Universitat Autònoma de Barcelona

Midwifery in low resource environments. Challenges and opportunities in maternal and reproductive health service provision

Anna Maria Speciale

AUTONOMOUS UNIVERSITY OF BARCELONA

Midwifery in low resource environments. Challenges and opportunities in maternal and reproductive health service provision.

DOCTORAL THESIS, DOCTORATE IN DEMOGRAPHY

DEPARTMENT OF GEOGRAPHY
CENTRE FOR DEMOGRAPHIC STUDIES

Anna Maria Speciale, author

Montserrat Solsona, director

JUNE 2016

CONTENTS

ACKNOWLEDGEMENTS

I would like to begin this thesis by expressing my sincerest gratitude for the people and institutions who have made this possible as well as, the many people who have stood by my side during this process. The African proverb “It takes a village to raise a child.” comes to mind. I have had an amazing village of supporters and I am forever grateful.

To begin I would like to thank all of the personnel from the Centre d’Estudis Demogràfics (CED) for the years of support and guidance. In particular I would like to thank Anna Cabre, for accepting my phone call years ago when I was “curious” about demography and providing me the opportunity to enter into this institution. Over the years she has offered me endless guidance and shown unending flexibilities as I merged my previous passions with demography. I would also like to thank Albert Esteve, the CED’s current director who has offered me the opportunity to continue this course of study and has always provided a great example to follow. To follow, I would like to thank Montserrat Solsona, my thesis advisor and Director of the doctoral program. There are not enough pages to list all of the reasons why I would like to thank Montse. She has been more than an advisor to me, but a true mentor, advocate and friend. I can’t thank her enough for always believing in me.

Also in the CED I would like to thank Soco Sancho, I cannot count the number of time she has assisted me as I struggled to understand paperwork and administrative processes and Herminia Pujol for her academic administration support. I am also grateful to Xavi, for the technical support, as well as Toni for all sorts of support and always having a kind word. I’d like to thank Eulalia (and Toni) for my early days of intercanvi, English to Catalan.

I am incredibly grateful to my two “hermanas del CED”, Carolina and Doris, this experience would not have been the same without them. Their guidance and friendship is a gift that I will have forever.

I would also like to thank Cristina Giudici from La Sapienza in Roma. Her knowledge, enthusiasm for statistics and general are very much appreciated and made my time at La Sapienza invaluable.

I would like to thank Jim Campbell and Petra ten Hoope-Bender, two amazing mentors for me. I am grateful for their kindness and support. I am honored that they have shown so much faith in me over the years. They have both provided me with strong role models as well as amazing opportunities.

I would like to thank my many friends in Barcelona who have supported me over the years with kind words, friendship and many times a place on their couch during my returns to Barcelona to work on this PhD. I came to Barcelona for a PhD and left with an adopted family of amazing people.

I would like to express gratitude to my family, including my aunt Susan for proof-reading this thesis, it was a tremendous help. I would like to thank Marco, my favorite demographic event thus far. He reminds me to be curious and to believe everything is doable and anything is possible. Finally, I would like to thank my mom and my sister. They are two of the strongest women I know and my respect and admiration for them is unending. My passion for women’s health in underserved areas is undoubtedly a

gift from my mother, who has taught about compassion, love, feminism, social justice, hard work and strength, as well as telling me my birth story a million times when I was little.

Thank you very much.

LIST OF ABBREVIATIONS

AAAQ	Availability, Accessibility, Acceptability, Quality
ACNM	American College of Nurse Midwives
ANC	Antenatal Care
ANC1	Antenatal Care1
ANC4	Antenatal Care 4
BPHS	Basic Package of Health Services
CAC	Comprehensive Abortion Care
CBE	Competency Based Education
CEDHA	Center for Educational Development in Health, Arusha
CEmONC	Comprehensive Emergency Obstetric Neonatal Care
CHERG	Child Health Epidemiology Reference Group
CHN	Community Health Nurses
CME	Community Midwife Education
DVD	Digital Video Disk
eLRP	eLearning (electronic Learning) Resource Package
EPHS	Essential Package of Health Services
EPMM	Ending Preventable Maternal Mortality
FTE	Full Time Equivalent
GHWA	Global Health Workforce Alliance
HBCI	High Burden Country Initiative
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HRH	Human Resources for Health
HRRH	Human Resources for Reproductive Health
ICM	International Confederation of Midwives
ICT	Informational and Communications Technology
ICS	Instituto de Cooperacion Social
IHS	Institute of Health Science
IT	Informational Technology

IUD	Inter-uterine Device
KNMTC	Kumasi Nursing and Midwifery Training Center
LAM	Lactational Amenorrhea Method
LCD	Liquid Crystal Display (type of television or display monitor)
LiST	Lives Saved Tools
LTFP	Long term family planning
MDG	Millennium Development Goals
MICS	Multiple Indicator Surveys
MMR	Maternal mortality ratio
MoHSW	Ministry of Health and Social Welfare
MoPH	Ministry of Public Health
MSF	Midwifery Service Framework
MVA	Manual Vacuum Aspiration
OSCE	Objective Structured Clinical Examination
QMNC	Quality Maternal Newborn Care
RMH	Reproductive and maternal health
RMNH	Reproductive, maternal, Newborn and child health
SBA	Skilled Birth Attendance
SDG	Sustainable Development Goals
TFR	Total Fertility Rate
UCLA	University of California Los Angeles
UHC	Universal Health Coverage
UN	United Nations
UNAIDS	United Nations AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations International Emergency Child's Fund
WHO	World Health Organization

TIMELINE OF IMPORTANT PUBLICATIONS, INITIATIVES, PROGRAMS AND EVENTS

Year	Publications, initiatives, programs, occurrences
1987	Safe Motherhood Initiative
1994	Three-delay model was developed by Thaddeas and Maine
2000	Millennium Declaration, Millennium Development Goals
2003	Publication of the first Countdown to 2015
2006	Global Health Workforce Alliance (GHWA) was formed
2007	Taskforce for Scaling up Education and Training was formed
2009	Child Health Epidemiology Reference Group (CHERG) began
2010	United Nations Secretary General began the Global Strategy for Women's and Children's Health
2010	Trends in Maternal Mortality 1990-2010 Report
2010	Every Woman, Every Child Launched
2010	ICM Essential Competencies for Basic Midwifery Practice first version published (amended 2013)
2010	ICM Global Standards for Midwifery Education first version published (amended 2013)
2011	Greentree meeting, inception of High Burden Country Initiative
2011	Publication of the first State of the World's Midwifery
2012	Every Woman, Every Child: from commitments to action. The First Report of the independent Expert Review Group (iERG)
2012	Sixth WHO, UNICEF, UNFPA and The World Bank Maternal Mortality report
2013	World Health Organization Partnership for Maternal Newborn and Child Health meeting to identify key policies and tracer indicators that monitor quality of services for maternal reproductive, child and newborn health services

2014	State of the World's Midwifery
2014	Framework for Quality Maternal Newborn Care (QMNC)
2014	Publication of Lancet Series on Midwifery
2015	End of Millennium Development Goals (MDGs)
2015	Sustainable Development Goals (SDGs)
2015	Midwifery Services Framework
2015	Ending Preventable Maternal Mortality

LIST OF FIGURES

LIST OF MAPS

LIST OF TABLES

INTRODUCTION

It would be impossible for any one document, or doctoral thesis to be able to propose the solution to the maternal and reproductive health challenges in low resource countries. What´s more, it is clear that there is no single solution. Nonetheless, it can be agreed that a strong, capable, quality maternal and reproductive health workforce, is an important component in the effort to improve maternal and reproductive health in low resource countries. Globally, there is great variation in the titles and types of cadres that attend to women and provide maternal and reproductive health services. However, in recent years discussions regarding the maternal and reproductive health workforce have come to focus on the midwifery workforce, and midwives have been identified as the key cadre of health workers for the improvement of reproductive and maternal health in the post 2015 agenda (WHO, 2016).

The national requirements for midwifery vary greatly across countries as do scopes of work and professional responsibilities. At an international level, midwifery is supported by the International Confederation of Midwives (ICM), an organization that seeks to provide coherence and non-authoritative regulation of midwifery internationally. The ICM sets international standards for midwifery education and has produced lists of competencies that midwives across the globe are expected to have (WHO, 2016; ICM, 2013). It is estimated that midwives that are educated in accordance with the ICM´s international standards can provide 87% of the essential interventions that are generally needed by women and newborn (UNFPA, ICM and WHO, 2014). A recent analysis of 461 systematic reviews showed that 56 outcomes including “maternal and neonatal mortality, neonatal and maternal, preterm birth and psychosocial outcomes” can be improved by interventions that are part of the scope of practice of midwifery (Refrew, et al., 2014).

The aim of this thesis is to investigate the quality of midwifery service provision, as well as actions for the improvement of the current level of quality and to a lesser extent availability. In this thesis I will present the challenges that midwifery and midwifery services face in low resource countries. It is important to note that midwifery service and midwifery care provision are used interchangeably in this thesis, simply meaning the (clinical) care or service provided by midwives. I will detail the findings from original midwifery service provision studies and midwifery training studies, presented as case studies created from three low resource countries, Afghanistan, Ghana and Tanzania. On the global health stage, there

has been a call for the establishment of a greater literature base regarding midwifery (ten Hoope-Bender, et al., 2014). It is my hope that this thesis may in some way contribute to meeting this need for midwifery-focused research, particularly midwifery-focused research completed by midwives.

The Millennium Development Goals

In 2000, 189 member nations met at the United Nations headquarters in New York to sign the Millennium Declaration, a declaration of the collective priorities for peace, security, the environment, poverty reduction and human rights. From this declaration and future meetings, the Millennium Development Goals (MDGs) were born. The MDGs addressed key areas for development and set benchmarks to be reached in 2015 (Unicef, 2005). Goals 4-6 are health related, with MDG5 specifically addressing maternal health, specifying: (A) a reduction in maternal mortality by three quarters between 1990 and 2015 and (B) universal access to reproductive health care by 2015 (WHO, 2015). While an understanding of the larger context of the MDGs is relevant, for the purpose of this thesis a more profound appreciation of MDG5, is most important.

Progress in reaching MDG5 has been very mixed and Sub-Saharan Africa has lagged behind other regions. In 2006, Richard Horton, of the Lancet, sent out an urgent call to action stating that progress in Sub-Saharan Africa had stalled as the proportion of births receiving skilled birth attendance (SBA) had remained largely unchanged since 1990. (Horton, 2006). A 2012 article by Mbizvo and Say also spoke of unequal progress and highlighted the need for concern regarding Sub-Saharan Africa, citing a decline in maternal mortality ratio (MMR) in Asia of 4% annually, while only .5% annual decline in Sub-Saharan Africa (Mbzivo and Say, 2012). What's more, the number of births in Sub-Saharan Africa has continued to increase by 1.5% each year. (Mbzivo and Say, 2012). It is estimated that between 2011 and 2015, more than one hundred million women will have unattended births in Sub-Saharan Africa and South Asia. (Crowe, Costello and Pagel, 2011)

At the time of writing this thesis, 2016, has just begun and final notes and tallies of progress will be created. It is clear that many low-resource countries will not meet their goals. As a response to the unfinished progress United Nations (UN) agencies have created the Sustainable Development Goals (SDGs) (UN, 2015). The SDGs will be covered in detail in the final chapter of this thesis.

Post 2015 Global Health Agenda

It has become widely recognized that uneven progress across regions and within countries has contributed to the inability to meet the MDG goal of reducing maternal mortality by three quarters. In recent years the focus of the global health community has turned to the post 2015 agenda and to incorporating lessons learned in the maternal and reproductive health MDGs. Less attention is being given to what interventions save lives and more attention is being given to how to make sure that all who need these interventions are able to acquire them.

The Sustainable Development Goals (SDGs) have been developed as a continuation of the work started in the Millennium Development Goals. For the next fifteen years countries will use the SDGs as guidance toward priority actions. The key areas for the SDGs include: people, planet, prosperity, peace, partnership.

In the Post-2015 agenda there is a great human rights focus, looking at health care as a basic right for all humans, and maternal health care as a right for all women. Currently the most widely accepted vehicle for carrying this concept through is Universal Health Care (UHC). While UHC began as a vague concept that lacked global agreement on its definition and what it should entail (Clift, 2015; O'Connell, Rasanathan and Chopra, 2013), a greater consensus has now been reached. UHC is defined as "the desired outcome of health system performance whereby all people who need health services (promotion, prevention, treatment, rehabilitation and palliation) receive them, without undo financial hardship" (Clift, 2012) UHC steps beyond the medical paradigm to also address health care in terms of human rights and equality. It is expected that the attention to inequality will be particularly relevant to the most underserved groups such as women and children, (Quick, Jay and Langer 2015) providing an opportunity for great improvement in women´s health services (Quick, Jay and Langer 2015).

