framework to assess the role of the health system in the utilisation of maternal health services in countries with limited resources.

12.2 Recommendations

Health services are highly context specific. Therefore, there is no single set of best practices that can be put forward as a model for improved performance, although there are basic principles that can be generalised. In general, good performance needs comprehensive, multidimensional interventions targeting an overall health system instead of applying selected types of reform or fragmented approaches to reform

targeting certain areas, which may guarantee some improvement in these areas but it may not be sustainable; sometimes using fragmented approaches has negative consequences on other parts of the system. Eventually, the responsibility of the overall performance of the Sudan health system lies with the government, which in turn should involve all sectors of society in its stewardship.

In chapters 7 to 10, a number of gaps in the functions of the health system in Sudan have been identified and require serious attention and adoption of a multifaceted intervention. However, before starting, the government should formulate a clear and realistic working plan based on a clear vision, objectives and tailored to the available resources; all parties should contribute and commit to this plan. Moreover, a major area of change should be stewardship function as it is responsible for managing and/or regulating the national health system and it work across the entire elements of the health system to guarantee well-functioning system and efficient use of resources as well as giving more focus on developing an effective information system as a starting point to improve the performance of the system. It is the pillar of the enhancement of the performance (see 12.2.1 for some suggested ways to improve this function)

The following are suggested interventions that target the four functions to improve their performance, accordingly contributing to better health system performance and improved access to and quality of maternity care.

12.2.1 Stewardship

1. It is essential to guide the primary healthcare plan by the national vision and national policy rather than disputed among many cooperated donors who mange the plan according to their views which at the end to the very poor health outcomes and malfunction in the health system. The road map of maternal mortality reduction is considered a good base to lead the PHC planning.
2. Health information: to move towards a real evidence- based system of health care, developing a robust and comprehensive information system (e.i., registration, and surveys) should be given a priority. That will very much help in identifying the maternal needs in each locality, conceptualising efficient health plan sensitive to the real community and individual needs, and assessing precisely the health system performance as well as quantifying the impact of all health activities in order to be able to maximise the benefits of similar future activities. Accordingly, better response to health needs requires, reliable and timely information on health determinants, health system performance and health status.
3. Accountable supervision and assessment system

4. There is no real coordination between all parties working in health system although a numerous number of coordination mechanisms such as regular meetings and committees. Better coordination is needed even within the same health partnership.
5. Work with communities in order to increase the level of health awareness with respect to maternal health complications and its associated symptoms in order to be able to identify the high-risk cases and facilitate the transfer process.
6. Strengthening the coordination within directorates in ministries, between ministries, and between ministries and donors and minimise the various coordination mechanisms available by assessing them and keep the most effective ones giving all parties will be committed to apply them., There is a good chance to establish effective collaboration between SMOHs and FMOH as the latter provides regular and continuous technical and financial supports which can be used to encourage both sides to work together in an effective and harmonised way. Lack of updated and accurate information, as well as qualified staff hinders effective collaboration.

12.2.2 Financing the health system

1. Applying new mechanisms in the health system that guarantee equal distribution of government financing in order to narrow the obvious disparity gap across the states in favour of deprived states
2. As donors' strategies have shifted, reducing the aid to Sudan, particularly UNFPA, the main RH donor, the Sudanese government should urgently start to find new alternatives to finance the system. This applies most acutely to the Primary Health Care in Sudan, to substitute the 80% donors' share of its financing.
3. Better management of the foreign aid through applying a series of interventions that may reduce the waste of the funds and resources:
 - a. Reduce the overheads that go to the principal recipient and then sub-recipient organisations, which amounts to 25% of the overall aid.
 - b. Commit to the domestic procurement system rather than applying the UN or the donor's procurement system in order to save both money and time.
 - c. Increase the coordination among donors and be more flexible in accepting some changes in their projects or activities. That could be more efficiently accomplished if the government has an obvious plan and donors committed to this plan rather than their individual agendas.
 - d. Give a priority to produce new Village Midwives, particularly the 2-year programme rather than investing all training money in financing the in-service training to VMWs as the main challenge is the shortage in the availability of VMWs

4. Good management of the existing resources will alleviate the challenge of persistent shortage of resources; thus both FMOH and SMOH consider the following steps:
 - a. Strengthen the coordination within and between each other with respect to submitting the proposals and receiving findings. That could be performed through one financing system (for international aid).
 - b. Coordinate and integrate with providing health services and other associate activates like training or supervision in a sense that well-funded programmes such as AIDS programme can coordinate with other programsme; thus relevant activities (lower- funded) like safe motherhood activities can be performed along with AIDS activities using the same facilities.
 - c. Coordinate with other counterparts (like the military, police, educational hospitals) thus benefit from their well-funded facilities.
 - d. FMOH/SMOH should avoid any agreement with donors related to financial commitments if they will not be able to meet these. Transparency principal is essential in any agreement; thus, it is important to negotiate their actual contributions better than let donors invest in projects that will not be implemented because the government could not meet its commitments in these projects.
 - e. Ensure the completion of all required paperwork/progress reports for any grant to be able to release it on time.
5. Primary health care service should be under the national governance to guarantee sustainability through greater contribution from the government in financing the sector instead of donors

12.2.3 Health service delivery

1. Service and Institutional component

- a. Referral system: establishing a network among health facilities in the three levels (i.e., primary, secondary, and tertiary) in order to identify the proper facility and care level before moving the case. Also, ensure to link village midwives with this network through providing them with mobile phones that can be used to find out where is the proper health facility and inform them that there will be an emergency case arriving shortly.

- b. Ensure a sufficient number of blood banks and well distributed, supplies, and necessary equipment, particularly in the facilities that provide emergency services and do not depend on patients in providing these things.
 - c. Develop referral and EmoC protocols.
 - d. Improve the infrastructure of the PHCs and their services in order to attract patients to seek care rather than going to secondary or tertiary hospitals.
 - e. Upgrade some of the primary healthcare centres (PHCs) by adding a birth room to provide normal birth care services in order to reduce the congestion at hospitals and the other associated problems like cleanliness and workload. In addition, this solution will encourage women to deliver in safer and hygienic place near to their homes and avoid extra cost at hospitals and transportation problems or deliver at home. The requirements needed to bring this solution to the real world is to equip a labour room and recruit a few midwives at these centres to keep them work during the entire day beside refresher training for staff such as management of normal deliveries, identifying danger signs during delivery and refer a complicated cases and skills for active management of the third stage of labour.
2. Means of transportation: including ambulances should be established on the community level where each community has resources suited to its specific context and needs. However, ambulances do not constitute a serious aspect in most of the communities as there is no road network and even clear home addresses. Therefore, there are other alternatives can be considered according to the nature of each community.
- i. Ministries can provide auto rickshaw ambulance, emergency motor tricycle, to Village midwives or to local authorities to be under request from Village midwives.
 - ii. Arrange at each local communities volunteers who own transportation means; hence Village midwives can call them in emergency cases in the neighbourhood
3. Including postnatal service in the package of maternal services will largely help in reducing the avoidable maternal deaths and provide necessary training to health providers to be able to provide proper postnatal care service.
4. Commit health providers and institutions to apply maternal health services guidelines

5. Both women and village midwives should know where, how, and when women should be referred particularly village midwives who do not know about EMoC and they did not study providing antenatal and postnatal care.
6. Disseminate information on danger signs during pregnancy, birth and the postnatal period among women during the antenatal visits; that can help them in taking the decision of seeking maternal health care at the right time when they start to develop medical complications. Also, train village midwives on the transfer plan (i.e., where, how, and when) in order to be ready.
7. Health providers (in health facilities, communities) should be committed to discuss an emergency plan with women in order to ensure the first daily in the referring system.
8. The cost of antenatal visit needs to be revised as health providers may ask for unnecessary tests and ultra-scan that women should pay every month before going to the PHC, which constitute a burden and a barrier to care.

12.2.4 Health providers

1. **Village midwives:** maternal health system is largely depending on village midwives in providing services. The current midwifery services are poor and do not cover all Sudan. Reform of the midwifery sector should consider two main aspects: technical and financial aspect:
 - a. **The technical aspect,** the three key interventions: integrating village midwives in the Sudan health system, regular in-service training based on needs assessment and enhancing the midwifery training curricula. That should take absolute attention from ministries of health in order to guarantee tangible and rapid improvement in maternal health services and eventually a notable reduction in maternal mortality.
 - b. Incorporating village midwives in the health system is the 1st step in the reform procedure through several low cost interventions besides a village midwives recruitment plan which is considered costly and it is recommended to be implemented on the long rather than short-term or intermediate-term plan because of the financing constraints.
 - c. **The financial aspect,** there are many ways that guarantee a regular salary for village midwives that can help them beside income coming from providing midwifery services, such as helping them in establishing small enterprises by giving them small loans with no interest/ or awards, recruiting village midwives who are working in small villages, establish funds in each local community by regular small donations from local communities dedicated to the village midwives' salaries. In remote areas where there are a limited number of pregnant women, ministries can resolve the transportation gaps so

that a village midwife can cover a few more villages, if the villages are close to each other.

