ANALYSIS OF FACTORS THAT CONTRIBUTE TO HIGH NUMBER OF MATERNAL DEATHS IN SINGIDA REGION TANZANIA

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A thesis submitted in partial fulfilment of the requirement for the degree of Master of Public Health by Dorothy Onesphoro Kijugu from Tanzania

Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.
The thesis Analysis of factors that contribute to high number of maternal deaths in Singida region Tanzania is my own work.

Signature…….....

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ABSTRACT.

Tanzania has high maternal mortality ratio (MMR) whereby the MMR in 2005 was 578 per 100000 live births. There are no regional/local maternal deaths audits conducted so it's not possible to disaggregate for Singida region. From 2004 - 2007 the number of facility based maternal deaths in Singida has increased from 0.1% to 0.2% of the total live births. The study questions in this paper explore the socio-cultural, economic and health service factors that lead to delay in women accessing EmOC in Singida region. In order to address these issues, the methodology includes collection of secondary data as well as grey literature sources on maternal health. The secondary data from Tanzania illustrates that a high number of maternal deaths occurs during labour, delivery and in the immediate post natal stage.

This study concludes that in the context of Singida region the three delays in accessing EmOC do indeed contribute to high numbers of maternal deaths. Other determinants of maternal mortality include Illiteracy, low awareness of obstetric danger signs, beliefs, and gender barriers to decision making, cost of transport and poor road infrastructure. Health service factors include inadequate funds and weak management that gravely undermine availability of quality maternal health services. The study concludes with a series of recommendations including, improving human resources and ensuring community involvement in births preparedness, allocating more funds to ensure adequate availability of health resources and strengthening multisectoral collaboration and public private partnership.

Key words: maternal mortality in Tanzania, three delays model for maternal health, cause of deaths maternal deaths, delay in access to EmOC.

Word Count – 12,398.

ACRONYM LIST.

AIDS-Acquire Immune Deficiency Syndrome

ANC-Antenatal Care

BEmOC-Basic Emergency Obstetric Care

BMI-Body Mass Index

CEmOC-Comprehensive Emergency Obstetric Care

CHMT-Council Health Management Team

CI-Confidence Interval

DHS-District Health Secretary

DMO-District Medical Officer

EmOC-Emergency Obstetric Care

FGM-Female Genital Mutilation

FP-Family Planning

GDP-Gross Domestic Product

HIV-Human Immunodeficiency Virus

ICHD-International Course in Health Development

KIT-The Royal Tropical Institute of Amsterdam

LSCS-Lower Segment Cesarean Section

MOH-Ministry of Health

NPERCHI-National Package of Essential Reproductive and Child Health Interventions

NUFFIC-Netherlands Universities Foundation for International Cooperation

SW-Socio Welfare

MDG-Millennium Development Goal

NGO-Non Government Organization

NHP-National Health Policy

OPRAS-Open Performance Appraisal System

OR-Odd Ratio

PAC-Post Abortion Care

PHC-Primary Health Care

RCH-Reproductive and Child Health

RCO-Regional Commission Office

RHMT-Regional Health Management Team

RMO-Regional Medical Officer

SBA-Skilled Birth Attendant

SMI-Safe Motherhood Initiatives

STI-Sexual Transmitted Diseases

SWOT-Strength, Weakness, Opportunity and Threat

TBAs-Traditional Births Attendants

UNFPA-United Nation Population Fund

US$-United State of America Dollar

VU-Free University of Amsterdam

WHO- World Health Organization

WDPEH- Women Dignity Project and Engender Health

DEFINITIONS OF TERMINOLOGIES AND CONCEPTS.*

Direct Causes of Obstetric Complications: these are complications that occur because of the pregnant status. According to the WHO it includes complications like severe bleeding, sepsis, eclampsia (hypertensive disorders in pregnancy) and obstructed labour. Direct causes contribute to about 80% of maternal deaths globally. However, 13% of maternal deaths are due to the complications of unsafe abortion.

Indirect Causes of Obstetric Complications: these are underlying conditions that become aggravated by the pregnancy such as malaria, anaemia and HIV. This group contributes about 20% of maternal deaths globally.

Dispensary: is the health unit responsible for the supervision of health posts in its wards. It also provides Maternal and Child Health (MCH), delivery services and other health services. It is responsible for referring complicated patients to higher health facility level.

District hospitals: is another health unit that is important in provision of health services in the country. This is a level whereby expected to have adequate capacity in terms of skills and resources than a health centers. It is equipped to provide CemOC, BemOC and all other National Package of Essential Reproductive and Child Health Interventions unless more special care required. In addition this level is responsible for participatory planning, monitoring, supervision and evaluation of health activities in the district.

Enabling working environment: In respect to the motherhood initiatives it includes availability of skilled providers who works in the environment where all resources to ensure safe deliveries and management of complications are available for example equipment, supplies, infrastructure, transport, electrical network, water and communication systems, human resources, health policies, supervision and management and clinical protocols and guidelines.

Health centre: is a health unit between dispensary and district hospital. It supervises dispensaries and provides services that are more advanced. It is entitled to offer BEmOC and in some CEmOC provided resources are available. However, due to the permitted resources it has limited capacity to provide a full range of the

National Package of Essential Reproductive and Child Health Interventions.

Health services organization: The public health services organized in a pyramid that consists of seven patterns as outlined in the figure one.

Maternal Mortality Ratio (MMR): this is a number of maternal deaths per 100,000 live births. However the number of maternal deaths per 100,000 pregnancies would be a more precise measurement since it could account for those who die from unsafe abortions. The experience shows that it is very difficult to have precise data on number of pregnancies.

Maternal Mortality/ Maternal Deaths: the Tenth International Classification of Diseases, define a maternal death as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes" (WHO, 2009).

Opportunity costs: is the next best use to which monetary or time resources could be directed if not consumed in the current activity.

Referral consultant hospitals: this is a specialized health unit where more sophisticated skills and technologies are available so that be able to respond to the complicated cases that are referred from the regional hospital. This unit helps to cut off the need to refer patients abroad.

Regional hospitals: this is a health unit that unlike district hospital entitled to provide more other specialized care. It plays a role of supportive supervision to all health activities in the region.

Skilled attendance (or skilled care): this is a health care services and care that is provided by a skilled provider who works within an enabling environment therefore capable of responding to the normal deliveries and all kinds of obstetric complications.

Skilled Birth Attendants (Skilled Care/Provider/Staff): this is a trained qualified provider who works within an enabling environment therefore capable of responding to the normal deliveries and all kinds of obstetric complications. Skilled births

attendants include qualified providers such as midwife, nurse or doctor

Traditional Birth Attendants (TBAs): these are informal providers of deliveries services who are not formally trained to acquire skills and competencies according to the national health policy. Although they provide delivery services locally and recognized by the community they not skilled to diagnose complications, treat and refer in time.

Treatment abroad: this is treatment of patients out of the country mainly due to lack of skills and expert to treat the particular case in the country of origin. There is a defined procedure for the treatment abroad.

Village health post: This is a simplest health unit in the hierarchy of the health system in Tanzania. Generally the main responsibilities are to provide general health education and advices on maternal and other health services, also identifies referral cases.

**All of the above working definitions are drawn from official guideline documents including WHO Maternal and Newborn survival and health guidelines (2006), WHO Maternal mortality (2009), Integrating management of pregnancy and childbirth (WHO 2007), UNFPA Safe Motherhood program (2007), MOH (2008) and Witter, S. et al (2000).*

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CHAPTER 1: INTRODUCTION.

I am a medical doctor, holding a first degree in medicine since 2001. I was employed by the Ministry of Health since 2005 and posted to work at the rural district hospital. Eight months later I was appointed to become hospital in charge and saved for three years before being appointed to the level of District Medical Officer (DMO) and posted to another rural district in Singida region. During my working experience maternal morbidity leading to high numbers of deaths was a major concern due to delay in access and receiving appropriate treatment. I choose to write my thesis on factors that contribute to maternal mortality in Singida region because a maternal death is the most challenging issue at my working facility.

The general objective of this thesis is to analyze factors which contribute to maternal mortality in Singida region and recommend some possible interventions to reduce and prevent maternal mortality. The thesis will help to raise the knowledge and awareness of the health administration in the region and advocate for all other stake holders to join hands in addressing maternal deaths. This thesis has significance in the light of addressing the Millennium Development Goal 5 (MDG 5) by 2015.

1.1. Background.

Tanzania: is a country located in east Africa. It covers 940,000 square kilometers. The boundaries are Kenya and Uganda to the north, Rwanda, Burundi, Democratic Republic of Congo and Zambia to the west, Malawi and Mozambique to the south and Indian Ocean to the east (DHS, 2005).

Singida region is located at the central part of the country. It covers 49,438-squre kilometers. To the north boarders with Shinyanga region, east with Manyara and Dodoma regions, south Iringa and Mbeya and Tabora to the West. Tanzania is among poor developing low income countries of sub Saharan Africa. Agriculture is the main source of the income in the country. According to the ministry of planning, economy and empowerment (2006) in 2005 the country had a population of 36.2 million with a GDP per capita of US$ 300. In 2001 about 36% of population lived below poverty line.

Demographic profile of Singida region: According to the census (2002), the region had a population of 1,090,578 with the annual growth rate of 2.3%. According to the population projection based on census 2002, the region had a population of 1,294,584 people in 2008 at a growth rate of 2.3% annually. Female and women of child bearing age accounted about at 50.9% and 21.5% respectively. Of the total population only 13.7% lives in towns. In 2002 census, the Total Fertility Rate was six, birth rate of 4.6% and maternal mortality rate of 176 per 100000 live births.