UHC is largely based on the concept that a minimum service package should be available to the entire population as needed (UN, 2014). This is important for improving reproductive and maternal health as related services are recognized as fundamental to UHC packages. Similarly, the removal of financial barriers which is inherent to UHC, will be positive for maternal and reproductive health as women generally have less access to money in low and middle resource countries (Quick, Jay and Langer 2015). UHC is not a new concept as countries such as Afghanistan, Mexico, Thailand and Rwanda have begun implementing universal coverage of some basic services since the late 1990's, early 2000's. Studies show

important improvements for these countries in areas of maternal and reproductive health (Quick, Jay and Langer 2015). Afghanistan´s progress will be discussed in greater detail in chapter three of this thesis. While it continues to face large challenges in maternal and reproductive health, it is undeniable that great progress has been made since the beginning of its Basic Package of Health Service in 2003 (Transitional Government of Afghanistan, 2003) and the beginning of its education program for community midwives in 2002 (UNFPA, 2014).

In addition to the quest towards UHC, the post 2015 agenda for maternal health includes targets for Ending Preventable Maternal Mortality (EPMM) by 2030. A key factor of the EPMM strategy includes the integration of maternal and newborn health services. Newborn health goes beyond the scope of this thesis, but it is important to note that in the post-2015 agenda, it will be invariably linked to maternal and reproductive health (WHO, 2015). The framework for EPMM focuses on "implementation effectiveness" which poses a paradigm shift in maternal and reproductive health development (WHO, 2015). In this paradigm programs should be evaluated for effectiveness of care, programming and service delivery. Like UHC, efforts toward EPMM must be taken from a human rights approach, viewing maternal, (newborn) and reproductive health as rights for all (WHO, 2015). EPMM will be covered in greater detail in the conclusions of this thesis.

The provision of a Basic Package of Maternal and Reproductive Health services under UHC and the SDGs and working towards EPMM will require a greater number of service providers (Quick, Jay and Langer, 2015). In particular midwives have been identified as one of the most cost-effective cadres to be tasked with addressing maternal and reproductive health in low resource countries in the post 2015 agenda. However, as will be a reoccurring theme in this thesis, increasing the number of midwives is only a small piece of the solution (Quick, Jay and Langer, 2015).

Global Midwifery

Internationally, it has been noted that one of the greatest contributors to the ill-health state of maternal and reproductive health in low resource countries is the health workforce shortage. Despite the inconsistency in the composition of this workforce, the recognized shortage of the midwifery workforce is widespread. Ann Stars of Family Care International cited by Anderson (2010) specified that as little as 3%

of the global workforce (midwives) are being asked to contend with half of the world's maternal deaths (Anderson, 2010). The 2014 State of the World´s Midwifery report that included survey results from 73 low and middle income countries found that while these 73 countries are responsible for 92% of maternal and newborn death and stillborn globally, they only have 42% of global midwifery and nursing work force (UNFPA, ICM and WHO, 2014). It has been estimated that of the 75 highest need countries, only seven have sufficient health workforce to achieve high coverage of essential interventions (Bryce et al., 2014). However, the 2014 State of the World´s Midwifery report surveyed 73 of the same 75 Countdown countries and per their analysis based on 46 key interventions for sexual, reproductive and newborn health, even fewer (four) countries had the ability to address their need (UNFPA, ICM and WHO, 2014).

In June 2014, the Lancet produced a series on Midwifery. This was the first journal series of its kind from a journal of the Lancet´s caliber (45.217 impact factor in 2014). One of the Lancet´s articles will be addressed in greater detail in the conclusion of this thesis. The series aimed to call attention to the field of midwifery and explore the role of midwives globally in the care of women and newborns. It also highlight the role of midwives in the post-2015 agenda and their potential to pick-up on the unmet challenge of MDG 5 and to meet the healthcare needs of women and children in low, middle and high resource countries. It is anticipated that the series will begin a wave of maternal health literature that recognizes the key role of the midwife in maternal and reproductive health across countries of all economic levels.

This thesis aspires to contribute to the greater body of literature that supports midwifery, midwives and women and families everywhere. As stated by Richard Horton, editor of the Lancet, "Midwifery therefore has a pivotal, yet widely neglected, part to play in accelerating progress to end preventable mortality of women and children.", or more simply to quote the White Ribbon Alliance "the world needs midwives more than ever"(Mc Conville, 2014).

Initial research question and Hypothesis

In coming years maternal and reproductive health services will increasingly be provided by midwives. Midwives have been called on to be the main cadre addressing the maternal and reproductive health problems of low-resource countries. (Horton et al., 2014). However, there is currently a global midwifery shortage. While an international movement to increase the number of midwives has begun across low-

resource countries, increased attention is being given to the quality of the current midwifery workforce. This thesis focuses on the following research question: ***Are midwives in low resource countries providing the quality maternal and reproductive health services that are needed? What gaps exist? What training improvements will better prepare midwives to provide quality maternal and reproductive health services?***

I hypothesize that an essential first step is to understand the current challenges and deficits in service provision and training. This requires specific mixed method analysis. Once challenges are understood, interventions to improve the quality of midwifery services must include improved training systems for both student midwives and midwives that are currently working.

Objectives of the thesis

The objectives of this thesis include:

1. Demonstrate that the development of a quality midwifery workforce and the execution of quality midwifery service provision is impacted and challenged by multiple factors.
2. Understand what mechanisms in the midwifery education system require reinforcement for the production of quality midwives.
3. Demonstrate that midwifery education can be improved and the quality of the midwifery service provision can be increased through a systemic intervention approach that is multifaceted and takes into consideration both pre-service and in-service learners.

Structure of this thesis

In order to achieve the objectives of this thesis the first chapter provides a detailed discussion of the current context of maternal and reproductive health in low resource countries. This chapter presents current data regarding maternal and reproductive health as well elaborating on current monitoring and reporting mechanisms that are used as references for maternal and reproductive health data in low resource countries. The use of maternal mortality as the most commonly used indicator for maternal health and the implicit shortcomings of flatly associating surviving birth with good health is also

discussed. Additionally, recent estimates of regional progress towards the maternal and reproductive health related Millennium Development Goals (MDGs) are presented and reveal important regional disparities.

As the first chapter continues, an analysis and literature review of many factors that impact maternal and reproductive health in low resource countries is presented. Beginning with the demographic concepts of fertility and birth interval, an analysis of data and contributing factors is provided. Reproductive health concerns including access to family planning and safe legal abortion are also addressed within the context of low resource countries. Additionally, an analysis of factors that impact obstetric health including access to antenatal care, skilled birth attendance and place of birth is included. Finally, concepts relating to care and service provision such as coverage, access, quality and inequity are explained. Quality of service provision is of particular importance to this thesis and therefore the Framework for Quality Maternal Newborn Care (FQMNC) is explored in this chapter of the thesis. An explanation of the current policy environment regarding maternal and reproductive health in low-resource countries concludes this chapter through an analysis of Universal Health Care (UHC) and the Ending Preventable Maternal Mortality Initiative (EPMM) and their prominence in the post-2015 (post- MDG) political agenda. An understanding of the current policy environment is important as it provides an understanding of the ultimate goal to be achieved: avoiding senseless maternal deaths and improving maternal and reproductive health through quality service provision for all women. Finally a review of global midwifery and key related concepts closes the first chapter.

The second chapter of the thesis contains a description and explanation of the work presented in this thesis. Each of the three research case studies is presented providing key information and indicators on each of three countries featured in the case studies. The case studies all involve original data and this chapter provides relevant information regarding study design, methodology and data analysis. Additionally, key terms and concepts are defined in this second chapter. Chapter two serves as a guide to the rest of the thesis.

Chapters three, four and five are the case studies of this thesis, and as previously stated, represent original research conducted in-country. Chapter three is a case study highlighting an analysis completed in Afghanistan in 2012 and presents the Tanahashi framework conducted with a modified Delphi approach. This research activity was conducted in 2012 with a group of key stakeholders as an analysis of

barriers and bottlenecks that detract from the effective coverage of midwifery services in both rural and urban settings. Chapter four is a case study from Tanzania and provides further insight into the actual level of quality of midwifery care provision. The original field research presented in this chapter was completed in two zone's of Tanzania's Lake region, a rural region, and included an evaluation of the skill level of midwives that had graduated between the years 2010-2013. The study also examined the training system for midwives, seeking to identify areas for improvement and provide potential explanation for the actual skill level of the recent graduates. Chapter five is a case study from Ghana, exploring the outcomes of a program that included a system approach to midwifery training improvement. The interventions were included skills updates and career path building for instructors, infrastructure changes within the schools (the creation of libraries, computer labs, instructor offices), as well as the creation of simulation laboratories, training in teaching and coaching skills, and an eLearning Resource Package.

This thesis concludes with a review of the case studies highlighting how they build upon one another to present a more complete picture and to ultimately test the hypothesis of this thesis. This is followed by a discussion of the potential of midwifery, calling on a recently published article that models the lives that could be saved if the world's needs for midwives were met. This section continues with a discussion of the limitations of the studies presented as well as a discussion of future areas for study. A discussion of the future of midwifery is included. The post 2015, post MDG agenda provides a powerful opportunity for midwives. The final chapter ends with a look forward toward the improvement of reproductive and maternal health in low resource countries.

1. THE CURRENT CONTEXT OF MATERNAL HEALTH IN LOW RESOURCE COUNTRIES

1.1. Tracking maternal and reproductive health in low resource countries

The World Health Organization (WHO) uses maternal health to refer to " the health of women during pregnancy, childbirth and the postpartum period"(WHO, 2013). WHO does not have a specific definition for reproductive health, instead it is an extension of the definition of general health, which is defined as "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, reproductive health addresses the reproductive processes, functions and system at all stages of life" WHO goes on to say that "reproductive health, therefore, implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so" (WHO, 2016). However as the two are invariably linked, it is difficult to address maternal health without addtessing reproductive health as done in the goals set for MDG5. The linkages between the two (maternal and reproductive health) will become more evident throughout the course of this thesis.

In 2012, the WHO, UNICEF, UNFPA and The World Bank released their sixth report looking at maternal mortality across the world and ranking the nations seeking to achieve MDG 5A. In 2010, 40 countries still had a MMR equal or greater 300/100,000 live births (36 of them in Sub-Saharan Africa). In 2010, the goals for reducing MMRs (as per MDG5) had been met only by 10 countries, and only 9 countries were considered on-track. Conversely 19 countries were identified as having made insufficient progress and 11 had made no progress. The report estimated that worldwide there was an annual decrease in MMR of 3.1%. This is much less than what is needed to meet MDG 5. The report conveys the greatest progress in Eastern Asia where the MMR has reduced by 69% from 1990 to 2010 (The World Bank et al., 2012).

Countdown to 2015 (referred to as Countdown) "is a global movement to track, stimulate and support country progress towards the health-related Millennium Development Goals, particularly goals 4 (reduce child mortality) and 5 (improve maternal health)"(Bryce et al.,2014) that began in 2003 during a meeting of the Bellagio Study Group on Child Survival. Countdown produces documents and reports as well as country profiles that track the progress of 75 low and middle income countries. These countries are

responsible for more than 95% of maternal and newborn deaths (Bryce et al.,2014). While the maternal mortality ratio is a commonly used indicator, it does not tell the whole story regarding maternal or reproductive health, as the absence of death should not be confused with good health, appropriate service, or adequate coverage (Graham and Campbell, 1992). This is a key point, which is often ignored. Simply being alive cannot possibly serve as a proxy for good health. What´s more, it can be assumed that surviving childbirth does not mean surviving unscathed. Nonetheless much of the existing literature ignores obstetric morbidity, defined as "conditions during pregnancy, delivery and the post-partum period" (Zuryak et al., 1993). Instead most literature relies heavily on maternal mortality as the key indicator for assessing maternal health and it is often considered as the sole indicator to measure progress towards MDG5. However, the Countdown country profiles do go beyond maternal mortality and focus on each country's level of coverage of key maternal, newborn and child health interventions that have been proven to reduce mortality. The list of these indicators can be found in Appendix I. In addition to intervention coverage indicators, country profiles include "demographic, nutritional status and mortality statistics; coverage levels and trends for proven reproductive, maternal, newborn and child health interventions; and policy, health system, financial and equity indicators" (Bryce et al.,2014) .