2. Retention policy: implement a retention policy rather than rely on ad hoc individual interventions. It is not necessary to depend on the financial incentives only; many low cost interventions are effective.
3. Capacity building:
 - a. The HRH plan should be designed based on **training needs assessment** to identify the real training needs rather than donors' interests, which have distorted the health training system in Sudan.
 - b. Review the curricula periodically and ensure these are up to date.
 - c. Measuring the impact of training
 - d. Ensure a sufficient number of well-qualified trainers and instructors.
 - e. Ensure proper infrastructure that can accommodate a good learning environment.
 - f. Train health staff in all levels on EMoC and using EMoC protocols also, the procedures of the referral system.
 - g. Train village midwives on how to identify the EMoC cases and how to give the first aid and transfer a woman at risk to the higher level of healthcare and empower her more in health facilities through letting her to follow her case inside the health facility as she will be responsible for the case afterwards.
 - h. Educate current village midwives how to measure blood pressure, to detect signs of pre-eclampsia, as eclampsia is a high mortality risk taking into consideration the majority of them are illiterate, thus replacing measurement units with colours as well as providing the midwives with training courses on antenatal care will significantly help to improve the quality of services.
 - i. Develop a trainee's database or any tool to guarantee equal training opportunities distribution among all health staff.

12.2.5 Further research

The Maternal Health System Performance (MHSP) Framework introduced a comprehensive assessment of most parts of the health system which can be considered pioneer work that provides a significant contribution to the health assessment research. However, medicine and private health sector were not analysed properly in this study and so neither were not covered in the MHSP framework. Considering its role in the system will deepen and enlarge the scope of the assessment of the health system performance, particularly as the private sector is playing an important role in providing maternal services yet is not controlled or supervised by the health system in Sudan.

This study has suggested that stewardship can perform effectively to maximise the use of the health system resources. Nevertheless, there is still a gap in the research related to this scheme where financing the health system (i.e., the government funding and civil society's donations) is not sufficient to finance the basic needs of the health system in low income countries; while international awards may guarantee some improvement in health expenditure these also introduce the drawbacks of using international aid such as NGOs imposing their agendas and working in scattered projects rather than throughout the national plan. Alongside this, more research is required in identifying which health insurance system is suitable for the low and middle-income countries where governments have limited resources and the majority of the household members, who are working in private or informal sectors, would not be able to pay the fee of the subscription of health insurance.

Appendix I

Study participants

The qualitative data of the maternal health system study (MHSS) were collected from five different groups of study participants: decision makers, stakeholders, health providers, village midwives, women (maternal health services users/ non-users). A total of 15 in-depth interviews comprising 10 decision makers belong to top management level in the Federal Ministry of Health (FMOH) and the State Ministry of Health in Khartoum (SMOH) as well as 5 Stakeholders representing the most significant donors in both national and international organisations working in maternal health field in Sudan. All interviews were conducted face-to-face in Khartoum in Arabic language using semi-structured questionnaire. 6 focus group discussions have been conducted with women and three focus group discussions with village midwives (see chapter 6 for more details about the sample)

Tables (A.1), (A.2), and (A.3) provide analysis of the socio- demographic characteristics of the 5 groups.

Table (A.1) Percent distribution of decision make and stakeholder participants by selected backgrounds, Sudan, 2012

Characteristics	Decision Makers Group (DM)		Stakeholders Group (SH)	
	N	%	N	%
Gender				
Female	2	20	3	60
Male	8	80	2	40
Education				
Bachelor	0	0	1	20
Master	2	20	3	60
PhD	8	80	1	20
General Years of Experience				
5	0	0	1	20
10	0	0	2	40
12-14 years	5	50	0	0
18-29	4	40	2	40
42	1	10	0	0
Years of Experience in the Ministry				
1-2	4	40	2	40
4-6	2	20	1	20
10-15	4	40	1	20
20	0	0	1	20
Total	10	100	5	100

Source: MHSS, 2012

Table (A.2) Percent distribution of women (users/non-users) by selected backgrounds, Sudan 2012

characteristics	N	%
Age		
17- 29	11	39.3
30-39	14	50.0
40-49	3	10.7
Women's education		
No formal education	4	14.3
Primary	12	42.9
secondary	8	28.6
University	4	14.3
Number of children		
1-2	9	32.1
3-5	10	35.7
6+	9	32.1
Ever had complications during last pregnancy		
Yes	4	14.3
No	16	57.1
Minor health complications	8	28.6
Received antenatal care		
Yes, regular	16	57.1
Yes, not regular	4	14.3
No	8	28.6
Assisted at delivery		
None	4	14.3
Village Midwife	20	71.4
Physician	4	14.3
Place of delivery		
Home	16	57.1
Health facility	12	42.9
Received postnatal care		
Yes	9	32.1
No	19	67.9
Woman has a right to:		
Work		
Accepted	21	75.0
Rejected	7	25.0
Take a decision in spending her own money alone		
Accepted	12	42.9
Rejected	16	57.1

characteristics	N	%
Take a decision related to her children		
Accepted	26	92.9
Rejected	2	7.1
Participate in purchasing goods		
Accepted	27	96.4
Rejected	1	3.6
Participate in taking a decision of family planning utilisation		
Accepted	13	46.4
Rejected	15	53.6
Woman is beat if she did something anger him		
Accepted	12	42.9
Rejected	16	57.1
Work status		
Working	6	21.4
Not working	22	78.6
Health insurance		
Covered	3	10.7
Not covered	25	89.3
All women	28	100.0

Source: MHSS, 2012

Table (A.3) Percent distribution of village midwives by selected backgrounds, Sudan 2012

characteristics	N	%
Age		
40-49	10	66.7
50-52	5	33.3
Number of training courses have been received in the last 3 years		
none	9	60.0
One course	4	26.7
2 courses	2	13.3
Recruited at health system		
Yes	5	33.3
No	10	66.7
Has another source of income		
Yes	5	33.3
No	10	66.7
Satisfied with income		
Yes	1	6.7
No	14	93.3
Satisfied with working conditions		
Yes	9	60.0
No	6	40.0
Satisfied with women's and family's behaviour with her		
Yes	9	60.0
No	6	40.0
Total number of village midwives	15	100.0

Source: MHSS, 2012

Appendix II

Relevant publications during the PhD study period

	Publication	The Author Role
1	Bashir A., Ibrahim, G., Bashier, B., and Adam, B. (2013) 'Neonatal Mortality in Sudan: Analysis of Sudan Household Health Survey, 2010', <i>BMC Public Health</i> .	I performed the entire analyses of the paper and wrote the data and methodology section (This paper has been published)
2	Ibrahim, G. and Abdel Aziz, M. (2012) <i>The distribution of health workforce in Sudan: An ecological case study of impact on maternal health and mortality</i> . Sudan: GAVI.	I performed the entire statistical analysis of the paper and wrote the paper under the conceptual framework suggested by Dr. Mona. She revised the entire paper and added some parts. (This paper has been submitted to GAVI)
3	Ibrahim G. (2012) the role of health system in women's utilization of maternal health in Sudan. (A report on my field work and preliminary findings of the study presented to British Sociological Association because i got the Phil Strong Memorial Prize for 2011). Available at: http://www.britsoc.co.uk/media/48885/Phil_Strong_Prize_2011_Ghada_Ibrahim.pdf?1443729192062	I wrote the entire paper and did preliminary analysis of the qualitative data. (This paper has been published)
4	Ibrahim, G. and Abdel Aziz 'Retention and equitable distribution of health workers: Does it matter? The case of maternal health and mortality in Sudan'. (Under revision to be publish).	I performed the entire statistical analysis of the paper and participated with Dr. Mona in writing the paper. (This paper recently was submitted to the Lancet and under revision)

Appendix III

1. Sudanese ethical clearance certificate

Republic of Sudan
National Ministry of Health

HEALTH RESEARCH COUNCIL

NATIONAL RESEARCH ETHICS REVIEW COMMITTEE

Date: 6/5/2012

Ethical Clearance Certificate

This is to certify that the proposal (No. 159-2-12) entitled (Role of the health system in women's Utilization of maternal health services in Sudan) introduced by Mss. Ghada Hussain Ibrahim from PHI, has been approved by the National Health Research Ethics Committee, National Ministry of Health to be carried out in the Sudan.