Social economic and cultural profile of Singida: there are nine groups of indigenous people who reside in the region. Despite that there are also other tribes from different regions. According to Singida Yetu (2007) the region is among poorest regions in the country. On 2004 Singida was among regions with highest poverty severity index (Mkenda *et al* 2004). In addition the Tanzania Poverty and Human Development Report (2005) documented that in 2000/01 year Singida region was among three last regions that had high proportion of population living below the basic needs poverty line of 1 US$ per day.

According to the Demographic Health Survey (DHS, 2005) the findings on social economic and cultural situation are outlined in the table 1 below.

Table 1. Socio economic trends for women in Singida region.

Key Areas	Rate
Education status	
• Women who completed primary school	48.5%
• Women who are literate	62%.
Employment	
• Women who are involved in agriculture	89.3%
• Women who are doing professional works	2.2%
Decision making and power	
• Women who perceive that have power to self decide on health care	49.5%
• Men who perceive that women are able to decide on the number of children	56%
Barriers for access to healthcare	
• Lack of money to spend for health care	64.3%
• Long distance to health facility	55.9%
• Transport constrains	55.1%
• Going/travelling alone	42.5%
• Unfriendly services	28.2%
• Unavailability of female worker	17.2%
Harmful practices for maternal health	
• **Prevalence of female genital mutilation**	43.2%
Top five causes of domestic violence	
Proportion of women who reported different reasons for domestic violence	
• Argue with a husband	51.1%
• Go out without telling a husband	46.3%
• Refuse to have sex with a husband	33.1%
• Burn food	29.6%
Source: DHS (2005).	

As shown in Table 1 above, women have low literacy rate, limited exposure to media and power to make self decision on health care. Although there are multiple barriers to access health care the major are lack of money, transport constrains, long distance to health facilities and unfriendly services. High prevalence of domestic violence due to cultural endangers women's reproductive health.

1.2. Tanzania's health system.

National health policy: the National Health Policy (NHP) (2003) intends to achieve quality Primary Health Care (PHC) services for all citizens especially those most at risks. It is committed to improve reproductive

and maternal health services. In order to achieve better goals the NHP recognizes the potential of multisectoral collaboration therefore it includes various stakeholders and co actors from different levels of society which also addresses the wider determinants of maternal health.

The National health policy acknowledges the community potential in health problem analysis and design of appropriate actions. It aims to involve entire community through initiating family health promotion. The NHP also considers the role of traditional medicine and other alternative medicines in influencing maternal health while aiming to promote and regulate these practices.

Different ministries are involved in order to address the issues of health resources that involve availability of skilled and motivated health providers, drugs, supplies, equipments behaviour change communication and infrastructures. Other ministries and sectors role is to ensure good nutrition status in pregnancy, high literacy rate, community development, gender equality, justice and empowerment of women in all health parameters. The NHP also recognizes the potential of NGOs in attaining quality maternal health services, through strengthening public private partnership in delivery of health services.

The Ministry of Health has organized a National Package of Essential Reproductive and Child Health Interventions (NPERCHI) (MOH, 2008). This package includes Ante Natal Care (ANC), Care during childbirths, obstetric emergency care, postpartum care, post abortion care, family planning services, STI/HIV AIDS care prevention and nutrition. The Ministry delivers these services through Primary Health Care under local government authorities. The Primary Health Care (PHC) is a central element in health promotion since it coordinates actions among all stakeholders.

However, different international and local strategies aim at improving maternal health; these have led to the evolution of services and emergence of a series of guidelines and protocols in order to guide practitioners to deliver a comprehensive package of services. To date the UNFPA (2003) has defined priority actions for safe motherhood practices that include

1. To ensure that women receive and have access to information on reproductive health, counselling and services for preventing unwanted pregnancies.
2. To have all pregnant women access skilled medical care during the whole motherhood period

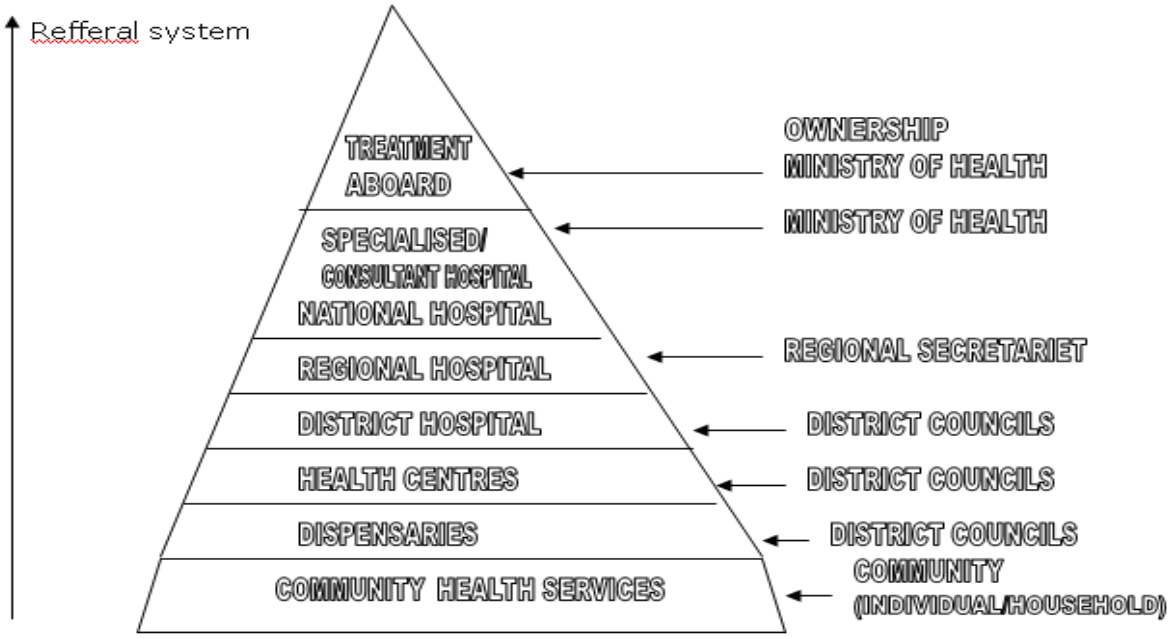
3. To address issues of geographical, socio cultural, economic , legal and regulatory barriers that hinder access to skilled maternal health care
4. To ensure strengthened capacity of health system at all level so that delivers efficient and effective reproductive health services.

In order to comply with the above-mentioned strategies Tanzania has adopted the National Road Map Strategic Plan to Accelerate Reduction of Maternal, Newborn and Child Deaths in Tanzania 2008-2015. This road map will guide all stake holders to combat maternal mortality. Other National strategic plans that inform and guide the development of maternal health services includes;

1. National Strategy for growth and poverty reduction 2005-2010
2. Health sector reform and strategic plan 2005-2010
3. Reproductive and child health 2005-2010
4. Health sector support program 2008-2012
5. Primary health services development program 2007-2017
6. Tanzania vision 2025
7. Millennium development goals

Health services organization: the organization of health services in Singida region is as per directives of the Ministry of Health Tanzania (MOH). The government health referral services assume pyramidal patterns of structure as shown in Figure 1 below.

Figure 1 Organization of government health services in Tanzania.



Source: MOH (2005).

Health management and administration: As shown in Figure 1 above, the district is the operational unit responsible for referral healthcare services under the auspices of the district council. There is a district health board that ensures community participation in the health management. The District Medical Officer (DMO) is a secretary to the district health board. Every health facility has its own facility committee to ensure community participation.

Table 2. Health facilities in Singida region.

Facility	Government owned total	NGO owned total	Total available	Total required	Shortage
Regional hospital	0	0	0	1	1
District hospital	3	6	9	10	1
Health centers	11	1	12	84	72 (86%)
Dispensaries	107	38	145	358	213 (59.5%)
Community health posts	0	0	0	366	366
Nursing training schools	1	2	3	8	2
Laboratory training schools	1	0	0	3	2
Source: RMO (2007).					

From Table 2 above it is notable that there is a severe shortage of health facilities especially dispensaries and health centers. Health centers and dispensaries are important health units to ensure delivery of Comprehensive Emergency Obstetric Care (CEmOC) and Basic Emergency Obstetric Care (BEmOC) respectively. In addition there are inactive community health posts that could serve as a backup for general health education, basic maternal health promotion and identification of referral cases. Although existence of nursing and laboratory training schools in the region augment the human resource capacity for service delivery but it is not adequately meeting the Human Resource needs based on national norms.

According to the RMO (2007) of the total available health facilities include 86% coverage for ANC services. There is still poor access to HIV/AIDS care and treatment services and only few of the available health facilities provide Anti Retro Viral Therapy. Post abortion care (PAC) services are only provided at hospital level which is only 5% of the total health facilities in the region. Although the government health policy for delivery of maternal health services advocates exemption of services from financial charges the access to services is still lower than expected.

The capacity of the regional clinical skilled health work force is shown in Table 3 below, where notably there is a shortage of about 54.4% of the required staff.

Table 3. Profile of skilled health workers.

CADRE	AVAILABLE	REQUIRED	SHORTAGE
Medical doctors	10	35	25 (71.4%)
Specialist doctors	12	22	10 (45.5%)
Assistant medical officers	28	56	28 (50%)
Clinical officers	118	191	73 (38.2%)
Pharmacist	3	7	4 (57%)
Nursing officers	69	175	106 (60.6%)
Nurses	222	520	298 (57%)
Laboratory technicians	5	16	10 (62.5%)
Radiographers	2	8	6 (75%)
Total	469	1030	560 (54.4%)
Source: RMO (2007).			