In 2013, the World Health Organization and the Partnership for Maternal, Newborn and Child Health held a meeting to identify key policies and tracer indicators that monitor quality of services for maternal reproductive, child and newborn health services. The indicators can be found in Appendix II. This expansion of focus to extend beyond simple coverage of services and interventions, to look at the quality of health care being offered has become a prominent point of discussion in the final years of the MDG period. Throughout the information presented in this thesis the relevance of quality of care in addition to coverage of health services will appear as a reoccurring theme. Chapter three of this thesis discusses a method to measure and monitor coverage and quality that provides complimentary information that enriches what can be learned from the indicators described above.

As per Countdown, a maternal mortality ratio is classified as high maternal mortality when ranging from 300-499 deaths per 100,000 live births and very high when there are 500 or more deaths per 100,000 live births. The 2014 Countdown report states that half of the 75 low and middle income countries monitored have high maternal mortality ratios and over 21% (16 countries) have very high maternal mortality ratios (Bryce et al., 2014). It is worth noting that all 16 of these very high maternal mortality ratio countries are located on the continent of Africa.

The Countdown report for 2014 echoed the findings of other publications. Few countries were expected to reach MDG5 goals for reducing maternal mortality. Cote d´Ivoire is noted as having the least annual improvement in MMR with a (-).5% reduction annually (Bryce et al., 2014). That is to say that the maternal mortality ratio in this country has actually increased. On the other end of the spectrum, Rwanda has made great advances, having the greatest annual reduction in MMR of the countdown countries, 8.6% annually. Across the countries a positive trend was noted, and nearly 75% of countries saw greater progress in lowering MMRs from the 2000 to 2013, as opposed to during the first decade of the MDGs (1990-2000) (Bryce et al., 2014). As will become clear in this thesis, there are multiple factors that contribute to maternal health on both individual and systemic levels. Interventions to improve maternal health rarely yield immediate results. This may contribute to the lower increase during the first ten years of the MDGs. It is also relevant to note that progress is varied within countries. There is generally greater progress in improving maternal health in urban areas than rural areas (UN, 2010). While a country's national level of maternal mortality may fall, without disaggregated or mapped data, it is difficult to know if improvements are localized, or if all women are benefiting.

Table 1 highlights the progress made on MDG 5, showing the "current" status of regions using the most recent data from June 2014. This chart has been adapted from 2014 MDG Report to show only the data that regards MDG 5.

Table 1. Millennium Development Goal 5 Progress by region, 2014

	Northern Africa	Sub-Saharan Africa	Eastern Asia	South-Eastern Asia	Southern Asia	Western Asia	Oceania	Latina America and the Caribbean	Caucasus and Central Asia
Reduce Maternal Mortality by ¾	Low mortality	Very high mortality	Low mortality	Moderate mortality	Moderate mortality	Low mortality	Moderate mortality	Low mortality	Low mortality
Access to reproductive health services	Moderate access	Low access	High access	Moderate access	Moderate access	Moderate access	Low Access	High access	Moderate access

Source: Table adapted from. UN, 2014

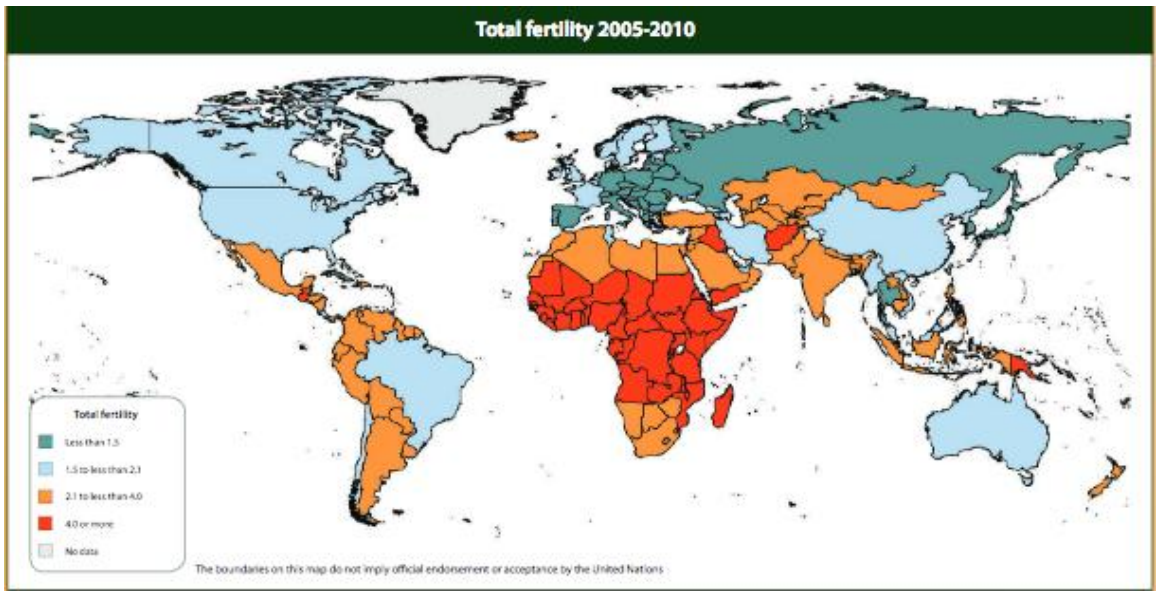
1.2. Key factors that impact maternal and reproductive health

A woman´s maternal and reproductive health is impacted and determined by a multitude of factors, many socio-economic in nature. This is particularly obvious in low-resource environments, as the general wealth of a woman´s surrounding population has been shown to be an important factor. Women living in low and middle income countries have higher reproductive health mortality when compared to women living in high-resource countries (Malarcher, 2010). Poverty has a strongly negative impact on women`s reproductive and maternal health. Studies have shown that countries with higher rates of poverty and that started with higher levels of maternal mortality are at a disadvantage for achieving MDG 5 (Cohen et al., 2014). From a gender studies perspective there is a strong link between girl's access to education and reproductive health. With regard to the many socio-economic factors that determine women´s reproductive and maternal health, political support and prioritization are of key relevance for improvement (Mulligan et al., 2014).

Health status and access to care are often not evenly distributed across a country. Geographic barriers, transport and referral services also have key impacts on a woman´s health Mulligan et al., 2014). For those that are able to overcome these and other boundaries and succeed in accessing care, the facility itself may determine each woman´s fate. Commodity shortages are a reality across the globe. Sufficient supplies and an enabling environment for workers are also critical components (Mulligan et al., 2014).

From a demographic and health perspective, the total fertility rate, the total number of live births that a woman will have in her lifetime, is of great consequence in maternal and reproductive health, as large family size (high fertility) is associated with increased risk of maternal mortality (Malarcher, 2010). One study completed by Diamond-Smith and Potts, used Swedish data from 1911 to 2005 modeling the impacts of reducing TFR and improvements in obstetric care from 1911 to 2005 levels. Researchers found that even without improvements in obstetric care changing TFRs from 1911 to 2005 levels would reduce maternal mortality by nearly 50% (Diamond-Smith and Potts, 2011). The map below shows TFRs across the globe between the years 2005-2010. This graphic is taken from the UN Fertility Patterns 2013 Report (UN, 2014).

Map 1. Total Fertility Rates, 2005-2010

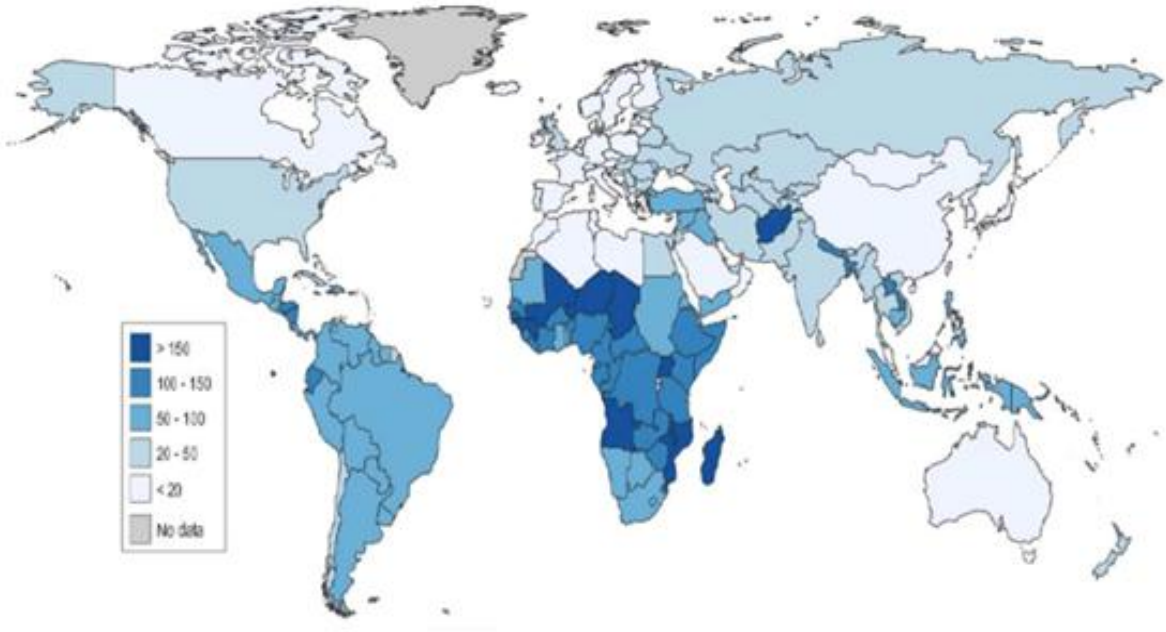


Source: UN, 2014

In particular, the fertility rates of adolescents are of great importance as adolescent mothers are more likely to have poor outcomes, and increased maternal morbidity and mortality. Map 2 shows the adolescent fertility rates globally. It is important to note that while it is similar to the map above, some important distinctions can be observed, particularly in Africa (Mulligan et al., 2010).

Fertility in a society is attributed by a variety of components. A determinants of fertility framework has been developed and conceptualizes the factors that contribute to the fertility of women in a society. While each country has its own context and factors that impact fertility levels, the framework presented in Figure 1. provides insight into background and proximate variables that lead to fertility rates (Mulligan et al., 2010). This framework was developed by Bongaarts (Bongaarts, 1978).

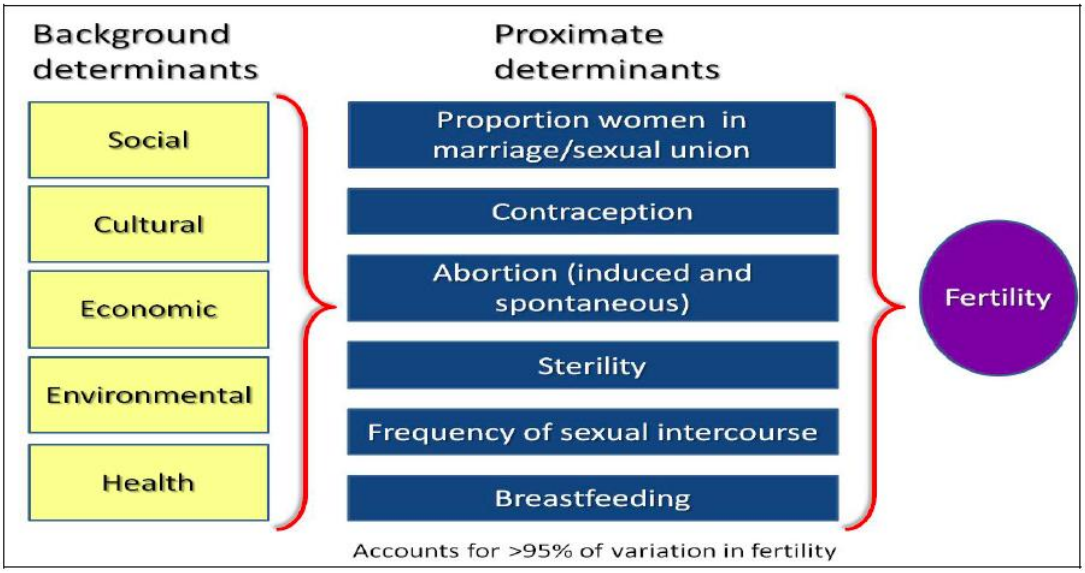
Map 2. Age specific fertility rates 15-29



Source: World Bank, 2008. Analysis of data by DFID.

