HEALTH SYSTEMS FACTORS THAT IMPACT ON ACCESS TO MATERNAL SERVICES FOR WOMEN WITH DISABILITIES IN SUB-SAHARAN AFRICA: A SYSTEMATIC REVIEW

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Section 0: Preamble

To my mother, who despite numerous challenges in accessing maternal services, gave birth to my siblings and me. Special thanks go to my husband Gift, for the constant support, encouragement and for looking after our children during the process of my study.

Abstract

Maternal mortality is an enormous global challenge that is most prevalent in sub-Saharan Africa (SSA). Its prevalence in the SSA region has been attributed to inadequate access to maternal services (MHS) amongst the poor and rural women. In an attempt to improve access to maternal services, women with disabilities (WWDs) have generally been neglected. Little is known about the health systems factors that facilitate or hinder access to MHS for WWDs. However, available studies for women in general in SSA, examining health systems determinants of access to MHS, utilise the silo approach thereby providing fragmented and ineffective solutions to maternal mortality. Globally, taking a comprehensive health systems approach to understand the full range and interconnectedness of health factors is now recognised as crucial in understanding and planning complex health problems such as access to MHS. This paper presents findings from a qualitative systematic review of empirical studies providing evidence on the health systems factors that impact on access to MHS for WWDs in SSA.

This dissertation comprises three sections, namely Part A, Part B and Part C. Part A reviews the Protocol; it presents the background and the qualitative systematic review methodology that is utilised in this study. A systematic search of five data bases is outlined and inclusion and exclusion criteria set out to select the suitable tool. A data extraction tool is designed to summarise the studies in a common format and to facilitate synthesis and coherent presentation of data.

Part B is the review of existing empirical literature on access to MHS for both women in general SSA and for WWDs globally. Theoretical frameworks of access to health care services and health systems frameworks are also presented in this section. Furthermore, Part B provides the background on why access to MHS for WWDs is important. This section explores how health systems approach can be adopted to reveal the factors that impact on access to MHS; it links the complex systems framework to the availability, accessibility, acceptability and quality framework.

Part C is a complete systematic review journal manuscript. The background of the study and methodology are described. This section also includes the findings from the systematic review of original journal articles published in English from 2000 to 2014 that report empirical findings on health systems factors that impact on access to MHS WWDs in SSA.

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I would like to express my gratitude to my supervisor, Dr Maylene Shung King. I will forever cherish her depth in knowledge of health systems research that she always demonstrated in our discussions during consultations. My study utilises a health systems approach which I would not have got right without Dr Maylene Shung King's guidance.

I would also like to thank Nhlanhla Nhleko, the postgraduate librarian at Durban University of Technology, for the assistance he provided in searching for studies from different databases and on the tutorials on how to use the Endnote referencing software.

Many thanks go to my beloved husband Gift and children, Munenyasha and Tinashe for their love and support. They endured many hours of loneliness during the period I was writing this work. I dedicate this thesis to you all.

Last but not least, I thank my Heavenly Father for blessing me with good health, wisdom, and the energy to soldier on in face of many challenges.

Declaration

I, Doreen Mheta student number MHTDOR001, hereby declare that the work on which this dissertation is based is my original work and where the work of others has been used it has been attributed or acknowledged.

This work in neither a whole nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Signature: Signed by candidate .....

University of Cape Town, August, 2015.

Dissertation Contents

Acronyms and Abbreviations

AAAQ	Availability Acceptability Affordability Quality of health
CINAHL	Cumulative Index of Nursing and Allied Health
CASP	Critical Appraisal Skills Programme
EmOC	Emergency Obstetric Care
FGD	Focus Group Discussion
MDG	Millennium Development Goals
MHS	Maternal Healthcare Services
PWD	People with disabilities
SSA	sub-Saharan Africa
WWD	Women with disabilities
WHO	World Health Organisation

Part A: Research Protocol

Contents

Health systems factors that impact on access to maternal health services for women with disabilities in sub-Saharan Africa: A systematic review

1.0 Introduction and Problem Statement

1.1Introduction

After the promulgation of the Millennium Development Goals (MDGS) in 2000, governments have undertaken steps to reduce maternal mortality. Unlike other regions, sub-Saharan Africa (SSA) has not seen considerable improvements in indicators linked to maternal mortality, leading to fears that the Millennium Development targets will not be met. One of the interventions to reduce maternal mortality which has received global attention, especially in low and middle income countries is improving access to maternal services. However, there are persistent inequalities in access to maternal health care services (MHS) (Say and Raine, 2007). These inequalities are between the developed and developing countries as evidenced by the fact that in the developed countries there is almost universal access to skilled birth attendance and quality maternal care services while in SSA more than 50% of women give birth without skilled attendance. Within these SSA countries, inequalities in access to MHS are experienced between the rural and population as well as the rich and the poor (Sisal et al., 2007). Within the poor population of women requiring maternal services in SSA, there are subgroups that are particularly vulnerable, amongst which women with disabilities rank high.

Approximately one billion people world-wide experience some form of disability, and within this group, women experience higher prevalence of disability compared to men (World Health Organisation (WHO), 2011). It is estimated that 10% of the population of people with disabilities are women of child-bearing age, and the majority of this population lives in middle-income and low-income countries (WHO, 2011). Disability refers to a wide range of conditions which include the congenital absence or loss of limb, sensory functions, progressive neurologic conditions such as chronic diseases, the ability and inability to perform cognitive functions as

calculating sums and psychiatric disorders such as schizophrenia and bipolar disorder (Redshaw et al., 2013).

Despite the fact that universal access to health care services is being promoted, women with disabilities (WWDs) are a marginalised population within society whose experiences with healthcare systems across the world are not readily understood (Smith et al., 2004). This implies that achieving universal access to reproductive health services which is a target set to reduce maternal mortality might be a challenge to achieve. Health care services are improved by taking into account the experience of the populations with the healthcare. Because, little is known about WWDs experiences with the health system, it may mean that it is a challenge to improve their experience and access to these services. Universal reproductive health also implies that sexual reproductive health needs for all women including WWDs should be met. However, research in SSA indicates that the sexual reproductive health rights of women are generally not met and the situation is worse for WWDs as their sexual rights are barely recognised in policy (Ehiri, 2009). History highlights that for a long time WWDs have been denied information about sexual and reproductive health, denied the right to establish relationships and to decide whether, when and with whom to make a family (WHO, 2009). This created numerous challenges when they seek sexual reproductive health care services up to the present day.

Several frameworks have been developed in a bid to ensure universal access to health care services. One these frameworks is the dimension of universal access with equity framework which asserts that the needs of vulnerable populations should be considered so as to ensure universal access to services (Frenz and Vega, 2010). However, in SSA where maternal mortality ratios are as high as of 900 per 100 000 live birth, WWDs seem not to be considered as a special group which also requires MHS just like other women. This is regardless of the fact that their needs for MHS may be compounded by their impairments which may result in them needing extra services over and above those that are required by women in general.

Reduction of maternal mortality is high on the agenda and a target ‘to reduce maternal mortality by 75% by 2015’ has been set. This target implies that there is need to improve maternal health care services (MHS) provided to pregnant women. These may be classified into three; prenatal health care, childbirth and postpartum care. Nevertheless, in a bid to reduce maternal mortality, emphasis is placed on intra-partum care, as most maternal deaths are concentrated around

labour, delivery and immediate post-partum period (Say et al., 2014). Due to this understanding it also generally agreed that improving access to quality effective child birth and immediate post- partum period will lead to a reduction in the majority of the maternal deaths (Kinnely et al., 2010). For the purposes of this study, MHS will refer to childbirth services and immediate postpartum care.

In many parts of SSA, large proportions of women (including WWDs) have limited or no access to MHS (Smith et al., 2004). In such situations, it may be a challenge to have services that are user friendly to WWDs. Most women in SSA face challenges such as restrictive norms and values, poverty and gender inequalities in accessing MHS (Nyamtema et al., 2011). In such instances, WWDs may encounter a multiple burden as they have to encounter challenges as other women and over above those also encounter challenges that are specific to their impairments. Furthermore, they impairments may result in WWDs facing numerous economic challenges. Some of the challenges which were recognised by WHO International Classification Function Disability and Health(ICF) conceptual framework as contributing to disability are; lack of mobility aids, inaccessible clinics and procedures, lack of accessible information, lack of appropriate training for health care workers and the attitudes of people without impairments (Begley et al., 2009). Though WWDs constitute a substantial population, they often have poor access to health care needs and this may pose a public health problem.

Existing research indicates that there are WWDs who have become mothers and delivered healthy babies (Redshaw, et al., 2013). Amidst these reports is a recognition of the many barriers to accessibility of MHS for WWDs (Begley et al., 2009). Several studies in SSA, attribute the lack of progress towards MDG5 (reduction of maternal mortality by 75% by 2015) to limited access to formal MHS (Nyamtema et al., 2011). Unfortunately, most research on access to MHS in SSA focuses on non-disabled women (Tarassoff, 2013). Thus there is a gap in literature on access to MHS and on the factors that impact on access to MHS for WWDs especially in SSA.

Access to MHS as an intervention to reduce maternal mortality does not operate in a vacuum. Thiede et al (2007) argue that access to health services is multidimensional and comprises three different elements which are, availability, affordability and acceptability. They further argue that these elements are interrelated and as such cannot be separated from each other. While Sibley and Wainer (2011) define access as the ability to use services when they are needed,

McIntyre, Thiede and Birch (2009) define it as a degree of fit between the health system and the population it serves. Therefore, access to maternal health MHS is a complex intervention in that it consists of different dimensions which require the well-functioning of the diverse elements of the health care system. The different dimensions of access and the actual use of access are captured by the Accessibility Availability Acceptability and Quality of health care services (AAAQ) (Peters et al., 2015). The AAAQ framework is therefore a useful instrument to explore the determinants of access to MHS for both women in general and WWDs as it also captures that non-discriminatory aspect which is eluded by other access frameworks.

A health care system is defined as a sum total of all the organizations institutions and resources whose primary aim is to improve health (WHO, 2007), From this definition, it can be inferred that health systems comprise of different components which may function as separate entities or inter connectedly to improve the health of the populations. Several frameworks have been designed to try and capture the way in which the different components of the health system operate. The most widely used framework is the WHO health systems framework which portrays the health systems as made up of six different blocks that perform different functions. In order to bring in human component of the health system, Sheik et al., 2011 adapted the WHO framework and came up with a complex systems framework which categories the health system into hard systems and soft systems. The complex systems frameworks also illustrates that there is a complex interrelationship between the different elements of the systems which impacts on the outcomes of the system. This research draws from the Sheik et al., 2011 systems framework to explore what the different health systems factors that impact on access WWDs are and how the inter relationships of these factors impact on access to MHS.

As the SSA's health systems struggle to meet basic standards of care, many experts believe that systems wide barriers to delivery are preventing greater progress in MDGs (Bryan et al., 2010). Studies reveal that characteristics of the health system and the users themselves affect access to health care (Gulzar, 1999). Despite the global move towards the importance of health systems factors, in particular taking a comprehensive health systems approach to understand a full range of interconnectedness between factors, in understanding and planning interventions for complex problems such as access to MHS knowledge about the systems factors that impact on access to MHS is piece meal and there is no comprehensive overview of the health systems factors impacting on access to MHS. Though a study by McPacke et al., (2013), utilises a systems approach in assessing the impact of health care financing mechanisms on access to

maternal services, this study focuses on the interrelationship of finance and human resources health and access thereby not considering other systemic factors. Furthermore, it only explores the access of women in general and not on WWDs. This study therefore seeks to investigate the health systems factors that impact on access to MHS for WWDs in SSA utilising a systems approach in order to have a comprehensive understanding of these factors.

1.2 Problem statement

Reducing maternal mortality has been a priority worldwide. One of the millennium MDGs is to reduce maternal mortality ratio between 1990 and 2015 by three quarters (Bailey et al., 2006). The African Union launched a campaign on Accelerated Reduction of maternal mortality in Africa (CARMMA) in 2009 and the United Nations (UN) secretary general launched a global effort to focus leaders' attention on women's and children's health (WHO, 2010). Despite these efforts, a lot still needs to be done in order to ensure that women worldwide have safe and healthy pregnancies (Say et al., 2014). The burden for the reduction of maternal mortality is worse for SSA as 50% of maternal deaths globally are experienced in this region (Nyamtema et al., 2011). Research indicates that interventions to reduce maternal deaths are available, inexpensive and not complex but the challenge is on the health systems' ability to effectively and efficiently deliver these interventions (Say et al., 2014). Inability of health system to deliver the effective intervention leads to these interventions being inaccessible to the people who need them most.

Considering the fact that access to MHS is a challenge for women in general in SSA, problems in access to MHS may be disproportional and inequitable for WWDs who tend to experience multiple layers of discrimination and exclusion (Lawthers, et al., 2003). Disability is an umbrella term covering impairments, activity limitation and participation restrictions (WHO, 2014). A generalised misconception that WWDs are not sexually active and hence will not require MHS results in the provision of MHS not disability friendly health professionals not being well trained to deal with WWDs during their pregnancy (Begley et al., 2009). In addition, WWDs are likely to encounter financial, logistical and physical barriers, to accessing MHS (Ehiri, 2009). The population of WWDs in SSA is likely to increase as many women are being disabled due to complications during pregnancy and child birth and others due to violent crimes, natural disasters and wars (WHO, 2011). With the increase of women who are being disabled, MHS should be accessible and responsive to needs all women including WWDs (Lipson and Rogers, 2000).

Though there are not many studies on the prevalence of poor pregnancy outcomes among WWDs, a study by McConnel et al (2009) found out this group of women experiences higher rates of pre-eclampsia, children with low birth weight and more frequently admitted to neonatal intensive care compared to the non-disabled cohort. Increased risk of adverse pregnancy outcomes has been noted in women with some chronic illnesses, such as rheumatoid arthritis and schizophrenia (Lin, Chen and Lee, 2009). Other authors report that WWDs are more likely to experience health problems complicating pregnancy than other pregnant women and are at a higher risk of secondary conditions, such as urinary tract infections, respiratory infections, seizures, asthma, depression, chronic pain, fractures, and falls (Gavin, Benedict and Adams, 2006). Research also indicates that treatment options for such secondary conditions increase the risk of foetal abnormalities (Prillenltensky, 2003).

The discussion above indicates that WWDs not only require access to MHS just like any other women, but also require other services over and above those required by women in general due to the complications peculiar to their impairments (Barber, 2008). Nonetheless, there is paucity of literature that investigates the MHS experiences of this special group of people who also face a multi-layered vulnerability (Smith et al., 2004). The available knowledge does not provide a comprehensive overview of the factors that impact on access to MHS for these women. This study therefore, seeks to understand the health factors that impact on access to MHS for WWDs utilising a health systems perspective. The health systems approach will help in developing an understanding of how the health systems as a sum of interdependent and interrelated components impact on access to MHS rather than focusing on a single independent component such as health care financing

A health systems approach promotes the understanding of how different components of health systems are interrelated, interconnected, and interdependent to influence each other within the whole system. Globally, there is move towards utilising the system wide approach in assessing health care interventions to the extent that an international body called Health Systems Global was established to place the spotlight on adopting a health systems perspective in research. The latest international symposium was held in Africa in October 2014 (South African Medical Research Council, 2014). A health systems approach can facilitate the exploration of the full range and interconnectedness between the factors. This study therefore seeks to review available literature on health systems factors that impact on access to MHS for WWDs in SSA employing a qualitative systematic review methodology.

2.0 Research Question and Justification

2.1 Research question

2.1.1Main research question

What are the health systems factors that impact on access to MHS for WWDs in SSA?

The main question is on WWDs and access to MHS. Literature search highlighted that access to formal MHS played a key role in the reduction of maternal morbidity and mortality for women in general. Furthermore, the brief scan of literature highlighted that there is dearth in research that explores the experiences of WWDs when accessing MHS in SSA.

Given increasingly recognised importance of health systems factors, in particular taking a comprehensive health systems approach to understand a full range of interconnectedness between factors, that is recognised as crucial in understanding and planning interventions for complex problems such as access to MHS, the study will be conducted in two parts. Due to the fact that the factors that impact on women in general will also impact on WWDs' access to MHS, the first part of the will help to understand in a comprehensive fashion the factors that impact on access to MHS for women in general in SSA. In order to contextualise what this would mean for WWDs, the second part of the study will focus on understanding the health systems factors that impact on access to MHS for WWDs. Combining the two parts of the study will facilitate a more comprehensive analysis on how the health systems factors that apply specifically for WWDs, are impacted on by the prevailing health system factors that determine access to MHS for all women in SSA.

2.1.2 Sub research questions

1. What are the health systems factors that impact on access to MHS in SSA?
2. What are the health systems factors that contribute to disability friendly MHS?

Justification of question one

From the literature search that has been conducted so far, there is dearth in literature for health systems factors that impact on access to MHS for WWDs in SSA. Only three studies conducted in SSA (Smith et al., 2004, Bremer, Cockburn and Ruth, 2010; Ahumuza et al., 2014). These studies do not provide a comprehensive and in-depth insight onto all the factors that impact on WWDs' access to MHS in SSA. As a result, the researcher will examine the health systems factors that impact on access to MHS for women in general as they can give an insight into the general factors that impact on access to MHS in SSA. This question arose due to the fact that amidst the many factors that impact on access available, research focuses on maternal factors

such as women's age, parity, cultural beliefs, education, socio economic status, religious affiliation and examines systems factors in a fragmented way, thereby providing piece meal information on the health systems factors. Therefore, the first part will provide a comprehensive analysis of the health systems that determine access to MHS for women in general in SSA.

Justification of question two

This question will help in identifying the health systems factors that were not included in the studies that were examining the health systems factors that impact on access to MHS for all women in SSA. Literature beyond Africa will then be assessed on the health systems factors that specifically impact on access to MHS for WWDs. The results for the second part will be combined with the results of the first part of the systematic review. This will allow a more comprehensive analysis of how the health system factors that apply specifically to WWDs, are impacted on by the prevailing health system factors that determine access for all women in SSA.

3.0 Study Design

The study utilises a qualitative systematic review methodology. Green, Johnson and Adams (2001) assert that a qualitative systematic review entails detailed rigorous and explicit methods and uses qualitative methods of data analysis such as thematic analysis to interpret meaning of the collected work. This type of review allows for the pooling of findings from qualitative studies, mixed methods and quantitative methods (Mallet et al., 2012). Conclusions are drawn from the collective meanings of the pool of research (Bearman and Dawson, 2013). This study design has been selected as it useful in gathering large quantities of literature in the subject of health systems factors that impact on access to MHS for WWDs. This is an area which is not well researched; thus a qualitative systematic review will be a useful conclusion for pooled findings of studies utilising a different study designs examining health systems factors that impact on access to MHS for WWDs and highlighting the existing gaps in knowledge.

3.1 Systematic Review

3.1.1 Description of a systematic review

A systematic review is a literature review focused on a research question that tries to identify, appraise, select and synthesise all high quality research evidence relevant to that question

(Needleman, 2004). Rigorous and explicit methods are employed. These methods include; a detailed search of literature based upon a focused question, defined inclusion and exclusion criteria for articles and a detailed description of all the steps undertaken in carrying out the research. The aim of systematic reviews is to find all research published and unpublished, assess the studies on the basis of defined criteria and synthesise the findings in an unbiased way. In as much as there are different types of systematic reviews, this study will utilise a qualitative systematic review. Though the use of qualitative review method is highly contested, one of its advantages is that it allows for the researcher to integrate, consolidate, summarise and critique findings from studies utilising qualitative, mixed, and quantitative research methods (Green, Johnson and Adams, 2001, Bearman and Dawson, 2013). The themes of a qualitative systematic review are generated from findings of included studies. Though the objectivity of the selection of studies is usually questioned, the strength of the qualitative systematic review is on the fact that it brings about a collective meaning of research conducted utilising different study designs as the reviewer interprets the primary researchers' findings.

A brief scan of the existing literature revealed that there is paucity of research that investigates the experiences of WWDs when accessing MHS. Furthermore, the few studies that are available worldwide have small sample sizes, are localised and mainly utilise qualitative methods. As a result, looking at a study only from a single site will not generate sufficient insight into the health systems factors that impact on access to MHS for WWDs. In addition, to the best of the author's knowledge, there has not been synthesis in a single review that highlights the systems factors that impact on access to MHS for WWDs utilising a systems approach. In order to gather much existing information and consolidated the pooled results of these studies, a qualitative systematic review was considered the most suitable design as it increased the breath of understanding the health systems factors impacting on WWDs in SSA in a comprehensive manner by pooling together results from studies conducted in different settings utilising different study designs and samples (Mallet et al., 2012). Moreover, the qualitative method of data analysis that will be utilised will facilitate the validation of the study because when the factors that impact on access to MHS for WWDs in SSA appear over and again across studies saturation will be reached.

The systematic review is in two parts.

a) A systematic review of health systems factors that impact on access to maternal health services for women in sub-Saharan Africa.