Maternal health indicators: Despite the fact that the regional health system provides all maternal health services in line with the NPERCHI still poor maternal health indicators are observed. According to the available health information from the DHS report 2005 the maternal health indicators outlined in Table 4 below.

Table 4. Maternal health indicators in Singida region.

KEY AREA	SINGIDA
ANC Services	
• ANC first visits	94%
• ANC all visits	62%
• ANC timely visit	14%
• Mean gestation age at first visit	5.4%
• Women access to information on danger signs in pregnancy	39.3%
Trends in Delivery	
• home deliveries	58.6%
• Traditional Birth Attendants	11%
• relatives	30.6%
• without any assistance	3.9%
CEmOC	
• Lower Segment Caesarean Section	3.1%
Post natal care	
• Timely Postnatal care attendance for those delivered outside health facilities	7.1%
Family Planning	
• Women using any method of family planning	18.3%
• Women using modern method of family planning	16.9%
• Women using traditional method of family planning	1.4%
• Women reported to have an approval of husbands on the use of family planning	43%
• Women with unmet need for family planning	25%
Other health issues	
• HIV+ pregnant women	8%
• Prevalence of Anemia due to Malaria in pregnant women	15%
• Prevalence of under nutrition among women of reproductive age (15-49 years)	10%
Source: DHS (2005).	

From Table 4 above: despite the high attendance of ANC at first visit only few women pay timely visit and attend for the recommended four ANC visits. In addition there is high proportion of home deliveries, low access to information on obstetric danger signs and poor utilization of postnatal

and family planning care. Only few women access CEmOC well below the World Health Organization (WHO) estimation of 5-15% of pregnant women from any subgroup who require Lower Segment Caesarean Section (LSCS) due to complications of deliveries (MOH, 2008). Moreover, there is high prevalence of non emergency obstetric conditions.

Due to the National health policy abortion without medical reasons is illegal hence therefore there is no clear evidences on the magnitude of the problem in the region. However a study conducted in Hai district Kilimanjaro region reported that a third of maternal deaths attributed to abortion (MOH, 2008).

Overall, as evidenced in the tables and analysis, there are major gaps and skill shortages in human resources and deficits in the health infrastructure that influence the quantity and quality of health services.

CHAPTER 2: IDENTIFYING THE DETERMINANTS OF MATERNAL MORBIDITY AND MORTALITY.

2.1. Problem Statement.

The World Health Organization estimated that 536,000 maternal deaths occurred in the year 2005 globally (WHO, 2009). Of the total deaths, 99% occurred in developing countries where 450 deaths per 100,000 live births were reported (WHO, 2009). However, within developing countries sub Saharan Africa had the highest burden where maternal mortality ratio was reported at 900 deaths per 100000 live births (UNFPA, 2005). Tanzania is one among ten developing countries that contribute to 61% of the global total of maternal deaths (MOH, 2008). In 2005, the demographic health survey report documented 578 deaths per 100000 live births (DHS, 2005).

In Singida region the Regional Health Management Team (RHMT) documented 219 maternal deaths out of 115, 473 live births that delivered in health facilities for a period from 2004-07 (RMO, 2007). According to the available information the trend of maternal deaths that occurred in health facilities in Singida region is shown in the table 5 below.

Table 5. Maternal mortality in Singida region, 2004-2007[1]

DETAILS	2004	2005	2006	2007	TOTAL
Total live births each year	25,000	28,326	27,488	34,659	115,473
Expected deaths each year	145	164	159	200	668
Total deaths occurred each year in health facilities	34	66	58	61	219
Proportion of health facilities maternal out of total live births	0.136%	0.233%	0.211%	0.176%	0.19%
Missing Deaths=expected deaths –health facilities deaths	111	98	101	139	449
Source: RMO (2007).					

From the Table 5 above, each year health facilities registered fewer deaths than expected. Of the total expected deaths for the whole period of four years about 67% of deaths occurred outside the health facilities (missing deaths). According to the WHO (2009) "80% of maternal deaths could be prevented if women had access to essential maternal health

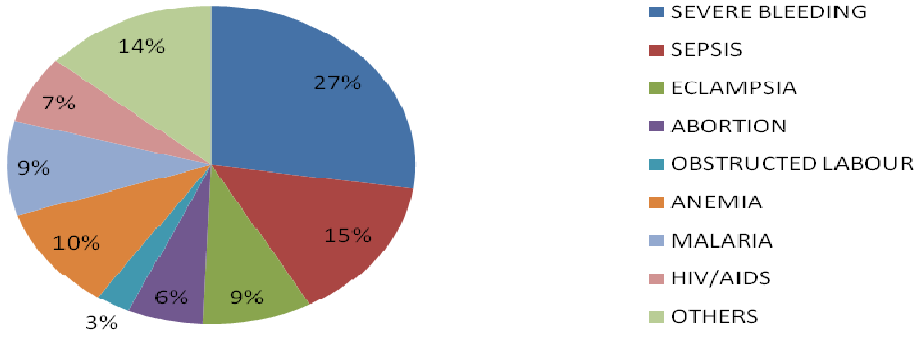
[1] Table 5 describes maternal deaths in Singida region – however there are limitations to the data available at regional level which precludes the opportunity to conduct precise measures – the national MMR has therefore being used as a benchmark to compare regional incidence for maternal deaths.

services" (WHO, 2009). This means Singida region had a chance of avoiding about 534 of the expected death or 175 of deaths that occurred in health facilities if essential maternal services were available. Therefore provided that there are chances to avoid most of maternal deaths it worth studying factors that contribute to maternal deaths in the region.

2.2. What are the factors that contribute to maternal deaths?

According to the literature the direct and indirect causes of obstetric complications contributed 60% and 26% respectively. The Figure 2 below shows the percentage distribution of health facilities causes of maternal deaths from the year 2004 to 2007 demonstrating the major causes of death to include; severe bleeding, sepsis and eclampsia.

Fig. 2. The percentage distribution of health facilities causes of Maternal Deaths in Singida Region from 2004 to 2007 (in clockwise order)



Source: RMO (2007).

In Singida a high proportion of maternal deaths that occurred in health facilities were due to direct causes (in this case 60%). Despite that, according to the UNFPA (2000) "most maternal deaths (61 per cent) take place during labour, delivery or in the immediate post-partum period" (UNFPA, 2000). It is also known that "Up to 15 per cent of pregnant women in all population groups experience potentially fatal complications during birth…" (UNFPA, 2000). This means that despite many factors that lead to maternal deaths at different period of pregnancy many fatal factors cluster around the peri-natal stages; that start from labour, delivery and few days after delivery. "…most maternal deaths cluster around labour and postpartum period" (Fotso *et al* 2008). In fact it is recognized that most maternal deaths could be prevented given that we

know how to prevent and manage complications; "rapid treatment can make the difference between life and death" (WHO, 2009). According to the Ministry of Health (MOH) there are two categories of factors that contribute to maternal deaths (MOH, 2008). These are health and non health system factors.

Among health system factors include

1. Shortage of health resources that include skilled health providers, funds, drugs, equipments, supplies and health infrastructure.
2. Weak health management at all levels and inadequate coordination between public and private facilities
3. Lack of motivation and commitment among health staff
4. Weak referral systems

"There is a severe shortage of human resources at all levels" (MOH, 2008). However, the shortage is more severely marked in rural districts (MOH, 2008). Singida region reports 54.4% shortage of the required staff. Shortage of skilled providers; this can affect delivery of quality healthcare provision. According to UNFPA (2009) among factors that hinder progress in maternal health is a severe shortage of skilled health providers. The MOH (2008) acknowledge that one of the factors that leads to a weak health system services in the country is the health work workforce crisis.

There is inadequate capacity of the health management and administration that contribute to a slow process of recruitment, staff placement and promotion (MOH, 2008). Weak health management adversely effects health services linked to motivation and commitment of the available health staff. In addition due to weak health management there is poor coordination among stakeholders. This contributes to weaken the capacity of entire health system. The MOH acknowledge that there is "inadequate coordination between public and private facilities" (MOH, 2008).

In terms of health financing, there are inadequate funds available for the health sector. From 2002 to 2007 the allocation of the National budget to health sectors ranged from 9.7% to 11.6% respectively (MOH, 2008). This is below 15% as recommended by Abuja declaration. Shortage of funds affects recruitment of adequate skilled staff, purchase of adequate drugs, equipment and supplies, availability of health infrastructure and maintenance of logistics. Inadequate health infrastructure leads to poor geographical accessibility and long distance from the residence of some users. Despite geographical inequalities in access to health care there is a weak referral system (MOH, 2008). Poor health facilities infrastructure

affects privacy and confidentiality during provision of services. Despite shortage of funds the MOH (2008) report shows that there is always delay of the approval of the government funds for the purchase of health resources.

Due to shortages of health resources there is often unavailability of quality services. Poor quality of services leads to poor acceptability by users which are a major reason for low utilization in the public health system. In rural Tanzania, despite closeness to the health facilities and exemption from user charges women opted to travel long distance to seek quality delivery services from private facilities (Mrisho *et al* 2007). Studying about quality of the critical care during complicated deliveries in Northern Tanzania Olsen *et al* (2004) argued that "it is neither the mothers' ignorance nor their lack of ability to get to a facility that is the main barrier to receiving quality care when needed, but rather the lack of quality care at the facility" (Olsen *et al* 2004)

Non health system factors, MOH (2008)

1. Poor health seeking behaviour
2. Illiteracy and inadequate health education on obstetric emergency,
3. Poverty and low priority in health
4. Social cultural beliefs and practice that leads to gender inequity
5. Inadequate community involvement and participation in health management.
6. Poor road infrastructure and long travelling distance to health facilities.