The principal investigator is requested to submit a copy of the final report to the National Health Research Ethics Committee.

Dr. Iman Abdalla Mustafa
Reporter of the
National Research Ethics Review Committee



2. Participant Information Sheets

a) Focus group discussion Participants:

although the majority of women who will participate in the focus group discussion are illiterate according to the Sudanese official statistics, research assistants will have an information sheet as a guide when they meet the potential participants and they will illustrate it in a simple way to the participants. Also, they will not ask women for a signed consent.

Participant information sheet for women's focus group discussions

School of Community and Health Sciences, City University London

Study Title:

THE ROLE OF THE HEALTH SYSTEM IN WOMEN'S UTILISATION OF MATERNAL HEALTH SERVICES IN SUDAN

Invitation

My name is Ghada Ibrahim; I am a student at City University London in United Kingdom, pursuing a PHD in midwifery. To fulfill the academic requirement for the award of my degree, I am expected to conduct a research study. This will be done in collaboration with the Federal Ministry of Health and Academy of Health Sciences, Sudan. You are therefore invited to participate in this research study.

Before you decide whether or not to take part in this research study, you need to know the purpose, the benefits and possible risks of the study to you and what will be expected of you during the study. This form provides that information. The study staff will discuss the information with you. They will answer any questions you may have. After the study has been fully explained to you, you can decide whether or not you want to participate.

Please note that:

Participation in this study is completely voluntary. You can withdraw at any time and you can decline to answer any questions that you do not wish to. The decision about whether or not to participate in this study or to answer any questions will not have any negative effect on you.

Also, a tape recorder will be used to record the discussion in order to capture the true picture of what we have discussed that will be used in the analysis.

What is the purpose of the study?

Maternal mortality and morbidity still pose a significant challenge to policy makers and health professionals. No significant improvements in maternal and child health indicators have been achieved in Sudan up to the present time threatening the achievement of the 4th and 5th Goals of MDGs. There is thus a great need for better understanding of the barriers to the provision and utilisation of maternal healthcare services in order to improve the health and survival of Sudanese mothers. This project aims to identify the barriers to the use of maternal health services in Sudan during the perinatal period – when most deaths and serious morbidities occur. In addition, it aims to assess health system with respect health providers, referral system of maternal morbidities, and maternal health services delivery.

Why have I been chosen?

You have been chosen to take part in the study because you are a mother with new child birth.

Do I have to take part?

Taking part in the study is entirely voluntary. You are free to withdraw at any time of the study or refuse to answer any of the questions without giving a reason. If you withdraw from the study, I will destroy all your identifiable information, but will need to use the data collected up to the point of your withdrawal. Declining to take part will not have an adverse impact on your care. If you decide to take part it is important that you are as open as possible in your replies during the interview. You can rest assured that all the data will be anonymised so your comments will not be identifiable.

What will happen if I decide to participate?

If you agree to participate, I will invite you to take part in a group discussion with other women, which will last up to about 90 minutes.

If you agree to take part in **focus group**, these will take place at the main premises of Academy of health sciences. Topics for the focus groups will be specific issues in the barriers to the provision and utilisation of maternal healthcare services in order to improve the health and survival of Sudanese and improve the health services providing to mothers .

What will I have to do?

If you agree to participate in the interview we will set a mutually convenient time for all. The interview will take place at private room at the hospital.

What are the possible disadvantages and risks of taking part?

When conducting the focus group discussion, there is always the risk of uncovering topics which may be sensitive for the people being in the focus group discussion. If, at any point in time you feel distressed, I can suggest discontinuing in the discussions also you are free to leave the meeting room or you can discontinue if you wish.

What are the possible benefits of taking part?

You will not directly benefit from this study, but what we will learn will help us in coming up with solutions on how to promote the Sudanese health system with respect to maternal health as well as utilisation of these services among women. Thus, it is hoped that this study can contribute to improving maternal health and avoiding deaths due to pregnancy and delivery.

Is there any compensation for participation?

There will not be any financial compensation linked to participation in any research activities in this study. But we will be providing snacks and refreshments during group discussions and other group activities and transport reimbursement for attending the group.

Will my taking part be kept confidential?

Yes. I will follow ethical and legal practice and all information about you will be handled in confidence.

What will happen to the information I provide?

Only my supervisors, PI and research assistants will have access to this data. Interviews and field notes will be entered onto a computer for analysis. Name substitution system rather than using the participant's real names will be applied in order to maintain the anonymity. Data will be stored securely at City University London for the duration of the study and after the study is finished. Any information you share with me will be seen only by myself and my academic supervisor to ensure confidentiality. Your anonymity will be maintained in the final report which will be submitted as part of my course work.

What will happen to the results of the research study?

The results of the study will be submitted as a PhD Dissertation as well as being made available more generally to people concerned with obstetric and midwifery care locally and more widely. Presentations will be organized to

disseminate findings locally within both state and federal ministers of health and will be use in reforming maternal health system in Sudan. Also it may be presented in other health authorities. Relevant findings will also be disseminated via journals, conferences at national and international level. If you are interested in the research findings I will be very pleased to invite you to a presentation held in the hospital and forward you a summary of the research findings.

How much time i will have to reflect before being asked to consent?

Two days will be allowed between having the study explained and being asked for consent. A researcher will telephone you to ask whether you are interested to participate in the study and, if so, to agree a the date and the time for the discussion. You will also receive a reminder phone call one day before the discussion.

Who has reviewed this study?

Ethical approval has been given by City University London Research Ethics Committee. In addition, this study has been authorized by the Research Ethics Committee of Federal Ministry of Health In Sudan.

Who can I contact if I have any question or concern?

If you would like to complain about any aspect of the study, City University London has established a complaints procedure via the Secretary to Senate Research Ethics Committee. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Role of the health system in women's utilisation of maternal health services in Sudan.

You could also write to the Secretary at:

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Email: [REDACTED]

The alternative local Sudanese contact to complain about the study is: [REDACTED]
[REDACTED]. Tel Number: [REDACTED], Fax : [to be added], P.O.Box [to be added], Khartoum, Sudan.

Who do I contact for further information?

If you would like more information about this study and what is involved then please contact me or my supervisor through email and telephone

Ghada Ibrahim [REDACTED] or [REDACTED]

Prof. Christine McCourt (Researcher's supervisor) [REDACTED] or [REDACTED]

Thank you for taking the time to read this and I look forward to hearing from you

Yours sincerely,

Ghada Ibrahim

b) In-depth interview Participants:

Information sheet for staff participants

School of Community and Health Sciences, City University London

Study Title:

THE ROLE OF THE HEALTH SYSTEM IN WOMEN'S UTILISATION OF MATERNAL HEALTH SERVICES IN SUDAN

Invitation

My name is Ghada Ibrahim; I am a student at City University London in United Kingdom, pursuing a PHD in midwifery. To fulfill the academic requirement for the award of my degree, I am expected to conduct a research study. This will be done in collaboration with the Federal Ministry of Health and Academy of Health Sciences, Sudan. You are therefore invited to participate in this research study.

Before you decide whether or not to take part in this research study, you need to know the purpose, the benefits and possible risks of the study to you and what will be expected of you during the study. This form provides that information. The study staff will discuss the information with you. They will answer any questions you may have. After the study has been fully explained to you, you can decide whether or not you want to participate. Once you understand this study, and if you agree to take part, you will be asked to sign this consent form. You will be offered a copy of this form to keep.

Please note that:

Participation in this study is completely voluntary. You can withdraw at any time and you can decline to answer any questions that you do not wish to. The decision about whether or not to participate in this study or to answer any questions will not have any negative effect on you.

Also, a tape recorder will be used to record all in-depth interviews in order to capture the true picture of what we have discussed that will be used in the analysis.

What is the purpose of the study?

Maternal mortality and morbidity still pose a significant challenge to policy makers and health professionals. No significant improvements in maternal and child health indicators have been achieved in Sudan up to the present time threatening the achievement of the 4th and 5th Goals of MDGs. There is thus a great need for better understanding of the barriers to the provision and utilisation of maternal healthcare services in order to improve the health and survival of Sudanese mothers. This project aims to identify the barriers to the use of maternal health services in Sudan during the perinatal period – when most deaths and serious morbidities occur. In addition, it aims to assess health system with respect health providers, referral system of maternal morbidities, and maternal health services delivery.