Due to the dearth in literature for health systems factors that impact on access to MHS for WWDs in SSA the researcher will review literature on access to maternal services for women in this region to answer the primary question on health systems factors that impact on access to for WWDs (Smith et al., 2004; Ahumuza et al., 2014). It is logical to believe that the systems factors that impact on access to MHS for women in general also impact on access to MHS for WWDs. Therefore, the first part of the study will focus on identifying the health systems factors that impact on all women in SSA. Though there are several systematic reviews that have been conducted in SSA, none of them utilise a holistic approach to systemic determinants of access to MHS. Whereas, a systematic review by Moya and Mustafa (2013) focused on the different factors that influence facility based delivery in SSA focusing mainly on maternal, community, socioeconomic and contextual factors, Knight, Self and Stephen, (2013) examined the health systems factors that impact on access in SSA and other regions. Knight, Self and Stephen utilised a silo approach to the systems factors and did not examine the impact of the interrelationships between the systems factors.

2. A systematic review of health systems factors that impact on access to MHS for WWDs.

The second part of the systematic review will be on the factors that impact on access to maternal services for WWDs. No geographical boundaries will be considered in this part. Studies from all over the world will be reviewed. This study will investigate if there are new health systems factors that impact on access to MHS for WWDs which were not identified in the studies that examined the health systems factors that impact on access to MHS for all women.

The findings from the two systematic reviews will be combined so as to give a more comprehensive picture of the health systems factors impacting on access to MHS for WWDs, over and above the factors raised for women in general.

3.1.2 Inclusion Criteria

Part one of the studies (Health systems factors that impact on access to maternal services for all women).

Type of studies: The study will include primary studies or studies that have a clear empirical base utilising, qualitative, quantitative and mixed methods. This is due to the fact that health systems research is recognised as a hybrid or interdisciplinary field drawing on different traditions and methodological approaches (Sheik et al., 2011). In other words, a wide variety of methodologies and disciplines are adopted to investigate health systems issues. In addition, literature on access is diverse and complex such that it includes epidemiological studies, case studies, descriptive studies, psychological, economic as well as policy documents. Thus a focus on studies utilising a particular study design may lead to narrowing down the number of studies to include in the study yet there may be many more that are informative utilising several other study designs.

Types of Articles: Original primary empirical studies utilising qualitative, quantitative and mixed methods will be included in this study. This will be in order find as many studies as possible to gain a comprehensive understanding of the health systems factors impacting on access to MHS. Looking at a variety of studies would widen the scope of search.

Geographical Scope: The papers that will be selected for this research will be those reporting on studies undertaken in SSA as this is the geographical scope of interest.

Time: Papers published in English from 2000 up to 31 December 2014 will be searched. This period has been chosen specifically because the MDGs were set in 2000. From the year 2000, a lot of effort has been placed into the reduction of maternal mortality and improving access to MHS. During the same period also, there was an emphasis on strengthening health systems and using systems wide approaches to examine health care interventions.

Language: Only papers written in English will be included due to time constraints. Having studies written in other languages translated would take more time and more logistical challenges such as money and also assessing if the translations would have been done accurately.

Population of Interest: The population of interest comprises all women of reproductive age group accessing maternal services.

Content of Studies: The studies that examine the impact of health systems factors on access to maternal services for women in SSA will be considered. They will include those that examine the

different elements of health systems on access to MHS. Studies which assess the impact of; policies, human resources, health financing, service delivery, information systems, medical technology and drugs, attitudes, beliefs and values on access to MHS will be included in this research. Both hard ware and software elements of the health systems will be considered.

Part 2 of the study: systematic review on health systems factors that impact on access to MHS for WWDs.

Type of studies: The study will include studies which utilise qualitative, quantitative and mixed methods. The research will not focus on a single study design because from the brief literature search there seem to be a few studies that specifically examine the impact of health systems on access to MHS for WWDs. A focus on studies utilising a particular study design may lead to narrowing down the number of studies to include in the study when there is already an indication that they are few.

Types of Articles: Original empirical primary studies will be included.

Geographical Scope: There will be no geographical limitation on this part of the study. This is due to the fact that in general, WWDs accessing MHS are an under researched population. Thus, having a geographical limitation would lead to a few studies being identified.

Time: Papers published in English from 2000 up to 31 December 2014 will be considered. This period was chosen specifically because the MDGs were set in 2000. From the year 2000 a lot of effort has been placed into the reduction of maternal mortality and improving access to MHS. During the same period also, there was an emphasis on strengthening health systems and using systems wide approaches to examine health care interventions. 2014 is the year at the brink of 2015 the year by which the MDG targets should have been achieved. Furthermore, the Convention of the Rights of Persons with Disabilities (CRPD) which emphasises the importance of recognising the sexual rights of the people with disabilities was established in 2006.

Language: Only papers written in English were included due to time constraints. Having studies written in other languages translated would have taken more time and more logistical challenges such as money and also assessing if the translation has been done accurately.

Population of Interest: The population of interest comprised all WWDs of reproductive age group accessing MHS.

Content of Studies: The studies selected examine the impact of health systems factors on access to MHS for WWDs. They included those that examine the different elements of health system that is; policies, human resources, health financing, service delivery, information systems, medical technology and drugs, attitudes, values and beliefs impact on access to maternal services. In so doing both hardware and software health systems factors were considered. Selected studies reported on the impact of one element or on the impact on several elements of the health systems and or considering the impact on the relationships, interconnectedness and interplay of the different elements of the health systems on access to maternal services.

3.1.3 Exclusion Criteria

Studies that were done prior to the year 2000 were not included. Literature which is written in other languages other than English will be excluded because of time restrictions as the study has to be completed within stipulated time. It would take longer to try and have the studies translated. Publications prior 2000 will be excluded due to the fact that extensive efforts to enhance maternal services have been from 2000 when the MDG targets were developed. Citations without abstracts will not be included. Papers that document access to general health services were excluded as the main focus of the study is access to MHS. In addition, articles reporting drug and procedural interventions will be excluded as they not within the scope of this study. For the first part that is, a systematic review on access to MHS for women in general in SSA, papers that are not from the region will be excluded. This is because the geographical study focus is SSA.

3.2 Data Collection

The initial papers will be identified by searching for literature published in SSA in English from 2000 up to December 2014. The search terms will include; health systems and access to MHS, human resources and access to MHS, health financing and access to MHS, leadership and governance and access to MHS, health information systems and access to MHS, medical technology, drugs and access to MHS, sub-SSA, developing countries and middle income countries. For the second study, the search terms will include health systems factors, WWDs

and access to maternal services, women with physical disabilities and access to MHS, women with hearing impairments and access to MHS, blind women and access to MHS. The search terms for the study on WWDs also includes access to MHS because there are a few studies that examine access to maternal for WWDs let alone the health systems factors access to MHS for WWDs. From these studies, the researcher then extracted the health systems factors that are described and their impact on access. The search will be conducted in general data bases that are; Pubmed, Medline via EBSCOhost, CINAHL Plus with full text via EBSCOhost, Africa-Wide Info via EBSCOhost and Proquest Health and Medical Complete. Articles will also be searched through the "cited by" search as well as citations included in the reference lists of included articles. The literature search will include all studies from different study designs so as to yield a broader range of papers. After searching, the studies will be screened against inclusion and exclusion criteria.

3.3 Data Extraction

Articles will be identified and imported into the EndNote X7 reference management software. Duplicate articles will be excluded. Firstly, titles and the abstracts will be scanned and the researcher decided on whether to include or not to include the studies. Secondly, EndNote X7 program will be used to check for duplication of articles and to delete the duplicated articles. Then articles that will be considered to be eligible for the review will be retrieved in full further assessment after the reading the abstract and title. The texts will be read to assess for inclusion. Finally, all full-text articles will be assessed for eligibility, the judgment reached whether a study is eligible and reasons in case of exclusion and will be well-documented.

3.4 Data Analysis

The articles will be read as transcripts. A data extraction form will be formulated to document and analyse the information on the health systems factors that impact on access to MHS for WWDs. The data extraction form will only include reported study findings by the authors in the results section of the article. Data analysis will be exploratory as it will not presuppose any relationship or significance of the factors that will be identified.

The thematic data analysis or synthesis method will be utilised. Thematic synthesis involves the identification of the main issues or themes that arise on a particular topic in the literature by synthesising the issues presented by the researchers (Dixon-Woods et al., 2005; Mays, Pope and Popay, 2005). The themes can either be through assessment of themes by inquiry of the existing literature (theory driven) or data driven that is emerging from the studies. This study

comprises both predetermined themes which are guided by the Sheik et al., (2011) and data driven themes that as the sub themes will emerge from findings of included studies. The major themes are policies, service delivery, human resources, information systems, financing and medical products vaccines and technologies, attitudes beliefs and values. Studies will also be examined to assess if they report on the interplay, interconnected and relationships of the different elements of the health systems on access to MHS for women in general as well as WWDs. Scripts with similar meaning will be grouped together in the same category and the categories that are related will be grouped together to generate a sub-theme. The sub-themes that have similar characteristics will be identified and classified under the predetermined themes. Emerging themes will be coded in the same way.

3.5 Quality Appraisal

Quality appraisal entails "the process of systematically examining the research evidence to assess its validity, results and results before using it inform decision", (Hill and Spittlehouse, 2003). Quality appraisal for studies using the qualitative study design is generally a highly contested area. Nevertheless, several appraisal instruments have been designed to evaluate the qualitative research. Amongst the different appraisal instruments, Critical Appraisal Skills Programme (CASP), is commonly used and has been the selected instrument for quality appraisal in this study (Banning, 2011; Kane, Wood and Barlow, 2007; Noyes and Popay, 2007; Harden and Thomas, 2005; Tranfield, Denyer and Smart, 2003). This programme considers three important issues which are validity, credibility and reliability through ten appraisal items that allow efficient assessment of the studies. Though the instrument is commonly used by others, other authors have identified some weaknesses and provided suggestions for the development of more detailed guidance for explicit judgement of qualitative studies (Dixon-Woods et al., 2006). The CASP criteria will be utilised for appraisal of articles by looking at aims and methodology, study design, participant recruitment, data collection, data analysis, presentation of findings, authors' discussions and conclusions. Papers that are deemed to be of poor quality against the CASP criteria were excluded from further review.

4.0 Limitations of Study

This study will be conducted in partial fulfilment of a Master of Public Health degree. Thus it has to be completed within the stipulated time. Time constraints will not only result in studies written in other languages not to be considered but also grey literature. This may have result in

the study missing important information considering SSA comprises Francophone (French speaking) and Lusophone (Portuguese speaking) countries.

5.0 Information Dissemination

The research findings may be of interest to the policy makers, international stakeholders on access to maternal health interventions and those working with people with disabilities, health systems researchers and the School of Public Health of University of Cape Town. In addition, a summary of the findings will be uploaded on the UCT School of family and public health website. If granted permission the study results will also be uploaded on the Health systems trust website Human sciences research council (HSRC). A journal article will also be prepared with the Reproductive health Journal.

Time line

Table 1: Review timeline

Component	Activity	Date
Part A: Protocol	Subject Formulation	December 2013
	Draft	January 2014
	Edits	February and March 2014
Part B : Literature Review	Research	December 2012- April 2014
	Draft	June 2014
	Edits	July and August 2014
	Final edits	September 2014
Part C: Journal Manuscript	Data collection	August 2014- October 2014
	Data analysis	October 2014- December 2014
	Results	January 2015 to Feb 2015
	Draft	March 2015 to May 2015
	Edits	June 2015 to July 2015
	Final Edits	August 2015
Dissemination and Submission	Intention to submit	15 July 2015
	Submission	15 August 2015

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Appendices

Appendix 1: Search Strategy

1.1 Search for women in general

Databases	Date of final search	RESULTS					
		Total Search	Relevant Articles Retrieved	Combined Databases	After Removal of Duplicates	After Title Screening	After Abstract Screening
Africa-wide Information	25 June 2015	208	28	1640	1320	54	34
Cumulative Index of Nursing and Allied Health (CINHAL)	25 June 2915	2047	365				
Medline	25 June 2015	10 270	416				
Proquest	26 June 2015	2424	419				
Pubmed	26 June 2015	2606	413				
Total		17555	1640	1640	1320	53	34

Africa wide via EBSCOhost (28)

Search terms; Health system factors that impact on access to maternal services.

Search mode: Smart Text Searching; Expanders: Apply related words; Limiters: Scholarly (Peer Reviewed) Journals. Publication type Journal Article; Year Published: 2000-2014; Language: English.

CINAHL Plus with Full Text (365)

Search terms: Health systems factors impacting on access to maternal services in sub-Saharan Africa.

Search modes: SmartText Searching; Limiters - Full Text; Published Date: from 2000/01/01 to 2014/12/31; English Language; Peer Reviewed; Journal Subset: Peer Reviewed; Publication Type: Journal Article; Sex: Female.

MEDLINE (416)

Search terms: Health systems factors that impact on access to maternal services sub- Saharan Africa

Search modes: SmartText Searching; Limiters; Full Text; Date of Publication: from 2000/01/01 to 2014/12/ 31; English Language; Human; Sex: Female; Journal & Citation Subset: MEDLINE; Publication Type: Journal Article; Expanders: Apply related words; Also search within the full text of the articles.

ProQuest Health and Medical complete (418)

Search terms: (health systems factors that impact on access to maternal services in sub-Saharan Africa).

Publication date: from 2000/01/01 to 2014/12/31

Pubmed (413)

Search terms: (("Health Syst (Basingstoke)"[Journal] OR ("health"[All Fields] AND "systems"[All Fields]) OR "health systems"[All Fields]) AND factors [All Fields] AND impact [All Fields]) AND access[All Fields] AND "maternal health services"[MeSH Terms] OR ("maternal"[All Fields] AND "health"[All Fields] AND "services"[All Fields]) OR "maternal health services"[All] AND (Journal Article[ptyp] AND (hasabstract[text] AND "loattrfree full text"[sb]) AND ("2000/01/01"[PDAT] : "2014/12/31"[PDAT]) AND "humans"[MeSH Terms])

Filters: Journal Article; Free full text available; Full text available; Publication date from 2000/01/01 to 2014/12/31; Humans; English; MEDLINE; Nursing journals; Dental journals.

1.2 Search for women with disabilities

Databases	Date of final search	RESULTS					
		Total Search	Relevant Articles Retrieved	Combined Databases	After Removal of Duplicates	After Title Screening	Eligible Articles for Review
Africa-wide Information	25 June 2015	34	3	343	65	278	14
Cumulative Index of Nursing and Allied Health (CINHAL)	25 June 2915	6632	335				
Pubmed	26 June 2015	23	14				
ProQuest Health and Medical complete	27 June 2015	244	8				
Total		6933	343	343	65	278	14

Africa-wide Information (3)

Search terms: disabled women and access to maternal services. Search modes: SmartText Searching; Limiters - Full Text; Published Date: from 2000/01/01 to 2014/12/31; English Language; Peer Reviewed; Journal Subset: Peer Reviewed; Publication Type: Journal Article; Sex: Female.

CINHAL (335)

Search terms: access to pregnancy and childbirth services for disabled women. Search modes: SmartText Searching; Limiters - Full Text; Published Date: from 2000/01/01 to 2014/12/31; English Language; Peer Reviewed: Peer Reviewed; Publication Type: Journal Article; Sex: Female.

ProQuest Health and Medical complete (8)

Search terms: access to maternity health care services for disabled women. Limiters; Full text; Source type: Scholarly Journal; Peer reviewed: Peer Reviewed; Language; English; Publication date: 2000/01/01 to 2014/12/31.

Pubmed (14)

Search terms: (("disabled persons"[MeSH Terms] OR ("disabled"[All Fields] AND "persons"[All Fields]) OR "disabled persons"[All Fields] OR "disabled"[All Fields]) AND ("women"[MeSH Terms] OR "women"[All Fields]) AND access[All Fields] AND ("BMC Pregnancy Childbirth"[Journal] OR ("pregnancy"[All Fields] AND "childbirth"[All Fields]) OR "pregnancy childbirth"[All Fields]) AND ("delivery, obstetric"[MeSH Terms] OR ("delivery"[All Fields] AND "obstetric"[All Fields]) OR "obstetric delivery"[All Fields] OR "delivery"[All Fields]) AND services[All Fields]) AND ("research and review articles"[filter] AND ("2000/01/01"[PubDate]: "2014/12/31"[PubDate]))

Filters: Journal Article; Free full text available; Full text available; Publication date from 2000/01/01 to 2014/12/31; Humans; English; MEDLINE; Nursing journals; Dental journals.

Appendix 2: Assessment Criteria/Quality Appraisal Tool

Critical Appraisal Skills Programme (CASP)

making sense of evidence

10 questions to help you make sense of qualitative research

This assessment tool has been developed for those unfamiliar with qualitative research and its theoretical perspectives. This tool presents a number of questions that deal very broadly with some of the principles or assumptions that characterise qualitative research. It is *not a definitive guide* and extensive further reading is recommended.

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of qualitative research:

- **Rigour: has a thorough and appropriate approach been applied to**
- **key research methods in the study?**
- **Credibility: are the findings well presented and meaningful?**
- **Relevance: how useful are the findings to you and your organisation?**

The 10 questions on the following pages are designed to help you think about these issues systematically.

The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions.

A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

The 10 questions have been developed by the national CASP collaboration for qualitative methodologies.

Screening Questions

1. Was there a clear statement of the aims of the research? ❑ Yes ❑ No

Consider:

– what the goal of the research was

– why it is important

– its relevance

2. Is a qualitative methodology appropriate? ❑ Yes ❑ No

Consider:

– if the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants

Is it worth continuing?

Detailed questions

Appropriate research design

3. Was the research design appropriate to address the aims of the research? Write comments here

Consider:

– if the researcher has justified the research design (e.g. have they discussed how they decided which methods to use?)

Sampling

4. Was the recruitment strategy appropriate to the aims of the research? Write comments here

Consider:

– if the researcher has explained how the participants were selected

– if they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study

– if there are any discussions around recruitment (e.g. why some people chose not to take part)

Data collection

5. Were the data collected in a way that addressed the research issue?

Write comments here

Consider:

- *if the setting for data collection was justified*
- *if it is clear how data were collected (e.g. focus group, semi-structured interview etc)*
- *if the researcher has justified the methods chosen*
- *if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted, did they used a topic guide?)*
- *if methods were modified during the study. If so, has the researcher explained how and why?*
- *if the form of data is clear (e.g. tape recordings, video material, notes etc)*
- *if the researcher has discussed saturation of data*

Reflexivity (research partnership relations/recognition of researcher bias)

6. Has the relationship between researcher and participants been adequately considered?

Write comments here

Consider whether it is clear:

- *if the researcher critically examined their own role, potential bias and influence during:*
  - *formulation of research questions*
  - *data collection, including sample recruitment and choice of location*
- *how the researcher responded to events during the study and whether they considered the implications of any changes in the research design*

Ethical Issues

7. Have ethical issues been taken into consideration?

Write comments here

Consider:

- *if there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained*
- *if the researcher has discussed issues raised by the study (e. g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)*
- *if approval has been sought from the ethics committee*

Appendix 3: Article summary table

Author 's' and year of publication	Country of study	Study Objectives	Population	Methodology	Data analysis	Study findings

Appendix 4: Data extraction form

Extraction Item	**Details**
Title	
Author and year	
Journal full reference	
Aims or Research Question	
Participant characteristics	
Recruitment Context (e.g. where people were recruited).	
Sampling method	
Study design	
Type of study(Meso, Micro or Macro)	
Theoretical background	
Data collection (what data collection methods were used?)	
Data analysis (how was the data analysed)	
Health systems factor	
More information on the health systems factors	
Most relevant findings	

Part B: Review of Literature

Contents

1.0 INTRODUCTION

The global quest for good maternal health has brought many governments and international organisations together in their search for solutions on how to reduce maternal mortality. Approximately 300 thousand women die annually due to complications in pregnancy and child birth (Nyamtema et al., 2011). Furthermore, many women are disabled by these complications. In the year 2000 many governments committed to the reduction of maternal mortality. Despite many efforts being put in place to reduce maternal mortality deaths, maternal mortality ratios have not fallen significantly especially in sub-Saharan Africa (SSA).

Though maternal mortality and morbidity is a global problem, it does not affect all women uniformly. Maternal mortality and morbidity are more prevalent in women who occupy the lower end of the socioeconomic ladder, who face numerous challenges in accessing maternal health services (MHS). Due to this understanding, it has been agreed that the strategies ensuring that all pregnant women have access to emergency obstetric care, skilled birth attendance within well-functioning health systems are key to maternal mortality reduction (Essendi, Mills and Fosto, 2010). However, throughout the world, many women still have challenges in accessing MHS especially in SSA.

Research indicates that in SSA, access to MHS is worse off for vulnerable and poor women (Ronsmans and Graham 2006). Amongst the population of the poor women, women with disabilities (WWDs) may be in a worse off situation as they face triple marginalisation that is, being a woman, being poor and having impairments. As the rights of WWDs are generally not recognised and met, WWDs have been identified as a special group whose sexual reproductive health needs should be addressed. Article 32 of Convention on the Rights of Persons with Disabilities (CRPD) in international cooperation insists that all international cooperation should be inclusive of persons with disabilities (CRPD, 2006). As such, efforts in the area of preventing maternal mortality should also include WWDs.

The following literature review focuses mainly on access to MHS in SSA. Literature on the burden of maternal mortality globally and in SSA is reviewed in this section. In addition, access to MHS for women in general and WWDs and the need for further research utilising systems thinking will be described.