Poor health seeking behaviour is practiced by some pregnant women, which may be caused by illiteracy and inadequate awareness on danger signs. Although 94% of pregnant women attend first ANC (MOH, 2008) due to shortage of human resource there might be no provision of adequate health education. Due to poor health seeking behaviour women might not be seeking health care timely therefore come when they have complications. Especially from the second pregnancy and above women do think that they are want to deliver at home, therefore they don't need health care (Majinge, 2006).

Culture and beliefs is cited as one of the reasons why women do not get the care they need (WHO, 2009). In some cases even if a woman is capable, low priority in health and fear of opportunity costs might limit timely decision to seek health care. Lack of community involvement in management of health system can lead to poor support of health strategies that aim at reduction of maternal deaths. However, poor road

infrastructure, geographical inaccessibility and long distance to health facilities might contribute to delay of women during obstetric emergencies.

From the above information there are multiple factors that can interact and lead to delay in rapid treatment and therefore result to maternal deaths. Although quality timely care doesn't always mean better outcome the estimated 0.2% facilities death is not acceptable and has increased from the 2004 estimate of 0.14% (RMO, 2007). Despite that from the Table 5 above the number of deaths is even higher given the difference between expected and actual documented deaths by health facilities. Although the period in which the highest number of maternal deaths occurs is very narrow there is an opportunity to avoid deaths if adequate rapid treatment is offered (WHO, 2009). The EmOC services are currently the most effective approach to manage obstetric complications that occur during pregnancy.

However, although the provision of EmOC is resource constrained the few available if well managed and utilized could save the lives of women. Kayongo *et al* (2006) monitored a four year EmOC project in Tanzania and Rwanda. According to the statistics there was an increase in met needs for EmOC from 14% to 19% in Tanzania and from 16% to 25% in Rwanda from year one to four respectively. In all countries there was a decline in Case Fatality Rate from 30%-50%. The final report acknowledges that the project "…achieved modest improvements in services, even in the face of the considerable constraints of rural district hospitals" (Kayongo *et al* 2006). Though the statistics are not highly convincing of success, the achievement has shown that with more sustainable efforts, it's possible to improve utilization of EmOC services.

Given that emergency treatment can save lives of pregnant women, I will explore the factors that contribute to delay in emergency services for obstetrics and identify contributory factors that may account for the high number of maternal deaths in the region. I have chosen Maine & Thaddeus three delays modal of maternal mortality (1994) as a means of classifying the staging of risk for the pregnant woman in labour. The schematic illustration and analysis of this model are presented in the methodology chapter below.

2.3. Study questions.

This thesis addresses the following questions:

1. What are the social economic and cultural factors that lead to delay in accessing EmOC services in Singida region?
2. What are the health services factors that lead to delay in provision of EmOC services in Singida Region
3. Are there gaps in EmOC strategies that need to be addressed in order to avoid three delays, improve maternal services and reduce mortality in the region?

2.4. General objective.

To analyze factors which contribute to maternal mortality due to direct causes in Singida region and recommendations for some other possible interventions to reduce and prevent maternal mortality.

2.5. Specific objectives.

1. To explore social cultural factors that lead to delay in accessing EmOC (services in Singida region
2. To explore social economic factors that lead to delay in accessing EmOC (services in Singida region
3. To examine health services factors that lead to delay in provision of EmOC services in Singida Region
4. To examine the challenges encountered by the regional management team in terms of implementation of the strategies to reduce maternal mortality.
5. To provide recommendations for a regional health system contribution to reduction of maternal mortality

2.6. Methodology.

Source of data and key search words: This thesis is mainly based on the literature review. Secondary health facility data accessed from the regional health office Singida aims to describe the magnitude of the problem.

Search strategies include internet search to access literatures through Google search engine, database from Pubmed, Scoppus, and different websites including WHO, UNFPA, SMI and World Bank. I will also use information from KIT and VU libraries, Tanzanian government and health website, and governments from countries that have similar health indicators. However I will also apply my own experience and knowledge gained during the course and draw on experiences from my fellow ICHD participants.

Search words combination: Maternal mortality ratio, EmOC, Tanzania. Three delays model, maternal health, UNFPA, skilled births attendants

Limitation of the study: this work is based on a desk review sourced by secondary data and anecdotal evidence and direct personal observations. I acknowledge that primary data could allow access to key informants and obtain more precise data that could reflect the current real situation. Some specific regional and country documents were not accessible for this review, therefore limiting the local perspectives for maternal health. In addition the applied conceptual frame work has its own limitations that are described in the chapters below. Given the stated limitations of the document, it is acknowledged that there is more scope for field research on this subject in my country.

Applied conceptual framework: Maine & Thaddeus three delays modal of maternal mortality (1994) will inform the conceptual framework for this literature review.

The model analyses maternal mortality as a function of delay in receiving appropriate quality treatment. According to Maine &Thaddeus (1994) from the onset of obstetric complication to the outcome there are multiple factors that interfere with the chances of a woman getting rapid quality treatment which are called delay factors. With the three delays, there are different underlying issues which influence the decision making and thus the reason for delays.

The above factors assume that the woman and family have knowledge and awareness on obstetric complications, empowered to make timely decision and able to arrive at health facility in time. Finally the facility should be able to provide timely quality care. The model is organized these delays into three phases as outlined below.

Phase I: delay in deciding to seek care. There are many factors that inhibit a woman from making timely decision to seek care. At this particular phase decision making is facilitated by factors that can be either actual or perceived barriers. Among these factors include; socio economic, cultural and legal political, geographical accessibility and perceived quality of care at the point of delivery.

Phase II: delay in identifying and reaching medical care. This phase is mainly dominated by actual barriers that may hinder identification and reaching the health facility. Among these include geographical distribution of health facilities, distance from home to the facility, availability of transport and fare.

Phase III: delay in receiving adequate and appropriate care. This phase entails health facility barriers that hinder the provision of timely quality treatment. These include adequacy of referral system, availability equipments, drugs, supplies and adequate trained, skilled and competent staff. From the above described phases, maternal deaths can occur as a result of combination or independent phase.

Maine and Thaddeus model of maternal mortality (1994) – application of a SWOT Analysis.

The strengths and weaknesses of the model presented below consider the opportunities and threats during implementation of the strategies to address three delays. The analysis below will at the first focus on the general key strengths and weaknesses and secondly on the Table 6 at the separate phases of delays. The approach used to develop the SWOT is by literature review and my own experience by observation taking into account the feasibility of implementing strategies against delays in the context of Tanzania Singida region.

General strengths of the model.

- It concentrates on the analysis of factors that contribute to maternal deaths at the narrow interval between onset of obstetric emergency and outcome.
- The addressed barriers to access EmOC are universal to developing and developed countries ie. beliefs and cultures, so are well evidenced in the literature.
- It focuses on the delays as a function of multiple determinants.
- It insists on birth preparedness as a key solution to avoid maternal deaths that occur due to emergency obstetric conditions

General weaknesses of the model.

- It does not capture underlying risk factors for emergency obstetric events and therefore assumes all women have good health backgrounds, to withstand the emergency obstetric complications after treatment.
- It assumes that birth preparedness is central to improving access and there will be available quality services. However, despite good birth preparedness there are some other factors that may prevent timely access to EmOC such as transport break down, absence of health provider, incorrect diagnosis at health facility and change in climate.