This project aims to:

Analyze and assess obstacles in the health care system and identify required changes in policy with respect to health providers, referral system of maternal morbidities, and maternal health services delivery.

Identify barriers to the use of maternal health care service focusing on health system and population factors including women's status.

Identify maternal healthcare needs on the community level.

Provide evidence-based recommendations for policymakers and intervention organizations on how to improve maternal health system elements under scarce resources in Sudan and develop a strong referral system for poor women with pregnancy-related morbidities, and hence reduce maternal morbidity and mortality levels.

Why have I been chosen?

You have been chosen to take part in the study because you are an Decision maker, stakeholder, midwife, health visitor or professional health provider.. I intend to invite you to participate in this research study.

Do I have to take part?

Taking part in the study is entirely voluntary. You are free to withdraw at any time of the study or refuse to answer any of the questions without giving a reason. If you withdraw from the study, I will destroy all your identifiable information, but will need to use the data collected up to the point of your withdrawal. Declining to take part will not have an adverse impact on your position at work. If you decide to take part it is important that you are as open as possible in your replies during the interview. You can rest assured that all the data will be anonymised so your comments will not be identifiable.

What will happen if I decide to participate?

If you agree to participate , you want to consent to be interviewed by me. The interview will last up to about 90 minutes.

If you agree to be **interviewed** we will set a mutually convenient time when you are off work. The interview can take place at your work place in convenient private place. The interview will be based on themes such as: your professional background, your experience in dealing with health system elements, your opinion regarding financing maternal health services, main challenges facing the improvement of maternal health.

How much time i will have to reflect before being asked to consent?

Two days will be allowed between having the study explained and being asked for consent. A researcher will telephone you to ask whether you are interested to participate in the study and, if so, to agree a the date and the time for the discussion. You will also receive a reminder phone call one day before the discussion.

What will I have to do?

If you agree to participate in the interview we will set a mutually convenient time for this. The interview will take place at private room at the hospital. If you agree to participate in the focus groups, participants will set a time convenient to all.

What are the possible disadvantages and risks of taking part?

When conducting interviews there is always the risk of uncovering topics which may be sensitive for the people being interviewed. If, at any point in time you feel distressed, I can suggest discontinuing the interview or you can discontinue if you wish.

What are the possible benefits of taking part?

You will not directly benefit from this study, but what we will learn will help us in coming up with solutions on how to promote the Sudanese health system with respect to maternal health as well as utilisation of these services among women. Thus, it is hoped that this study can contribute to improving maternal health and avoiding deaths due to pregnancy and delivery.

Is there any compensation for participation?

Decision makers, stakeholders and professional health providers: There will not be any financial compensation linked to participation in any research activities in this study.

Village Midwives: There will not be any financial compensation linked to participation in any research activities in this study. But we will be providing a small amount of money to compensate your time that you will spend with us.

Will my taking part be kept confidential?

Yes. I will follow ethical and legal practice and all information about you will be handled in confidence.

What will happen to the information I provide?

I will follow ethical and legal practice and all the information about you will be handled in confidence. Your name will only appear on the consent form, which will be kept secured in a locked cabinet in the Academy of health sciences in Sudan and then Midwifery Department of City University London. Only my supervisors, PI and research assistants will have access to this data. Interviews and field notes will be entered onto a computer for analysis. Your name will be kept safe and not appear at any time in the research data or in the report. Data will be stored securely at City University London for the duration of the study and after the study is finished. Any information you share with me will be seen only by myself and my academic supervisor to ensure confidentiality. Your anonymity will be maintained in the final report which will be submitted as part of my course work.

The only personal information which I shall collect about you during the course of the research is the information on the consent form. The consent form will be kept strictly confidential, separate from the data and only anonymised information will leave the hospital.

What will happen to the results of the research study?

The results of the study will be submitted as a PhD Dissertation as well as being made available more generally to people concerned with obstetric and midwifery care locally and more widely. Presentations will be organized to disseminate findings locally within both state and federal ministers of health and will be use in reforming maternal health system in Sudan. Also it may be presented in other health authorities . Relevant findings will also be disseminated via journals, conferences at national and international level. If you are interested in the research findings I will be very pleased to invite you to a presentation held in the hospital and forward you a summary of the research findings.

Who has reviewed this study?

Ethical approval has been given by City University London Research Ethics Committee. In addition, this study has been authorized by the Research Ethics Committee of Federal Ministry of Health In Sudan.

Who can I contact if I have any question or concern?

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You could also write to the Secretary at:

██████████
██
████████████████████
████████████████████
████████
██████████

Email: [REDACTED]

The alternative local Sudanese contact to complain about the study is: [REDACTED]
[REDACTED]. Tel Number: [REDACTED], Fax : [to be added], P.O.Box [to be added],
Khartoum, Sudan.

Who do I contact for further information?

If you would like more information about this study and what is involved then please contact me or my supervisor through email and telephone

Ghada Ibrahim +[REDACTED] or [REDACTED]

Prof. Christine McCourt (Researcher's supervisor) [REDACTED] or [REDACTED]

Thank you for taking the time to read this and I look forward to hearing from you

Yours sincerely,

Ghada Ibrahim

3. Participant Consent Form

Informed consent form for In-depth interview Participant

Title of the study: **THE ROLE OF THE HEALTH SYSTEM IN WOMEN'S UTILISATION OF MATERNAL HEALTH SERVICES IN SUDAN**

Principal Investigator: Ghada H. Ibrahim

Participant Identification Number: _____

Instructions: Please tick box to indicate agreement.

1.	I confirm that I have read and understood the information sheet dated 2011 for the above named study and I have had the opportunity to ask questions and have had these questions answered satisfactorily.	
2.	I understand that my participation is voluntary and that I am free to withdraw at any time without any negative consequences affecting my relationships at my work	
3.	I agree to be interviewed as part of the above study	

Name of participant Signature of participant Date

Name of Investigator Signature of Investigator Date

Important Note: for those who are not know how to read or write, researcher should fill this consent form without participant's signature and then audio record their consents directly before conducting the interview or the FGDs

4. Data collection tools

1. Decision Maker schedule:

مشروع
أثر النظام الصحي على استخدام الامهات لخدمات رعاية الأمومة في السودان
صانع القرار
2012

القسم الاول: معلومات شخصية

	الاسم الاول:		الوظيفة:	
	كود المبحوث:		مكان العمل	
	النوع:		القسم / الإدارة:	
	آخر شهادة تم الحصول عليها:		عدد سنوات الخبرة في المؤسسة:	
	سنة التخرج		عدد سنوات الخبرة في مجال العمل بصورة عامة:	

القسم الثاني: وصف للوضع الحالي لتخطيط النظام الصحي

- ماهي الاستراتيجيات والخطط الموضوعية كذلك القرارات الصادرة فيما يتعلق بقطاع الصحة الإنجابية خلال العشر سنوات الأخيرة ؟
- واي من تلك الاستراتيجيات تم تفعيلها
- ما مدى فعالية تلك الاستراتيجيات واثارها على صحة الأمومة في السودان ؟
- (في حالة فشل أو عدم الفعالية) ماهي الاسباب وراء الفشل أو عدم الفعالية؟
- من هم المسؤولين حالياً سواء اشخاص أو مؤسسات عن عملية التخطيط للنظام الصحي؟
- ماهي الخطوات التي تتبع عند وضع الخطط المتعلقة بالصحة الإنجابية؟
- ما هي الجهات المسؤولة عن اعتماد تلك الخطط؟
- ماهي الآليات المتبعة لتحديد احتياجات الامهات فيما يتعلق بالصحة الإنجابية وذلك لتضمينها في الخطط الصحية (تفاصيل واضافات)؟
- كيف يتم تحديد الاولويات في الخطة؟
- هل هناك نظام دوري لمراجعة الخطط الصحية الموضوعية كل فترة زمنية مثل مراجعته سنوية او كل 5 او 10 سنوات؟
- ما هي الخطوات المتبعة لتطبيق نظام المتابعة والتقييم؟
- ما هي المشكلات والتحديات التي تواجهكم عند وضع الخطط الصحية؟
- ما هي المشكلات والتحديات التي تواجه المسؤولين في مرحلة التنفيذ التقييم؟