2.0 Search Strategy

A literature search was conducted to establish what is already known about access to MHS in SSA. It entailed reading peer reviewed articles published from 1990 to June 2015. These articles were retrieved from electronic databases, namely, PUBMED, MEDLINE, EBSCOHOST, Google Scholar, Science Direct and Cochrane Database of Systematic Reviews. In addition, the reference lists of applicable studies were scrutinised for additional relevant citations.

2.1 Inclusion and Exclusion criteria

Articles in English only were considered. Although the initial search strategy included both developed and developing countries for access to MHS for women in general, the most relevant studies are the studies conducted in SSA. Studies conducted beyond SSA were excluded. For studies pertaining to access to MHS for WWDs studies from both developing and developed countries were considered.

2.2 Search terms

The following key terms were used;

Access, barriers, maternity services, health services, pregnancy, child birth, obstetric care, antenatal care, maternity, maternal mortality, safe mother hood initiatives, systems factors, access interventions, women with disabilities pregnancy and childbirth, disabled women delivery services, barriers to access to MHS for WWDs, facilitators of access to MHS for WWDs.

3.0 Summary of Literature

3.1 Maternal health: A Global perspective

In the year 2000, 189 countries signed the Millennium Declaration, which had several millennium development goals (MDGs). The fifth MDG was to reduce maternal mortality ratio between 1990 and 2015 by three quarters (Bailey et al., 2006). An additional target for MDG 5 which was added in 2008 is to achieve universal reproductive health by 2015 (Nyamtema et al., 2011). Due to minimal progress in the reduction of maternal mortality and the understanding that maternal mortality and morbidity impact negatively on development, maternal health was positioned as part of an even broader stage of Women Deliver for Development in 2007 (Horton, 2010). In a bid to strengthen the fight against maternal mortality, United Nations (UN) secretary general also launched a global effort to focus leaders' attention on women and children's health through the integration of maternal health with programmes to reduce new born and child mortality (Horton, 2010; Say et al., 2014). As the burden of maternal deaths is higher in developing countries, the African Union also launched a campaign on Accelerated Reduction of maternal mortality in Africa (CARMMA) in 2009. These efforts seem to be failing to achieve the desired goal to reduce maternal mortality in developing countries especially in SSA (Fournier, 2009, Nyamtema et al., 2011; Say et al., 2014).

3.2 Maternal health in Sub-Saharan Africa

Though a decline in maternal mortality, from over 500 deaths to approximately 300 thousand deaths per year from 1990 to 2010 was experienced globally, the magnitude of the maternal mortality decline was not significant in SSA (Nyamtema et al., 2011). The region only recorded 41% decline as compared to a 64% decline for Southern Asia (Magoma et al., 2010). Over and above the maternal deaths, a large proportion of women suffer from childbirth or pregnancy related injuries such as obstetric fistula (Ronsmans and Graham, 2006, Fillippi et al., 2006). Whereas childbirth is a threat to women's lives and health in SSA, the risk is very low in high income countries.

A difference in mortality rates of 230 per 100 000 live births for developing countries versus 16 per 100 000 live births in developed countries reflects inequalities in access to quality formal MHS (Say et al., 2014). As most maternal deaths occur during the intra-partum period, low maternal mortality rates in high income countries are attributed to access to quality (MHS) (Horton, 2010). In SSA while most women access antenatal care, less than 50% of women

deliver in health facilities (Mselle, 2013). The poor access to MHS in SSA may be the reason why ten countries with highest maternal mortality ratios are in SSA and some of the countries such as Botswana, Cameroon, Chad, Congo, Lesotho, Somalia, South Africa, Swaziland and Zimbabwe experience a rise in maternal mortality (Hogan et al., 2010). Access to quality MHS and skilled attendance is vital as it resulted in a reduction in maternal mortality in the developed countries in 20th century (Bhutta, Lassi and Mansoon, 2010). Consequently, many governments have undertaken steps towards improving access to MHS so as a means to reduce maternal mortality. Despite many efforts being put in place, access to MHS is still a challenge to many women in SSA (Smith et al., 2004, Mselle, 2013, Say et al., 2014).

3.3What are maternal health services?

Maternal health services comprise a wide range of both curative and preventive health services that are important to women of reproductive age (Smith and Salzbach, 2008). MHS that are specifically designed for women of reproductive age group encompass a wide range of services that include; family planning, preconception, prenatal and post-natal care that are geared towards the reduction of maternal mortality and morbidity. Though all the components of MHS are important, the most critical are; labour, childbirth and immediate post-partum services as almost three quarters of maternal deaths are concentrated during these periods (Kinney et al., 2010). Thus, most governments are focusing on increasing access to quality emergency obstetric care.

3.4 Why women with disabilities?

3.4.1 Definition of disability

There is no one concise definition of disability leading to either over estimation or underestimation of the population of people with disabilities (2008). In general a person with a disability is someone who has a physical, cognitive or sensory impairment that has a long term adverse effect on his or her ability to do daily activities. 'Disability is a decrement in functioning at the body, individual or societal level that arises when an individual with a health condition encounters barriers in the environment' (WHO, 2001). The Convention on the Rights of Persons with Disabilities, Article 1 (CRPD) states that persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others (CRPD, 2006). These definitions have been used and a population of around 650 million has been estimated to be having a form of disability. Amongst this population, most of the people live in the developing countries. Amongst the population of people with

disabilities in the developing countries 75% are women. For the purposes of this study, the CRPD will be used. This CRPD definition incorporate the two dominant models of disability which are the medical and the social. The manner in which health care workers define a person with a disability will determine their attitudes towards and the manner in which they will treat the person with a disability.

3.4.2 Models of disability

Traditionally disability was viewed as an individual problem directly caused by disease or other health condition therefore requires sustained medical care. For a person who has visual, mobility or hearing impairment, their inability to see, walk or hear is understood as their disability (Watermeyer et al., 2006). Because of such a belief, management of disability is aimed at the cure or the individual's adjustment that would lead to almost cure. Such a perception of disability has resulted in people with impairments seen as people unable to perform normal activities for instance, WWDs seen as incompetent with regards to having a normal birth and becoming a good mother (Barber, 2008). The major impact of this model was the exclusion of PWDs from access to services such as healthcare. This exclusion led to the realisation that the rights of PWDs are not met and resulted in the formulation of the CRPD in 2006. The CRPD makes provisions for women in Article 6 and Article 23 which states that the need for sexual reproductive rights for PWDs to be met (CRPD, 2006).

The CRPD was based on the social model of disability. The social model of disability views disability as the interaction between individuals with a health condition such as Down syndrome with environmental factors such as negative attitudes, inaccessible transport and buildings (WHO, 2014). This model of disability perceives society as the one which disables people with impairments by designing everything to meet the needs of the majority who are without impairments (Watermeyer et al., 2006). Through this model, PWDs are capable of being involved in most activities as long as an enabling environment is created. It is the community's (policy makers, service providers and other stakeholders) responsibility to remove the disability barriers. To foster the social model, pregnant WWDs should be viewed as any other women first and deal with their MHS needs instead on focusing on the disability. Such a perception would create an enabling environment that will facilitate the women to be successfully pregnant and deliver healthy babies as emphasis is on listening to and fully hearing WWDs, supporting their choice and control and removing barriers to equal opportunities in health care (Barber, 2008). Although there is much written about the social model, the medical

model continues to influence societal attitudes and has an impact on how the health care workers perceive, interact and treat pregnant WWDs (Prilleltensky, 2003).

CRPD stipulates that PWDs have the right to access the same range of quality and standard of free affordable health care and programs as provided to other people (CRPD, 2006). This includes sexual reproductive health and population based public health programs. Despite these conventions, PWDs still face numerous challenges when they seek health care services. The situation is worse for WWDs seeking MHS as there is an ingrained belief that they are asexual and hence are not expected to either be pregnant or deliver normal babies (Redshaw et al., 2013). On the contrary, many WWDs are becoming pregnant and thus require MHS (Gavin, Benedict and Katleen, 2006). However, research indicates that WWDs face many challenges in accessing MHS and that the MHS services are not adequately prepared for pregnant WWDs (Begley et al., 2009).

4.0 Access to health care

Despite the fact that access to health care is given so much emphasis in health policy and planning, there is no consensus in the precise meaning of the term (Gulliford et al., 2002; McIntyre, Thiede, and Birch, 2009; Sibley and Wainer, 2011). Whereas Thiede et al (2007) defines access to health services as multidimensional and comprising three different elements which are, availability, affordability and acceptability which are interrelated and cannot be separated from each other, Sibley and Wainer (2011) define access as the ability to use services when they are needed. McIntyre, Thiede and Birch (2009) add another dimension to access that people in need may have physical access to a service but have difficulties in utilising the services, and so or them access is the degree of fit between the services and the population who need them. The manner in which the MHS are organised may be a barrier to access to other groups of people (Frenz and Vega, 2010). In SSA, there is little information on how WWDs access MHS, thereby making it difficult to conclude whether the services are permeable for this population or not.

4.1 Availability Accessibility Acceptability and Quality of health care framework

Though there are several models of access to health care services, the Availability Accessibility Acceptability and Quality framework (AAAQ) is the most useful framework especially with regards to maternal services for women in general as well as WWDs. It emphasises the aspect

of non-discrimination and quality of care as dimensions of care which other frameworks of access do not emphasise. AAAQ addresses important aspects of MHS which may either hinder or enhance the utilisation of services by all women including WWDs and these aspects should be of benefit to those who utilise MHS (Hunt and deMesquity, 2010).

Conceptual framework of accessing health care services

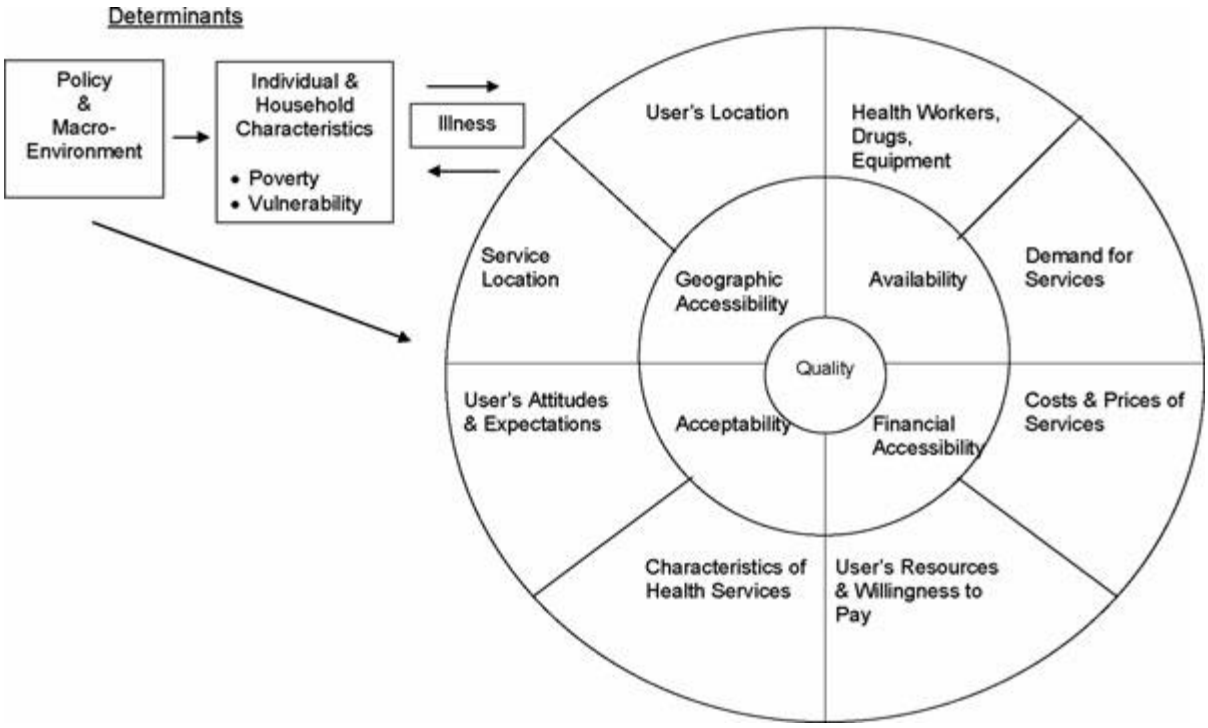


Figure 1, Peters et al., 2008.

Availability of health services; implies that trained medical and professional personnel, essential drugs and services should be in sufficient quantity. Studies in SSA indicate that physical availability of health facilities does not translate to utilisation of these facilities due to inadequacy of resources such as professional personnel, beds, labour wards, essential drugs and blood supplies (Kyomuendo, 2003, Cham, Sundby and Vangen, 2009, Akum, 2013). Inadequate resources may hinder access to MHS and may also inhibit the provision of quality services by health care workers.

Accessibility to health care; implies that health care services have to be physically and economically accessible to everyone without any form of discrimination (Hunt and de Mesquita, 2010). It does not only refer to the physical environment, it also refers to information and communication factors thereby covering issues such as transport, ability to get information about the importance of using MHS. Economic accessibility implies that services should be

affordable to all who need MHS. Economic accessibility implies that services charges as well as indirect costs such as transport cost and lost income as women seek services should be minimised. Though in most countries in SSA, MHS are provided for free in the public sector; women still incur several other expenses such as informal charges, transport costs and having to buy medicines that will not be available at the hospital (Mselle et al., 2011). These expenses may be too high for the women in general as well as WWDs and may have an impact on their access to MHS.

Acceptability of health care services; refers to the provider's attitudes towards the expectations of women as well as the women's attitudes and expectations towards providers (Thiede et al., 2007). If the women's expectations are not met, and if the services provided are not culturally sensitive, the MHS may be available but not acceptable and may not be utilised. Attitudes can be detected in the interactions between women and the health care providers when women are seeking services. Attitudinal barriers will make trust relationship between healthcare providers and women difficult to maintain resulting in less utilisation of MHS by the women who need these services.

Quality of services; is an important component of all the other dimensions of access (Sisal et al., 2012). It is also related to the technical ability of the health service to impact on the outcomes of women's pregnancies. The outcome of women's pregnancies will impact on women's future use of the services. For MHS to have a positive impact on women's pregnancies resources should be available. In addition, heath care services should be affordable, accessible and acceptable.

4.2 The state of access to maternal services in sub-Saharan Africa

It is estimated that between 1990 and 2010 maternal mortality ratios declined by 41% in SSA and thus it is less likely for this region to reach the target of reducing maternal mortality ratio by 75%. While in Europe skilled birth attendance is almost 100%, it is less than 46% in SSA which is way lower than the expected levels which were pegged at 85% in 2010 and 90% in 2015 (Kinnely et al., 2010). Limited vital medical supplies such as antibiotics, and magnesium sulphate for eclampsia, safe blood supplies, upgraded facilities, and better transportation services to emergency obstetric care and low levels of caesarean deliveries are some of the challenges of MHS in SSA (Campbell and Graham, 2006; Santon and Holtz, 2009). Given that this is the current state of affairs in SSA, it can be concluded that there are many challenges in

accessing quality MHS. Amongst the descriptions of the many challenges that women face in accessing MHS, little is said about the needs of WWDs.

While studies report on several factors that hinder or enhance access to MHS for women in SSA, most focus is on; maternal factors, cultural factors, social and economic factors and less research has been conducted on the health systems factors that impact on access to MHS in SSA. While the health systems comprise of different systems blocks as identified by WHO, these blocks are interconnected through their different functions. For example, policy makers formulate policies which are then implemented by service providers and for the implementation to take place, there is need for financing and management of the different programs (Penn-Kekana, McPake and Parkhurst, 2007). Given the fact that access to MHS is a complex issue, and that globally there is increasing recognition of embracing a systems approach when turning to make sense of, and developing interventions for addressing, complex issues, there is need or research on access to MHS to utilise a systems approach. In contrast, most research oh health systems determinants of access focuses on particular components of the health care system, such as the effect of a particular financing mechanism on the distribution of service use in the population negating the interrelationships of these components (McIntyre, Thiede and Birch, 2009).

4.2.1 Women with disabilities and access to maternal services

Though WWDs who need maternal services have many of the same health concerns and needs as other women, they may also have special concerns that are related to their disability. Below is a table of some of the impairments that can have impact on pregnancy and will result in women with disabilities requiring additional services as compared to those required by WWDs.

Table 1: Some impairments that present additional challenges in pregnancy

Impairment	Description of the impairment
Sensory	Visual or hearing impairment without speech
Physical	Loss of limb, spinal bifida, spinal cord injury cerebral palsy
Mental health	Schizophrenia, bipolar disorder
Learning disabilities	Down syndrome, birth injury

Barber, 2008

Challenges faced by WWDs in accessing MHS may result in inequalities in MHS provision. The inequalities are a result of complex factors that are intertwined such as segregation of WWDs, attitudinal barriers, and physical barriers (Ehiri, 2009). As many WWDs face a great deal of unpredictability in their daily lives they want care that is well planned and which helps them to eliminate the unexpected (Redshaw et al., 2013).

Tackling health inequalities is high on the health systems agenda. Universal coverage with equity implies that close to 100% needs of the disadvantaged are met. Women are among the disadvantaged groups who have specific needs of reproductive health care which should be met by health systems and amongst them WWDs were identified as a vulnerable group whose reproductive health needs should be recognised but are not met (Smith et al., 2004). While WWDs have the same desire and become mothers as other women, they often face challenges such as social and attitudinal exclusion (Begley, et al., 2009). For SSA to achieve MDG5b (universal access to reproductive health care by 2015), there is need to ensure that health systems are responsive to MHS needs of WWDs by eliminating discrimination with regards to accessing these services. Frenz and Vega (2010) point out that the health system can facilitate or hinder access for groups with fewer resources by being less permeable and navigable by these groups.

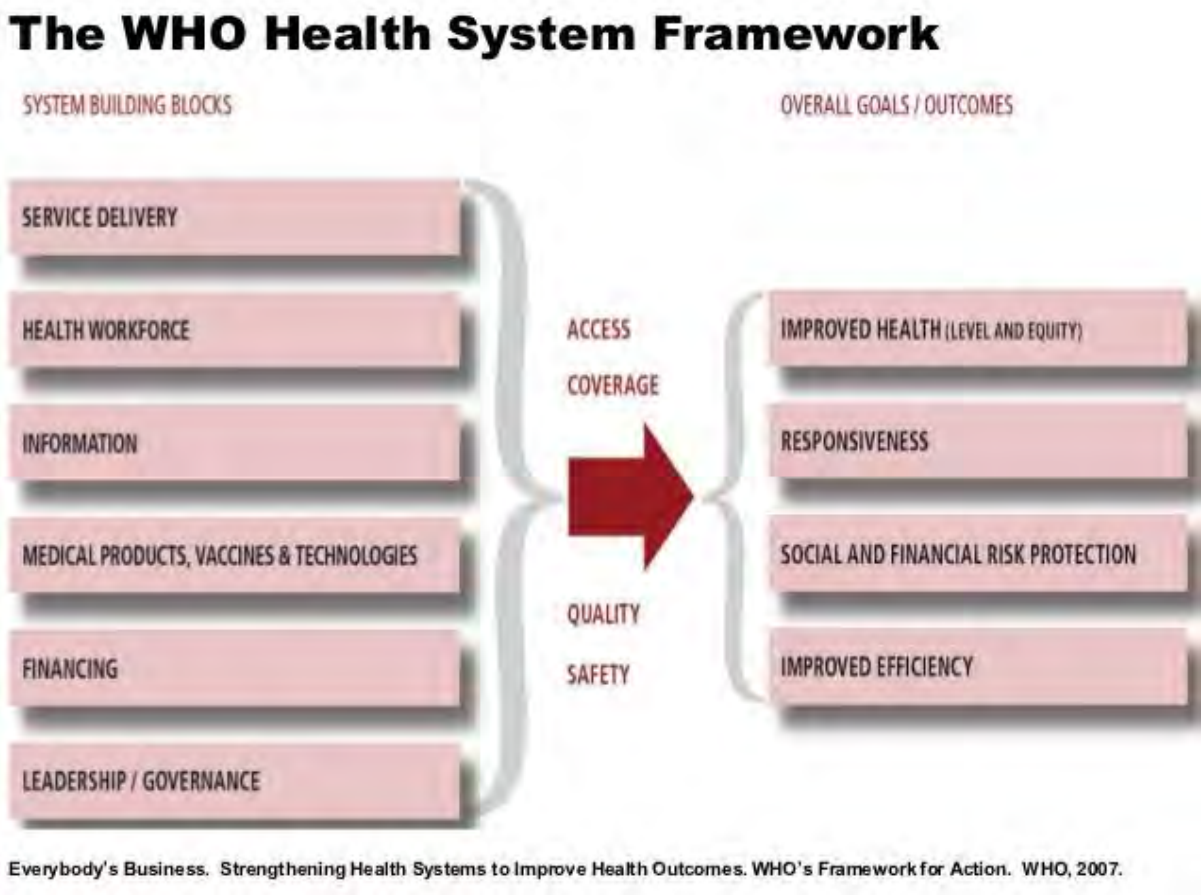
In order to ensure universal coverage almost all the barriers to accessing health care services must be removed and users should be empowered so as to be able to use services. The health system or program should reach all groups implying maternal health programs must also reach and should be accessible to WWDs and take into consideration the differential needs of different groups of women. WWDs may have specific needs that are peculiar to their disabilities which may need to be considered in providing MHS for them.