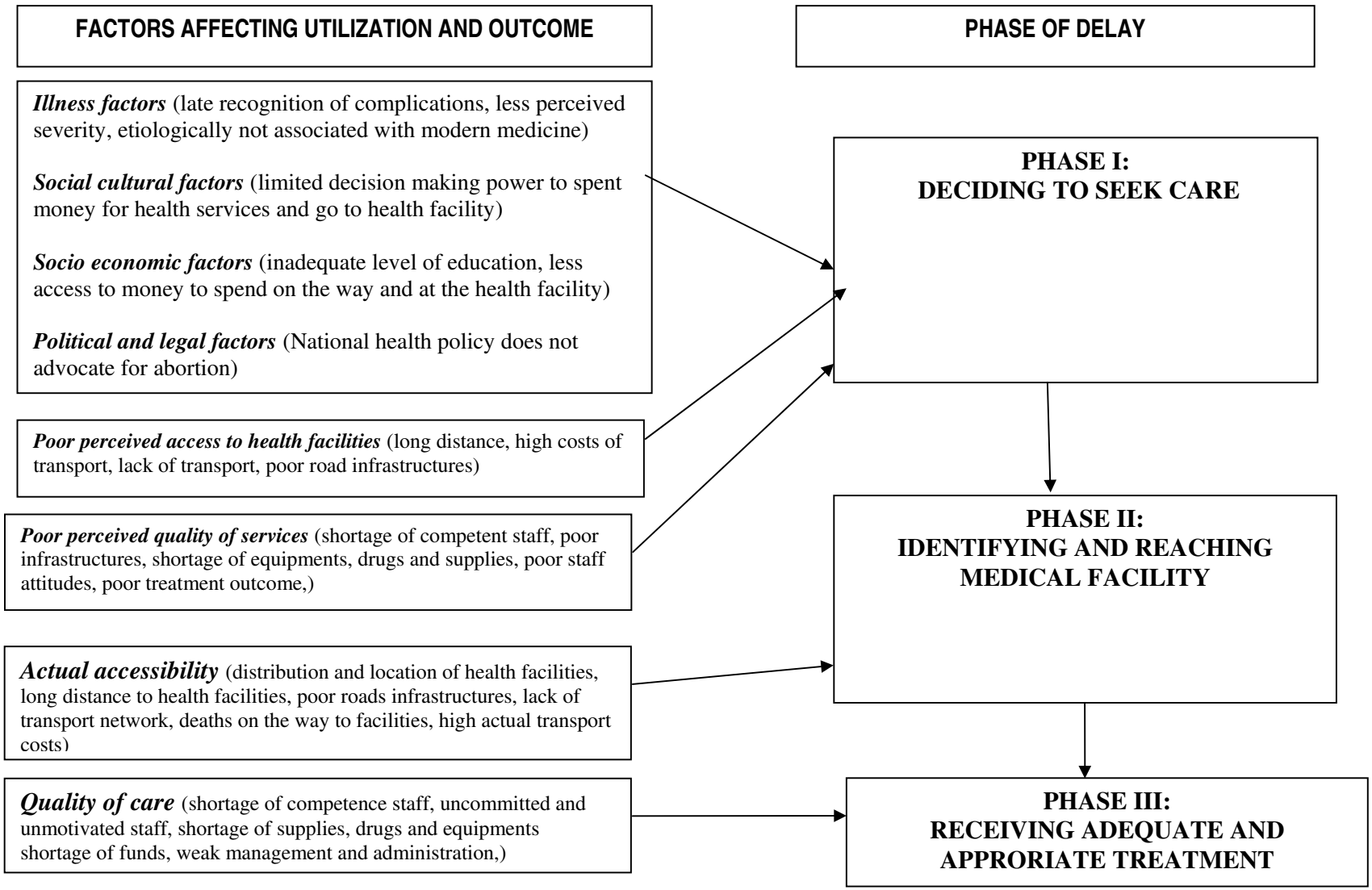
Table 6. SWOT analysis of the model by phases of delays.				
PHASES OF DELAYS	**STRENGTH**	**WEAKNESS**	**OPPORTUNITY**	**THREAT**
PHASE I: Decision to seek care	It acknowledges that fast decision to seek care is essential based on the acute nature of obstetric emergencies	It assumes people will easily change their cultures and behaviour to ensure timely access to care at health facilities	Existence of behaviour change communication programs	Cultural resistance to changes and negative rumours that will undermine the acceptability
PHASE II: Identifying and reaching care	It takes into account the issue of availability of transport because obstetric emergencies requires urgent attention	It assumes developing countries will have adequate funds to develop road infrastructure and ensure regular transportation.	Political willingness to address maternal mortality	Other country disasters that may lead to change of priorities in allocation of funds to address transport network and road infrastructure.
PHASE III: Receiving adequate and appropriate treatment	It acknowledges that quality of care is essential final component for saving life	It assumes that there will always be competent health staff to ensure correct diagnosis. In addition quality care does not automatically lead to the better outcome	Political willingness to address maternal mortality will strengthen opportunities for on job trainings and supportive supervision	Lack of political and ministerial will to dedicate resources for health infrastructure, commodities and human resources.

However, despite some weaknesses, this model will help as an immediate tool to explore factors that contribute to delay in accessing EmOC in order to take into account effective strategies to address the delays.

Based on the above description the figure 3 below is an adaptation of Maine & Thaddeus three delays modal of maternal mortality that will guide my literature review (Maine and Thaddeus, 1994)**.**

By using this model to analyse the issues related to maternal health management at local level, the thesis will provide information about challenges at the regional health management level in relation to implementation of the strategies to reduce maternal mortality. It will also recommend feasible interventions that can contribute to reduction of maternal deaths.

Fig. 3. **Three delay model of maternal mortality (Maine and Thaddeus, 1994).**



CHAPTER 3: LITERATURE REVIEW.

In line with the above background information, this section will explore additional specific literatures that will provide more evidences to address the research objectives. The review will be guided by the frame of the three delays model of maternal mortality by Maine and Thaddeus (1994). The frame work has been described above in chapter 2.

3.1. First delay: at this stage women interact with multiple factors before reaching the decision whether or not to seek health care. Among factors that influence decision making include

- Illness factors
- Socio cultural factors
- Perceived high economic costs and poor quality of care

People have their own ways of dealing with the different presentations of the obstetric complications. In some cases they perceive as less severe and therefore ignore, take some local or modern medications or decide to deal in their own ways of choice. This approach can be augmented by insufficient awareness on obstetric danger signs, beliefs and cultural behaviour in relation to illness. By the time they accept that the illness is complicated and need health care services is already a delay.

Studying perceived delays in seeking health care according to the episodes of serious illness and its implications for safe motherhood in rural Bangladesh Killewo *et al* (2006) found that seeking modern health care is the last option when there is obvious failure to contain the disease according to their local approach. Before that people tend to initiate their own strategies of containing the illness according to the way they perceive and judge. Among documented local responses to illness is self treatment, ignoring the disease, positive thinking, waiting or get treatment from informal health providers. As stated above, delay due to illness factors is influenced by insufficient knowledge and awareness on obstetric danger signs. In southern Tanzania it was found that "the proportion of women with skilled care at delivery increased with knowledge of danger signs" (Mpembeni *et al* 2007). The increase was significant and it ranged from 39% among women who didn't know any danger signs to 68% among those who knew four or more signs ($P<0.05$).

Low status of women in the society, cultural and beliefs are among factors that lead women fail to access health services include (WHO,

2009). Cultures limit some women to have authority to make self decisions to seek health care. In these circumstances often the decision is carried by husband, parents in law, relatives or other influential people. Lack of authority to make self decision leads to delay receiving care. Olsen *et al* (2008) found that in highlands of rural northern Tanzania men who head families have great power to influence all issues related to pregnancy and delivery. In this circumstance women have to wait for the choice of their husbands regarding childbirth. Mrisho *et al* (2007) found in rural Tanzania that traditions, cultures and pattern of decision making power in the family prevent women from delivering in health facilities. However, in southern Tanzania women who ever discussed with their partners about place of delivery when they become pregnant they were more likely to deliver in health facilities (Mpembeni *et al* 2007).

Beliefs can lead women, families and other stakeholders during obstetric complications to associate the causes differently from modern medicine, thereby initiating different health seeking strategies and finally delay. The WDPEH (2006) revealed that some skilled birth attendant give local herbs in order to accelerate the labour in cases where labour pains cease. In northern part of Tanzania which borders with Singida region to the east it was found that "husbands had a traditional affiliation in 55% of the maternal deaths cases against 31% of the control" OR 2.6 95% CI 1.2-5.7 (Olsen *et al* 2008).

Perceived socioeconomic barriers create disincentive for women from timely decision to seek care. Prior to decision making women count for the opportunity and actual costs incurred on the way to health facilities. According to Mpembeni *et al* (2007) the major causes of home delivery include fear of high costs involved when referred to the hospital while there is availability of TBAs. In addition Mrisho *et al (*2007) revealed that lack of access to money is the reason why women in rural Tanzania cannot make decision.

Perception of poor quality of care in health facilities is another disincentive to seek delivery services. Poor attitudes of health staff, unavailability of skilled staff, poor health infrastructure and amenities that prevent privacy and confidentiality, lack of drugs, supplies and equipments are among issues that can create negative incentive from seeking care. In Nepal, a study carried to show the influence of staff attitudes on utilization of professional midwifery care documented that improved staff attitudes to clients contributed to increased utilization of services (Clapham *et al* 2008). In order to improve EmOC ensured availability of drugs, supplies and better staff attitudes were among suggestions given by women in Kenya (Pearson and Shoo, 2005). In

Uganda, low availability of drugs, no medical officer when needed and unfriendly midwifery were issues that compromised the quality of EmOC (Lalonde *et al* 2003).

Illiteracy affects health care seeking behaviour and prolongs the time to make decision to seek care. This is because education is important tool during critical analysis of decision making weather to seek modern health care. Mpembeni *et al* (2007) found in southern Tanzania that deliveries of women who spent more years in school were more likely access health facilities than those who did not attend any school or spent less years (OR 1.44, 95% CI 1.05-1.96). According to Mrisho *et al* (2007) women in rural Tanzania acknowledged that carelessness and lack of education can make a woman decide to deliver not at health facility. Moreover they admitted that due to lack of knowledge of the risks prevents some women from changing their decision to deliver at home even if the condition is alarming. In Sri Lanka, government commitment to address women literacy contributed to decline in MMR (WHO, 2009). However studying risk factors for maternal deaths in highlands of rural northern Tanzania Olsen *et al* (2008) found contradictory arguments, that paternal illiteracy that played important role of risk factor to maternal deaths. Therefore it is obvious that despite women literacy decision making can be influenced by other influential people. Based on this argument the authors suggested the importance of considering the literacy of all decision markers when addressing maternal deaths.

3. 2. Second delay: this occurs at a stage where a woman is expected to identify and reach the medical facility. The stage is mainly dominated by actual socioeconomic factors that predict whether a woman will identify and reach a medical facility in time. Among these barriers include

- lack of transport network
- lack of fare for the transport
- irregular transport

It is seen from the above barriers that reliable transport and availability of fare for the transport are the main socio economic factors to enable women timely identify and reach health facility. The necessity of reliable transport comes from the fact that often in developing countries the health facilities are inadequate and unevenly distributed therefore far to reach. In addition due to poor road infrastructure in some cases there is geographic inaccessibility of health facilities.

In three rural districts including Singida it is documented that "the most commonly cited barriers to facility-based delivery were lack of money and

excessive distance to the nearest hospital" (WDPEH 2006). Another study documented that 84% of women in rural Tanzania decided to give birth at home because of the problem of transport and distance (Mrisho *et al* 2007). In addition from this study authors found that during in depth interviews lack of transport was reported from all eight villages as a common factor that leads to home delivery. One interviewee reported that she decided to give birth at home because of lack of transport to the nearby facility while walking could take over two hours. In Sri Lanka improved transport and referral network is one among elements that contributed to the decline in MMR (WHO, 2009).