القسم الثالث: تمويل الخطط الصحية

- ماهي المصادر المستخدمة في تمويل الأنشطة والبرامج الخطط الصحية؟
- هل هي كافية؟ ومستمرة؟
- ما هي اهم المشكلات والتحديات المرتبطة بالتمويل؟
- هل التمويل يوجه بشكل عادل الى كافة الاماكن الجغرافية؟ في حالة الإجابة بـ "لا" لماذا؟
- اي الأنشطة / البرامج أكثر تأثراً بنقص التمويل وكيف تتعاملون مع هذا النقص؟
- هل هناك تكامل أو تنسيق بين وزارة الصحة والجهات المانحة فيما يتعلق بأجندات صحة الأمومة؟
- ما هي أفضل الطرق لتوحيد أو لتكامل أجندات العمل الخاصة بالجهات الأجنبية الممولة لمشروعات صحة الأمومة مع الخطط الوطنية للصحة الإنجابية؟
- هل تلعب وزارة الصحة أي دور في التنسيق بين الجهات المانحة؟ وما هو؟
- ماهي التحديات أو المشكلات التي تواجه وزارة الصحة في التعامل أو التعاون مع أجندات الجهات الممولة؟

القسم الرابع: سياسات اصلاح النظام الصحي

- ماهي القرارات أو السياسات الإصلاحية التي اتخذت منذ التسعينات وحتى الآن لتحسين النظام الصحي فيما يتعلق بتنمية الموارد البشرية العاملة في قطاع الصحة الإنجابية، نظام الإحالة والخدمات الصحية المقدمة للامهات؟
- على اي اساس وضعت تلك القرارات أو السياسات الإصلاحية؟
- ماهي اهم تحديات التنفيذ؟
- ماهي الآثار (الإيجابية والسلبية) التي ترتبت على تنفيذ تلك السياسات أو القرارات؟
- ما هو تأثير الإصلاح الصحي الذي تم تنفيذه على مستويات استخدام خدمات الصحة الإنجابية؟
- ما هو تأثير الإصلاح الصحي الذي حدث في التسعينات والمتعلق بوضع رسوم للخدمات الصحية في مجال رعاية الأمومة على مستويات الاستخدام وجودة الخدمة؟

القسم الخامس: تقديم خدمات رعاية الأمومة

- هل يوجد نقص في استخدام خدمات رعاية الأمومة؟

- لماذا هناك نقص في استخدام خدمات الأمومة بين السيدات؟
- وكيف من الممكن زيادة نسبة الاستخدام بين النساء من وجهة نظرك؟
- ما هي الاطراف التي تقدم خدمات رعاية الأمومة في السودان؟
- هل هناك اي نوع من التعاون او التكامل بين تلك المؤسسات؟
- وكيف لهذا التعاون ان يتم تطويره ووضع في شكل أكثر فاعليه؟
- ما هي انجح البرامج والمشروعات التي تقدم خدمات صحة أمومة في السودان؟
- ما هي عوامل نجاح تلك المشروعات من وجهة نظرك؟
- ما هي اهم التحديات او المشكلات التي تعوق استمرار نجاح تلك المشروعات؟
- الى اي مدى توجد عدالة في الوصول لخدمات الأمومة على مستوى ولاية الخرطوم؟
- ما هي الجهود " إذا وجدت" لتضييق الفجوة في هذا التفاوت وذلك للوصول الى العدالة في الحصول على خدمات رعاية الأمومة سواء من الحكومة او القطاع الخاص؟
- ما هي الاسباب وراء الاخفاق في تحقيق العدالة في الحصول على خدمات الصحية المقدمة للامهات؟
- هل هناك اقتراحات لزيادة فرص السيدات للحصول على خدمات رعاية الأمومة في تلك المناطق؟
- هل يوجد معايير لجودة خدمات رعاية الأمومة المقدمه؟
- ما هي تلك المعايير؟
- ما هي الحلول البديلة للسيدات اللاتي لا يستطعن ان يحصلن على الخدمات الصحية في المناطق التي تنقصها خدمات رعاية الأمومة؟
- ما هي اقتراحاتك لتحسين خدمات رعاية الأمومة (جوده واتاحه)

القسم السادس: نظام الإحالة للسيدات اللاتي عاتين من مشكلات اثناء فترة الحمل والولادة وما بعد الولادة

- من وجهة نظرك ما هي اهم الاسباب العامة التي تجعل الكثير من السيدات يتلقين الخدمة الصحية متأخرا مما يعرض حياتهن لخطر الوفاة؟
- ما هي اهم المشكلات والتحديات التي تعوق تطبيق نظام الإحالة بشكل فعال؟
- ما هي اسباب التأخير في الإحالة سواء داخل الخرطوم او الإحالة من باقي الولايات للخرطوم؟
- الى اي مدى تؤثر اجراءات التحويل على حالة المريضة؟
- من وجهة نظرك كيف يمكن تطوير نظام الإحالة للسيدات اللاتي يعانين من مشكلات صحية نتيجة للحمل والولادة بحيث يكون أكثر فاعليه؟

القسم السابع: مقدمي خدمات رعاية الأمومة

- ما هو رأيك في أعداد ونوعية مقدمي الخدمة بالنسبة للاحتياجات سواء في الخرطوم او على مستوى الولايات؟
طبيب
تمريض
القابلات القرويات/ زائرات صحيات
فنيين
- هل هناك حلول بديله لسد هذا العجز أو الفائض؟
- كيف يمكن لوزارة الصحة تطوير قطاع العاملين في مجال صحة الأمومة في ظل الموارد المحدودة؟
- ما هو دور الذي تقتصره للمنظمات الغير حكومية (ومنظمات المجتمع المحلي) في تقديم وتطوير قطاع مقدمي الخدمات الصحية لتتكامل مع وزارة الصحة في تطوير هذا القطاع؟
طبيب
تمريض
القابلات القرويات/ زائرات صحيات
فنيين
- ما هو وضع القابلات الصحيات في النظام الصحي؟
- ومن وجهة نظرك كيف يمكن تضمين قطاع القابلات الريفيات تضمينهم داخل النظام الصحي الرسمي؟ وما هي التحديات والمشكلات المصاحبة لعملية تضمين هذا القطاع في النظام الصحي وهل يمكن تجاوزها او حلها؟
- ما هو رأيك في الخدمة المقدمة من القابلات الريفيات وكيف يمكن تحسينها؟
- ما هي اهم المهارات التي تنقصهم؟
- ما هي اهم التحديات والمشكلات التي تقابل هذا القطاع في أداء عمله بشكل مرضي؟
- كيف يمكن اصلاح وتطوير قطاع القابلات الريفيات؟

القسم الثامن: التدريب وبناء القدرات

- ما هي الجهة / الجهات المسؤولة عن تقديم التدريب اثناء الخدمة "in service" للعاملين في قطاع صحة الأمومة؟
- هل هناك خطه تدريبية تنفذ في الوزارة؟ (وما هو المدى الزمني الذي يؤخذ في الاعتبار؟ وهل يتم مراجعتها بشكل دوري؟)
- على اي اساس توضع خطط التدريب؟
- وضح كيف يتم الاعلان عن الدورة التدريبية وكيفية اختيار المتدربين؟
- هل هناك معايير واضحة لاختيار الافراد لحضور الدورات التدريبية؟
- مصادر تمويل برامج التدريب؟ وما هي اهم مشكلات تمويل التدريب
- هل تلك المصادر كافية ومستمرة؟
- هل هناك اي علاقة تعاون بين الوزارة والمنظمات (الدولية والغير حكومية) التي تقدم برامج تدريبية فيما يتعلق:
التنسيق على مستوى تخطيط للبرامج التدريبية
الفئات المستهدفة
المناطق الجغرافية المستهدفة
- ما هي اقتراحاتكم لتطوير علاقات التعاون بين الوزارة والمنظمات (الدولية والغير حكومية) التي تقدم برامج تدريبية فيما يتعلق :
التنسيق على مستوى تخطيط للبرامج التدريبية

الفئات المستهدفة

المناطق الجغرافية المستهدفة

- كيف تقييم الوزارة المتدرب والمنهج التدريبي (للباحث: ركز على ادوات التقييم، معايير التقييم المستخدمة)
- هل التدريب الذي يحصل عليه العاملون يؤثر في المسار الوظيفي والترقي لهؤلاء العاملين؟ وضح؟
- هل تقوم الوزارة بقياس أثر تدريب العاملين على المجتمع فيما يتعلق بتحسين صحة الأمومة وتقليل الوفيات؟
- هل الحوافز المالية التي يحصل عليها المتدرب تؤثر في اقبال العاملين على حضور الدورات التدريبية سواء سلبا او ايجابا؟
- ما هي الطريقة المثلى (سواء مقترحه او مطبقه بالفعل) لكي تضمن الوزارة توزيع الفرص بشكل عادل ودون التأثير بعوامل خارجيه مثل وجود الحوافز المالية او المعارف؟
- ما هي اهم التحديات التي تواجه عملية التدريب في قطاع الصحة؟
- هل هناك أي اقتراحات لديك لتطوير منظومة التدريب في قطاع الصحة؟