Short birth interval (less than two years between births) is positively correlated with poor child survival and family size is positively correlated to maternal mortality. Women with a greater number of children are at greater risk (Greene and Merrick, 2005). Unwanted pregnancy, often due to unmet contraceptive need, is also strongly linked with unsafe abortion, a key cause of maternal mortality (WHO Media Centre, 2013). According to the WHO, unsafe abortion can be defined as "a procedure for terminating an unintended pregnancy carried out either by persons lacking the necessary skills or in an environment that does not conform to minimal medical standards, or both" (WHO, 2011).

Figure 1. Determinants of Fertility Framework

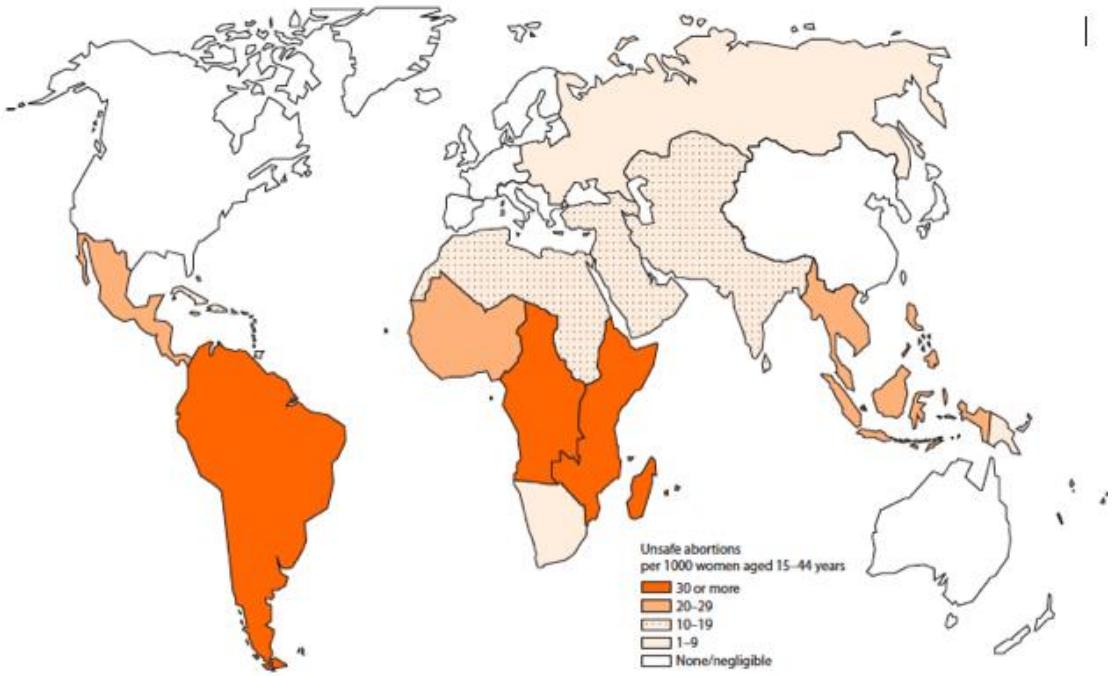


Source: Bongaarts, 1978.

Nearly one-fifth of women of reproductive age live in countries where abortion is only allowed as a life-saving measure or not at all (WHO, 2011). Barriers to safe abortion are not limited to the legality of abortion. In countries where abortion is legal, laws may require provider approval or be left to provider scrutiny. A lack of skilled providers or high provider fees may also contribute to high levels of unsafe abortion. Additionally, religious, cultural and social norms may impede access to safe abortion.

Unsafe abortion is considered to be a "geo-dependent" phenomenon (Malarcher, 2010), as death due to unsafe abortion is nearly exclusively confined to developing countries (WHO, 2011). The map below (map 3) shows the geographic imbalance of unsafe abortion.

Map 3. Unsafe abortion



Source: WHO, 2011.

The Safe Motherhood Initiative, developed in 1987, has identified pillars to reduce maternal mortality. These include family planning, antenatal care, obstetric care and postpartum care (Ahmed, Liu and Tsui, 2012). The Trends in Maternal Mortality 1990-2010 report roughly supports these guidelines as it attributes the decline in MMR to an increase in contraceptive use, increase in at least one antenatal care (ANC) visit with a skilled provider per pregnancy, increase in skilled birth attendance (SBA) and the availability of antiretroviral therapy (WHO, 2012).

Lack of access to contraception also has important negative impacts on maternal and reproductive health. Decreasing the number of unplanned pregnancies and births are important actions towards reducing maternal mortality (Cleland et al., 2006). Methods of contraception are often placed in three main groups modern, natural and traditional. Table 2 explains each one.

Table 2. Types of contraceptive methods

Method Type	Description
Modern	Hormonal methods, intra-uterine devices, sterilization (male and female), modern vaginal methods (diaphragm and spermicides), condoms.
Natural	(Fertility awareness methods), Lactational amenorrhea (LAM), periodic abstinence, withdrawal.
Traditional	Folk methods, as well as any natural methods.

Source: Mulligan et al,. 2010

Method preference varies globally according to geography and context. However these preferences are also transient and change over time. According to WHO, women with unmet contraceptive need are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child (Cleland et al., 2006).

Studies have shown that women`s reasons for not using contraception vary and may include: perceived health risks and side effects of contraception, family or spousal pressure or disapproval, infrequent intercourse, breastfeeding and limited access to family planning services (Mulligan et al., 2012). In many countries contraceptive use is greater in urban areas and amongst wealthier women. Unmet need must also be understood within its context. In areas where fewer children per woman are desired, it may be easier to have higher levels of unmet need. Additionally some women will voice having unmet need for child spacing as opposed to unmet need for limiting the total number of children. Studies have also shown that as contraception becomes more available, levels of unmet meet may actually increase as the demand for family planning may grow faster than the supply (Mulligan et al., 2012).

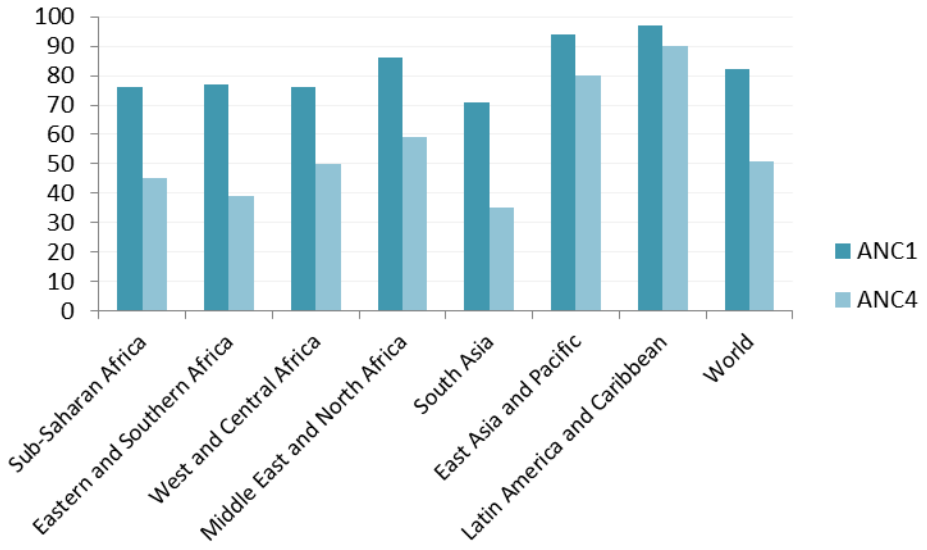
Access to antenatal care is also considered to contribute to maternal and reproductive health. Antenatal care is defined as “screening for health and socio-economic conditions likely to increase the possibility of specific adverse pregnancy outcomes, providing therapeutic interventions known to be effective; and educating pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them” (WHO, 2006) Antenatal care is often measured in terms of coverage and is “an indication of access and utilization of health care during pregnancy” (WHO, 2006). Antenatal care is expected to include a set of essential interventions. These interventions include management of obstetric complications, as well as immunization, malaria treatment/prophylaxis during pregnancy and detection and treatment of sexually transmitted diseases (Lincetto et al., 2013).

Access to antenatal care is often measured as coverage of one antenatal visit per pregnancy (ANC1) and coverage of 4 antenatal visits (ANC4). The WHO recommends four antenatal visits with a skilled professional during pregnancy prior to birth for maximum benefits. Antenatal care visits should also be recognized as key opportunities to advocate for skilled attendance at birth (SBA) (Lincetto et al., 2013). In a recent study in Bangladesh maternal mortality was lower in women who had three or more ANC visits as opposed to less than 1 ANC visits (Pervin et al., 2012). Attendance to antenatal care varies greatly in lower and middle resource countries with ANC1 often being greater than ANC4.

The Figure 2 is adapted from UNICEF data and shows ANC1 and ANC4 data across the globe, based on region. The last two bars in this figure show the world level and level of lesser-developed countries as conjunct. The data represents averages based on data available between the years 2009 and 2013.

Factors associated with attending ANC may include education, marital status, geographic distance to appointments from home, feeling ill during pregnancy or having had difficulty in a previous pregnancy/birth, workload and understanding the benefits of antenatal care (Tsegay , Gebrehiwot and Goicolea, 2013). However, there is evidence that attendance to antenatal care is increasing. The 2014 Millennium Development Goal report shows that ANC4 increased 37% from 1990 to 2012, with 52% of women having four or more antenatal visits during the course of their pregnancy (UN, 2014).

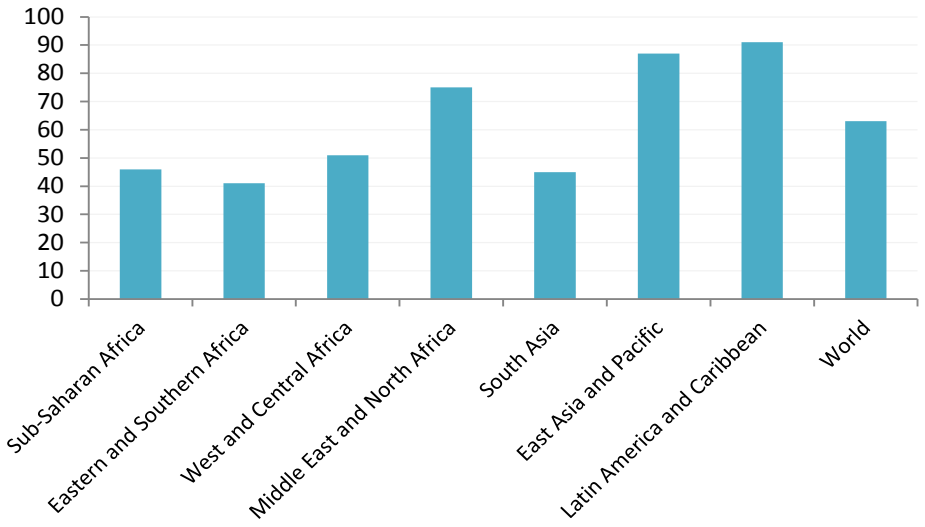
Figure 2. Rates of 1 antenatal care visit and 4 antenatal care visits 2009-2013 Averages, by region at world level



Source: Original elaboration using data from UNICEF data set. UNICEF, 2014

It has been suggested that the best strategy to reduce maternal mortality in low-resource countries is like one where the normality of the birthing process can be optimized by professional midwife attendants and a supporting team within a health facility (Campbell and Graham, 2006). While there are studies from high resource countries that show that facility delivery does not produce better outcomes than a planned home birth for healthy, low-risk women (Olsen and Clausen, 2012) it is often advised that facility birth be sought in areas with high maternal mortality rates as found in low resource settings (Campbell and Graham, 2006); women in low resource environments may also have a lower propensity to be low-risk or to have access to settings that meet the requirements for safe home birth. Figure 3 was created using UNICEF data based on averages of data collected between 2009 and 2013.

Figure 3. Rates of facility deliveries, 2009-2013 averages by region and at world level



Source: Original elaboration using data from UNICEF data set. UNICEF 2014.