5.0 Health Systems approach to understanding access to maternal services

While access to MHS is key for both women in general and WWDs, understanding what the health systems that provide these services is important. A health system is a sum total of all the organisations, institutions and resources whose primary aim is to improve health (WHO, 2007). This means that a health system has many parts which include patients, communities, health providers, health organisations, pharmaceutical companies, health financing organisations and

other organisations. WHO (2000) describes the health system functions as stewardship, resource creation, service provision and financing and these functions are categorised into six building blocks.

Figure 2: WHO health system frameworks

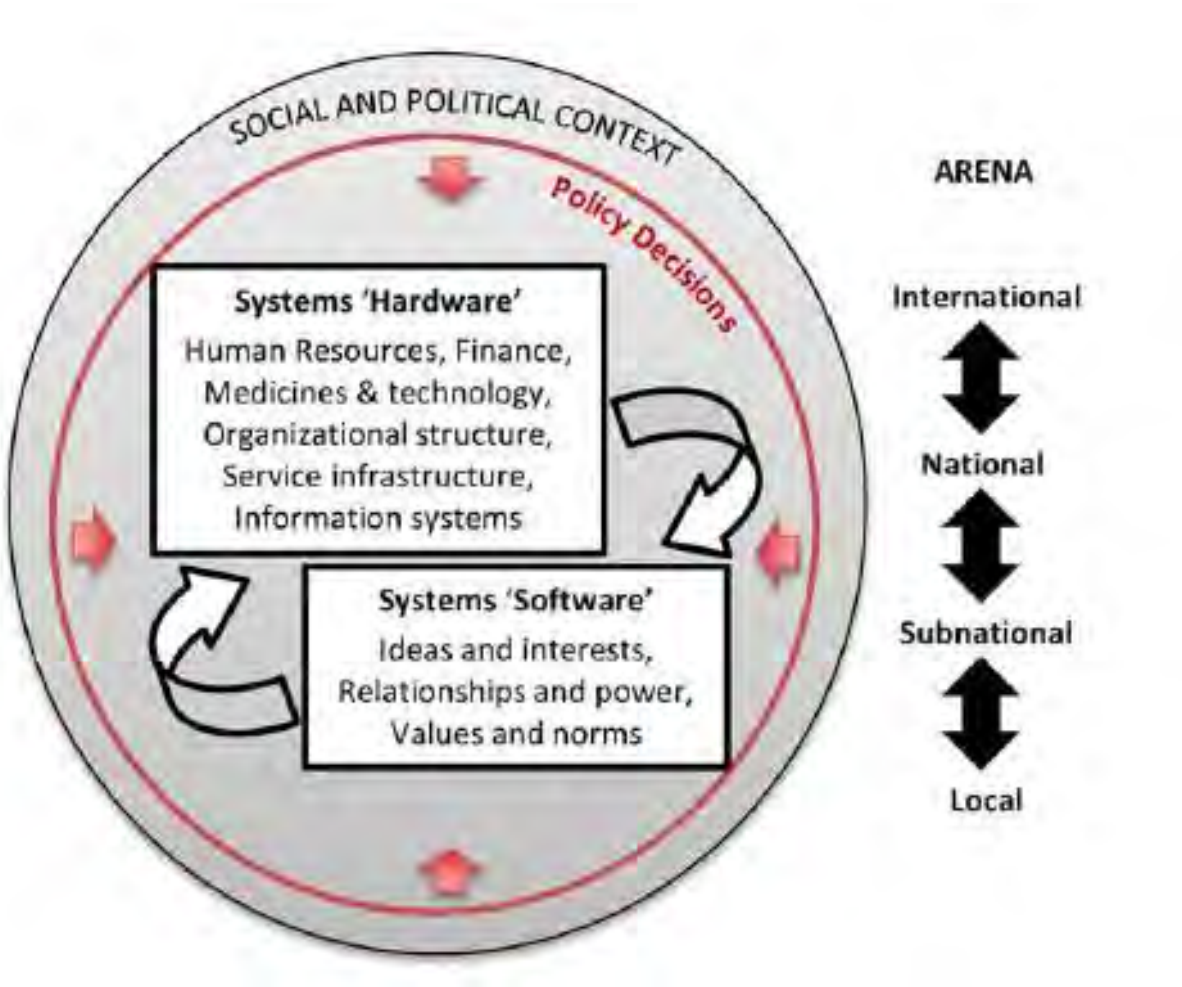


Source: WHO, 2007.

Better access depends on interconnectedness of these six building blocks that is; health policies, strategy, plans that prioritise health needs and set out revenue sources and resource requirements on motivated and properly trained and remunerated health workers, infrastructure, drugs and equipment and good referral links (Penn-Kekana, McPake and Parkhurst, 2007). Thus research on health systems determinants on access should also consider the inter connectedness and interrelationships of the systems elements on the dimensions of access. Though, the WHO health systems framework is useful, the components system in understanding the composition of health systems it has its short comings that have been identified by other authors.

Due to a realisation of the weaknesses in the WHO health systems blocks, Sheik et al (2011) proposed a complex systems framework reflects the complex relationship between the different systems elements and adds the human aspect. Sheik et al (2011) adapt the WHO health systems framework by categorising the health systems into hard ware systems (human resources, financing medicine and technology, organisational structure, service infrastructure and information systems) and software systems, the latter of which includes the beliefs, values and attitudes that govern the relationships amongst the stakeholders in the health systems. These software systems are intricately intertwined with the hardware systems to impact on any healthcare interventions including to access interventions.

Figure 4: Health systems hardware and software



Source: Sheik et al., 2011.

It is important to note that the clinical interventions needed to promote MHS have been identified and used for decades in high income countries, but they seem not to be producing similar results in the low and middle income countries. This may be attributed to the fact that

interventions to address MHS in developing countries are addressed mainly though fragmented approaches unrelated to the wider systems. Parkhurst et al. (2005) point out that the health systems factors that shape the use and effectiveness of existing services or technical inputs are less well understood especially in SSA. Furthermore, the health systems of SSA are weak and have challenges in maternal services as compared to the developed countries (Knight, Self and Kennedy, 2013). Experts are now advocating for system wide approaches to address health care problems as the system wide barriers are believed to be the ones hindering progress in disease specific MDGs in SSA (Bryan, et al., 2010). In order to come up with system wide approaches, there is need to understand the systems factors that enhance or hinder the effectiveness of interventions and MHS can be a useful programme to explore utilising an holistic systems approach which considers the interrelationships of the different components of a health system.

A health systems approach is a process of understanding how different elements within a system interact, are interrelated and interdependent and how these influence each other within the whole system. Kroelinger et al., (2014) further articulate that the complex systems approach can be of vital importance in understanding the complicated delivery systems within which maternal health programs are implemented. As previously stated, much research on access to MHS focuses on the impact of maternal factors and the systems factors are ignored. A health systems approach provides a comprehensive framework through which to examine the multiple health systems factors and their interrelations that determine access to MHS for WWDs.

Knight, Self and Kennedy (2013), articulate that the literature on systems factors is scarce in SSA as compared to the high income countries. Most studies in SSA focus on a specific subsystems such as drug supply or human resources training. Looking at access to MHS with a health systems lens, will be a holistic approach which will help to identify where the system is doing well and where it is not doing well. This may lead to the development of interventions that enhance access to MHS which cut across the whole system rather than focus on an individual component of the system.

6.0 Conclusion

This review of literature reveals that though there are several studies in SSA that examine the actors impacting on access for women in general, there is literature dearth on studies focusing on WWDs. While access to MHS is a challenge to most women, it disproportionately affects

the poor women of which WWDs are more vulnerable. Given the increasing interest of taking a systems approach when attempting to make sense of, and developing interventions for addressing, complex issues such as access, there is need for studies that comprehensively examine what the health systems factors that impact on access to MHS are and also explore the impact of interconnectedness of these health systems factors access. Furthermore, a systems approach in understanding the health systems factors impacting on access is vital as it is unlikely that any of the components of the system could singularly be held responsible for inadequate access to MHS for WWDs in SSA.

A systems perspective will help in identifying where the system is doing well and where it is failing WWDs in terms of access to MHS. A health systems improvement on access to MHS for WWDs will also have a positive impact on access to MHS for women in general. Given the paucity of literature on access to MHS in SSA, there is need to conduct a study which makes meaning of findings conducted in SSA and beyond on the systemic factors impacting access to maternal services for WWDs. To contextualise these factors, a pooling of findings on studies conducted on access to MHS for women in general could provide sufficient insight into what are the health systems factors operating in the SSA.

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Part C: Journal Manuscript

Health systems factors that impact on access to maternal services for women with disabilities: A systematic review.

Contents

Health systems factors that impact on access to maternal services for women with disabilities: A systematic review

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Abstract

Background: Access to formal maternal health care services plays a key role in the reduction of maternal mortality and morbidity. However, there is little information available on the experiences of women with disabilities (WWDs) in accessing maternal health care services (MHS) in sub-Saharan Africa (SSA). Globally, there is a move towards embracing a comprehensive health systems approach to understanding the full range and interconnectedness of health systems factors especially in planning interventions for complex health problems such as access to MHS. This paper reports on the findings of a qualitative systematic review on access to maternal services for WWDs in SSA.

Methods: A two phase qualitative systematic review was designed. Five electronic databases were searched, firstly, for empirical studies that report on health systems factors that impact on access to maternal services for women in general in SSA and secondly for studies that report on health systems determinants of access to MHS for WWDs, published from 2000 to 2014. For both searches, only free full texts with abstracts available written in English were considered. Data extraction involved consideration of the influence of health systems factors on access to MHS using the complex systems framework by (1) through examining how studies directly or indirectly relate and discuss how hardware systems factors, software systems and their interconnectedness impact on the different dimensions of access portrayed by (2).

Results: A total of 34 studies reporting on systemic factors impacting on access to MHS for women in SSA were included in this study and fourteen studies for WWDs globally. Whereas most studies reported on the impact of hardware systems as well software systems on access, they mostly utilised the silo approach. The studies reported that the health systems factors that is; human resources, finance, service delivery, medical technology, information have an impact on access as individual components and as interconnected elements of the health system. Transport though not recognised as a World Health Organisation health systems block was highlighted as an important factor that determines access to MHS in SSA

Conclusion: To the best of the author's knowledge, this is the first systematic review that examines health systems factors that impact on WWDs in SSA. The findings also confirm that the different systems elements operate as separate entities, but are not mutually exclusive as they constantly interact with each other. The interaction either positively or negatively impact on access to MHS. In addition, the review revealed that there is a paucity of research that examines the health systems factors that impact on access to MHS for WWDs in SSA.

However, the systematic review could not differentiate the factors that impact on the women with different impairments as the studies did not necessarily make differentiation between women with different kinds of impairments

Key words: Maternal services, Obstetric services, Health systems, Access, Disability, Utilisation, Pregnancy.

Introduction

Maternal mortality is one of the global public health challenges. Approximately three hundred thousand women die globally due to complications in pregnancy and child birth every year (3). Most of the deaths (99%) occur in developing countries with almost half of them occurring in SSA (4) (3). This has resulted in the reduction of maternal mortality being one of the global public health priorities. One of the targets which have been set, as part of the Millennium development goals (MDG), is the reduction in maternal mortality by 75% by 2015 (5). In addition, universal access to sexual and reproductive health (SRH) services was regarded as a prerequisite for achieving the MDGs in 2015 (6).

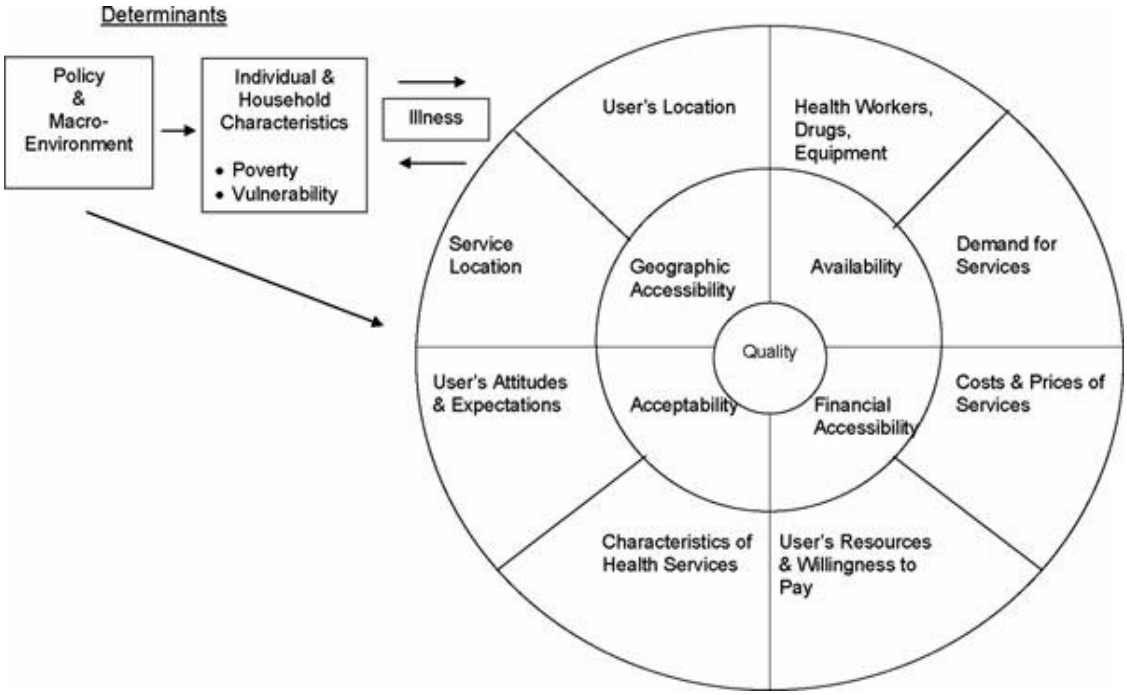
Though access to quality, formal peri-partum care is crucial, in many parts of SSA, where widespread poverty exists, very large proportions of women, including especially vulnerable groups such as WWDs, have limited or no access to MHS (7) (8). It is documented that amongst PWDs, WWDs are worse off compared to their male counterparts and have less access to essential services including health care services (7). It is therefore most likely that WWDs will be disproportionately worse off with respect to accessing good quality MHS, given their additional needs over and above those of able-bodied women.

Considering that approximately 10% of PWDs are women of childbearing age and that the majority of this population lives in middle-income and low-income countries, and that WWDs who are of childbearing age require MHS just as able-bodied women, there is need for health systems in SSA to ensure that MHS are accessible to WWDs too (9)(10). Millennium Development Goal 5(MDG) stipulates targets to achieve the reduction of maternal deaths for all women by 2015, key of which is universal access to SRH (7). Universal reproductive health implies that SRH needs for all women including WWDs should be met. However, little cognisance is taken of the additional needs of subgroups such as WWDs and their compounded health needs are not adequately considered in these universal goals.

Though many disabilities do no prevent sexual and reproductive life, less attention is given to their pregnancy, child birth and postpartum health care needs (11). This is as a result of the dominant belief that PWDs are asexual hence cannot become pregnant or deliver babies. Nonetheless, studies from developed countries reveal that there is an increase in the number of WWDs who are becoming pregnant and delivering healthy babies (11). Despite the fact that there is an increase in WWDs who are successfully mothering children, they face numerous challenges in accessing MHS (12). Whereas the biomedical model promotes the hard elements (infrastructure, equipment, availability of human resources and so on) and technical requirements of service delivery, the social model of disability advocates for the consideration of the soft elements such as perceptions, attitudes, beliefs and values that are paramount to how WWDs are treated. In creating disability friendly MHS, a bio-social model of disability will be the most suitable to consider both the hardware needs and software needs of WWDs in accessing MHS.

Access to health care services is a complex notion which different authors have defined in varying ways. Amongst these various definitions the common understanding is that access to health services is multidimensional and comprises three different elements which are interrelated and cannot be separated from each other (15). Other authors contend that access is not just the presence of a facility, but the actual use of the service (14) (15). In this study, the conceptual framework for accessing health care services (AAAQ) in Figure 1 below is utilised as it incorporates the various descriptions of access and its actual use. This framework describes the four main dimensions of access from both a demand side and a supply side perspective (2). It also emphasises the aspects of non-discrimination and quality of care as dimensions of access which is important especially for WWDs seeking MHS which are not emphasised by other access to health care frameworks. AAAQ framework is also important for WWDs as it addresses both the structural aspects and attitudes issues which are a major issue for them.

Figure 1: Conceptual framework for assessing access to health care services.

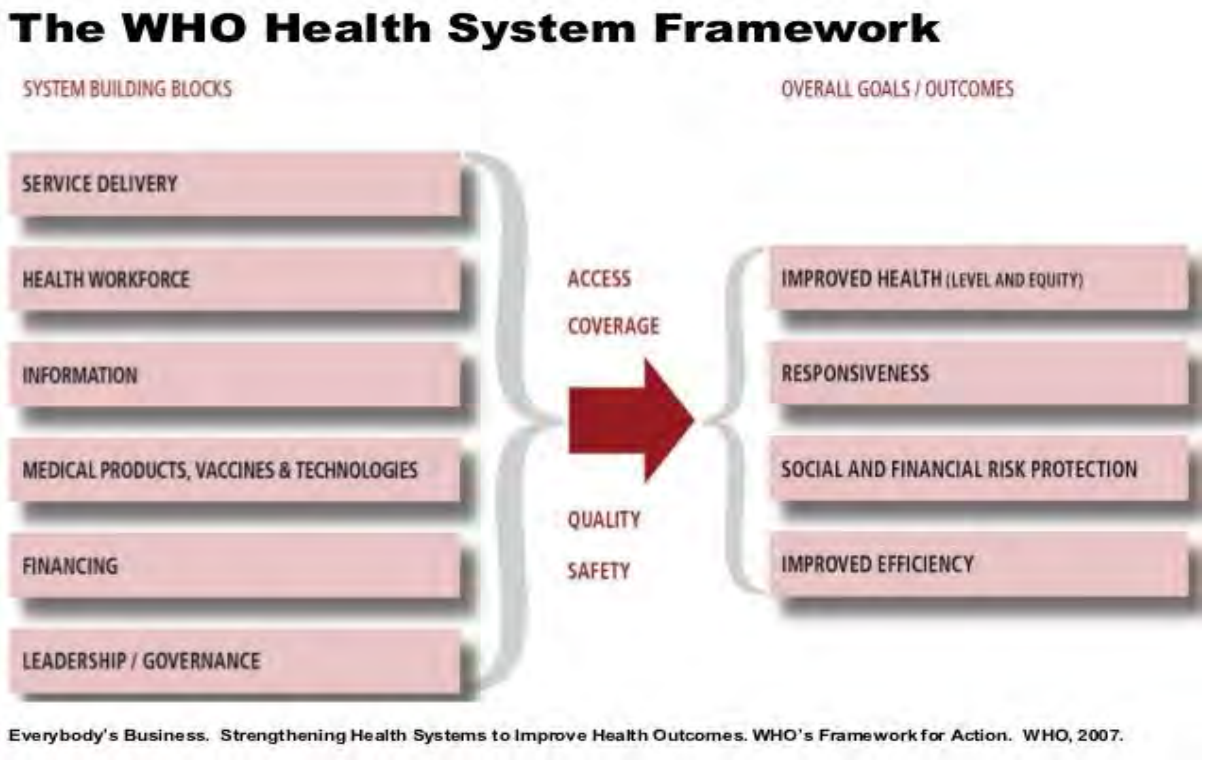


Source: (2).

Better access depends on interconnectedness of health policies, strategy, plans that prioritise health needs and set out revenue sources and resource requirements on motivated and properly trained and remunerated health workers, infrastructure drugs and equipment and good referral links (16). However, most research conducted on access to MHS focus on particular components of the health system, such as the effect of a particular financing mechanism on the distribution of service use in the population (15). Furthermore, there is little research available on the challenges that WWDs face when accessing MHS in SSA and globally.

A systems approach emanates from the belief that systems are made up of parts that interact towards a common purpose. It focuses on the interconnectedness of the different parts as well as the relationship between the constituent parts. Health care system is a sum total of all the organisations, institutions and resources whose primary aim is to improve health (17) including key actors such as patients, communities and providers. Several conceptual models that now exist demonstrate the essential health system components and their interconnectedness. The first model developed by the WHO still predominates, with more recent models improving on the original concept.