Addressing the issue of distance to health facilities Mpembeni *et al* (2007) found that women who lived within 5km from health facilities were more likely to deliver at health facilities than those who lived more than 5km (OR 3.84, 95% CI 2.61—5.65). Although the RMO (2007) reported that 86% of the total general population access health services within a range of 5kms, in reality only few facilities provide EmOC. It is important to note that where quality is assured women tend to go and deliver at that health facility regardless of distance. Kruk *et al* (2009) and Mrisho *et al* (2007) found that in rural Tanzania quality of care was highly valued to the extent that women could decide to bypass free of charge government health facilities that are closer to their home and go to seek private facilities that are distant.

3.3. Third delay: occurs at health facilities and is related to the technical quality of care. Among reasons why women do not receive care they need is unavailability and/ or and poor quality of provided services (WHO, 2009).

The components of third delay that affect the quality of care include;

- Shortage of skilled and competence staff including female health staff.
- Uncommitted and unmotivated staff
- Weak management and administration of health services
- Shortage of funds, supplies, drugs and equipments
- Lack of privacy, confidentiality, poor organization of services and infrastructure

According to WHO (2009) most of the maternal deaths are avoidable given the presence of skilled care at births. High coverage of skilled attendance at births helped Sri Lanka to lower the MMR (WHO, 2009). However, Singida region estimated 54.4% shortage of skilled and competence staff (RMO, 2007). This is contributed by the perception that

Singida considered hardship post therefore only half of staff posted report and stay (MOH, 2008).

Although WHO (2009) insists on skilled attendants at births the UNFPA (2009) says skilled health providers alone is insufficient without enabling factors that can ensure provision of comprehensive obstetric care during complications. An enabling working environment is essential to support health providers to perform competently. However, analyzing competences among skilled providers in managing obstetric complications Harvey *et al* (2007) found that there is a wide gap between skills and competencies in addressing EmOC. In addition the Quality Assurance Project in four countries including Rwanda found low scores among Skilled Birth Attendants (SBA) on the basic obstetric care. Even the skilled providers without such competencies might not be able to provide expected care therefore maternal deaths can occur even in health facilities. "Core competencies are pre requisites to ensuring best practices and improved quality of maternal health care" (Canavan, 2008).

Women deny seeking health services because of poor staff motivation and commitment. This has been documented in several studies. Unfriendly services were a critical barrier to accessing health services as reported by women in Tanzania (DHS, 2004). In rural Tanzania Mrisho *et al (*2007) documented that women complained that health providers in many public facilities make use of abusive language, deny providing services, lacking compassion and refusing to assist accordingly. The MOH (2008) acknowledges that there is low motivation and inadequate capacity of human resource management and administration to effect the motivation and commitment of health staff.

In line with the inadequate managerial skills there is work overload of the available managers, as accounted for by shortage of skilled staff. Inadequate managerial skills and work overload affect the efficiency of the management and administration, and thereby contribute to low performance of EmOC. The study about the availability of human resources for EmOC in northern Tanzania concluded that "Availabilit*y* of qualified personnel as well as institutional management and capacity determine the quality of emergency obstetric care services and personnel" (Olsen *et al* 2005). In Singida region shortage of skilled providers affects the quality of management and administration. This is because health managers are hired from among health staff. While among CHMTS members only two are eligible and confirmed 65% of the available health facilities headed by Nurses or health attendants that is not according to standards (RMO, 2008). Inadequate managerial skills and work overload affect supervision and performance appraisal at work.

According to the RMO (2008), the open performance appraisal system (OPRAS) introduced in the period of public service reforms is slow and only few staff or supervisors know well. Inadequate supportive supervisions and weak (OPRAS) contribute to poor performance of obstetric health services and can lead to poor quality and delay in provision EmOC.

Adequate funds are essential for building and sustaining health systems. However, there is "chronic under funding of the health sector" (MOH, 2008). Although Abuja declaration (2001) recommended allocation of 15% of National budget to health sector there has been no increase from 2001 to 2007, the allocation of budget ranged only from 9.7% to 11.6% (MOH, 2008).

While "Rapid treatment can make the difference between life and deaths" (WHO, 2009), due to shortage of funds there is inadequate availability of drugs, supplies, equipments and health staff that are essential elements in offering rapid treatment. From 2006 to 2008, the RCH reports continuously reported shortages of different essential equipments and supplies. Although the National health policy advocate for pregnant women's exemption of user fees at any government facility, evidence shows that women are asked to buy drugs, supplies and equipments. Remarks from one participant "…when I went to the health facility for delivery I was asked to buy everything, even Panadol…" (Mrisho *et al* 2007). According to his study nearly all participants said they do not give birth at a health facility because they could not afford to have money to pay for hospital services, including delivery kits and food.

Lack of privacy, confidentiality, poor organization of infrastructure and services can deny women the option to seek health services. There is a shortage of funds to develop and renovate health infrastructure in Singida region (RMO, 2008). In rural Tanzania due to the shortage of funds to ensure availability and renovation of health infrastructure women complained that some health facilities do not have special delivery room with lack of adequate space and privacy (Mrisho *et al* 2007). Treating females and males in the same room decreases privacy and confidentiality during delivery. In addition, the study found that women perceive that privacy and confidentiality is also determined by the sex and age of health providers who offer delivery services. Women did not prefer to be delivered by young midwives who appeared like their children. Despite that even young women did not prefer delivering at health facilities where male health workers were involved in deliveries. Women of Singida reported that unavailability of female workers was one of the barriers to utilization of health services (DHS, 2005). Currently of

the total clinicians in the region, there is only one female medical doctor (RMO, 2008).

In conclusion, all three delays adversely effect the access, availability and quality of care that will be provided to the at all three stages of a woman's labour, delivery and post natal experience.

CHAPTER 4: DISCUSSION OF STUDY RESULTS/ FINDINGS.

The discussion of findings and results will be achieved by synthesizing the issues as derived from the analysis of the three delays in order to address the underlying causes of high maternal morbidity and mortality.

4.1. Social cultural factors that lead to delay in accessing EmOC services.

Findings suggest that cultures involve certain harmful beliefs, traditions and social norms that can lead to delays in accessing EmOC (Killewo *et al* 2006). Cultural taboos and deficits are mainly influenced by insufficient knowledge and awareness which can extend to lack of knowledge on obstetric danger signs for women and other community members. In these circumstances a response to the illness is mainly influenced by beliefs and traditions, whereby women move from one informal provider to another and delay appropriate care provision. In other cases low awareness on obstetric danger signs leads women to self treat and not to seek formal healthcare which can result in major complications in delivery.

However, whenever women timely identify the obstetric complications lack of power to seek care can prevent them from timely access EmOC. While obstetric complication is an urgent issue women are forced to obtain permission from their husbands, mothers in law and other key influential people. Breaking rules can lead to the serious consequences such as domestic violence and marriage break-up. Although according to the literature women fail to make decisions because they don't have access to money, this also depends on both lack of access to funds and cultures. The norms that women should be accompanied by their husbands or other key people may lead to delay while the illness progresses while conversely women may have permission but no funds to travel and access care. In Singida about 43% of women reported that they fail to access health services because of the fear of going alone (DHS, 2005). Therefore having money may not help a woman in quick decision making if she believes in traditional husband superiority.

Building high levels of awareness on obstetric danger signs can help break cultures that oppose timely access to EmOC. This has been revealed by findings from a study in southern Tanzania that among women who delivered in health facilities, a high proportion were acutely aware of danger signs and therefore came to the facility on time (Mpembeni *et al* 2007). In addition, it was found that previous discussion about delivery can help to overcome obstacles that may prevent women

from delivering in health facilities (Mpembeni *et al* 2007). This means both couples become equally aware of the obstetric complications and importance of delivering in health facilities, therefore the decisions become more informed and timely.

Socio cultural barriers are broad and extend to the health facilities. Here it means women have their socio cultural preferences in respect to the provider of health services. In cases where women perceive that the quality of services is below cultural standards they may delay seeking care until the condition is critical. Cultural standards may be compromised by multiple barriers that can include; poor quality of communication and relation between staff and patients, absence of female workers, presence of young midwives and male providers during deliveries, poor amenities and infrastructure that limit privacy and confidentiality, poor organization of services, cleanness and hygiene.

From the above discussion it is evident that high awareness on obstetric danger signs is essential for women, partners and entire community to facilitate positive health seeking behaviour from formal health facilities. Maternal health education using various means that include ANC, mass media communications is the main component that helps raise awareness on obstetric danger signs and enables women and families to stand against cultures that prevent timely access to EmOC. However, regardless of high knowledge and awareness on obstetric danger signs, provisions of services that are culturally acceptable are essential to encourage access and render quality care.

In relation to Singida region and maternal health, it is convincing that low awareness to obstetric danger signs prevents timely emergency care seeking. Women of Singida have limited access to money and power to make decisions, have limited permission to leave home and they are not allowed to argue with husbands (DHS, 2005). Given cultural limitations to make decisions to seek health care it is unlikely for the women to get away from home without making sure that a husband is aware. Breaking these rules can lead to domestic violence. This means in case of obstetric emergency they have to struggle to make sure that the husband is informed. Other barriers and constraints relate to poor service quality and perceptions by the users. While about 28% of women complained about unfriendly services about 17% complained that lack of female providers is a cultural barrier that prevents access to health care (DHS, 2005). This means that the quality of services is not culturally responsive to the needs of users.