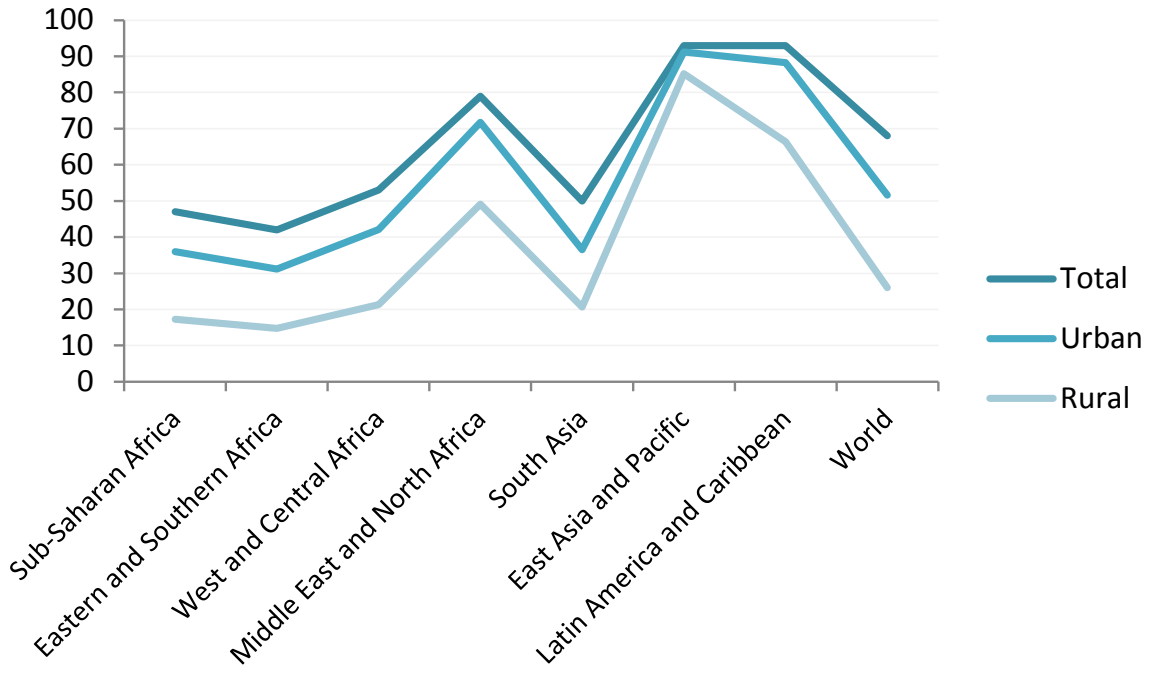
It is important to note that in low resource countries facility delivery may or may not imply the availability of emergency obstetric services such as cesarean section. Also, in the current environment of health worker shortages, facility delivery does not guarantee skilled birth attendance (SBA). Some health centers rely on auxiliary staff, including cleaning staff, to deliver babies during the hours that providers are off-duty. I myself have known several facilities in Haiti and Sub-Saharan Africa where this is true and I know anecdotally that it is common. Nonetheless, SBA is considered to be a key component in improving maternal health and reducing maternal mortality (Campbell and Graham, 2006).

A skilled birth attendant is described as a professional "trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns"(Harvey et al., 2007). This definition usually includes the cadres of midwife, nurse and physician. From 1990 to2012 the level of skilled birth attendance rose from 56% of deliveries globally to 68% in 2012 (UN, 2014). However, across developing countries, nearly 40 million births took place without skilled birth attendance in 2012 alone (UN, 2014). Access to skilled attendance at birth is believed to lead to improved maternal and

neonatal outcomes (UN, 2014) however there is not a great body of research establishing a clear relationship between SBA and decreases in maternal mortality in poor countries (Scott and Ronsmans, 2009). This difficulty can in part be explained by the fact that randomized trials that would include randomly assigning women to birth either with or without SBA would clearly be viewed as unethical. Nonetheless, there is evidence from developing countries to support the idea that maternal mortality is decreased in the presence of quality SBA (Adegoke and Van Den Broek, 2009). Graham et al (2000) utilized a complications sensitivity analysis in developing countries and created estimated projections that 16% to 33% of maternal deaths could be eliminated with SBA (Graham, Bell and Bullough, 2009).

Rates of skilled birth attendance are lowest in South Asia and Sub-saharan Africa where it is estimated that between 130 and 180 million births will have taken place in these regions between 2011 and 2015. Of these births, 90% will have occurred in rural areas (Crowe, Costello and Pagel, 2012). Figure 4 depicts rates of skilled birth attendance by region, rural, urban and at a global level.

Figure 4. Rates of Skilled Birth Attendance, 2009-2013 Averages, by region, at world level and disaggregated by urban and rural



Source: Original elaboration using data from UNICEF data set. UNICEF, 2014.

1.3. Coverage, access and equity: key concepts in maternal and reproductive health provision

In the section above I discussed the benefits of each of these interventions or components of care. In the next two sections I will explain the concepts of coverage, access, quality and equity.

Coverage for maternal and child health can be defined as "the proportion of women and children in need of interventions who actually receive them" (Bryce et al., 2013). Like access, quality and equity, appropriate coverage of health services is vital to improving maternal health, in that health cannot be improved if services are not widely available to the needing population. Coverage is often measured through intervention specific coverage indicators, that is to say the percentage of the eligible population that actually receives a service or intervention. In 2012 the WHO selected eight coverage indicators for maternal and child accountability. They can be found in Appendix III (WHO, 2012).

Like most health indicators, measure of coverage should be evaluated at the most disaggregated level possible. National coverage levels do little to show the disparities amongst groups, income levels, or between rural and urban populations (among others) that are common in low and middle resource countries.

Unfortunately in countries with the greatest need, the coverage indicator data is often limited. An independent expert review group established by the United Nations Every Woman Child strategy, released a 2012 report stating that of the 75 countries that together constitute 95% of mortality among women and children, only 11 had current data on the eight coverage indicators mentioned above (WHO, 2012).

Coverage data for low and middle income countries may come from a variety of sources, including the Demographic and Health Surveys (DHS) which are produced by the US Agency for International development, or from Multiple Indicator Surveys (MICS) produced by the UN Children´s Fund. These data sources depend on household surveys (Bryce et al., 2013). Beginning in 2009, the Child Health Epidemiology Reference Group (CHERG) works to improve coverage measurement. This group assessed coverage indicators utilizing an extensive research review. The group found that "sensitivity and specificity of coverage indicators are highly variable across interventions, with some suggestion of more accurate reporting for events related to care-seeking behaviors (e.g., place of delivery) or invasive

interventions (e.g., finger/heel stick or cesarean section performed)." The group also found that there important differences in the specificity and sensitivity of indicators across urban and rural settings.

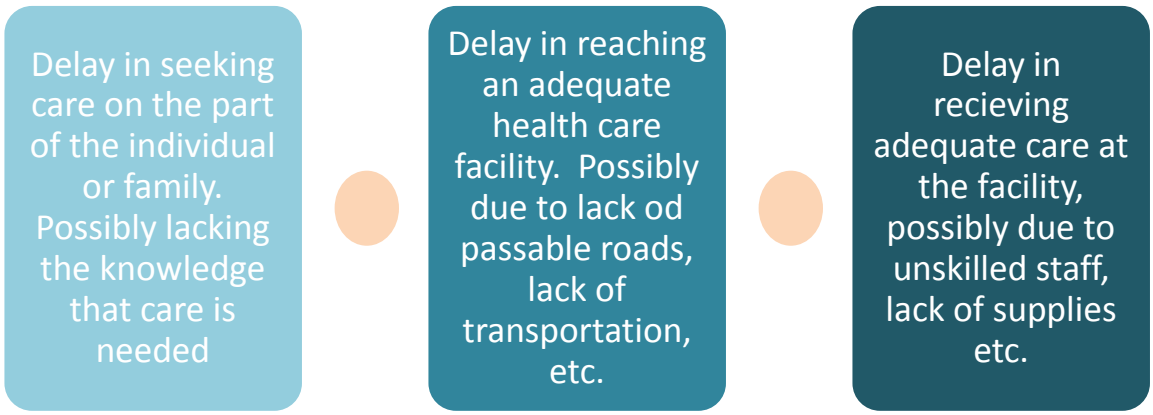
The lack of reliable data on intervention coverage is just one of the reasons why it cannot be expected to tell the whole story regarding coverage. This data may offer insight into what is happening but seldom offers no understanding of why it is happening. This points to the advantage of also incorporating qualitative data to fully understand effective coverage. Chapter three of this thesis talks about a qualitative methodology that can be used to evaluate coverage, specifically effective coverage which will be discussed in further detail in that chapter.

Access to care has been defined as a population´s ability to reach health services (Tanahashi, 1978). However, that definition offers little insight into the nuances behind accessing care. The idea that a person is able to obtain the health services they need without difficulty would obviously be ideal access. Access to care depends on multiple factors from those that relate to the individual woman as well as the context she lives in which is impacted by larger societal and governmental characteristics. In 1994 a model known as the Three-delay model was developed by Thaddeas and Maine to describe the levels of delays that women encounter between the onset of an obstetric complication and appropriate treatment (Thaddeas and Maine, 1994). Appropriate access to care can only be achieved when there is appropriate knowledge that care is needed on the individual level. That is to say the woman and families are aware that they need care, and know where to go to get care. Additionally access requires that the care be feasible for women and families, can they afford the care, is it geographically attainable? And finally once the care is reached are their skilled providers, are there enough medicines, if in a facility does the facility have the appropriate technical capacity (i.e. is there an operating room if the woman needs to access a cesarean section). Figure 5 below is a depiction of the Three Delays Model.

Access depends on the individual, the environment and community, the provider and the larger health system- which includes government support. Unfortunately maternal health has not always been seen as a priority in national or even health-specific agendas. Maternal and reproductive health often constitute a very small portion of national health budgets and Human Resources (Africa Progress Panel, 2010) for Reproductive Health (HRRH) often receive an even smaller piece of the pie. However, this prioritization must be go beyond appropriate funding, good governance and coherent strategies that include human

resources for health are critical. As will be discussed in the next section, access to care alone is not enough to resolve maternal mortality (Anderson, 2010).

Figure 5. Three delays model



Source: Orginial elaboration based on: Thaddeas and Maine, 1994

1.4. Quality and equity of service provision, making care matter

Quality of care can mean the difference between life and death and is a central theme of this thesis. Once a woman accesses a facility, the quality of care offered plays a fundamental role in the outcome. Again this concept can be tied to the third delay of the Three Delay model. In the post 2015 MDG agenda, which is to include UHC (to be discussed in detail later), the WHO/World Bank have created monitoring frameworks that argue that greater attention should be given to quality of services obtained and not just the ability to access services (WHO, 2015). Quality of care encompasses various factors, but largely looks at provider skill level and capacity to perform the necessary interventions and provide the necessary care.

The relevance of quality of care became clear during the MDG 5 push to increase the maternal health workforce. As countries struggled to lower maternal mortality, maternal health worker shortages became obvious. In an effort to address the critical shortages, governments across the globe began aggressive efforts to increase the number of midwives, reproductive health workers and health workers in general. Unfortunately much of the focus was given to the number of workers produced and not the quality or skill level of workers being created. While admissions to schools were increased, it was common that the number of staff at the school remained the same. Similarly few efforts were made to assure quality in the skill set of those teaching, nor were courses in pedagogy or clinical instruction regularly added in national education plans. Training institutions often face very limited resources and national budgets often failed to meet the needs of schools prior to admission increases, with no adjustment after. In many parts of Sub-Saharan Africa it is common to find midwifery skills laboratories that are void of functional manikins for practicing, and without basic medical equipment such as blood pressure cuffs, thermometers or labor couches. Some training institutions are completely void of skills laboratories all together and students rehearse either through imagination/role play or directly on the wards, where they "practice" with live patients. Another issue with the drive to rapidly increase the number of midwives has been the student selection. The criteria for midwifery varies enormously across the globe. Systems for student selection and study requirements differ across countries, and in some countries midwifery students to be assigned to midwifery nearly-exclusively or exclusively based on test scores (Fullerton et al., 2011). That is to say a young male or female may be offered midwifery as their only career choice, whether or not they feel any desire to practice midwifery or even work in health care. Obviously this may impact morale, study habits and ultimately the quality of care offered.