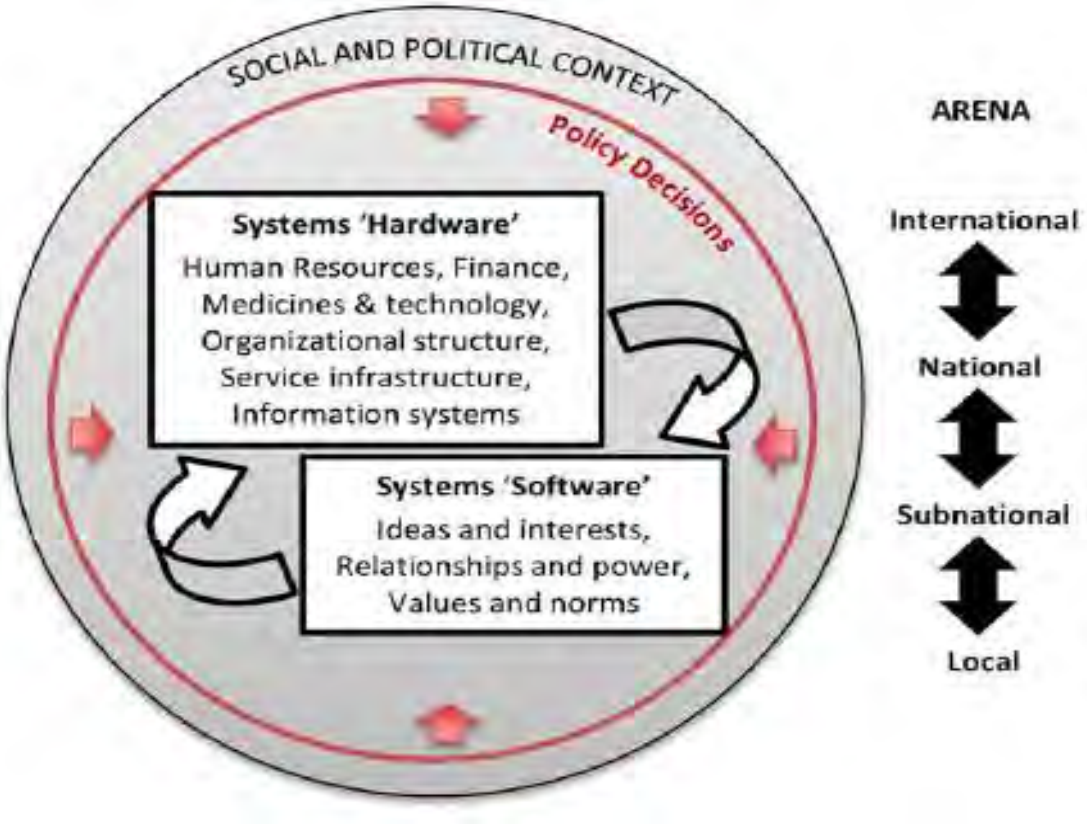
Figure 2: WHO Health system framework



Source: (17).

Figure 2 above portrays the health systems as made up of six different blocks that perform different functions to impact on access. This framework is very useful to understand what constitutes a health system. However, a systems approach focuses on the whole, as well as on the complex relationships amongst the different components (2). This complex relationship amongst the component parts is summarised by (1) in the complex systems framework in Figure 3 below. Though there are other frameworks that describe the systems hardware and software, the complex systems framework is an adaptation of the WHO system framework and adds the software system aspect and the complex interplay of hardware and software elements. Therefore, in this study the complex systems framework was utilised. The recognition of soft elements is crucial as it instrumental in demonstrating how MHS are perceived which then impacts on the outcomes of MHS.

Figure 3: Complex systems framework



Source: (1)

Existing research reveals that there is paucity of studies that comprehensively addresses the full range of health systems factors that determine women's access to MHS. Amidst the many factors that impact on women's access to MHS, maternal factors (level of education, socio economic status, marital status, etc.) are the well-researched and selected health system factors (18). Furthermore, where these selected health system factors are addressed, they tend to focus on the 'hard elements' of the system at the exclusion of also understanding the soft elements that are also now increasingly recognised as crucial to the delivery of good quality health care. Because, there is increasing recognition globally, of embracing a systems approach when turning to make sense of, and developing interventions for addressing, complex issues such as access to MHS in the quest for reducing maternal morbidity and mortality, it is vital that more studies utilising the systems approach be conducted (19). This is particularly pertinent for addressing health needs of groups such as WWDs, as the social model of disability demands a recognition of the soft elements and how these impact on how WWDs are perceived and treated as well as the hard elements by emphasising the removal of disabling factors. Of the available studies examining impact on health systems factors on access to MHS, the researcher only identified one (20) which explores inter-relationships of health care financing mechanism,

human resources of health and the impact of these on access to MHS. This study does not explore all the health systems elements yet it is widely known that challenges in access are a result of a complex interplay of all the components that make up the health system. Of the identified studies on access to MHS for WWDs none of them utilised the comprehensive systems approach.

In order to explore the challenges faced WWDs in SSA utilising a health systems approach, this research seeks to answer the question, what are the health systems factors that impact on access to MHS for WWDs in SSA? The objectives are twofold;

1. To better understand, in a more comprehensive systems fashion, the factors that hamper or facilitate WWDs' access to MHS in SSA.
2. To document the health systems factors that explore the range of factors impact on access to MHS in SSA.

This two-fold approach had to be adopted as a quick review of the available literature revealed that: there is a paucity of research on WWDs in SSA and their access to MHS, and therefore little is known of specific health systems factors that impact on WWDs in SSA. It is logical that all the factors that impact on women in general in SSA will also apply to WWDs, so the one component of the review focused on understanding the health systems factors that determine access to MHS for all women. In order to contextualise what this would mean for WWDs specifically, it necessitated a second part to the review that extended beyond SSA and that focused on understanding the health system factors that impact on WWDs. This was obtained from systematically reviewing available studies beyond SSA. Combined, the two parts of the systematic review allowed a more comprehensive analysis of how the health system factors that apply specifically to WWDs, are impacted on by the prevailing health system factors that determine access for all women in SSA.

Methods

Though qualitative systematic review design is highly contested it has been utilised by other reviewers. Due to the fact that health system research is multidisciplinary, interdisciplinary and transdisciplinary with contributions from both health sciences and health sciences utilising qualitative, quantitative and mixed methods study designs, a qualitative systematic review was the most suitable study (21). The major advantage of the qualitative research is that it allows the researcher to integrate, consolidate, summarise and critique findings from studies utilising different research methods (21). A qualitative systematic review was thus undertaken in order

to explore and develop a comprehensive understanding of the health systems factors that impact on access to MHS for WWDs, through a health systems lens/perspective. Studies utilising, qualitative research methods, quantitative methods and mixed methods, conducted in different settings and focusing on variety components of the health system, were consolidated thereby increasing the breath and understanding of the factors that hinder or enhance access to MHS for WWDs (22). However, to enhance credibility of the qualitative systematic review, it should be backed by corresponding authors of included studies which could not be done due to time and logistical constraints (22).

In order to facilitate the validation of the study, thematic data analysis was employed. Thematic synthesis enabled the themes to be both theory driven and content driven (23). The major themes were driven by (1) complex systems framework as well as the AAAQ framework as portrayed by (2). As explained above, the review was undertaken in two phases; the first phase being the review for the systemic factors that impact on women in general's access to MHS in SSA and the second phase being a the review for the systems factors that determine access to MHS for WWDs. The results were combined to give a comprehensive perspective of the factors that will be in play for WWDs access to MHS in SSA.

Search strategy

For the first phase of this study, a systematic search of peer reviewed, published literature, from 2000 to 2014, was conducted to identify the health systems factors that impact on access to MHS for women in SSA. The search was conducted in five electronic databases namely Medline, Pubmed, Cumulative Index of Nursing and Allied Health CINAHL Plus with Full Text (EBSCO) and Africa wide information via EBSCOhost and Proquest Health and Medical complete. These data bases were considered to be sources of relevant literature on this topic. The keywords phrases and MeSH terms were, "Health systems", "Access to Maternal health care services", Access to Maternity health care services" "Childbirth services" and " sub-Saharan Africa". For WWDs, the search was conducted in four databases that is Proquest Health and Medical Complete, the key words and MeSh terms used were Access, "maternal health care services", "maternity health care services", childbirth services, "pregnancy health care services", "disabled women" and "women with disabilities".

Article selection

Studies that report empirical findings on health systems factors influencing access to MHS for women in SSA were included. For the second phase of the review, inclusion studies had to report empirical findings on health systems factors that impact on access to MHS for WWDs.

Original and review journal articles with available free abstract and full text published in English from 2000 to 2014 were identified from data bases. The period was selected because promulgation of the MDGs in 2000 much effort on improving access to MHS and at the end of 2014 more effort is on evaluating the successes of these efforts. In addition during this period, the CPRD which emphasises the sexual rights of PWDs was established in 2006 which also falls within this period.

Studies were excluded when they were not reporting on the health systems factors influencing access to MHS. For the first part of the review, studies not conducted in SSA were excluded. For the second part of the review, studies that reported on health systems factors impacting on access to MHS for women in general were excluded. Furthermore, articles or citations without abstracts, papers that document access to general health services, articles reporting drug and procedural interventions were excluded. Titles and abstracts were screened against the inclusion and exclusion criteria after removing duplicates from the combined search output. Full text reading of identified studies was subsequently done and final review articles selected.

Quality review and data extraction and analysis

Though assessment of quality of qualitative studies is a highly contested domain, selected articles were assessed for quality through the Critical Appraisal Skills Programme (CASP) (24). Quality of studies was determined by the examination of aims and methodology, study design, participant recruitment, data collection, data analysis, presentation of findings, authors' discussions and conclusions of the different studies using the ten CASP screening questions. Papers that were deemed to be of poor quality against the CASP criteria were excluded from further review. Some of the CASP screening questions were incorporated in the data extraction form such that during data extraction the articles were still be screened for quality.

The data extraction form included the following sections: study design (qualitative, quantitative or mixed methods), characteristics of the participants, whether they are pregnant women, WWDs, nurses, doctors or midwives, recruitment context, sampling methods, data collection (survey, interview, focus group discussion) and data analysis methods. Data extraction was guided by the complex systems framework (1) and WHO framework (17, to explore which health systems factors impacted on the different dimensions of access to MHS as portrayed by AAAQ framework.

Thematic data analysis was conducted in three different stages (23). The first stage was detailed line by line reading of the studies' findings sections to identify explicitly or implicitly stated systemic factors enhancing and hindering access to MHS for WWDs and women in general. The second stage was the organisation of the systemic factors that are related together to generate sub themes. These subthemes were then categorised according to the hardware systems as well as software systems factors as articulated by (1) and how these impact on the dimensions of access as articulated by (2). Other categories that could not be categorised under the hardware or software systems were created.

Data analysis was guided by (1)'s complex systems framework to examine how different elements as well as the relationship and interconnectedness of hardware and software systems impact on the different dimensions of access that are portrayed by the AAAQ framework (2). Data analysis was undertaken iteratively to determine the systemic factors impacting on access to MHS and how they interact to impact on the different dimensions of access. Firstly, findings for studies on women in SSA were analysed to document the systems factors that impact on access to MHS for women in general. Then, an analysis of the findings for WWDs was conducted so as to explore the systems factors that impact on access to MHS that are peculiar to WWDs. The findings were then combined so as to contextualise the health systems determinants of access to MHS in SSA.

Results

Characteristics of selected articles

More than 17 500 studies were identified in the initial search for women SSA, of which 53 were retrieved for full-text review. Most of the studies were eliminated because of western, setting and not reporting on health systems factors or access to MHS. After full text reading of the 53 articles, 34 articles met inclusion criteria for the review. The summary of the included articles is provided in Table 1. Nineteen of the remaining studies fulfilled one or two of the exclusion criteria and were deemed as poor quality are summarised in Table 2. Of 34 studies, 17 studies were of high quality, and the rest were deemed of good quality.

The studies under review were conducted in Ghana, Gambia, Tanzania, Uganda, Nigeria, Malawi, Ethiopia, Benin, South Africa, Morocco, Zambia and Zimbabwe. Ghana and Tanzania had the greatest number of studies, with each country having eight and seven studies respectively. The reason for these two countries having more studies was not established. Most

of the studies (23) utilised the qualitative study design. This may be due to the nature of the content of the studies which may have required qualitative methods to gather the data. Six of the studies utilised mixed method that is qualitative and quantitative method and five of the studies made use of the quantitative study design. Only one study used the quasi experimental study design (before and after).

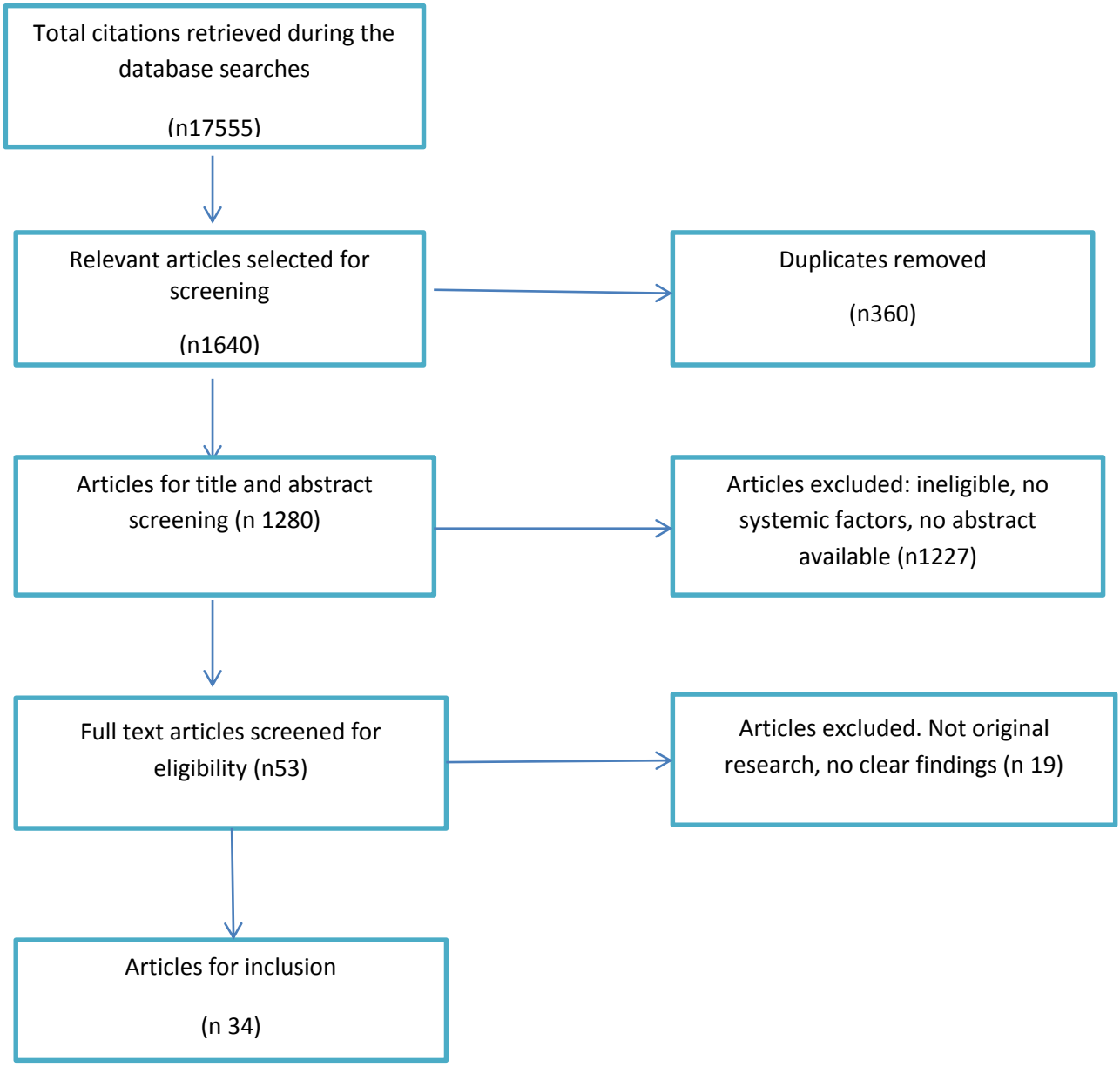


Figure 2: Search flow chart for studies of access to MHS for women in general in SSA.

The search for WWDs access to MHS yielded more than 9000 studies. However, only 23 studies were selected for full text reading. Of these 23, a total of 14 fulfilled the inclusion criteria while eight were excluded as they were of poor quality and fulfilled one or more of the exclusion criteria. The details of the included studies are summarised in Table 3 while the ones for excluded studies are summarised in Table 4.

Of the 14 included studies, 10 were conducted in developed countries namely England, Ireland, Sweden, Canada and USA. Amongst the five that were conducted in developing countries only three were conducted in SSA that is Zambia, Cameroon and Uganda. Most of the included studies utilised qualitative study designs, were localised and had small sample sizes, three utilised the quantitative survey methods and only one utilised the mixed methods. Of the 14 studies eight were high quality and the rest were of good quality. The systems factors that were identified included fragmented services, MHS providers not well trained to deal the interaction between pregnancy and disability, inaccessible facilities and equipment and inadequate information about pregnancy and disability.

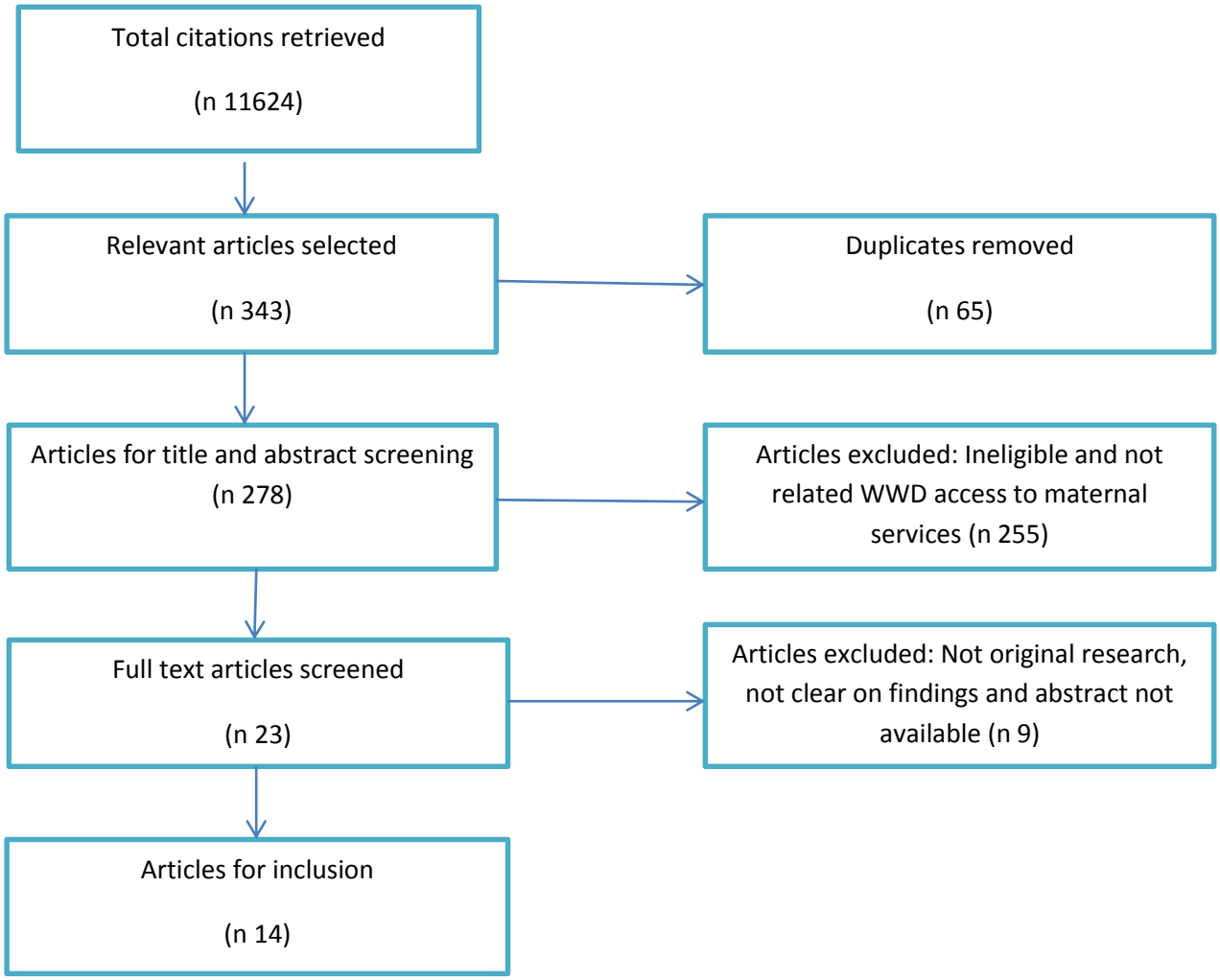


Figure 4: Search flow chart for studies of access to maternal services for WWDs.

Table 1: Summary of included articles for women in sub-Saharan Africa

Author(s) and year of publication	Country of study	Study objectives	Study Population	Methodology	Data analysis	Findings
(25)	South Africa	To examine whether women in Mdantsane are accessing and using maternal health care services.	267 women and 6 staff members	Structured questionnaire and in-depth interviews	Bivariate and multivariate models were used for quantitative data analysis and thematic data analysis was used for the qualitative.	Onset of labour was sudden thereby prompting home delivery. This is the reason two-thirds of the women cited for not having delivered at health facilities. The second and third most reported reasons for not having delivered at health facilities were distance and lack of transport respectively.
(26)	Ethiopia	To explore health-service providers' perceptions of facilitators and barriers to the utilisation of institutional delivery.	Eight health extension workers and four midwives	In depth interviews	Thematic analysis approach	Lack of drugs and equipment, poor infrastructure and insufficient expertise (in terms of HEWs) hindered their performance. These factors together with transportation barriers made women's access to skilled delivery and emergency obstetric and neonatal care difficult.
(27)	Tanzania	To assess facilitators and barriers to institutional delivery in three districts of Tanzania.	915 women	Survey questionnaire	Chi-square test was used to test for associations in the bivariate analysis and multivariate logistic regression was used to examine factors that influence institutional deliver.	Of the 233 women who did not deliver in health facilities, 11.2% stated that lack of transport was the major reason that hindered them from delivering at a health facility.