القسم التاسع: تحديات العمل

ماهي التحديات الادارية والفنية التي تعوقك عن أداء مهام عملك على الشكل الاكمل؟ وكيف يمكن حلها؟
هل يوجد نظام مطبق للمتابعة والتقييم لأدائك في العمل؟
ما هو؟
وكيف يمكن تطويره؟

2. Stakeholder schedule:

مشروع

دراسة أثر النظام الصحي في السودان على مستويات استخدام السيدات لخدمات صحة الأمومة

القسم الاول: معلومات شخصية

الاسم الاول:	الوظيفة:		
كود المبحوث	المؤسسة		
	القسم/ الإدارة		
	عدد سنوات الخبرة في المؤسسة		
آخر شهادة تم الحصول عليها	عدد سنوات الخبرة في مجال العمل بصورة عامة		

القسم الثاني: الوضع الحالي لتخطيط النظام الصحي

- كيف يتم تحديد الموضوعات المتضمنة في اجندة العمل السنوية للمؤسسة؟
- كيف يتم تحديد الاولويات في خطه العمل السنوية؟
- على اي اساس يتم التخطيط وتوزيع الخدمات الصحية المقدمة من قبل المؤسسة (التوزيع الجغرافي، نوعيه الخدمات)؟
- ماهي الأنشطة الحالية لقطاع صحة الأمومة في المؤسسة؟
- ماهي الآليات المتبعة لتحديد احتياجات الامهات فيما يتعلق بالصحة الانجابية وذلك لتضمينها في الخطط الصحية؟
- ما هي الجهة المسؤولة عن وضع تلك الخطط داخل المؤسسة؟
- ما هو مسار اعتماد وتنفيذ الخطة داخل وخارج المؤسسة؟
- كيف يتم عمل متابعه وتقييم للمشروعات التي تنفذ؟
- من وجهة نظرك ، ماهي أهم التحديات المرتبطة بوضع الاجندة السنوية وخطط / برامج صحة الامهات؟
- ما هي اهم تحديات المتعلقة بمرحلة اعتماد وتنفيذ المشروعات؟
- على اي اساس يتخذ قرار توسيع مشروع في منطقته جغرافية او تضيق نطاقه او أغلقه تماما؟

تمويل مشروعات صحة الأمومة والتعاون المشترك

- ماهي المصادر المستخدمة في تمويل الأنشطة الصحية؟ هل هي كافية؟ ومستمرة؟
- ماهي أهم التحديات المرتبطة بالتمويل؟
- ماهي الأنشطة أو البرامج التي تعاني من نقص في التمويل لديك؟
- وكيف تتعاملون مع هذا النقص في تمويل أنشطة المؤسسة؟
- على اي اساس يتم توزيع التمويل على الأنشطة (هل هناك تفضيل لمنطقه جغرافية عن اخرى)؟
- ماهي أفضل الطرق لتوحيد أو لتكامل أجنذات العمل الخاصة بالجهات الاجنبية الممولة لمشروعات صحة الأمومة؟
- هل تدخل المؤسسة في شراكات مع الوزارات او مع جمعيات اهلية أخرى في السودان أو خارجه؟ ما هي أفضل الطرق لتكامل ولتعاون اجندة صحة الأمومة في مؤسساتكم مع اجندة وزارة الصحة والجهات المانحة الأخرى؟

- وماهي التحديات التي تواجهكم في التعامل مع وزارة الصحة؟
- ما هي اهم التحديات في التعاون مع المؤسسات المناظرة؟

تقديم خدمات رعاية الأمومة:

- في ظل نقص استخدام الامهات لخدمات رعاية الأمومة، ما هي اهم اسباب هذا النقص من وجهة نظرك؟
- وكيف من الممكن زيادة نسبة الاستخدام بين النساء او تحفيز النساء للحصول على الخدمة؟
- إلى أي مدى توجد عدالة في توزيع خدمات الامومة على مستوى ولاية الخرطوم وبين فئات المجتمع (الفقراء والأغنياء)؟
- وكيف تتعاملون مع هذه المشكلة؟
- ماهي الحلول البديلة المقترحة لتوفير تلك الخدمات في المناطق التي تنقصها خدمات رعاية الأمومة مثل الأماكن البعيدة او المناطق المحرومة؟
- هل توجد معايير للجودة في خدمات رعاية الامومة المقدمة من قبل مؤسساتكم؟ وماهي تلك المعايير؟
- وماهي الخطوات التي يتم اتباعها لضمان تطبيق معايير الجودة؟
- ماهي اهم المشكلات المرتبطة بخدمات رعاية الأمومة؟
- هل هناك اقتراحات من وجهة نظرك لتحسين جودة خدمات صحة الأمومة؟

القسم الثالث: نظام الإحالة للسيدات التي تعاني من مشكلات أثناء فترة الحمل والولادة وما بعد الولادة

- من وجهة نظرك ماهي أهم الأسباب العامة التي تجعل الكثير من السيدات يتلقون الخدمة الصحية متأخرا مما يعرض حياتهن لخطر الوفاة؟
- ماهي أهم المشكلات والتحديات التي تعوق تطبيق نظام الإحالة بشكل فعال؟
- من وجهة نظرك كيف يمكن تطوير نظام الإحالة للسيدات اللاتي يعانين من مشكلات صحية نتيجة للحمل والولادة بحيث يكون أكثر فاعلية؟

القسم الرابع: مقدمي خدمات رعاية الأمومة

- ما هو رايك في عدد مقدمي الخدمة بالنسبة للاحتياجات و عدالة توزيعهم الجغرافي (على مستوى ولاية الخرطوم)
- أطباء
- تمريض
- القابلات القرويات/ زائرات صحيات
- فنيين
- هل هناك حلول بديله لسد هذا العجز او الفائض ؟
- من وجهة نظرك ، كيف يمكن تطوير قطاع العاملين في المجال في ظل الموارد المحدودة؟
- أطباء
- تمريض
- ما هو دور المؤسسة التي تعمل بها في تطوير قطاع مقدمي الخدمات الصحية؟
- ما هو رايك في الخدمة المقدمة من القابلات الريفيات وكيف يمكن تحسينها؟
- وماهي أهم المهارات التي تنقصهم؟
- ماهي أهم التحديات التي تقابل هذا القطاع للحصول على التعليم والتدريب المناسب ليتخرجوا على درجة مهارية المطلوبة؟
- كيف يمكن اصلاح قطاع القابلات الريفيات؟

القسم السادس : التدريب وبناء القدرات

- ماهي الجهة / الجهات المسؤولة عن تقديم التدريب أثناء الخدمة "in service" للعاملين في قطاع صحة الأمومة داخل المؤسسة؟
- هل هناك خطة تدريبية توضع بناء على احتياجات العمل واحتياجات الافراد؟
- على أي اساس توضع خطط التدريب؟
- هل هناك معايير واضحة لاختيار الأفراد لحضور الدورات التدريبية؟
- ماهي مصادر تمويل برامج التدريب؟
- وماهي أهم مشكلات تمويل التدريب؟
- هل تلك المصادر كافية ومستمرة؟
- هل هناك اية علاقة تعاون او تنسيق بين المنظمات الشبيهة فيما يتعلق بتقديم تدريب لمقدمي الخدمات الصحية؟
- ما هي التحديات التي تواجه المؤسسات المختلفة فيما يتعلق بالتنسيق سواء على مستوى الاجندة التدريبية او الأماكن الجغرافية التي يقام بها التدريب؟
- كيف تتم تقييم عناصر العملية التدريبية ؟ (منشأة تدريبية - منهج تدريبي- مدرب- متدرب)
- (للمباحث: ركز على ادوات التقييم، معايير التقييم المستخدمة ومصدرها)
- عموما ماهي أهم التحديات التي تواجه عملية التدريب في قطاع الصحة ؟
- هل هناك اي اقتراحات لديك لتطوير منظومة (منشأة تدريبية - منهج تدريبي- مدرب- متدرب)
- التدريب في قطاع الصحة؟

تحديات العمل

- ماهي التحديات الادارية التي تعوقك عن أداء مهام عملك أو عمل المنظمة على الشكل الأكمل؟
- و كيف يمكن حلها؟
- ماهي التحديات الفنية المرتبطة بعملك والتي تؤثر في أدائك أو أداء قطاع صحة الأمومة؟
- هل يوجد نظام متابعة وتقييم للأنشطة (الخدمات الصحية ، التدريب، ...) التي تقوم بها المؤسسة ؟
- صف النظام المتبع في قطاع صحة الأمومة في المنظمة التي تعمل بها؟ وكيف يمكن تطويره؟