In addition, it is common for low resource countries to have poor measures in place that would regulate the quality of the existing work force (UNFPA, ICM and WHO, 2014). The 2014 State of the World´s Midwifery surveyed 73 countries about midwifery in their country. While in practice, over 90% have a government entity that regulates midwifery, only 48% of the countries surveyed have legislation that formally recognizes midwifery as a profession that is regulated (UNFPA, ICM and WHO, 2014). Professional associations also have an important role in assuring quality in the profession as well as advocating for midwives. However, particularly in low and middle resource countries, professional associations for midwifery are not always established and where they may have little or no legislative voice (UNFPA, ICM and WHO, 2014). The impact of a low quality midwifery workforce is twofold. Obviously the women they serve suffer the consequences of ineffective low quality care, which may

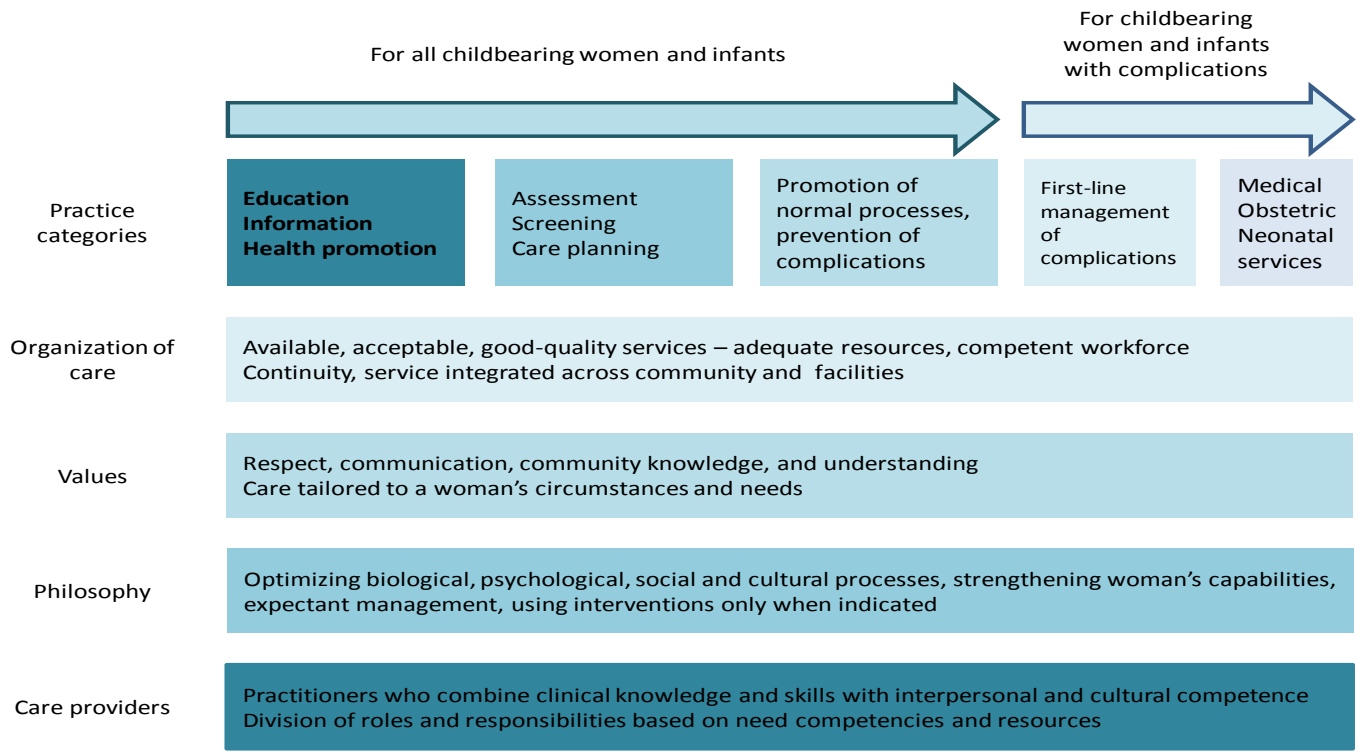
possibly be as damaging as no care whatsoever. Secondly students placed in clinical learning sites with low quality midwives will learn to provide low-quality care and the snowball effect may continue through many generations of midwives if not rectified.

In 2014 a Framework for Quality Maternal Newborn Care (QMNC) was developed and provides an optic through which the care for mothers and newborns can be considered. This framework "differentiates between what care is provided, how it is provided, and who should provide it, in all settings. It considers the elements of quality maternity care, identifies how the health system should be organised in order to provide quality SRMNH[1] care, the philosophy and values with which that care should be provided and by whom" (ICM, 2015). This framework provides vital information regarding the level of care required, the organization of care, the values that should be expressed, the philosophy that should be employed and the optimum care providers for the achievement of the highest quality of care. Figure 6 shows the QMNC framework and the various factors that contribute to the quality of midwifery care.

"Equity in health can be defined as the absence of systematic disparities in health (or in the major social determinants of health)" (Braveman and Gruskin, 2006). It is common that inequality is discussed conjointly with inequity, however the two are not synonymous. A recent article by Braveman et al explains the difference between the two concepts, pointing out that while inequity is unjust and generally is directed at social groups that are more or less advantaged, health inequality is not necessarily unjust. One would expect that an elderly man at the end of life would not have the same level of health as a robust teen-age boy. This is an example of unequal health but not inequitable health (Braveman and Gruskin, 2006). Health service inequity is often a particularly complicated problem to fix, as it doesn´t have its roots in the health sector. It is commonly a policy and infrastructure problem that requires political and infrastructure change across the society and is impacted by sectors such as housing, water, transport, food and energy (UN Platform on Social Determinants of Health, 2015; WHO, 2015) Improvements in health equity also lead to improved outcomes in other social sectors. As health increases in a population so does productivity and school attendance (UN Platform on Social Determinants of Health, 2015

[1] Sexual, reproductive, maternal, newborn, health.

Figure 6. Framework for Quality Maternal Newborn Care



Source: Graphic based on that found in Renfrew, et al., 201

Inequity in health may go unobserved or hidden when looking at national or regional average measures. Disaggregated measures are imperative for noticing inequity between groups. To that end in 2000, the WHO began to argue for the assessment of health by distribution, as opposed to looking exclusively at average measures(WHO, 2000). Descriptive, cross-sectional studies remain the most used for informing policy that aims to address inequity (Barros and Victoria, 2013) but there is not agreement regarding how to best demonstrate inequities or portray the results of inequity studies. Inequity can be expressed as an absolute or relative measure. DHS tends to offer results in quintiles. For example, disaggregated absolute results such as unmet need for contraception are expressed as separate values, in quintiles, ranging from wealthiest to the poorest. This allows the reader to calculate their own relative measures (Barros and Victoria, 2013).

Unfortunately, inequity is very common in maternal health. The Countdown 2015 study of 54 (Quick and Jay, 2014) middle and low resource countries discovered that coverage of skilled birth attendance was the least equitable service with regard to income-related inequity; the poorest quintile had a mean coverage of 32.3%, whereas the richest quintile had a coverage of 84.4%. Similarly only 35.9% of the poorest had more than four antenatal visits as opposed to 70.5% of the wealthiest (Bryce, Victoria and Berman 2014). Inequity in health is intrinsically linked to social justice and to the social determinants of health. While social conditions remain unequal, it is difficult to achieve equity in health care. For equity in health care to be effectively addressed socio-economic disparities must be addressed (UN Platform on Social Determinants of Health, 2015).

2. QUALITY IN MIDWIFERY MATTERS: CONCEPTUAL FRAMEWORK AND METHODOLOGY FOR THREE CASE STUDIES IN LOW RESOURCE ENVIRONMENTS

This chapter is designed to provide a road map for the following three chapters; it will explain the studies presented including their relevance to the research question.

Are midwives in low resource countries providing the quality maternal and reproductive health services that are needed? What gaps exist? What training improvements will better prepare midwives to provide quality maternal and reproductive health services?

The empirical research included in this thesis will be presented as case studies in chapters three through five. My role varied in each of the research studies and they all involved some level of collaboration with a larger research team. The case studies are presented in a sequence that allows the reader to follow the steps of the process of analyzing the current situation of midwifery service provision, identifying gaps and key areas for improvement and taking action for change toward the desired outcome of improved quality and availability of midwifery service. The case studies take place in three low-resource countries including Afghanistan, Tanzania and Ghana. All three of these countries have some of the highest maternal mortality rates globally (WHO et al., 2015).

2.1. What is meant by midwifery? Key vocabulary

As per the 2014 State of the World´s Midwifery Report, published by United Nations Population Fund (UNFPA), midwifery can be defined as, "health services and health workforce needed to support and care for women and newborns, including sexual and reproductive health and especially pregnancy, labor and postnatal care." This definition is obviously vague and is purposely vague in an effort to accommodate the great variation in midwifery across countries. In the Lancet Series for Midwifery published in June 2014, midwifery is defined as,

> *"skilled, knowledgeable and compassionate care for childbearing women, infants and families across the continuum from pre-pregnancy, pregnancy, birth, postpartum and the early weeks of life; core characteristics include optimising biological, psychological, and social processes of reproduction and early life, timely prevention and treatment of complications, acting as a conduit to other services, respecting women's individual circumstances and views, and working in partnership with women to strengthen women's own capabilities"* (Renfrew et al., 2014).

The UNFPA State of the World's Midwifery report defines a midwife to "include those health professionals who are educated to undertake roles and responsibilities of a midwife regardless of their educational pathway to midwifery, whether direct-entry or after basic nursing" (UNFPA, ICM and WHO, 2014). International Confederation of Midwives defines a midwife as the following: "A midwife is a person who has successfully completed a midwifery education programme that is recognised in the country where it is located and that is based on the ICM Essential Competencies for Basic Midwifery Practice and the framework of the ICM Global Standards for Midwifery Education; who has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery and use the title 'midwife'; and who demonstrates competency in the practice of midwifery." To add further clarity, the International Confederation of Midwives explains a midwife's scope of practice in the following way:

> *"The midwife is recognised as a responsible and accountable professional who works in partnership with women to give the necessary support, care and advice during pregnancy, labour and the postpartum period, to conduct births on the midwife's own responsibility and to provide care for the newborn and the infant. This care includes preventative measures, the promotion of normal birth, the detection of complications in mother and child, the accessing of medical care or other appropriate assistance and the carrying out of emergency measures.*
>
> *The midwife has an important task in health counselling and education, not only for the woman, but also within the family and the community. This work should involve antenatal education and preparation for parenthood and may extend to women's health, sexual or reproductive health and child care. A midwife may practise in any setting including the home, community, hospitals, clinics or health units" (ICM, 2014).*

The term 'midwifery workforce' has been the source of some debate and undoubtedly causes some confusion. The "midwifery workforce" is most commonly known to be the workforce of midwives. However, in certain occasions and in international policy discussions, it may be extended to include all of those that carryout tasks that are included in the scope of work of midwives. In these cases, the midwifery workforce may include nurses, general physician, obstetricians or even pediatricians. In this thesis, "midwifery workforce" will always pertain exclusively to professional midwives. The definitions for midwife and midwifery that will be used in this thesis and their sources are presented in Figure 7.

Figure 7. Vocabulary for midwifery

1. **Midwife:** A midwife is a person who has successfully completed a midwifery education programme that is recognised in the country where it is located and that is based on the ICM Essential Competencies for Basic Midwifery Practice and the framework of the ICM Global Standards for Midwifery Education; who has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery and use the title 'midwife'; and who demonstrates competency in the practice of midwifery.

2. **Midwifery:** Midwifery is skilled, knowledgeable and compassionate care for childbearing women, infants and families across the continuum from pre-pregnancy, pregnancy, birth, postpartum and the early weeks of life; core characteristics include optimising biological, psychological, and social processes of reproduction and early life, timely prevention and treatment of complications, acting as a conduit to other services, respecting women's individual circumstances and views, and working in partnership with women to strengthen women's own capabilities.

3. **Midwifery Services:** Clinical care offered by midwives. Used interchangeably with midwifery care provision.

4. **Midwifery workforce:** For the purpose of this thesis, midwifery workforce will include working professional midwives. It will not include other cadres of health workers that complete tasks that are usually included in the scope of practice of midwives.

Sources: 1) ICM, 2013 2) Renfrew, Mary J et al., 2014. 3) original definition 4) original definition.

Chapters four and five of this thesis address the training of midwives and use specific, related terminology. Figure 8 has key vocabulary that will be used in chapters four and five, the case studies that regard Tanzania and Ghana.

Figure 8. Vocabulary for Tanzania and Ghana case studies (chapters four, five)

1. **Pre-service:** refers to activities which take place before a person takes up a job which requires specific training, i.e. before a person 'enters service'. Properly speaking, also courses for graduates, in addition to those for undergraduates, are 'pre-service courses' if they provide the competence needed to perform new 'services'.