Additionally, in reference to the above discussion ANC is a strategy to raise the knowledge and awareness of obstetric danger signs. However, in Singida women register very late and only few attend all four standard visits. Poor attendance to ANC contributes to low awareness whereby only 39.3% of pregnant women access information as expected. While availability of adequate health staff is essential to quality healthcare, there is a shortage of health staff therefore high workload and inadequate time for giving health education. Limited time to facilitate health education sessions leads to low awareness on obstetric danger signs. Although raising awareness could be performed by community health posts, due to the shortage of health resources these posts are currently inactive. Efforts that ensure sufficient knowledge and awareness on obstetric danger signs for women and other community members in Singida is essential to overcome cultures that prevent timely access to EmOC.

Secondly, studies revealed that literacy is another important tool to ensure access to correct information (WHO, 2009). This is explained by the fact that education is important during critical analysis of decision making weather to seek modern health care. It was found in southern Tanzania that women who attend school were more likely to deliver in health facilities than those who didn't (Mpembeni *et al 2007*). This may be because unlike illiterate, literate women have additional means of access to health information through mass media such as news papers, telephone and radio that broad cast even in non local languages. Given broad access to health information literate women are more capable to make informed choices. However, sometime delays occur because of the influence of illiteracy of the community around pregnant women. This is for the reason that during the onset of obstetric complications a woman can be severely ill or unconscious. In this circumstances decision and support are expected to come from family, relative and other stake holders. Based on the influence of illiteracy of the community around pregnant women a study from highland of rural Tanzania suggested involving entire society when making strategies to ensure literacy (Olsen *et al* 2008).

Reflecting the importance of literacy to Singida region seen that only about 62% of women is literate (DHS, 2005). This means there is limited knowledge and awareness on obstetric danger signs. Although access to mobile telephone services could help direct communication between women and health providers for many purposes the telephone network are not yet fully extended to cover rural areas. Nevertheless, there are no health facilities with a telephone assigned to attend routine calls from the community. Efforts are required to ensure high literacy rate in line

with quality services so that minimize the chances of cultures that limit women to seek EmOC.

4.2. Social economic factors that lead to delay in accessing EmOC services.

Findings confirm that long distance to health facilities and costs involved while travelling to reach care contribute to the second delay. High costs to reach facilities are due to poor road infrastructure and lack of transport network. In less developed regions like Singida the environment is more rural therefore people are scattered and leave far from health facilities. People also encounter major geographic barriers such as mountains, rivers which may incur major costs to reach the facility.

Other evidence shows that quality of care outweighs the distance and costs therefore in some cases women can travel far and reach health facility of their choices regardless of costs given perceived high quality of services (Kruk *et al* 2009). However, this is not reliable due to the expenses in terms of time and money. Closer and accessible BEmOC and CEmOC facilities that offer quality services are crucial to create positive incentives to seek care under minimum expenses. Moreover, it is essential to develop maternity waiting homes so that enable women to wait for the onset of labour near their expected delivery dates.

Secondly, availability of funds is necessary to ensure payment of fare for the transport and settling bills for other costs that may occur. Despite real costs, socio economic constraints may be in the form of opportunity costs. Perception that seeking formal health care is involved with high costs creates disincentives to take action to seek care. In addition engagement of women in other socio economic activities or household responsibilities may lead to opportunity costs linked to seeking health care. In this circumstances women may buy time so that make sure other priority activities are not abandoned. Buying time may lead to delay because the illness perhaps progressing. However, having cash in hands may less help given lack of transport, poor road infrastructure and long distance to health facilities. Nevertheless, funds are not only for ensuring the necessary fare for the transport but also for ensuring access to the delivery of services at the health facility. Opportunities to earn more income, live in socio economically developed areas will influence the chances of a woman receiving care. Strategies that focus on community participation to ensure availability of fund are essential to alleviate lack of fare for transport when seeking EmOC.

The evidence to date is convincing that socio economic constraints contribute to the second delay. While about 64% of women in Singida reported to lack money for health care more than a half reported that transport and distance to the health facilities were among barriers that hindered access to health facilities (DHS, 2005). Only 38% of women are illiterate and only 2.2% are in professional employment. This means about 98% of women who work in agriculture industry do not earn sufficiently due to poor productivity contributed by weak technology. Dealing with the second delay requires efforts directed towards alleviating household poverty, illiteracy, ensuring good road infrastructure and transport network.

4.3. Health services factors that lead to delay in provision of EmOC services.

Findings suggest that shortage of health resources, poor technical quality of services, weak management and administration of available resources are three major issues that contribute to the third delay in accessing EmOC (MOH, 2008).

First, health resources that include funds, skilled providers, drugs, equipment, supplies and health infrastructure are essential to ensure availability of services. Availability of adequate funds is the key component to ensure both per-service and in-service training of staff, adequate recruitment of skilled health staff, purchase of drugs, equipment, supplies, development and maintenance of health infrastructure. Resources other than funds and skilled staff are essential to guarantee availability of enabling working conditions so that support skilled staff to perform competently. Due to the shortage of health resources users have to buy out of health facilities so that compensate the gap. Experience that there is often shortage of health resources may create negative perception and incentives towards seeking care in future.

Nevertheless, despite shortage of funds there is delay in approving release of available government funds (MOH, 2008). In some cases funds are released late therefore delay in transfer to the health facilities. During the period where funds are not yet available the facility is frequently out of stock of drugs and other commodities, consequently users are required to buy from private shops. Commitment to ensure adequate availability and timely release of funds is required so that ensure sustainable availability of health resources to address EmOC.

Secondly, findings suggest that poor quality of services prevents women to access EmOC in time (Olsen *et al* 2005). Quality of services is a broad

understanding that includes the time at which adequate treatment was provided and the influence of other factors and conditions during provision of that service. Although there are many dimensions of quality of services depending on the context the main categories are perceived and real technical quality. The perceived quality has been discussed above and in the previous chapter on social and cultural barriers. However, technical quality focuses on the way skills and competencies were applied to ensure patient chances for better health outcome and patient safety. Shortage of resources as stated above is the key element that compromises the quality of care.

Sometimes skilled providers fail to apply competencies due to unavailability of resources. In some cases there is improvisation of equipments to overcome the gaps in essential supplies. In addition other alternative drugs that are not effective may be used therefore undermine the trust of the outcome. Poor management and administration of available resources can contribute to poor quality of services even when all resources are available. For example while drugs, supplies and equipments are available the supplies officer or clinician may be not available. Available skilled providers also frequently lack opportunities to update their knowledge, skills and competencies. Therefore, both availability of resources and good management are essential to ensure quality services.

Finally, evidence shows that weak management and administration of available resources contribute to the delay in accessing EmOC in health facilities (MOH, 2008). The importance of quality institutional management in addressing EmOC has also been acknowledged by Olsen *et al* (2005). This is because weak managerial skills can affect the quality of routine supportive supervision and leads to inadequate performance reviews therefore, contribute to lack of motivation and commitment consequently poor quality and delay of EmOC. Due to shortage of skilled providers the available managers are also overworked with other clinical duties hence limited time to address managerial tasks. Low staff motivation and incentives leads to absenteeism and late reporting for duty to the health facility and leaving earlier than the expected time. Although there is a policy for disciplinary action, often actions are delayed due to weak management and long chain of decision making. Effective management and administration of available resources is essential so that ensure timely provision of EmOC.

External factors that can influence the performance of both managers and field staff also impact on the EmOC. Social and personal problems among health workers means they fail to perform. Efforts to counsel and

support the health staff could reveal external socio economic and cultural influences on the performance of the health staff. Active management and administration of human resources that focus on the broad determinants of staff performance is required when addressing EmOC.

Reflecting on the Singida regional experience, it is realistic that there are factors that contribute to the third delay in accessing EmOC. The region has an acute shortage of health funds and consequently fails to guarantee sustainable availability of skilled staff, drugs, supplies, equipments and other logistics. Unavailability of resources lead to unavailability of services therefore affects the perception of users and lowers their incentives to seek care. According to the RMO (2007) there is a shortage of about 54.4% of qualified health staff. This shortage also affects gender mix therefore compromises the quality of delivery services. Shortage of skilled staff contributes to the poor technical quality of services. Poor experience of technical quality may affect the desire of users to seek care in future. In addition, shortage of skilled staff weakens the performance of management and administration of the available health resources therefore poor supportive supervision and OPRAS that affects the quality of services. Estimates show that 65% of the available health facilities headed by unqualified managers (RMO, 2008).

Additionally, due to inadequate funds the regional health system fails to develop and renovate health infrastructure therefore inadequate space to address privacy, confidentiality and comfort. In these circumstances women may prefer to deliver at home where they feel comfortable and secured. At home women are managed according to their socio cultural preferences (refer also previous discussion on socio cultural barriers). They enjoy moral and spiritual support during difficult time of labour pain. Efforts needed to ensure that health providers adhere to ethics, provide moral support and sympathy during EmOC so that attract women from home deliveries.

Generally, the above discussion calls for required strategies that focus on ensuring adequate availability of health resources, management and administration of available resources, in order to sustain high quality of EmOC and timely delivery of services. While funds are important to ensure availability of resources good management is important to inspire health staff and to yield sustained commitment and motivation.

4.4. Gaps and challenges facing the regional health management team.

From the study shortage of funds to address health resources and weak management and administration of available resources are major challenges faced by the RHMT during implementation of EmOC. However, based on the available resources there are gaps that if narrowed can improve EmOC; here we elaborate on some solutions to problems that will enable the services to improve.