(28)	Nigeria	organisation To identify the barriers to prompt effective treatment of obstetric complications at a health facility	10 members of staff	In depth interviews	Quantitative data analysis	Inadequate resources such as drugs , supplies and blood transfusion, hindered provision of services, shortages o human resources, lack of skills and lack o functional ambulance hindered access to maternal services
(20)	Ghana, Zambia and Zimbabwe.	To understand the evidence of the impact of fees, exemptions and fee removal on HRH.	Financing policies in Ghana, Nepal, Sierra Leone, Zambia and Zimbabwe.	Literature review, desk-based analysis and document review, field studies and analysis.	Thematic data analysis and analysis of the distribution of the health workforce in each country computed concentration indices (CIs).	In order to achieve the millennium development goal of a global reduction in maternal mortality, technical interventions have to be accompanied by adjustment in settings of the health systems within which these services take place. Too often interventions are proposed and implemented in a vertical manner, without consideration of larger systems issues, resulting in disappointing outcome results. While the interventions needed to reduce maternal deaths are well known internationally, much more complex is the ability to implement them effectively within the constraints of the existing system.
(29)	Tanzania	To describe the weaknesses in the provision of acceptable and adequate quality maternal health care services.	16 women, six men, five midwives	Semi structured interviews and Focus group discussions.	Thematic data analysis	The bad birth care experiences of women undermine the reputation of the health care system, lower community expectations of facility birth, and sustain high rates of home deliveries. The only way to increase the rate of skilled attendance at birth in the current Tanzanian context is to make facility birth a safer alternative than home birth. The findings from this study indicate that there is a long way to go.
(30)	Morocco	To explore the hypothesis that simply reaching the hospital may not be sufficient to manage obstetric	303 maternal deaths from obstetric causes	Review of the causes of maternal deaths through	Thematic data analysis	The main factors linked to substandard care in hospitals (inadequate treatment and insufficient follow-up) were due to lack of

		complications and save mothers' lives.		analysing the circumstances that led to their deaths.		competence and motivation of health personnel rather than lack of resources.
(31).	Ghana	To explore and describe factors hindering utilisation of healthcare institutions for child delivery in the Bawku Municipality.	36 women	Focus group discussion.	Thematic Analysis	The main reasons for delay in seeking care: ignorance, poverty, lack of transportation and distance at the community level and facility shortcomings leading to maternal death: lack of personnel and skills, equipment, drugs and supplies, blood transfusion services and roadworthy ambulance for quick transfer of referred cases.
(32)	Ghana	To elicit personal accounts of Ghanaian women who survived a severe maternal morbidity identified by the new WHO near-miss criteria in an urban facility. To explore women's experiences of severe maternal morbidity and perceptions of the care they received to better understand quality of care.	Twenty women	Semi-structured interviews	Thematic analysis	The study shows that while women had ''heard'' things about Korle Bu (the hospital), given their desperation, they often came without much delay. While encouraging, more work needs to be done to improve the reputation of tertiary care hospitals so that women do not delay in seeking care. It is also important to emphasise that obstetric care does not exist in a vacuum with only the health care providers and the patients; rather it exists within the health systems environment where enabling policy and program environment such as effectively allocated resources and financial policies allowing access to affordable care make an impact in how women experience near-miss events and perceive care.
(33)	Malawi	To explore women's views of perinatal care. To describe perceptions of perinatal care among women who delivered at a district hospital in Malawi.	14 mothers	In-depth interviews	SPSS and Thematic analysis	The women were not critical of the care they received because they were not aware of the standard of care. Instead, they had low expectations. Health workers have a responsibility to inform women and their

						families about the care that women should expect.
(34)	Ethiopia	To assess the effect of individual, communal, and health facility characteristics in the utilisation of antenatal, delivery, and postnatal care by a skilled provider.	538 women	Structured questionnaire	Multilevel binary logistic regression using STATA software, version 9.1	Health facility characteristics, including performance (functionality) and cost of service were more important for use of skilled delivery care than other maternity services.
(35)	Ethiopia	To explore women's experiences and perceptions regarding delivery care in Tigray, a northern region of Ethiopia.	51women	Focus group discussions.	Thematic data analysis	Offering emergency obstetric services at the lower levels of care is currently unaffordable, consequently a good referral system is necessary. It means that community workers should be in close contact with higher resolution facilities, in order to ensure an adequate response to problems and complications that may arise during pregnancy, delivery and postpartum.
(36)	Malawi	To identify the socio-cultural and facility-based factors that contributed to maternal deaths in the district of Lilongwe, Malawi.	32 Maternal death cases	Chart extractions and in-depth interviews	Predictive Analytics Software Statistics 18 and Content analysis	The study revealed that the majority of the women who were poor, had low literacy and lived in semi-urban areas, did in fact reach a health facility, but did not receive the adequate or timely care needed to save their lives. Ideally we would like all delays in all phases to be addressed, but that is not realistic or feasible.
(37)	Gambia	To explore barriers of timely access to emergency obstetric care services resulting in perinatal deaths and in survivors of severe obstetric complications in rural Gambia.	20 women. Family members and traditional birth attendants were also interviewed.	In-depth Interviews	Content analysis	Lack of appropriate means of transportation were found to be major problems affecting timely evacuation of women with obstetric complications. Obtaining blood for transfusion was also identified as another impediment. Improved and timely access to EmOC backed by emergency transportation seems warranted for improved maternal and neonatal survival in poor rural settings in Gambia.

(38)	Tanzania	To explore experiences of women affected by obstetric fistula in the three phases of seeking care.	151 women who were admitted in fistula wards	In-depth interview and survey questionnaire	Content analysis	The study illustrates how poor quality of care at health facilities contributes to delays that lead to severe birth injuries, highlighting the need to ensure women's rights to accessible, acceptable and adequate quality services during labour and delivery.
(39)	Tanzania	To describe and compare the perceived quality of care and barriers to access it from both the users' and the providers' perspectives; and To suggest a supplement to the three delays model that identifies an effective strategy to provide timely and good quality emergency obstetric care (EmOC) to women suffering obstetric complications.	31 delivered mothers, 32 relatives, 19 health professionals and 15 traditional birth attendants.	In depth interviews and survey questionnaire	Thematic analysis and Epi-Info (4) 3.5.1	Forcing more women into already overburdened health facilities that do not provide safe births is a hazardous and inefficient strategy. To reduce maternal deaths, health systems need to be strengthened so women can access emergency obstetric care in time. The quality of EmOC must be assured by sufficient supplies, staff, skills training, supervision and monitoring.
(40)	Tanzania	To gain an understanding of the socio-cultural and health systems factors influencing women's decisions to seek antenatal, skilled delivery and immediate post-partum care.	18 providers, 66 women, 36 TBA and 40 elders men	Key informant interviews using semi-structured interview guides. Focus group discussions. Participant observation.	Thematic Analysis	The majority of women interviewed expressed concerns about specific routine and life-saving procedures conducted by health care providers during labour, delivery and immediate postpartum. Concerns mentioned by community members about caesarean deliveries and repair of genital tears need to be more sensitively handled by providers to allay women's fears about such procedures and to explain why they are performed (e.g., repair of major cervical tears to prevent severe postpartum haemorrhage).
(41)	Ghana	To document the number and type of surgical and obstetric healthcare worker as well as the overall volume of surgical	10 District hospitals	The World Health Organisation's Clinical	Quantitative analysis	The major barrier to improving surgical care at district hospitals in Ghana, which is the shortage of adequately trained physicians who can perform surgical and obstetrical

		and obstetric care in the facility.		Procedures Unit Tool for Situational Analysis to assess emergency and essential surgical care		procedures. Overall, the numbers of support staff appear to be adequate.
(42).	Ghana	To survey infrastructure characteristics, personnel, equipment and procedures of surgical, obstetric and anaesthesia care in 17 hospitals in Ghana.	17 health facilities in Ghana	WHO Tool for Situational Analysis to Assess Emergency and Essential Surgical Care	Quantitative data analysis	Lack of adequate emergency and essential surgical care is mostly attributable to the shortage of skilled surgical providers and not necessarily attributable to unavailable equipment or facilities.
(43)	Ethiopia	To focus on the quality of clinical care within a health facility in Ethiopia to consider how best to combine social science and clinical science perspectives and methods in order to make a comprehensive assessment of quality of care and identify priorities for change.	5 staff members, 12 women and 6 stakeholders.	Ward and case notes observations, Interviews and Nominal group technique with key stakeholders.	Nvivo7 was used to manage and analyse the data from all phases of data collection. Thematic data analysis was utilised.	Health facility characteristics, including performance (functionality) and cost of service were more important for use of skilled delivery care than other maternity services. Improving community awareness and perception on skilled providers and their care by targeting women who prefer non-skilled providers and those who do not have any awareness is very important.
(44)	Tanzania	To identify clinical causes of maternal deaths at a regional hospital in Tanzania; To assess major substandard care and make a comparison to the findings of the internal maternal deaths audits (MDAs); and To describe hospital staff reflections on causes of substandard care.	68 cases of maternal deaths	31 delivered mothers, 32 relatives, 19 health professionals and 15 traditional birth attendants.	In-depth interviews and survey questionnaire	Forcing more women into already overburdened health facilities that do not provide safe births is a hazardous and inefficient strategy. To reduce maternal deaths, health systems need to be strengthened so women can access emergency obstetric care in time. The quality of EmOC must be assured by sufficient supplies, staff, skills training, supervision and monitoring.
(45)	Mali	To evaluate the efficacy of the maternity referral system.	All cases with direct and indirect obstetric	Questionnaire	Logistic regression	Results show that in poor countries, programmes to reduce barriers to

			complications in 2003-2006.		models supported by STATA software, version 9.1	comprehensive emergency obstetric medical care can substantially decrease deaths associated with obstetric emergencies. Furthermore, they show that such programmes can be implemented on a large scale without major external funding.
(46)	Gambia	To assess the availability and quality of emergency obstetric care services in Gambia's main referral hospital.	30 Women.	In-depth interviews	Thematic analysis	Women seeking EOC services endure substantial delays before receiving definitive treatment. Multiple health service factors including lack of blood transfusion services, shortage of essential drugs (particularly Magnesium Sulphate) and shortage of doctors contributed to these delays. The need for transfusion or treatment of hypertensive pregnancy disorders inflated the final treatment costs to up to 18 times greater than the standard fees.
.(47)	Tanzania	To provide descriptive information necessary to assess AMTSL practices and identify major barriers to its use.	10 regional hospitals 15 district hospitals, and 4 faith-based hospitals. 106 providers.	Survey questionnaire, Observations, Document review and Structured Interviews.	STATA (Version 8.0) (College Station, TX, USA)	These findings indicate that there is need for updating the STGs, curricula and training of health providers on AMTSL and monitoring its practice.
(48)	Ghana	20 cases of maternal deaths were studied.	20 cases of maternal deaths were studied.	Maternal death assessment form	Thematic data analysis	Removing one financial barrier to accessing health services in the form of fee exemption is insufficient to reduce maternal mortality rapidly in Ghana. Even if fee exemption leads to women with complications arriving in hospital earlier, the poor care they receive in hospital causes many avoidable deaths.
(49)	Nigeria	To assess the Phase III delays that occur in the management of pregnant women admitted with obstetric emergencies at	96 women	Structured questionnaire	Statistical package for social sciences (SPSS).	Delays in delivery care still occur in this centre, mostly in patients requiring emergency caesarean sections. The major factor causing delays is theatre-related.

		the labour wards of Obafemi Awolowo University Teaching Hospital.				
(50)	Kenya, Rwanda, Southern Sudan, and Uganda	To set up program baselines on the availability and utilisation of EmOC services in these countries; To identify gaps and obstacles in providing EmOC services; and To make recommendations to governments based on evidence generated.	Nurse midwives and women attending antenatal clinics	Record reviews, in-depth interviews, observations, and FDG.	Thematic data analysis	To reduce maternal mortality ratio the states and development partners need to focus their effort to improve the coverage, quality, and utilisation of EmOC services through supportive national policy, effective program strategies, increased budget allocation to maternal health program, rural infrastructure development, and regular monitoring, and evaluation of progress.
(51)	Ghana	To investigate women's accounts of interactions with health care providers during labour and delivery.	21 women for in-depth interviews.	Focus group discussions and in-depth interviews.	Thematic analysis	Inter-personal aspects of care are key to women's expectations, which in turn govern satisfaction. Service improvements which address this aspect of care are likely to have an impact on health seeking behaviour and utilisation. Interventions to improve delivery care should not only be directed to the health professional, but also to general health system improvements.
(52)	Gambia	To identify factors that if avoided, may have prevented maternal deaths; and To describe the socio-cultural and health service factors associated with maternal deaths in rural Gambia.	30 women	In-depth Interviews	Grounded theory (Thematic analysis).	Health system inadequacies including lack of blood for transfusion, shortage of essential medicines especially antihypertensive drugs considerably hindered timely and adequate treatment for obstetric emergencies.
(19)	Uganda and South Africa	To trace out the ways in which health systems elements can shape maternal health outcomes.	Members of government, maternal health professionals,	Literature review	Thematic analysis	Skilled delivery attendance has been highlighted as essential for reducing maternal mortality. Yet the extent to which a skilled attendant can do this is dependent

			non-government organisations and donors involved in maternal health work were identified as key informants about the country's situation.			on the larger systems in which (s)he operates. High levels of skilled attendance combined with inappropriate mix between doctors and midwives or misallocation of staff can lead to sub-optimal maternal outcomes when provider practices are shaped in ways to reduce effective or efficient care. This study illustrates that reforms will not have universally positive or negative effects. Instead, their impact on maternal health care will depend on the structure of the health system implementing them.
.(53)	Uganda	To enhance understanding of why, when faced with complications of pregnancy or delivery, women continue to choose high risk options leading to severe morbidity and even their own deaths.	808 women 20 elders 240men and women for FDGs Respected traditional healers and health care workers.	Survey questionnaire FDGs Maternal death inquiries (verbal autopsies) were conducted.	Thematic data analysis	The use of primary health units and the referral hospital, including when complications occur, was considered only as a last resort. Lack of skilled staff at primary health care level, complaints of abuse, neglect and poor treatment in hospital and poorly understood reasons for procedures, plus health workers' views that women were ignorant, also explain the unwillingness of women to deliver in health facilities and seek care for complications.
(54)	Benin	To gain a better understanding of the experience of pregnancy and antenatal care, and of giving birth in a referral hospital.	19 women	In-depth Interviews	Thematic data analysis	Access to emergency obstetric care is a priority in the battle against maternal mortality, but it should not be at the expense of improvements in the quality of the interaction between women and health personnel and the challenges in ameliorating this interaction. Training programmes in maternal health care workers must emphasise improvement in communication skills and give midwives the means to explore the difficulties they encounter in their relationships with the women of the communities they serve.

.(55)	South Africa	To investigate the health seeking practices of pregnant women in a peri-urban area in Cape Town, South Africa.	32 women, midwives and indigenous healers	In-depth interviews; Focus group discussions; and Observations.	Thematic data analysis	There is need to move toward making service delivery patient-oriented rather than task-oriented. Listening to women and bridging the gap between the perceived needs of pregnant women and care provided by midwives are clearly major challenges facing the Cape Town maternity services.
(56)	Uganda	To examine the role of psycho-social factors such as attitudes, social influence and self-efficacy in influencing choice of place of delivery. To understand possible causes of disparity between high proportion of women attending ante-natal care yet only a much smaller proportion of them deliver in the health units.	275 (32 men and 243 women).	Focus group discussions (FGDs) and semi-structured interviews.	Thematic data analysis	The reasons for most deliveries not being supervised by trained health workers include insufficient numbers of trained health workers capable of supervising deliveries; unbalanced distribution of trained health workers, resulting into segments of the population having little access to maternity services; and inadequate remuneration of trained health personnel leading to a brain drain.

Table 2: Summary of excluded articles for women is sub-Saharan Africa

Author and year	**Reasons for exclusion**
(57)	This study was excluded because it is not a primary study thus does not meet full inclusion criteria.
(58)	This study is a report on early results of quasi experiment and hence the results may not be dependable.
(59)	The study did not examine health systems issues and as such was not within the scope of the current study.
(60)	The research paper focuses on other issues that are not health systems factors thus it is not within the scope of this study.
(61)	The study did not meet full inclusion criteria as it is not a primary study.
(62)	The study discusses other factors that impact on access other than the health systems factors.

(63)	The paper does not discuss health systems factors.
(64)	This study was excluded as it examined other factors that impact on access to maternal services which are not within the scope of this review.
(65)	This study was excluded as it examines contextual factors which are not health systems factors.
(66)	The study was excluded as it examines individual, household, community and state level factors which influence utilisation of maternal services but did not include health systems factors, which are the core of the current study.
(67)	The focus of the study was on equity in utilisation and not on health systems factors that impact on access in general.
(68)	This study identifies types of community involvement and examines factors influencing the level of community involvement in the management of obstetric emergencies which is not within the scope of current study.
(69)	The study was excluded because it is an ecological study. Ecological studies have numerous methodological challenges that limit causal inference.
(70)	The study focused on women's autonomy, social standing and economic status which are not within the scope of the current study.
(71)	This study was excluded as it examined other factors that impact on access to maternal services which are not health systems factors.
(72)	The study focuses on different cadres that provide maternal services and their impact on maternal mortality and not on access to maternal services.
(73)	The study deals with systems issues in maternal services but not in relation to access to maternal services, therefore, it is not within the scope of the current study.
(74)	This study was excluded because it examines the impact of human resources on maternal mortality and not on access to maternal services.
(75)	This study was excluded as it is not a primary study and as such does not fulfil the inclusion criteria.

Table 3: Summary of included studies for women with disabilities

Author(s) and year of publication	Country of study	Study objective(s)	Study population	Methodology	Data analysis	Study findings
(7)	Zambia	To ascertain how well health services in Lusaka, Zambia currently meet the safe motherhood and reproductive health care needs of women who have physical impairment leading to disability.	24 WWDs and health care workers	In-depth interviews	NVivo software was used to analyse the data. Thematic data analysis.	There is still need to promote inclusion of WWDs in mainstream health care activities. WWDs face numerous challenges when accessing maternal services. Health care workers lack knowledge on sexuality of WWD hence they are surprised when they see them pregnant. Positive discrimination for WWD is undertaken, but further purports discrimination of WWDs as everyone will take it that it is not normal for WWD to be pregnant.
(10)	Cameroon	To examine the reproductive health experiences of WWD in the Northwest Region of Cameroon.	Eight WWDs	In-depth interviews	Thematic data analysis	Most health care centres were physically inaccessible. The facility also did not have adequate disability friendly equipment. When it was available it was greatly appreciated. Healthcare workers were not knowledgeable about disability issues and as result were not sensitive to their needs. WWDs had problems mostly delivered through caesarean sections and the procedure is generally expensive. Some maternal service providers displayed negative attitudes towards women with disabilities. However, others gave extra attention to the women.