2. **In-service:** refers to training of persons already employed, e.g. health providers working in the public or private sector.

3. **Tutor:** Professor, teacher

4. **Preceptor:** interchangeable with clinical instructor, teaches/guides/oversees training clinicians during clinical practicums

5. **Clinical Instructor:** interchangeable with preceptor, teaches/guides/oversees training clinicians during clinical practicums

Sources: 1-2) WHO/EMRO, 2015. 3-5) Original definition

2.1. Understanding and evaluating Midwifery in low resource countries

Before intervening to improve midwifery service provision, it is imperative that the actual and current situation of each context is fully understood. Additionally, even in the presence of adequate data, health indicators such as maternal mortality, percentage of births that take place in facilities, unmet need for family planning and number of antenatal care visits, fall short in providing key information to policy makers. They may show what is happening, but they do not explain why it is happening.

In practice, the evaluation of midwifery and the workforce of midwives in any country is a very complex task as there are many areas that must be taken into account including social, political and financial considerations that at first glance may not appear to be related to health care. A concrete example of this

midwifery workforce assessment follows in a discussion of my experience with the High Burden Country Initiative (HBCI).

2.2. The Assessment Framework of the High Burden Country Initiative (HBCI)

In 2010 the United Nations Secretary General began the Global Strategy for Women's and Children's Health. Shortly afterwards, the UN health agencies (UNAIDS, UNFPA, UNICEF, World Bank, WHO) collectively known as the H4+, proposed supporting a group of countries with some of the world´s highest rates of maternal and newborn mortality in a new initiative (ICS Integrare, 2012). The eight countries that chose to participate included Afghanistan, Bangladesh, Democratic Republic of Congo, Ethiopia, India, Mozambique, Nigeria and the United Republic of Tanzania. These countries constituted nearly 60% of maternal and newborn deaths globally (ICS Integrare, 2012). In September 2011, a meeting was held at the Greentree Foundation in the United States and the scope of the initiative was determined. It was decided that the H4+ would work with each country´s government and international development partners to create national assessments of the midwifery workforce in all eight countries (ICS Integrare, 2012). The assessments were to utilize new and existing data to inform policy and to rapidly enhance the quality of and access to midwifery services at the community level through creation of a clear set of recommendations and costed policy options (ICS Integrare, 2012).

I was initially hired by Integrare, Asociacion de Cooperacion Social (ICS Integrare), a Barcelona-based social research institution, to support their work as the Secretariat of High Burden Country Initiative. The Secretariat is the agency in charge of the organization and execution of the initiative. However, I was soon asked to work with the director of Integrare in the oversight of the Afghanistan assessment.

The assessments had to be extremely detailed and comprehensive if they were to meet the over-arching goal of creating costed strategies for the scaling up and "skilling up" (ICS Integrare, 2012) of the midwifery workforce. It took several months for the very detailed HBCI Assessment Framework to be established. The first phase of the project involved coordinating the vision, objective and then creating a plan for how the assessments would be carried out. The assessments needed to take into consideration the many components that impact human resources for maternal health. However, the research framework also needed to be adaptable to each country's context and capitalize on the data that could

realistically be obtained or be made available in each of the countries. From these initial efforts and those during the completion of the first four assessments, a 31-page operational guidance and assessment framework was born. The assessment framework is very comprehensive and covers 5 main domains as they relate to the midwifery workforce in a country. Each domain is an area of study that must be analyzed in order to fully understand midwifery in a country.

The five domains are defined as follows:

"A. Essential interventions for maternal and newborn health (MNH) and Utilization. This domain relates to the access, equity, quality, efficiency and utilization of MNH services.

B. Midwifery workforce. This domain relates to the production and performance of the midwifery workforce. This includes pre-service education and in-service training capacities in the public and private sectors and the availability (including distribution and attrition), competencies, responsiveness and productivity of health workers.

C. Work environment. This domain relates to the enabling working environment to maximise and sustain the midwifery workforce's contribution to MNH.

D. Management and policies. This domain relates to the management system and the policies, leadership and partnerships to maximise and sustain the midwifery workforce's contribution to MNH.

E. Financing. This domain relates to the financial resources for providing adequate financial incentives and developing costed plans to maximise and sustain the midwifery workforce's contribution to MNH." (HBCI Secretariat and Technical Working Group, 2012)

This framework has now been used internationally for the assessment of the midwifery workforce in several countries. An examination of the full framework shows the level of comprehensive review that is necessary to understand both the actual state of midwifery services in a country as well as the challenges and potential areas of intervention that contribute to the current state. In this thesis I concentrate concretely on midwifery service provision and training, which would fall into Domains A and B of the HBCI framework. However, a complete analysis in a specific country would begin with these two areas which are the most obviously or directly related to the service provision and then spread out to look at the

other domains of the framework, following on to assess the environment in which a midwife works. Even in adequate numbers, with the correct skill set, if a midwife is practicing without adequate resources, medicines or referral systems, she/he will not be able to fully meet her population's needs. Similarly, a midwife that does not have the support of a professional organization that advocates for her/him to be able to practice within their full scope of practice, or a health system that does not distribute the worker where most needed will not be able to provide adequate midwifery services. The career path of a worker and morale must be considered. This will be addressed in the Ghana case study in Chapter five. A worker that does not have opportunity for growth and improvement may eventually lose interest, become apathetic and not practice at an optimal level. And finally, all health services, including midwifery services require financing. Proper fund allocation is key to all of the other components that contribute to effective midwifery service provision.

2.3. Framework for understanding shortages in the midwifery workforce

This section will provide a frame of reference and specific contextual information regarding midwifery and the process of scaling up as well as "skilling up" (ICS Integrare, 2012) the midwifery work force in low resource countries.

2.3.1. Midwifery Shortage

According to the 2014 State of the World's Midwifery there is a significant shortage of midwives in low and middle resource countries; the report revealed that surveyed countries had an estimated 22% of the midwifery workforce needed to meet reproductive and maternal health needs (UNFPA, ICM and WHO, 2014). In all three of the countries presented in these case studies, midwifery workforce shortages is an important concern. Of all of the countries, the situation in Afghanistan can be considered the most dire, with current estimates suggesting that only 23% of the current need for midwifery services is being met (UNFPA, ICM and WHO, 2014). What is worse is that it is estimated that at the current workforce trajectory, that is to say if there is not a change in the number of workers, added, lost and maintained each year, in 2030 Afghanistan will only have 8% met need for midwifery services(UNFPA, ICM and WHO, 2014). The situations in Tanzania and Ghana are more positive, however there are still important gaps. Currently Ghana's met need does not go far above that of Afghanistan as only 30% of the need for midwifery services was estimated to be met in 2014, according to the (UNFPA) State of the World's

midwifery. However based on projected need and projected workforce growth, even without additional intervention, it is estimated that 81% of Ghana's need for midwifery services will be met by 2030 (UNFPA, ICM and WHO, 2014). Of the three countries included in this thesis, Tanzania appears to have the highest met need according to official data. According to State of the World's Midwifery Report, in 2014 Tanzania had 74% met need for midwifery services and following its current trajectory it will have 97% met need in 2030 (UNFPA, ICM and WHO, 2014). In this way, the case of Tanzania is a perfect example of how workforce numbers alone do not tell the entire story. In chapter four I will look into why the state of maternal and reproductive health in Tanzania is so dire despite having nearly sufficient workforce numbers.

In 2006, the Global Health Workforce Alliance (GHWA) was formed in response the World's Health Organization's concerns that there was a global health worker shortage. At the time it was estimated that there was a shortage of 4.3 million trained health workers (GHWA, 2008). It was also noted that the greatest shortages were observed in the poorest countries. GHWA has continued to work on these issues, and has found that, particularly in Africa, efforts are failing. In 2007 the Task Force for Scaling up Education and Training was created. This task force aims to find cases of effective scale-ups and then uncover how to duplicate these models. In 2008, the task force projected that a 1.5 million health workers were needed in Africa in order to achieve Universal Health Coverage on the continent (GHWA, 2008).

2.3.2. Distribution of the workforce: Midwifery in rural environments

Midwifery shortages are even more pronounced in rural areas, particularly in low-resource countries. Health providers, including midwives, are hesitant to live and work in low-resource rural areas, despite the fact that health needs are greatest in low-resource, rural areas (GHWA, 2008). Health workers often do not feel motivated to move to rural areas, where they may have less amenities and a more complicated lifestyle than that of urban living (Dussault and Franceschini, 2006). Additionally, rural posts are often viewed as less prestigious among health providers (Dussault and Franceschini, 2006). Urban posts also allow providers easier access to a private clientele. This is a key consideration as holding a private practice to supplement public sector earnings is a common practice in low-resource areas (Dussault and Franceschini, 2006). Of great relevance to this thesis is the role that provider training plays in willingness to eventually practice in rural areas. Providers who are trained in rural environments are more likely to be willing to serve in rural areas (Dussault and Franceschini, 2006). In the case of

Afghanistan, this understanding played an important part in the development of their Community Midwife Education (CME) program, which chooses midwife candidates from rural communities and trains them in midwifery either in the CME midwifery school in their own region or in a CME school in the closest, safe region (Speakman et al., 2014). This program will be discussed in greater detail in chapter three. In chapters four and five I present case studies from Tanzania and Ghana respectively. Again most of these take place in rural training centers that were developed to improve midwifery workforce numbers in these rural areas.

In addition to the creation of rural training centers, many low-resource countries have constructed worker distribution policies in an attempt to redistribute trained health providers from urban to rural areas. These programs may include economic incentives, increased pay or bonuses, for accepting rural posts. Other countries, such as Zambia, require new graduates to work in rural posts for their first years of practice (UNFPA Zambia, 2015). However, these policies have implicit complications. Sending new graduates to work in rural posts translates into sending the least experienced workers into areas with the greatest health problems and the least resources. Midwives that are sent to rural areas, often have significantly less support staff and/or referral possibilities than midwives in urban centers. To that end they need training that focuses on independent practice, not relying on support staff. They also need training that increases their capacity to handle rural health issues and to practice fully. They also need to have skills that go beyond their recommended scope of practice, for use in cases of emergency as they may not have ideal access to referral in remote areas (WHO, 2010). Unfortunately, like rural health centers, rural training centers often have less resources than urban centers as opposed to more. Just as with practicing midwives, midwifery tutors would generally much rather teach in urban areas than rural areas for a variety of reasons, including lifestyle, resources and prestige. In chapter four, the case study from Tanzania will provide findings that show that the challenges that are faced by low resource training centers in rural zones as well as provide insight into the clinical capability of graduates of these programs.

2.3.3. Education and training of the Midwifery Workforce

In all three of the countries, the case studies of this thesis, there is a push to increase the number of midwives by increasing the number of newly trained midwives put into the work market. However, education without attention to quality will provide little improvement in the reproductive and maternal health in these countries. Conversely, one of the greatest ways to impact the quality of midwifery and prepare a midwife for the challenges that are implicit in the practice is through education and training.

Both pre-service and in-service can have important impacts on quality. Therefore, the quality of the training that is offered, including curriculum design, resources and teaching modalities, must be considered. Quality pre-service education provides a future midwife with a strong base. In low resource countries, there are multiple challenges to overcome even by the most qualified, skilled midwife. Facing the difficult state of health of women living in low resource countries, ill-equipped facilities, potentially poor pay and limited professional growth, providing a midwife with a strong clinical skill set is imperative.

GHWA has noted that in order to meet the current need, it is vital to employ innovative methods. Innovation may include the use of clinical simulation, eLearning, and competency based education (GHWA, 2008).

eLearning, "is a formalized teaching and learning system specifically designed to be carried out remotely by using electronic communication. Because distance learning is less expensive to support and is not constrained by geographic considerations, it offers opportunities in situations where traditional education has difficulty operating" (Techtarget, 2016) eLearning has been found to be particularly useful in low-resource countries, particularly medical and health education programs (Frehywot et al., 2013) where health worker shortages are notable and training institutions may not have adequate teaching staff, educational texts or other resources (Frehywot et al., 2013). eLearning programs can be executed through the use of mobile phones, tablets, or computers. Many eLearning programs can be condcted on-line, using internet as well as in pre-stored programs generally housed on USB's or the hard drives of computers. The latter is particularly important in low-resource areas where electricity and/or internet connection may be unreliable. eLearning can be an important asset but should not be considered a total replacement for traditional teaching methods, but as an accompanying option. Additionally, in order for eLearning to be successful technological resources, such as computers, tablets or mobile phones must be available and users and instructors must have the necessary level of familiarity with the technology being employed (Frehywot et al., 2013).