Gaps include weak public private collaboration and inadequate community involvement in addressing EmOC. During implementation shortage of health resources could be narrowed if the management could ensure better coordination with private partners (eg; NGOs, faith based hospitals) and the community health committees as representatives, for improved resource mobilization in order to address EmOC. For example while there is a shortage of health staff in public facilities, there is adequate staff in private facilities. While women lack fare and transport sometimes there are private cars available from their villages. Often when public health facilities run shortages of drugs, supplies and equipments there is an efficient purchasing procedure in private facilities that ensures sustainable availability of these resources. Therefore given strengths of private sector to ensure availability of resources there is a need to strengthen public private partnerships to enhance health service delivery for women in need of emergency obstetric services.

4.5. Conclusion.

The high number of maternal deaths in Singida region occurs as a result of multiple determinants that are socio-cultural, economic and health services factors. In spite of the fact that EmOC can prevent maternal deaths there are three delays to access EmOC that occur as a consequence of these factors. Although different strategies have been recommended to address maternal deaths there continues to be an increase in the number of women dying in childbirth. Strengthened efforts to simultaneously tackle all factors are required in order to reduce maternal deaths. The availability of EmOC facilities without concurrently addressing the broad determinants of delays will not reduce maternal mortality. However, addressing these determinants requires collaboration of all stake holders starting from an individual to family, community and national level. This section outlines the conclusions and recommendations in terms of the short to medium terms investments. The detailed recommendations will follow in section 4.6 below.

Delay I (Decision to seek care): low awareness on obstetric danger signs and Illiteracy are the main barriers for women and stake holders to stand against cultures (beliefs, traditions and lack of women power to make decision) that prevent from timely decision to seek EmOC. Due to illiteracy and low awareness on emergency obstetric complications, people tend to go for a local option supported by their cultures and beliefs.

Efforts that ensure high literacy rates and sufficient awareness on obstetric danger signs to pregnant women and other stakeholders are essential to overcome barriers that exist. However, addressing literacy may be time consuming. Therefore while long term plans to address literacy are put in place, efforts to ensure basic awareness among pregnant women and their families should be the first priority. These strategies will include integrating a maternal health education agenda in every community meeting to address birth preparedness. In addition, continuous feed back on local maternal death audit to key influential people will critically help raise the awareness. This will help challenge and break the socio cultural barriers that contribute to delay in decision making to seek EmOC. Other strategies will include health outreach services to the community and institutions to advocate and discuss their potential role in addressing timely access to EmOC.

Delay II (Identifying and reaching care): Long distance to the health facilities, poor road infrastructure, lack of transport and fare are factors that delay identifying and reaching EmOC. Strategies required so that ensure availability of BEmOC services closer to the users and that are linked to the CEmOC by smooth transport network. However, given the current deficit of health resources it is not possible to immediately bring these facilities closer to users. Therefore, community participation to raise awareness on these barriers eg; reliable transport is an ideal strategy. In addition, health facilities in collaboration with community and other private facilities should organize fund raising initiatives so that secure maternity waiting home are constructed near to the EmOC health facilities. This will help women to arrange to come earlier but closer to their delivery dates. Maternity homes will shorten the distance and ensure timely access to EmOC.

Delay III (Receiving adequate and appropriate treatment): Limited funds to ensure adequate availability of human and material resources, poor quality of services, weak management and administration of available resources contribute to delay receiving adequate and appropriate EmOC. Government commitment to address availability of health resources, effective management and administration is essential in

order to attain high coverage of skilled and competent birth attendants who are capable to provide timely quality care that is an essential component in prevention of maternal deaths. However, leaving the issue to the government alone will take a long time because of scarcity resources at the national level. For that reason while long term solutions are carried forward, community mobilization is important to find local solutions to accelerate availability of resources. This will include strategies such as temporary working contracts with retired health staffs under agreed local community incentives and public private partnerships. Public private partnership will help deliver resources for EmOC whenever required under the special agreement with the public health management. This will guarantee smooth access of services for poor women as per maternal health policy. At the same time, continuous on job training of available health staff will strengthen clinical, managerial and administrative skills so that be able to operate within limited resource settings.

4.6. Recommendations: The recommendations in table 7 below are given with respect to the proposed time for implementation and responsible implementing institution. While short term solutions address first phase strategies, the medium and long term solutions address second and third phase strategies respectively. The difference between phases is due to the fact that different strategies will differ in terms of investment of resources and time to set up systems and services.

Table 7. Recommended strategies to prevent delays.				
PHASES OF DELAY	**BARRIERS**	**RECOMMENDATIONS**	**PRIORITY TIMELINE FOR ACTION**	**RESPONSIBLE**
FIRST (I) : Decision to seek care	1). Illiteracy	Strengthen school (primary) uptake for both males and females	Medium term	MINISTRY OF EDUCATION
		Exempt girls from school fees and other charges from primary schools to the university level		
		Organize adult education to improve men and women's functional literacy		
		Include awareness on pregnancy and birth control in the academic curriculum from upper primary school level, university and in adult learning		
	2). Low awareness on obstetric danger signs	Strengthen male involvement in reproductive/maternal services	Short term	MOH& COMMUNITY
		Activate community health posts		
		Build awareness on obstetric danger signs out of ANC clinics eg; Community meetings, special meetings, radio communication, strengthen regional maternal health day etc		
		Encourage attendance for post natal health care		
		Use maternal death audits for planning of more efficient and effective services		

	3). Chain of decision making	Involve key decision makers, eg; husband and mother-in-law for supportive decision making and planning for referral	Short term	MOH& COMMUNITY
		Discuss ways of overcoming the barriers to decision making on access to EmOC with local leaders and decision makers.		MOH& MINISTRY OF SOCIAL JUSTICE, GENDER AND EMPOWERMENT
	4). Beliefs	Sensitize formal and informal religious leaders all of the issues related to maternal health	Short term	MOH& RELIGIOUS LEADERS AND OTHER STAKE HOLDERS
		Educate on combating beliefs on harmful practices		
SECOND (II) : Identifying and reaching care	1). Lack of money for transport	Ensure community fund raising initiatives	Short term	MOH& COMMUNITY
		Organize community based health insurance fund for emergency obstetric referrals		
		Strengthen public private partnership to address transport		
		Raise household income by giving priority of employment to women	Short term	MOH& MINISTRY OF LABOUR AND EMPLOYMENT
		Improve agricultural technology so that facilitate more household income	Medium term	MINISTRY OF AGRICULTURAL TECHNOLOGY
		Increase availability of health EmOC facilities that are closer and geographically accessible		MOH&OTHER STAKE HOLDERS
		Equip health facilities with transport for referral		

	2). Lack of transport	Community mobilization to ensure availability of transport	Short term	MOH & MINISTRY OF TECHNOLOFY AND INFRASTRUCTURE, COMMUNIITY
		Strengthen public private partnership to address transport		
		Ensure availability of community health facility radio or telephone network that is linked to health facilities so that timely initiation of supportive strategies		
		Increase availability of EmOC health facilities that are closer and geographically accessible	Medium term	MOH&COMMUNITY
		Equip health facilities with transport for referral eg; moto-ambulances.		MOH&OTHER STAKE HOLDERS
		Government to improve road infrastructure so that attract transport investors	Long term	MOH& MINISTRY OF ROAD INFRASTRUCTURE
	3). Poor road infrastructure	Community mobilization to ensure reliable transport	Short term	MOH& COMMUNITY
		Development of maternity homes ("waiting houses")	Medium term	
		High political commitment to address road infrastructure	Long term	THE GOVERNMENT OF THE RULLING PARTY
THIRD (III): Receiving adequate and	1). Inadequate funds to ensure availability of adequate health resources and	Government to allocate more resources according to Abuja declaration (15% of Government expenditure to health).	Medium term	THE GOVERNMENT OF THE RULLING PARTY

appropriate treatment	logistics	Prioritize maternal health expenditure on the NPERCHI given the high rates of maternal deaths	Short term	MOH
		Government to ensure timely approval and release of funds		CENTRAL GOVERNMENT
		Strengthen management and administration of health funds.		MOH & MINISTRY OF FINANCE
		Secure financial and other incentives for hard to reach areas eg; Staff housing near health facilities and others according to the context.		MOH & MINISTRY OF FINANCE
		Activate village health posts		MOH& COMMUNITY
		Ensure gender mainstreaming during training, recruitment and promotion	Short term	MOH& MINISTRY OF EDUCATION AND TECHNOLOGY AND MINISTRY OF LABOUR
		Allocate funds to increase health training institutions and uptakes	Medium term	MOH & MINISTRY OF FINANCE
		Multisectoral collaboration to allocate funds so that address other health determinants eg; improving nutrition status so that women have stable health backgrounds		MOH, MINISTRY OF SOCIO WELFARE AND MINISTRY OF AGRICULTURE
	2). Weak skills and competencies to manage health	Ensure effective management by recruiting competent managers, or by on job training and partnerships with other stakeholders.	Short term	MOH& TRAINING INSTITUTIONS

	resources	Shift skills and tasks to lower cadres by on job training		MOH
		Develop working contract with retired health personnel		
		Ensure availability of working protocol and guidelines		
		Strengthen partnership with private and other non government health facilities in delivery of EmOC		
		Strengthen skills of health facilities committees so that effectively collaborate with core health management teams in addressing EmOC		
	3). Weak support of health staff against non health facilities factors that influence motivation and commitment to work	Conduct a study to explore the non health system factors that affect the performance of health providers and find possible solutions. (multiple issues – eg; to health worker income, housing, personal challenges)	Medium term	MOH
		Develop and implement context specific human resource motivation and support plan		
		Ensure sustainable routine supportive supervision and OPRAS	Short term	

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