- ماهي التحديات التي تقابل مقدمي خدمات ومشروعات رعاية الأمومة بشكل عام وتوقعهم عن أداء وظائفهم على الوجه الأكمل؟

60- ماهي مشروعات صحة الأمومة التي تقدمها المؤسسة حالياً في السودان؟

م	اسم المشروع	تاريخ البدء	الخدمات التي يقدمها	المناطق التي ينفذ فيها المشروع	عدد العاملين في المشروع	اسماء الشركاء/ دورهم في المشروع

3. Health providers (Medical doctor/ Nurse) schedule:

مشروع
أثر النظام الصحي على استخدام الامهات لخدمات رعاية الأمومة في السودان
الطبيب/ الممرضة

2012

القسم الأول: معلومات شخصية

	الاسم الأول:	الطبيب 1.....	
	كود المبحوث:	الممرضة 2.....	
	النوع:	المنشأة:	
	آخر شهادة تم الحصول عليها:	القسم / الادارة:	
	عدد سنوات الخبرة في مجال العمل بصورة عامة:	عدد سنوات الخبرة في المؤسسة :	
		عدد الايام التي تعمل بها في المنشأة (في الاسبوع)	

القسم الثاني: خدمات رعاية الأمومة

- ما هي الخدمات التي يتم تقديمها في وحدة رعاية الامومة؟
 - الخدمات الفعلية المقدمة في رعاية الحمل
 - الخدمات الفعلية في الولادة
 - الخدمات الفعلية المقدمة في مرحلة ما بعد الولادة
- الى اي مدى هناك انتظام في المتابعة بين السيدات (الحالات) في تلقي خدمات رعاية الامومة؟
- ماهي أهم الأسباب التي تجعل السيدات تتوقف عن المواظبة على تلقي خدمات رعاية الامومة من وجهة نظرك؟
- ما هي اهم المشكلات المرتبطة بتوفير خدمات رعاية الامومة في المنشأة؟ .
- وما هو مستوى جودة الخدمات المقدمة؟
- هل يوجد معايير لجودة خدمات رعاية الامومة المقدمة؟
- وما هي تلك المعايير (ان وجدت)؟
- وما هي الخطوات التي يتم اتباعها لضمان تطبيق معايير الجودة؟ .
- ما هي اقتراحاتك لزيادة نسبة المستخدمات لخدمات رعاية الامومة وتقليل عدم الانتظام بينهم؟ .
- ما هي اقتراحاتك لتطوير الخدمات المقدمة للامهات سواء جودة او اتاحة؟
- ما هي اقتراحاتك لحل مشكلة نقص خدمات رعاية الامومة في الاماكن التي لا توجد فيها اي خدمات رعايه صحيه؟

القسم الثالث: نظام الإحالة للسيدات اللاتي يعانين من مشكلات اثناء فترة الحمل والولادة وما بعد الولادة

- برأيك ما هي أهم الأسباب التي تجعل الكثير من السيدات يتلقين الخدمة الصحية المتعلقة بالحمل والولادة متأخرة مما يعرض حياتهن للمضاعفات؟
- ما هي دواعي الإحالة؟
- ماهي إجراءات الإحالة المتبعة من قبل مؤسساتكم ؟
- ماهي مراحل الإحالة او الخطوات التي يتم اتباعها لأحاله الامهات اللاتي يعانين من مشكلات صحية متعلقة بالحمل والولادة؟

- الى اي مدى تؤثر اجراءات التحويل على حالة المريضة؟
- ما هي أسباب التأخير في الإحالة؟
- ما مدى الاختلاف في نظام الإحالة بين المؤسسات الصحية في الخرطوم ؟
- ما هي المشكلات التي تقابلك فيما يتعلق بإحالة السيدات اللاتي يعانين من مشكلات متعلقة بالحمل والولادة؟
- من وجهة نظرك كيف يمكن تطوير نظام الإحالة بحيث يكون أكثر فاعلية؟

القسم الرابع: مقدمى خدمات رعاية الامومة

- هل هناك نقص في اعداد مقدمي الخدمة في المنشأة التي تعمل بها (اطباء، تمريض، فنيين)؟
- ما هي المشكلات التي تواجهك اثناء عملك وتؤثر على ادائك؟ .
- هل تعاني من عبء زائد في العمل؟
- الى اي مدى تجد ظروف وبيئة العمل مواتية (تجهيزات المنشأة، ساعات العمل، قرب مكان العمل، طبيعة العمل، الامدادات الطبية، الكهرباء- والإضاءة- والتهوية- النظافة....)
- هل انت راضي عن ظروف العمل؟
- من وجهة نظرك، كيف يمكن تطوير قطاع العاملين في مجال الصحة في ظل الموارد المحدودة؟

القسم الخامس: التدريب وبناء القدرات

- هل هناك معايير واضحة في المنشأة التي تعمل بها لاختيار الافراد لحضور الدورات التدريبية؟
- ماهي؟
- ما هو رأيك في عدالة توزيع فرص التدريب بين العاملين في المنشأة؟
- متى كانت اخر دورة تدريبية حصلت عليها اثناء عملك في المنشأة؟ وكيف تم اختيارك فيها؟
- هل كنت تحتاج لتلك الدورة التدريبية؟
- ما مدى تأثير الدورة التدريبية على أدائك الوظيفي؟
- هل تشعر أنك تحتاج الى مزيد من الدورات التدريبية؟ .
- ماهي الوسيلة التي من خلالها تتعرف الادارة على احتياجاتك التدريبية؟ .
- هل هناك تقييم تمر به بعد حصولك على الدورة التدريبية؟ .

القسم السادس: تحديات العمل

- ماهي التحديات سواء الادارية او الفنية والتي تؤثر على عملك؟ وكيف يمكن حلها؟
- هل يوجد نظام مطبق للمتابعة والتقييم لأدائك في العمل؟
- ما هو؟
- وكيف يمكن تطويره؟

قائمة مراجعه

للباحث:

برجاء ملاحظة الـ

مكان الانتظار		
المساحة	1 - ضيقه	2- ملائمه
الإضاءة	1- ضعيفه	2- ملائم
التهوية	1- ضعيفه	2- ملائم
النظافة	1- نظيف	2- غير نظيف
غرفة الكشف		
ستائر	1- يوجد	2- لا يوجد
غطاء	1- يوجد	2- لا يوجد
سرير الكشف	1-يقابل نافذه	2- لا يقابل نافذه
حوض لغسل اليدين	1- يوجد	2- لا يوجد

4. Health providers (village midwives) schedule:

مشروع
أثر النظام الصحي على استخدام الامهات لخدمات رعاية الأمومة في السودان
دليل مناقشات بؤريه
قابلات قرويات
2012

القسم الاول: معلومات شخصية

	الاسم الاول:		1..... الطبيب	
	كود المبحوث:		2..... الممرضة	
	المنشأة:			
	النوع:		القسم / الادارة:	
	آخر شهادة تم الحصول عليها:		عدد سنوات الخبرة في المؤسسة :	
	عدد سنوات الخبرة في مجال العمل بصورة عامة:		عدد الايام التي تعمل بها في المنشأة (في الاسبوع)	

القسم الثاني: خدمات رعاية الأمومة

- ما هي الخدمات التي يتم تقديمها في وحدة رعاية الامومة؟
- الخدمات الفعلية المقدمة في رعاية الحمل
- الخدمات الفعلية في الولادة
- الخدمات الفعلية المقدمة في مرحلة ما بعد الولادة
- الى اي مدى هناك انتظام في المتابعة بين السيدات (الحالات) في تلقي خدمات رعاية الامومة؟
- ماهي اهم الاسباب التي تجعل السيدات تتوقف عن المواظبة على تلقي خدمات رعاية الامومة من وجهة نظرك؟
- ما هي اهم المشكلات المرتبطة بتوفير خدمات رعاية الامومة؟
- وما هو مستوى جودة الخدمات المقدمة؟
- هل يوجد معايير لجودة خدمات رعاية الامومة المقدمة؟
- وما هي تلك المعايير (ان وجدت)؟
- وما هي الخطوات التي يتم اتباعها لضمان تطبيق معايير الجودة؟
- ما هي اقتراحاتك لزيادة نسبة المستخدمات لخدمات رعاية الامومة وتقليل عدم الانتظام بينهم؟
- ما هي اقتراحاتك لتطوير الخدمات المقدمة للامهات سواء جودة او اتاحة؟
- ما هي اقتراحاتك لحل مشكلة نقص خدمات رعاية الأمومة في الاماكن التي لا توجد فيها اي خدمات رعايه صحيه؟