(76)	Uganda	To explore the challenges faced by male and female persons with physical disabilities in accessing SRH services in Kampala, Uganda.	40 PWPDs (20 female and 20 male) Key informants.	In-depth interviews and key informant interviews.	Thematic data analysis was utilised.	WWDs in Uganda face the challenges of poor physical accessibility, negative attitudes of healthcare workers and long ques. MHS in Kampala are not disability friendly as they lack ramps, have narrow, corridors and staircases, beds scales and toilets that are accessible to WWDs. The health facilities in Kampala are ill-prepared to address the MHS needs of WWDs.
(77)	England	To examine the lived experience of pregnancy and childbirth in women with spinal cord injury (4).	410 women with physical disabilities	Survey questionnaire	Univariate frequencies and multiple regression analysis	WWDs can provide valuable information to the health professionals as they are the ones who are in the situation.
(71)	Nepal	To describe disabled women's access and experience of maternal health care in rural Nepal. To explore how disability affects the type of maternal care and support received.	27 WWDs. Seven health care workers	Semi-structured interviews	Thematic data analysis	Negative attitudes of health workers led to poor patient provider interaction and resulted in women with disabilities not utilising maternal services. On the other hand, when women experienced good attitudes and interaction access was enhanced . Some pregnant WWDs may not be aware of the services available, or the importance of seeking health care during pregnancy or delivery, and this may prevent them from seeking services.
(78)	United States of America	To better understand from women's point of view their satisfaction with care services during pregnancy, birth and postpartum.	Twelve WWDs	Semi Structured Interviews.	Thematic analysis	Most health care workers are unaware of how pregnancy affects physical disabilities. High risk obstetrician focus on high risk pregnancy not on disabilities and pregnancy hence more attention is given to the well-being of the baby and less attention is given on the physical condition of the mother except if it impacts on the well-being

						of the baby. Health care system was more comfortable paying for tests for high risk obstetric care than referring to physical and occupational therapy. Care was fragmented and time constraints can prevent providers from communicating with each other to obtain knowledge. Accessible infrastructure such as bathrooms when it is available and suited women with disabilities was well appreciated. Most information for baby care is not suitable for WWDs.
(79)	USA	To examine the "psychosocial behaviours of women with physical disabilities.	946 women,(504 WWDs and 442 ordinary women)	Mixed method; Qualitative interview; and Survey questionnaire.	Statistical analysis for the survey and thematic analysis for the qualitative data.	WWDs reported considerable difficulty locating physicians who were knowledgeable about their disability to help them manage their pregnancy. WWDs also faced the challenge of inaccessible infrastructure such as measuring scales.
(80)	Canada	To investigate the meaning of motherhood amongst women with physical disabilities.	32 WWDs	In-depth interviews and focus group discussions.	Thematic data analysis.	Negative attitudes towards WWDs led to insensitive care being provided to WWDs. Health care workers displaying positive attitudes paid attention to the needs of WWDs and it was greatly appreciated by the WWDs.
(81)	North West England	To explore the recent experiences of mothers with disabilities. To investigate midwives' knowledge, experience, expertise and attitudes	Eight midwives five WWDs	In depth Interviews.	Thematic data analysis.	Midwives' lacked skills to offer practical solutions for infant care to overcome the disabling aspects of women's impairment. Midwives did not discuss possible additional needs therefore the opportunity to ask for help was not afforded.

		towards both people and mothers with disability.				
(82)	England	To examine the lived experience of pregnancy and childbirth in women with spinal cord injury (4).	Eight WWDs	Semi-structured interviews	Thematic data analysis	WWDs can provide valuable information to the health professionals as they are the ones who are in the situation.
(83)	Island of Ireland.	To discover the personal meanings that pregnant women with a disability ascribe to their pregnancy, child-birth and motherhood experiences as these are perceived and constructed by them.	Seventeen pregnant women from the island of Ireland who had a physical, sensory and/or intellectual disability	In-depth interviews	Interpretive phonological approach (Thematic data analysis).	Maternity carers, fearing the impact of disability on a pregnancy and unsure as to how best to deal with it, had serious reservations and viewed the women as 'high risk'. WWDs in this study believed they were subject to discriminatory practices. Four were offered terminations, solely on grounds of their disability. For most health care workers, education in awareness and training in disability practices have been absent. Pertinent information and advice relating to labour and childbirth were lacking for WWDs. Lack of teamwork and consultation meant that referral to specialists in the relevant disciplines was infrequent, except in acute cases.
(84)	Ireland	To explore the perceptions of two multi professional teams in Irish hospitals as to how maternity services to these mothers can be improved.	19 health-care professionals from midwifery, social work and public health nursing were recruited.	Focus group interviews	Thematic data analysis	Overall, the findings indicated a predominantly medicalised agenda, with the professionals, accordingly, in control of maternity care delivery throughout. The health and social care professionals' inadequate and fragmented education and training in relation to disabilities left them unprepared and ill equipped to empathise with and to meet the many and varied requirements, holistically, of disabled pregnant women. There is an urgent need for the development of

						protocols for health service providers to ensure that pregnant women with disabilities have access to appropriate support and maternity treatment. Further research is required to ascertain a deeper understanding of how all relevant professionals such as G.P.s, midwives, obstetricians, social workers and public health nurses/health visitors make decisions with regard to caring strategies for women who are pregnant and for mothers who are living with a disability. An effective multi-disciplinary referral mechanism needs to be established to ensure continuity of care.
(85)	Sweden	To investigate midwives' knowledge of, attitudes towards and experiences of caring for women with intellectual disability (ID) during pregnancy and childbirth.	600 midwives	Questionnaire	Data analysis was performed using the IBM SPSS 20.0 software programme for Windows	Almost half of the midwives (47.8%) affirmed that they had never received any education about pregnancy and childbirth of women with ID. The majority of midwives stated that they did not have adequate knowledge relating to these women's needs, and they felt unsure of how to adapt and give advice to women with ID. One-third of midwives expressed that women with ID should refrain from having children.
(11)	United Kingdom	To obtain a picture of disabled women's recent use and experience of maternity care and to better understand the issues arising with different types of disability.	50,000 women	Structured questionnaire	Statistical analyses were carried out using STATA 11 software (STATA Corp LP, College Station, TX).	There is still limited understanding of the antecedent factors that prevent disabled women from accessing maternity services because of abusive partner behaviour. The timing and frequency of prenatal appointments is determined by personal, social,

						organisational and environmental factors.

Table 4: Summary of excluded articles for women with disabilities

Author and year	**Reasons for exclusion**
(86)	The study investigated antenatal health and demographic factors and their impact on the birth-outcomes of women with intellectual disability. Health and demographic factors as well birth outcomes were not the scope of this study as this study examines the health systems factors that impact on access to maternal services for women with disabilities.
(87)	The study did not meet full inclusion criteria as it is not a primary study. It is more of an opinion piece.
(88)	The paper focuses on interventions that improve birth outcomes and did not cover any health systems factors that impact on access to maternal services for women with disabilities. Thus it is not within the scope of this study.
(89)	This research study examined the risk of adverse pregnancy and birth outcomes amongst women with disabilities. It did look at any factors that impact on access to maternal services hence it was excluded.
(90)	The study did not meet full inclusion criteria as it not a primary study.
(91)	The research was excluded due to the fact that it is not a primary study, as a result it does to meet the full inclusion criteria.
(92)	This is not a primary study thus it did not meet full inclusion criteria.
(13)	The study did not meet full inclusion criteria as it is not a primary study.

Health system factors that impact on access to maternal services for women with disabilities

The results from the two systematic reviews are combined so as to give a more comprehensive picture of the health systems factors that facilitate or inhibit access to MHS for WWDs, over and above the factors raised for women in general. The major themes were the hardware systems which include service delivery, information systems, financing and medical products, vaccines and technology and human resources. The software systems emerged as subthemes of some of the hardware systems, for example, attitudes emerged as a subtheme for the human resources which is a component of the hardware systems. The fact that some elements of the software systems emerged as subthemes for elements of the hardware systems illustrate the complex relationship between the hardware systems and software systems as highlighted by (1).

Over and above the elements of hardware systems and software systems portrayed by the complex systems framework, another emerging theme was that of transport. Transport from the homes to the facilities was reported as a major barrier to access by many studies. Though, for description purposes the different hardware systems will be discussed as separate entities as most studies would focus on a single hardware systems element, they overlap and are interconnected to impact on access to maternal services. The complex interconnectedness and relationship of the different elements of the systems could be inferred because even in cases when studies highlighted multiple factors they utilised the silo approach instead of an interconnected approach.

Human resources

Human resources play a crucial role in access to MHS. In health care, human resources are defined as the different kinds of clinical (providers and support staff) and non-clinical (administrators and managers) staff responsible for public and individual health interventions (93). Health services including MHS depend critically on the quantity, skills and commitment of the human resources. Though midwives are central to the provision of MHS, studies reported that, gynaecologists, surgeon's doctors and laboratory technicians can also impact on access to MHS. The complex interplay of hardware and software systems elements as highlighted by (1) as well how this complex interplay impacts on dimensions of access as articulated by (2) was highlighted by the studies. While hardware systems elements included, numbers, skills and training, software factors were attitudes, perceptions, and values. The predominant issues with human resources in SSA were numbers, skills mix and competencies which impact on the

availability dimension of access and as well as attitudes which impact on the acceptability of services. The availability factors impacted on the accessibility factors (cost and distance) as well as acceptability factors (attitudes). Most of the studies that focused on WWDs from the developed countries' main focus were on software systems factors, that is, attitudes, beliefs and values as well as competencies issues.

Numbers and skills mix

Human resources with adequate skills should be available in sufficient numbers so that women access MHS with relative ease. However, studies revealed that acute shortages of human resources especially qualified MHS providers is an enormous challenge in sub-Saharan Africa. 12 of the 34 explicitly or implicitly highlighted the fact that shortages of health workers have an impact on access to MHS (43) (50) (33) (51) (20) (28) (42) (31) (48) (26) (25) A study on the availability and use of EmOC in four countries (Uganda, Kenya, Rwanda and Southern Sudan) found out that the entire North-Eastern Province of Kenya did not have a government obstetrician/ gynaecologist and that there had been no surgeons and midwives employed by the local health authorities anywhere in Southern Sudan for several decades since the civil war (50).

Shortages of skilled MHS providers result in poorly skilled service providers providing care to women especially in lower care facilities. These poorly skilled workers cannot deal with some of the maternity emergencies thereby impacting on the quality of services provided as well as financial accessibility of health as women have to travel longer distances to seek care from facilities that have skilled human resources. Lack of skills as a factor impacting on access is highlighted in six of the reviewed studies (42) (41) (39) (40) (47) (28) A study conducted in Tanzania to describe and compare the perceived quality of care and barriers to access it from both the users' and the providers' perspectives by (39), found out that, *"A woman in labour may attend the health centre or dispensary, but later she needs to go to the hospital. They can't do much. ...the clinical officer or nurse tells them to wait until the morning. So the patient can be left with no care for six hours, they may die"*. Lack of skills amongst health care workers in the lower care health facilities leads to mistrust of the health systems by the women. If women mistrust the health care system they will prefer to deliver at home in the hands of traditional birth attendants, family and friends or even by themselves.

In addition, shortages of health care workers result in work overload for the existing MHS providers and translate to long waiting times for the women. Six studies in this review highlighted how shortages of human resources hindered MHS providers from providing quality maternal services (29) (20) (31) (32) (25) (28). A study conducted in Tanzania found out that health care workers were overburdened with women coming for deliveries and hence were forced to work overtime. In order to deal with the pressure the health workers selected who to give attention and leave other women on their own without support (29). High caseloads for MHS providers result in challenges of managing cross infections amongst the women who would be giving birth as well as the new babies. The women will thus prefer to deliver under the care of traditional birth attendants who would give them individual care.

Notably, the impact of shortages of human resources on access to MHS to WWDs was documented by a single study (84). This study reports that, despite the fact that women with disabilities require more time during consultation and examination because of their special needs caused by their impairments, health care workers could not afford to give WWDs the amount of time they needed because of heavy workloads (84). A shortage of human resources was not explicitly or implicitly alluded to by the studies for WWDs in SSA. However, it can be concluded that WWDs in SSA's access to MHS will be impacted by shortages of health care workers as this has been highlighted as an important factor impacting on access to MHS in general. The situation for WWDs will be worse off as they require more attention as well as more time during consultation due to the comorbidity of pregnancy and disability.

Attitudes

Attitudes are an element of software systems that impact on acceptability of MHS. Acceptability of services refers to the ability of the workforce to treat everyone with dignity, create trust and enable demand for services (2). Twelve out of the 34 studies included for the women in SSA either explicitly or implicitly pointed out the fact that health workers attitudes impact on access to MHS (39) (46) (38) (40) (48) (56) (54) (55) (31) (51) (33) (25). In many cultures pregnant women are undervalued because of their age and gender. Therefore, the human aspect of the relationship between MHS providers and women is of vital importance. Most of these studies (11 of the 12 studies) indicated that negative attitudes were displayed in the form of; lack of respect, insults, refusal to assist, rudeness, neglect and physical abuse. While studies for women in general attribute the negative attitudes to various factors such as inadequate staff members to deal with women, lack of motivation, low pay, long working hours and lack of essential supplies which in turn overwhelms them emotionally as well as the power

relations between women and the human resources (29, 31, 35) , studies for WWDs reveal that WWDs are stigmatised because of the dominance of the medical model of disability which makes society including health care workers perceive WWDs as people who are incapable of getting pregnant and delivering normal babies.

A study exploring the challenges that people with disabilities (PWDs) face in accessing sexual reproductive health services (SRH) in Uganda reports that, "…*even you in your status you sleep with men and more so you accept to conceive?...*"(76) . The belief that WWDs cannot successfully deliver healthy babies is so dominant in MHS provision that at times health care workers advise the pregnant WWDs to abort and those who are not yet pregnant not to get pregnant (83) (85). Just as the reports from studies for women in general, when WWDs experience negative attitudes they share their experiences with other women who require MHS creating fear amongst WWDs. The fear of experiencing negative attitudes from health workers deters women from using the facilities (7).

Though some studies advocate for positive discrimination of WWDs, there are no conclusive results on the impact of positive discrimination for WWDs on access to MHS. Two studies for WWDs in SSA report that at times positive discrimination is practised in favour for WWDs for instance when they are examined first so that they do not have to contend with long waiting times (10) (7). However, the purpose of positive discrimination is a bone of contention. On the one hand, it is appreciated by WWDs and reduces their waiting times (10). On the other hand, it perpetuates further discrimination of WWDs as it prevents them from meeting and mixing with other women seeking MHS (7).

Competences

Training equips MHS providers with skills to provide quality MHS. However, this review, revealed that some MHS providers in SSA have insufficient training and thus cannot handle complications when they arise and also cannot provide quality care. Four of the studies under review hinted on the fact that training of healthcare workers has an impact on access (43) (44) (41) (45). A study conducted in Tanzania by (44) found out that factors that contribute to substandard or poor quality of care is lack of adequate training in handling maternal health complications, *"Training of staff is insufficient, the last training was in 2003 and only a few midwives were trained; now they are rotated or retired. No doctors were trained. We have asked for more training several times"* (44). Another study conducted in Ethiopia by (43) pointed out that midwives were

not trained in utilising magnesium sulphate and because magnesium was rarely used it was scarce in the pharmacies. When this drug was available it was expensive.

Given such a bleak scenario for women in general, the situation of WWDs will be worse off as they have to be assisted by healthcare workers who cannot only handle complications for general women but are also not familiar with their disability needs. This is affirmed by WWDs, midwives and nurses. In (85), a study of midwives' knowledge of, attitudes towards and experiences of caring for women with intellectual disability (ID) during pregnancy and childbirth, almost half of the midwives (47.8%) of the sample of 375 affirmed that they had never received any education about pregnancy and childbirth of women with ID. The lack of knowledge may lead to anxiety amongst health care workers making them feel uncomfortable on how to care for WWDs (81) (79). However, there are no studies that report on the impact of disability training of the service providers on the way they treat WWDs. Nonetheless, this study can infer from the findings of a study conducted in Ireland by (84) when they report that, *"…the difference between Hospital X and Hospital Y is the public health nurses… haven't training, whereas in hospital Z they have training…"* that training on disabilities may have a positive impact on how the health care workers relate with the WWDs. The other reports on health care workers who have a positive relationship with the WWDs are individualised and attribute this positive attitude to the fact that they have developed these skills through their constant interaction with their relatives who have disabilities.

Service delivery

Health systems should ensure that services are efficient, effective and accessible (17). The function of service delivery as a hardware system element deals with how delivery of care is organised and the ability of the system to provide quality services (17). For health systems to provide quality services, adequate health infrastructure and equipment should be available. In addition, there should be coordination of services at all levels of care. While studies for women in general highlighted issues of availability of infrastructure and equipment as well poor referral systems, studies for WWDs reported on inaccessibility infrastructure and equipment as well fragmented services as impacting on access to maternal services.

Availability of infrastructure

Infrastructure is vital in the provision of MHS. There in need for basic infrastructure such as water, electricity, telephones, labour rooms and theatres. Out of the 34 studies reviewed, seven studies highlighted that inadequate infrastructure hindered access to maternal services (43) (50) (49) (32) (51) (31) (28). The review also found out that it is not only the lower levels of facilities

that are not well resourced. Even in higher levels of care facilities' access to MHS is marred by inadequacies of the systems such as shortages of electricity, shortages of theatres, labour rooms, scarcity of essential equipment (43) (49) (32) (51) (31) (28). A study in Ethiopia also highlighted that due to shortages of labour rooms labouring women had to utilise a corridor space which housed an insufficient number of beds, leaving women to labour on the floor (43). These experiences have an impact on acceptability of the services as the privacy and dignity of women will be jeopardised resulting in women will preferring to deliver in the privacy of their homes.

In addition to inadequate infrastructure and equipment, WWDs also have challenges of inaccessible buildings and equipment as well as unavailability of assistive devices. Out of the 14 included studies, five highlighted that WWDs face the challenge of inaccessible infrastructure. These studies include, (94) (10) (84) (76) (95). Such challenges may deter WWDs to use the health care facilities. A study conducted in Uganda which interviewed 20 WWDs, 16 (80%) sighted poor accessibility of facility as a challenge to accessing MHS. Furthermore, lack of assistive devices for WWDs is clearly articulated by a Cameroonian study, "…*I do not have a wheelchair and I cannot sit on the bench. I have to sit on the floor*…" (10). The review also found out that studies reported that when equipment and facilities that are accessible to WWDs are provided WWDs were appreciative (10) (80). Assistive devices, physical accessibility and accessible equipment need to be provided for WWDs in order to enhance access to MHS for WWDs.

Referral systems

A referral is whereby a health worker at one level of the health system has inadequate resources such as drugs equipment and skills to manage an obstetric complication seeks assistance of another facility which has better resources. Challenges with referral systems in facilitating access were highlighted by more than a quarter of the studies (ten). Referral systems in SSA are imperative as first level of care facilities that are closer to the populations are mostly manned by poorly qualified birth attendants and are not well resourced in terms of infrastructure and equipment to provide comprehensive obstetric care. As a result, they have to refer complicated cases. The first challenge identified in the referral systems is that of poorly skilled health workers who fail to detect obstetric complications early enough leading to late referrals (45), (39). Late referrals imply that women will not access the needed interventions on time.

Furthermore, challenges to referral systems exist when the responsibility of writing the referral letters is assigned to particular individuals, for instance, doctors and clinical officers (38). Consequently, women fail to be referred to other levels of care when these individuals are not available given the shortages of doctors and clinical officers in lower levels of care. In addition, continuity of care for women from one facility to another is problematic as women are not properly stabilised before they are referred to another level of care as well as suboptimal care on the way from one level of care to another due to absence of a health professional to accompany the patient and inadequate details in referral letters (39) (36) (35) (48).

Another challenge of the referral system illustrated by the included studies is unavailability of ambulances to transport women from one level of care to another (51) (39). Unavailability of ambulances in health care facilities to transfer women from one level to the other result in an increase in the cost of services as they will incur the costs of hiring vehicles. As a result, patients will end up not going to the referral hospital as they cannot afford the transport cost to ferry the women from one level of care to the other (39). Contrastingly, a study by (45) reports that a systems wide approach to improving referral systems that entails targeted improved communication and transport opportunities, alternative financing to reimburse health providers for all services, training and equipment to improve clinical management has been reported as having resulted in an increase in access to obstetric interventions. This study illustrates that for a positive impact on access, health systems need to utilise system wide interventions and avoid the silo approach.

Unlike general women who require referrals to higher care facilities only, WWDs also require well-co-ordinated services amongst different health care specialists. This can be attributed to the fact that pregnant WWDs who need MHS may also need occupational therapy or mental health services. None of the studies on WWDs conducted in SSA ever reported on this aspect and the reason for this gap was not established. Poor coordination (fragmented approach to service provision) of the different specialists results in poor referral systems and in WWDs not receiving the care that they need. Impact of fragmented services for WWDs was explicitly or implicitly discussed by four studies (94) (77) (81) (83). A qualitative study to understand women's views and satisfaction with care services during pregnancy birth and postpartum reports of a woman who requested for physical therapy to reduce increased spasticity which occurred as an after effect of a caesarean delivery and the hospital could not locate the physical

therapy referral resulting in the woman being discharged when she was very weak (78). The report above may also imply that there is a scarcity in specialists for WWDs.

Medical products, vaccines and technologies

For MHS to be accessible, drugs and other medical technologies should be available in all health care facilities. Drugs, cost of drugs as well as availability of blood were raised as issues that impact in access to maternal services for women in general and the studies for WWDs did not speak about any issues regarding drugs and medical technologies. Lack of research which reports on the availability of drugs in studies for WWDs may be attributed to the fact that most of the studies were conducted in developed countries that have well stalked facilities. In this review, seven studies pointed out that unavailability of drugs had a negative impact on access to maternal services (28) (42) (41) (46) (29) (43) (47). In instances where MHS are provided for free shortages of essential drugs in hospitals imply that women have to buy needed medication out of their pockets from private pharmacies thereby impacting on the financial accessibility of MHS. Due to the high costs of medication, women end up buying only the medication that they think is important or that they can afford as indicated by the report *"...They wrote three different types of medicines for her and none was available in the hospital…It was not until the following day that I raised some money enough to buy only one of the medicines prescribed"* (46). Visiting the facility and not getting medication may also work as a deterrent for women using health facilities.

Financing

The main purpose of financing, as hardware systems, is to overcome the financial barriers of access to health care services. While studies for women in general, highlighted that out of pocket payments, user fee removal, income disparities between private and public sectors impact on access to MHS, studies for WWDs which were mainly conducted in developed countries spoke about the fact that social insurance schemes do not pay for other services that may need. The impact of financing on access to MHS was explicitly and implicitly explored by 12 studies for women in general (56) (46) (37) (34) (54) (35) (32) (19) (38) (50) (43) (26).

Out of pocket payments

Paying of fees out of pocket was shown to be a constraint for many poor women in SSA by ten of the studies that report on health care financing for women in general. Women give birth at home because they do not have the money required for services and if they are provided with the services they are not discharged until they have paid the money(38) (56) (34). The impact of user fees can be worse for WWDs as they also require other services over and above the

MHS required by other women. Though user fees have a detrimental effect on the users, they can also be a source of motivation on service providers (19). Furthermore, removal of user fees may not result in an improvement in access if other factors such as poor quality of services and informal fees are requested which may in some cases be higher than the normal fees are still in place.