القسم الثالث: نظام الإحالة للسيدات اللاتي يعانين من مشكلات اثناء فترة الحمل والولادة وما بعد الولادة

- برأيك ما هي أهم الاسباب التي تجعل الكثير من السيدات يتلقين الخدمة الصحية المتعلقة بالحمل والولادة متأخرة مما يعرض حياتهن للمضاعفات؟
- ما هي دواعي الإحالة؟
- ماهي إجراءات الإحالة المتابعة من قبل مؤسستكم؟
- ماهي مراحل الإحالة او الخطوات التي يتم اتباعها لأحاله الامهات اللاتي يعانين من مشكلات صحية متعلقة بالحمل والولادة؟
- الى اي مدى تؤثر اجراءات التحويل على حالة المريضة؟
- ما هي أسباب التأخير في الإحالة؟
- ما مدى الاختلاف في نظام الإحالة بين المؤسسات الصحية في الخرطوم؟
- ما هي المشكلات التي تقابلك فيما يتعلق بإحالة السيدات اللاتي يعانين من مشكلات متعلقة بالحمل والولادة؟
- من وجهة نظرك كيف يمكن تطوير نظام الإحالة بحيث يكون أكثر فاعلية؟

القسم الرابع: مقدمى خدمات رعاية الأمومة

- هل هناك نقص في اعداد مقدمي الخدمة في المنشأة التي تعمل بها (اطباء، تمريض، فنيين) ؟
- ما هي المشكلات التي تواجهك اثناء عملك وتؤثر على ادائك؟
- هل تعاني من عبء زائد في العمل ؟
- الى اي مدى تجد ظروف وبيئة العمل مواتية (تجهيزات المنشأة، ساعات العمل، قرب مكان العمل، طبيعة العمل، الامدادات الطبية، الكهرباء- والإضاءة- والتهوية- النظافة...)
- هل انت راضي عن ظروف العمل ؟
- من وجهة نظرك ، كيف يمكن تطوير قطاع العاملين في مجال الصحة في ظل الموارد المحدودة ؟

القسم الخامس : التدريب وبناء القدرات

- هل هناك معايير واضحة في المنشأة التي تعمل بها لاختيار الافراد لحضور الدورات التدريبية؟
- ماهي؟
- ما هو رأيك في عدالة توزيع فرص التدريب بين العاملين في المنشأة ؟
- متى كانت اخر دورة تدريبية حصلت عليها اثناء عملك في المنشأة ؟
- وكيف تم اختيارك فيها؟
- هل كنت تحتاج لتلك الدورة التدريبية؟
- ما مدى تأثير الدورة التدريبية على أدائك الوظيفي؟
- هل تشعر انك تحتاج الى مزيد من الدورات التدريبية؟
- ماهي الوسيلة التي من خلالها تتعرف الادارة على احتياجاتك التدريبية؟
- هل هناك تقييم تمر به بعد حصولك على الدورة التدريبية؟

القسم السادس: تحديات العمل

- ماهي التحديات سواء الادارية او الفنية والتي تؤثر على عملك؟ وكيف يمكن حلها؟
- هل يوجد نظام مطبق للمتابعة والتقييم لأدائك في العمل؟
- ما هو؟
- وكيف يمكن تطويره؟

5. Users Guide:

مشروع

أثر النظام الصحي على استخدام الامهات لخدمات رعاية الأمومة في السودان ، 2012

دليل نقاش مجموعه بوريه

السيدات المستخدمات

- ما هي الاعراض التي اذا شعرتي بها اثناء فترة الحمل والولادة وما بعد الولادة والتي تجعلك تذهبي للطبيب او اي كادر صحي؟
- عايزه اعرف عملتي ايه في اخر حمل لكى من ناحيه المتابعه والولادة وما بعد الولادة ؟ (مكان المتابعه الكادر الصحي- مكان الولادة والانتظام في المتابعه)
- ما هي المشاكل الصحية واجهتك في اثناء فترة الحمل والولادة وما بعد الولادة؟ واتصفتي فيها كيف؟
- ايه الخدمات المقدمه ليكي في
 - المتابعه
 - والولادة
 - وما بعد الولادة
- ما هو رأيك في الخدمة التي استخدمتها اثناء الحمل والولادة لطفلك الاخير؟ (المكان شامل النظافة – الرسوم-الكادر)؟ وما هي اهم المشكلات اللي قابلتك اثناء تلقيكي الخدمة؟
- راكوا ايه في مدى توافر الخدمة – جودها- الرسوم؟
- ما هو التوقيت المناسب التي يجب فيه السيدة الذهاب لمتابعة حملها ؟ وهل من المهم المتابعه ما بعد الولادة؟
- من وجهة نظرك لماذا السيدات لا يستخدمن خدمات رعاية الحمل والولادة وما بعد الولادة في الحله؟ (توفير الخدمة-كوادر- رسوم – معتقدات ثقافيه- الأسرة)
- من الذي يتخذ القرار في ذهاب السيدة للمتابعة عندكم؟ ولو صاحب القرار غير موجود كيف يتم التصرف؟ وهل حدث ان رفض احد ذهابك للمتابعة (أميره: مثل الزوج او احد افراد الأسرة) مع اي كادر صحي في حالة حدوث مشكله صحيه اثناء الحمل والولادة وما بعد الولادة؟ وما سبب الرفض؟
- ما هي اقتراحاتكم لتحسين الخدمات المقدمه للسيدات وقت الحمل والولادة وما بعد الولادة؟ وما هي اقتراحاتكم لتشجيع السيدات في المنطقة لكي يذهبوا لمتابعة الحمل والولادة؟
- هل قابلتي انتي او شخص تعرفيه (جاره او قريبه) مشكلات في التعامل مع الكادر الصحي / القابلة
- من وجهة نظرك ما هي الاسباب التي تجعل السيدات لا يستخدمن خدمات متابعة الحمل والولادة ومتابعة ما بعد الولادة ؟ اذكي تجربتك مع شخص بنعرفيه – إن وجد.
- هل للعادات والتقاليد دور او لنظرة المجتمع دور في تشجيع السيدات او منعهم من زيارة كادر اثناء الحمل والولادة وما بعد الولادة؟

6. Non-Users Guide:

مشروع

أثر النظام الصحي على استخدام الامهات لخدمات رعاية الأمومة في السودان ، 2012

دليل نقاش مجموعه بوريه

السيدات الغير مستخدمات

- ما هي الاعراض التي اذا شعرتي بها اثناء فترة الحمل والولادة وما بعد الولادة تجعلك تذهبي للطبيب او اي كادر صحي؟
- عايزه اعرف عملتي ايه في اخر حمل لكي من ناحيه المتابعه والولادة وما بعد الولادة ؟
- ما هي المشاكل الصحية واجهتك في اثناء فترة الحمل والولادة وما بعد الولادة؟ واتصرفتي فيها كيف؟
- ما هي الاسباب التي حالت دون استخدامك لخدمات رعاية الأمومة في حملك الاخير؟
- هل للعادات والتقاليد دور او لنظرة المجتمع دور في تشجيع السيدات او منعهم من زيارة كادر اثناء الحمل والولادة وما بعد الولادة؟
- هل استخدمتي خدمات رعاية أمومة في اي حمل لكي- اشرحي تجربتك؟
- رايكوا ايه في مدى توافر الخدمة – جودها- الرسوم في المنطقة عندكم ؟
- من وجهة نظرك،،، ما هو التوقيت المناسب التي يجب فيه السيدة الذهاب لمتابعة حملها ؟ وهل من المهم المتابعه ما بعد الولادة ؟
- من الذي يتخذ القرار في ذهاب السيدة للمتابعة عندكم؟ ولو صاحب القرار غير موجود كيف يتم التصرف؟ وهل حدث ان رفض احد ذهابك للمتابعة (أميره: مثل الزوج او احد افراد الأسرة) مع اي كادر صحي في حالة حدوث مشكله صحيه اثناء الحمل والولادة وما بعد الولادة؟ وما سبب الرفض؟
- ما هي اقتراحاتكم لتحسين الخدمات المقدمه للسيدات وقت الحمل والولادة وما بعد الولادة؟ وما هي اقتراحاتكم لتشجيع السيدات في المنطقة لكي يذهبوا لمتابعة الحمل والولادة؟
- هل قابلتي انتي او شخص تعرفيه (جاره او قريبه) مشكلات في التعامل مع الكادر الصحي / القابلة

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