The impact of user fees on WWDs who require services of occupational therapists and at times physiotherapists and mental health specialists who will result in additional costs over and above that the other women incur. In developed countries that have social insurance, the insurance schemes have been reported as not being prepared to pay for the other services that (78). The plight of WWDs in SSA is thus worse as there is no study that ever reported on the existence of a social scheme for WWDs though study found out that procedures such a caesarean section and blood transfusion are costly even for women in general.

Income disparities between the private and public sector

Another health care financing issue raised in some of the studies is the income disparities between private and public sector which results in skilled workers over flooding the private sector while the public sector struggles in obtaining skilled health care professionals. This issue illustrates the interconnectedness of the systems elements whereby health service organisation (public/private mix), also links to finance and in turn human resource availability. Poor salaries in the public sector in the midst of a high paying private sector may result in skilled health workers opting to work in the private sector which has high salaries. A study by (19) reports that in 1999, 75.2% of South African medical specialists worked in the private sector. The result is that there will be fewer medical specialists in the public sector where the majority of the population access maternal services. Thus poor women using the public sector are prone to experience poor quality of care due to shortages of qualified personnel in the facilities. This will impact on access MHS for both WWDs as well as women in general. Low salaries in the public sector may result in the charging of informal fees and resale of drugs, accepting of bribes by health care workers to substantiate their salaries which may be much higher than the formal fees (53) (52) (19). Such practices increase the out of pocket payments for women seeking care which may be beyond their reach thereby having a detrimental effect on access to MHS.

Information

Availability of information to both health care workers and patients is essential to ensure access to quality MHS. Of the seven studies that explicitly or implicitly reported on information as having an impact on access to MHS, six studies highlighted that women are not being given adequate information about concepts, procedures and interventions undertaken (31) (40) (54) (55) (43) (51). Though women expected health workers to give them guidance, seeking for information and showing lack of knowledge warranted reprimand from other nurses and midwives thus women end up not asking (51). The health professionals attribute lack of communication of procedures to heavy workloads as reported by (43), *"We just don't put it as a priority. Improving the disclosure and the like, we can do it if we have an adequate man power"*. On the other hand, provision of information during antenatal care check-ups or at home visits about the dangers of obstetric complications or the benefits of institutional delivery by MHS providers was found out to be a major facilitating factor for the perceived increase in the level of women's awareness. The increased awareness of women leads to an increase in the utilisation of MHS (26).

For WWDs, the challenge is not only of having procedures not being communicated to them but also the scarcity of information about the interaction of disability and pregnancy as well as information in accessible formats such as brail and sign language. This is not only a challenge for WWDs, but also for MHS providers dealing with pregnant WWDs as they do not have research or literature to guide them on how to handle WWDs (81). WWDs encounter inaccessible information, for instance, print and visuals such as signs, labels, videos, for WWDs who are visually impaired and speech for WWDs who have hearing impairments (83). Studies also revealed that there is a challenge of communication between health care workers and WWDs who have hearing impairments and mental health challenges. This could be a grave challenge in SSA where there are inadequate people who assist WWDs (76).

Transport

The complex systems framework seems not to highlight the importance of transport in a health system. In the SSA context, the transport network is very poor and most poor household do not have their own vehicles. Furthermore, transport is of particular importance for women with physical disabilities, as they may require modified vehicles. The issue of lack of transport as a barrier to accessing MHS is articulated by four studies (27) (39) (50) (55). Even in urban areas where there are better public transport facilities, during the night in most countries, public

transport is scarce. Commencement of labour is not predictable and at times it happens in the night when public transport is not available. The study by (27) reports that, of the 233 women who did not deliver in a health facility 11.2% gave lack of transportation as the major barrier of getting to the facility. Provision of accessible and affordable transport enhances access to MHS. A study conducted in Rwanda reports that an emergency transport team which facilitates access to transport in emergency case at lower cost for the members of the scheme resulted in increased access to MHS amongst the poor women in that community (50).

The challenges for transport are worse for WWDs is SSA because most of the public transport is not designed for WWDs, for instance, those who are wheelchair bound (10) (7). This is a challenge not only for WWDs but also for PWDs in the general population seeking health care services. However, the situation is worse for WWDs as they have to deal with the stigmatisation by other commuters because pregnancy amongst WWDs is view as an abnormality. Using public transport is also a challenge to WWDs as they will have to drop off at bus stops which may be far from the facilities. The ones who have cars also have challenges in finding the parking which is designated for them closer to the buildings (94). WWDs SSA have to contend with the challenges of availability of transport that other women experience as well as having transport which is suitable for their needs.

Discussion

To the best of the author's knowledge, this is the first systematic review that examines health systems factors that impact on access to MHS for WWDs in SSA. The findings of the study also confirmed that the overall capacity of health systems in SSA is weak and judging by the high MMR, is limited in the ability to adequately address the needs of women in general who need access to MHS and that this is likely to be even worse for WWD, given their additional needs. It was thus necessary to first obtain an overview of health systems factors for women general in sub-Saharan Africa, given the dearth of research on WWDs and MHS in this region, and then obtain further insight from a review of WWDs and their access from the global literature, to understand what additional factors should be considered from WWDs in SSA. The evidence also shows that the AAAQ framework (2) is appropriate for understanding the interaction of the different systems blocks impact on access to MHS for WWDs as it captures the impact of both the software and hardware systems. The AAAQ also facilitates the exploration of how the different systems elements impact on the different dimensions of access to MHS.

Nonetheless, it was a challenge to establish the factors that impact on access to MHS for WWDs with specific disabilities. Most studies focused more on women with physical impairments who require infrastructural and equipment adjustment to suit their needs and the factors impacting on women with visual, hearing and mental impairment were not so detailed. This may be due to the dominance of the medical model of disability which focuses mainly on curing or fixing the impairments hence the infrastructural adjustments work as way trying to normalise the people with disabilities. The few studies that alluded to visual and hearing impairments spoke about information provided being in inaccessible formats (83) (84). Thus, the care that the women with visual and hearing impairments require during labour and immediate post-partum which could enhance their access was not established. Furthermore, the studies that reported on factors impacting on women with mental impairments mainly focused on the fact that communication with these women was a challenge (81) (95). Women with visual, hearing and mental impairments mainly require software systems adjustments which are not considered by the medical model and due to the dominance of medical model have been neglected not only by the health system but also by researchers.

Despite the fact that the study sought to look at both the factors that hinder and those that enhance access, most of the studies in this review focused on the factors that negatively impact on access. It is also vital to understand the factors that enable access so that health systems could draw on them when designing interventions to improve access on MHS for WWDs in SSA. Furthermore, the complex systems framework by (1) was suitable in data extraction and in identifying the health systems factors that impact on access, which are human resources, service delivery, medical products, vaccines and technologies, financing, information as well as the software issues such as attitudes and beliefs. Though the complex systems framework illustrates that all elements of the hardware systems and the software systems are vital in a health systems, most of the included studies highlighted the impact of hardware elements on access to MHS. With regards to access to MHS for WWDs, focus on hard systems may be due to the dominant biomedical model of disabilities which focuses mainly on the technical, hard systems as an attempt to improve access to services for PWDs and negates the value of soft elements. In order to improve access to MHS for WWDs in SSA, there is need for a balance in the use of the two models of disability.

The complex relationship between software systems and hardware systems is mainly depicted in the studies for WWDs. The interplay of the software systems and hard system is reflected by the exclusion of the needs for WWDs at the macro level for most of the countries represented

in the study. A study conducted in Uganda reports that, "*Although suggestions have been made on the need to make health care facilities disability friendly, the Ministry of Health has not yet put [this] into consideration*" (76). It is thus difficult to meet the needs of WWDs at the facility level when it is not a priority for the nation as a whole. This implies that even though the included studies did not report much on the policy decisions and the context, there is need for consideration of the WWDs' needs from that level.

Furthermore, the complex interplay of software systems and hardware systems is reflected by studies that report human resources as a factor that impacts on access to MHS. Health workers' perceptions and attitudes towards WWDs result in them stigmatising these women. The stigmatisation of pregnant WWDs demotivates them from using MHS when they need them as it impacts on acceptability of services. This could be overcome by embedding training on handling pregnant WWDs with the midwifery training. Included studies revealed that even though some health care workers were not trained in handling pregnant WWDs, they displayed positive attitudes towards WWDs because they had relatives with disabilities (81) (84). This interplay of software systems and hardware systems is also illustrated in included studies for women in general. Shortages of human resources resulted in healthcare workers being overwhelmed physically and mentally impacting on their attitudes towards women (29) (44).

The review revealed that better access depends on the interconnectedness of health policies, strategies, plans that prioritise health needs and set out revenue sources and resource requirements on motivated and properly trained and remunerated health workers, infrastructure, drugs and equipment and good referral links (16) (96). This is well represented by (1), complex framework that illustrate that there is a complex and dynamic relationship between the hardware systems and software systems, which impacts on the interventions put in place. A study by (20) illustrates the interconnectedness of hardware systems and how health service organisation (public/private mix), also links to finance and how human resource availability impacts on access to MHS.

The fact that the relationships and interconnectedness of the different elements impact on access to MHS implies that interventions to improve access to MHS need to employ the systems approach so as address all the elements as well as considering the relationships of the different elements of the systems. Optimising the function of one element in isolation may not result in much impact on access as revealed by studies reporting on the impact of user fee removal (19). As a result, there is need for a systemic approach (holistic) in addressing the

challenges that WWDs face in accessing MHS. Such a systematic approach may ensure that even the PWDs in the general population have an improved access to health care services.

While studies for WWDs from developed countries also focused on the lack of interconnected services for WWDs requiring MHS, this was not reported by any of the studies in SSA. Pregnant WWDs requiring MHS will also require services that deal with their peculiar disability as pregnancy may impact on the disability or the disability may impact on the pregnancy (92). Thus, there is need for these MHS services to be integrated and interconnected with other disability services for WWDs. However, the main focus for the studies for WWDs in SSA was on the systemic inadequacies such inaccessible infrastructure and equipment, negative attitudes of health care, lack training on how to handle pregnant WWDs who need MHS (7) (10)(76). Due to the fact that delays in referrals due to lack of ambulances and divisions of roles and responsibilities of health care workers are highlighted by studies for women in general, it can be concluded that if the referral system or women in general is bad then that of WWDs who may require services from other providers other than MHS will be worse off.

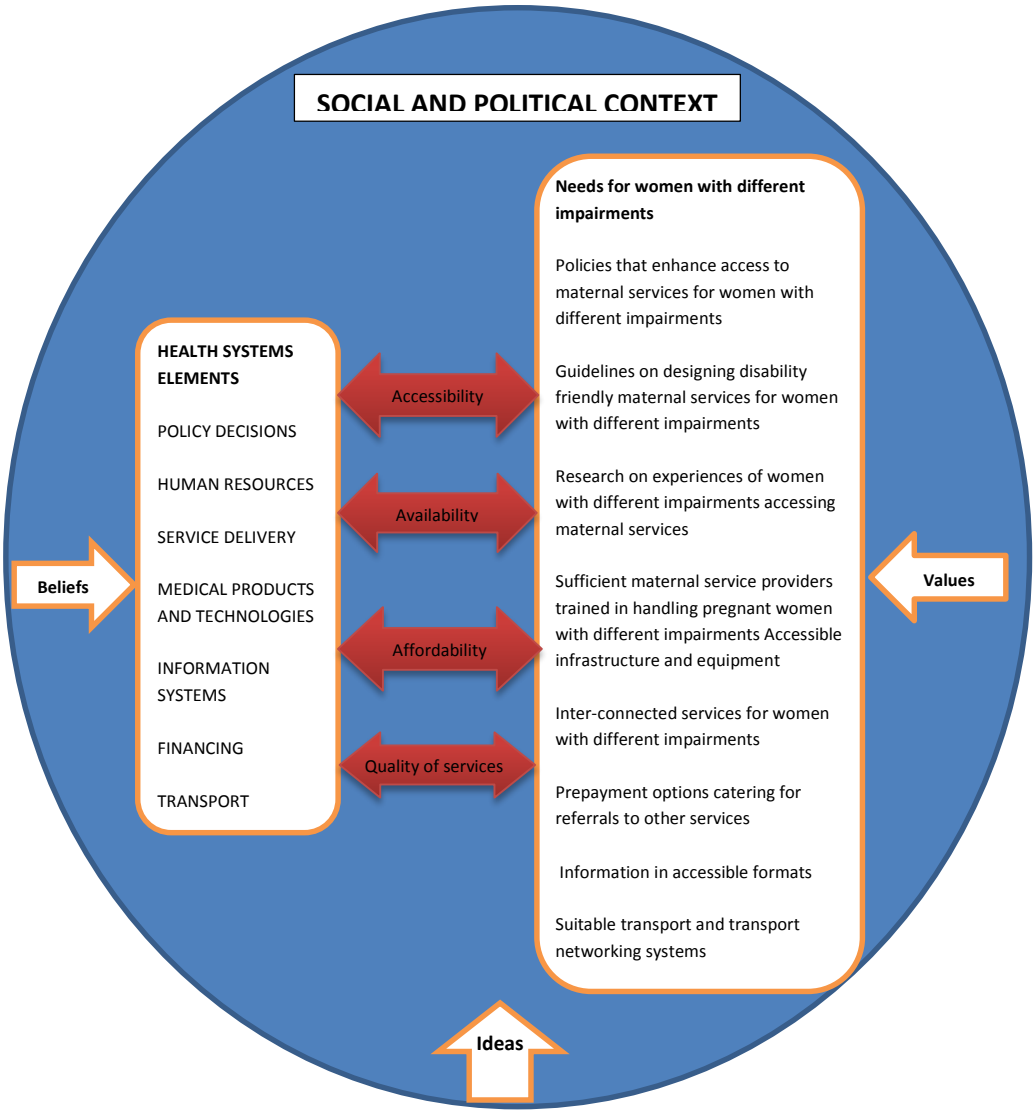
Lack of transport emerged as a major factor that hindered access to MHS (27) (39) (50) and (55). Though transport is not included as one of the hardware systems in the WHO and Sheik frameworks, transport should be considered as one of the essential hardware elements that impact on access to MHS for women in general and WWDs in SSA. Transport is of particular importance for women with physical disabilities, as they may require modified vehicles (7) (10). Several studies reported that women in general delivered at home even though they intended to deliver at health care facilities due to lack of transport (39). The fact that women have to find their own transport to ferry them to the health care facilities also increases their costs thereby impacting on the affordability of MHS especially for WWDs who are discriminated at many levels.

This study reveals that there is little research on the systemic factors that impact on their access to MHS for WWDs both in developed and developing countries. Between the year 2000 and 2014 only three studies documented systemic factors that impacted on access to MHS in SSA (7) (10) (76). The studies are localised and have small sample sizes such that generalisability of the findings is a problem. This may be an indication that the MHS needs for WWDs are neither well understood nor prioritised in SSA. However, WHO estimates that the population of PWDs will increase due to violent conflicts, hunger and increase in chronic diseases (9). In

addition, many women are being disabled during childbirth in SSA, thereby increasing the number of WWDs. Despite all this information, due to the dominant medical belief, there are no statistics of WWDs requiring MHS in SSA. This implies that more research on WWDs accessing MHS in needed in SSA.

The fact that the study only included studies that are published in English can be considered to be a limitation. There is a possibility that if studies published in other languages are included, new issues may arise especially considering that in SSA there are Francophone countries (French speaking counties) as well as Lusophone countries (Portuguese speaking countries). As a result, it is imperative that future reviews consider studies published in other languages. Furthermore, the different search terms could have yielded different results. The search terms utilised were focused mainly on articles that addressed health systems factors. Search terms such as obstetric services yield more articles that focused on the clinical aspect of MHS which was not the focus of this study. Though the inclusion and exclusion criteria was set before hand, objectivity of the included and excluded studies may have been jeopardised. Figure 5 below summaries how factors that impact on WWDs can be explored utilising a systems approach.

Figure 4: Assessing health systems factors impacting on access to maternal services for women with disabilities: A systems approach.



A systems approach considers all the factors that facilitate or hinder access to MHS. For health systems to develop disability friendly MHS, they need to have; policies that enhance access to MHS for women with different impairments, guidelines on designing disability friendly MHS for women with different impairments, research on experiences of women with different impairments accessing MHS, sufficient MHS providers trained in handling pregnant women with different impairments, accessible infrastructure and equipment, inter-connected services for women with different impairments**,** prepayment options catering for referrals to other services, information in different formats to cater for varying impairments and suitable transport for women with physical impairments. This can be achieved through identifying the

health systems hardware and software elements that impact on access to MHS for WWDs. Elements of the health systems could be examined as individual elements as well as considering how their complex inter-relationships impact on the four dimensions of access. Values, beliefs and attitudes play a critical role in the provision of MHS for WWDs. It is important that strategies that lead to transformation of these software systems within and beyond the system be put in place.

Conclusion

A systems approach to understanding the factors that impact on access to MHS for WWDs in SSA resulted in a comprehensive understanding of the factors that impact on access to MHS for WWDs. In as much as the study intended to establish factors that either enhances or hinder access, most of the studies in this review focused on the factors that hinder access. While studies from SSA highlighted that hardware systems are integral in access to MHS, studies for WWDs revealed that values, beliefs and attitudes play a critical role in how the health systems is organised and prepared for the provision of MHS for WWDs. In this regard, the dominant belief is that women with any kind of disability are not capable of becoming pregnant and deliver healthy babies. This is clear illustration of the interplay between software systems and hardware whereby the software systems detect the presence of the operations and availability of hardware systems, At the individual component level, it can be concluded that human resources, service delivery, information systems, financing and medical technologies impact on access to MHS in different ways.

The review also revealed that these elements are interconnected and the interplay between these different elements may hinder on enhance access to MHS. The human resource element was shown to be interconnected with financing as well as services delivery and the software systems elements. Nonetheless, most of the included studies focused on women with physical disabilities that require structural modification as well as equipment modification but fewer studies focus on the needs of women with visual, hearing and mental impairments who have their own special needs that may be more of software systems. In order to improve access to MHS for WWDs, there is need for the utilisation of a systems approach to the interventions. While the study focused on access to MHS for WWDs, the health systems factors identified may also impact on access to health care services for the PWDs in the general population. The short comings of health systems of SSA indicated in this study highlight the fact that the health systems of SSA are general weak and are incapable of delivering quality MHS for women in

general and the plight of WWDs may be worse as they have additional needs to those of general women.

List of abbreviations

AAAQ	Availability Acceptability Affordability Quality of health
CINAHL	Cumulative Index of Nursing and Allied Health
CASP	Critical Appraisal Skills Programme
EmOC	Emergency Obstetric Care
FGD	Focus group discussion
MHS	Maternal Health Services
PWD	People with disabilities
SSA	sub-Saharan Africa
WHO	World Health Organisation
WWDs	Women with disabilities

Competing interest

The author declares that she has no competing interests.

Author's contribution

Doreen Mheta is responsible for the conception, design, database searches, data extraction, analysis and interpretation of the articles, and the drafting and editing of this review.

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Part D: Appendix- Instructions for authors

Reproductive Health

Instructions for authors

Research Articles

Submission process | Preparing main manuscript text | Preparing illustrations and figures | Preparing tables | Preparing additional files | Style and language
See 'About this journal' for descriptions of different article types and information about policies and the refereeing process.

Submission process

Submission process

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- Title page
- Abstract
- Additional non-English language abstract
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- Background
- Methods
- Results and discussion
- Conclusions
- List of abbreviations used (if any)
- Competing interests
- Authors' contributions
- Authors' information
- Acknowledgements
- Endnotes
- References
- Illustrations and figures (if any)
- Tables and captions
- Preparing additional files

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For reporting standards please see the information in the About section.

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- indicate the corresponding author

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The Abstract of the manuscript should not exceed 350 words and must be structured into separate sections: **Background,** the context and purpose of the study; **Methods**, how the study was performed and statistical tests used; **Results**, the main findings; **Conclusions**, brief summary and potential implications. Please minimize the use of abbreviations and do not cite references in the abstract. **Trial registration**, if your research reports the results of a controlled health care intervention, please list your trial registry, along with the unique identifying number (e.g. **Trial registration**: Current Controlled Trials ISRCTN73824458). Please note that there should be no space between the letters and numbers of your trial registration number. We recommend manuscripts that report randomized controlled trials follow the CONSORT extension for abstracts.

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This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

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OnlineFirst chapter in a series (without a volume designation but with a DOI)
Saito Y, Hyuga H. Rate equation approaches to amplification of enantiomeric excess and chiral symmetry breaking. Top Curr Chem. 2007. doi:10.1007/128_2006_108.

Complete book, authored
Blenkinsopp A, Paxton P. Symptoms in the pharmacy: a guide to the management of common illness. 3rd ed. Oxford: Blackwell Science; 1998.

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Doe J. Title of subordinate document. In: The dictionary of substances and their effects. Royal Society of Chemistry. 1999. http://www.rsc.org/dose/title of subordinate document. Accessed 15 Jan 1999.

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ISSN International Centre: The ISSN register. http://www.issn.org (2006). Accessed 20 Feb 2007.

Dataset with persistent identifier
Zheng L-Y, Guo X-S, He B, Sun L-J, Peng Y, Dong S-S, et al. Genome data from sweet and grain sorghum (Sorghum bicolor). GigaScience Database. 2011. http://dx.doi.org/10.5524/100012.

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