In addition to technological methods of instruction, such as eLearning, simulation has been recognized as an important methodology for clinical taining. Simulation labs, outfitted with clinical models and medical supplies offer students the opportunity to practice and perfect clinical skills before attending real women. This is an important step away from the potentially dangerous concept of "practicing" directly on women. This is especially important in low-resource training institutions where it is common to find

shortages of clinical instructors, meaning students may not be as closely monitored at clinical practicum sites as is desired. Simulation is different from "traditional" procedure or clinical skill practice. For example skill practice may involve a student using a learning model to practice the technique and hand maneuvers for a bimanual compression, a potentially life-saving technique that involves squeezing the uterus to stop a deadly post-partum hemorrhage. This step of skill practice is extremely important, however once it is mastered simulation takes the learning process one step further. In a simulation a student may think she is simply practicing the delivery of the placenta, then to his/her surprise the patient model may begin to hemorrhage. In this case the student must recognize the signs of hemorrhage realize she/he must act, decide which action to take and successfully perform bimanual compression with the correct technique. Simulation creates a situation where the student's clinical decision making (deciding that he/she must take action) and clinical management (taking the correct action) are also practiced. Simulation supports realistic learning (Michelle, Kelly and Fry 2013), as well as increases confidence.

In recent years the focus towards quality clinical training has come to involve the concept of competency based education (CBE), the notion that clinical students have not completed their learning process (should not graduate) until they are clinically competent. This includes being able to perform necessary clinical skills and demonstrate appropriate clinical decision making and clinical management. Clinical competency is often tested through clinical simulation evaluation activities. Competency based education differs from traditional models, known as time-based education, where students the focus is on the number of years of study that are required by the clinical program (Gruppen, Mangrulkar and Kolars, 2012) . For example, in a time based program a midwifery degree may require four years of study for everyone, whereas in a competency based program it is recognized that some students may require more time or less time (within limits) to achieve competency. These programs provide the space and the expectation that each learner learns at their own place and seek to remove the stigma from not graduating all students within a predetermined period of study.

The training of more midwives is the obvious solution to the shortage in the midwifery workforce observed in low-resource environments. However, the focus must be on scaling up the workforce at quality in order to confront the existing challenges that the current midwifery workforce faces in these areas.

2.4. Midwifery in three case studies

This thesis is a compilation of two diagnostic studies, and an outcome evaluation. The subject of each of the case studies is the midwifery workforce (workforce of midwives), the objective of each of the studies is to contribute to the knowledge base regarding improvement of the quality of midwifery services being provided. Table 3 provides a guide for each of the case studies presented.

2.4.1. Institutional aspects of the empirical research

My roles in each of the case studies varied depending on the sponsoring institution and my actual employment. The research for the Afghanistan case study was completed in September in 2012, as part of the larger High Burden Country Initiative Study of the midwifery workforce in Afghanistan. As of yet this study is not yet published. This exercise contributed to findings regarding Domain A of the framework. The Executive Director of ICS Integrare and I ran the exercise.

The research for the Tanzania case study comes from an assessment completed in August of 2014 as part of my work with my current employer, the Department of Global Outreach (DGO) at the American College of Nurse Midwives (ACNM). The findings presented in this thesis stem from this assessment report (grey literature) and all data presented is cited as such.

The research presented in the Ghana case study stems from the project evaluation which was designed to demonstrate to donors the progress achieved as a result of the program.

The complete evaluation utilized a mixed methods approach with both quantitative and qualitative components. I began working for the organization in the final months of the program and was asked to design the program evaluation. I was not involved in any of the data collection but was responsible for the analysis of the data after the conclusion of the program.

Table 3. Guide to the case studies of this thesis

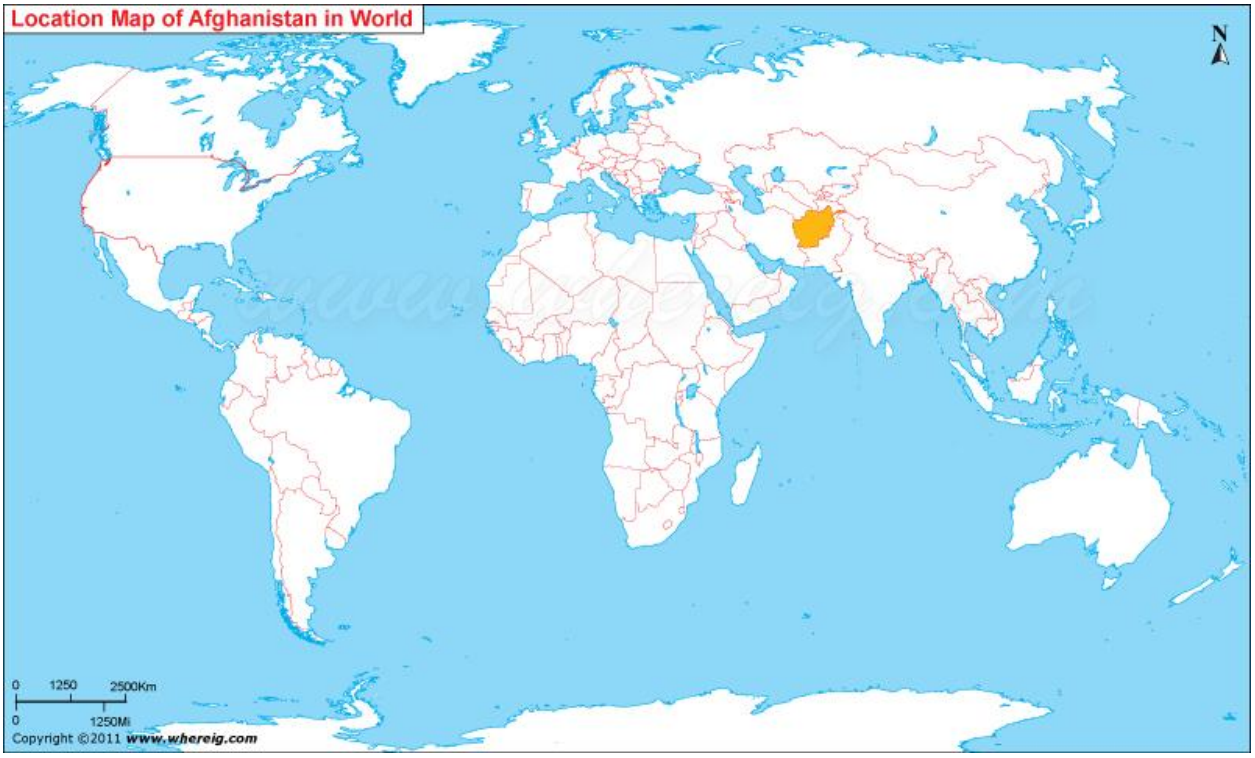
Chapter	Country	Collaborating Organization	Year Completed	Involvement of Ministry of Health	Reference Document	Type of data	Type of research	Frameworks, models, methods	Findngs presented
3	Afghanistan	ICS Integrare	2012	Yes	Not applicable	Primary	Qualitative	Tanahashi framework, Delphi method	Figure 9a, 9b, Table 9
4	Tanzania	American College of Midwives, Department of Global Outreach	2014	Yes	Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions.	Primary	Mixed method	Curriculum review utilizing mapping. Survey of scope of practice Skills testing utilizing Objective Structured Clinical Examinations (OSCEs) Surveys	Figures 10,11,12 Table 6, 11
5	Ghana	American College of Midwives, Department of Global Outreach	2013	No	Final Project Evaluation: Strengthening Midwifery Pre-service education in Family Planning and Comprehensive Abortion Care in Ghana	Primary	Mixed method	Structured group interviews Skills testing utilizing Objective Structured Clinical Examinations (OSCEs) Caseload surveys	Figures 13-27 Table 8,12

2.5. Afghanistan

2.5.1. Afghanistan case study: The relevant context of the case study

Chapter three is a case study from Afghanistan. Coming back to the research question of this thesis, chapter three relates to ***Are midwives in low resource countries providing the quality maternal and reproductive health services that are needed? What gaps exist?***

Map 4. Afghanistan



Source: Whereig, 2012.

Accessing data in Afghanistan is extremely difficult as much of the country is under extremist rule and cannot be safely accessed by data collectors or by health providers. The authors of DHS completed the Afghan Mortality Survey in 2010. However due to safety concerns, rural areas of the northern zones were not able to be completed (Afghan Public Health Institute et al., 2011). These same safety concerns make providing care to women in the areas under extremist control a formidable challenge. However, Afghanistan is often regarded as a success for midwifery due to the drastic reduction of estimated

maternal mortality from the years 2002 to 2010. In 2002, the maternal mortality ratio of Afghanistan was estimated to be between 1600 and 2200 per 100,000 live births, a tragically high ratio (Bartlett et al., 2005). Table 4 shows the data regarding the current maternal and reproductive health situation in Afghanistan. It is important to note that for the reasons just mentioned these are estimations at best, however they do provide a relevant initial context for understanding maternal and reproductive health in Afghanistan.

Table 4. Afghanistan maternal and reproductive health data

Indicator	National Data	Urban Data	Rural Data
% population urban	53%		
TFR	5.1		
% population female	48.5%		
MMR	396 [253-620]		
Percentage of women using modern method of family planning[2]		29%	17%
SBA		78.9%	42.1%
ANC1		71.7%	54.8%
ANC4		31.7%	13.6%
Facility Births		75.8%	39.9%
Abortion Law	Illegal		
Current met need for midwifery	23%		
Estimated met midwifery need for 2030	8%		

Sources: Central Statistics Organization (CSO), Ministry of Public Health (MoPH), and ICF International, 2016; World Bank, 2016; Islamic Republic of Afghanistan, Ministry of Public Health, 2011; WHO et al., 2015; Islamic Republic of Afghanistan, Ministry of Public Health, 2011; Woman on Waves, 2016; UNFPA, ICM and WHO, 2014

[2] Substitute indicator. Data regarding unmet need for family planning not available.

Despite great improvements, the information above shows a very concerning maternal and reproductive health situation. The case study presented in chapter three provides complementary qualitative information that provides insight into the *why* of Afghanistan's current health reality, utilizing a qualitative research technique known as the Tanahashi framework.

This qualitative method can be used to explain the state of maternal health that is not described by quantitative universal health indicators. That is to say it provides insight into the reasons why the state of maternal and reproductive health is what it is and what barriers and bottlenecks complicate midwifery service provision with the existing work force. It provides an understanding of how the accessibility, acceptability, availability, quality of contact impact the final effective coverage provided by the existing midwifery workforce.

In 1978, Tanahashi published a sentinel paper addressing the measurement of health coverage and provided a framework to address the allocation of resources, evaluate if services reach those who need it, and whether services appropriately meet the population´s needs (Tanahashi, 1978). The Tanahashi framework focuses on a coverage ideal (such as universal coverage) and then takes into account barriers and bottlenecks to achieving the ideal (Tanahashi, 1978). Barriers and bottlenecks are considered on several levels. The first is availability, considered to be a ratio between the capacity of the health system and the size of the target population. The second layer is accessibility, which addresses the population´s ability to reach health services. Acceptability is the third layer and may include factors such as cultural appropriateness and the cost of service. Contact is the fourth layer and refers to those that have been able to have contact with the service. It may also be expressed as a ratio between those that have had contact and the target population. Effective coverage is the fifth layer and reflects those that have had satisfactory service. Beginning with an ideal of total coverage, estimated reductions are taken for each of the layers, each reduction building off of the previous. What remains is the actual effective coverage (Tanahashi, 1978).

In recent years, a method similar to the Tanahashi framework has come into greater use, known as the AAAQ. AAAQ stands for Availability, Accessibility, Acceptability and Quality (ICM, 2015). In this framework, the last layers of the Tanahashi (contact and effective coverage) have become expressed as the quality of the contact, or the quality of the care provided. The AAAQ framework has become an

important framework for international health monitoring and evaluation in the post 2015, post MDG agenda (ICM, 2015; UNHR 2013).

Studies employing the Tanahashi framework, can best be completed seeking expert opinion through the use a Delphi method of study. The Delphi method originated in the 1960s as a tool used in information technology systems research (Okoli and Pawlowski, 2004). Since that time, the Delphi method has been used in a variety of fields, and with increasing frequency in recent years. In the Delphi method participants are asked to offer their expert opinions on a set subject matter or series of questions. The Delphi method can best be described as a controlled debate. While participants may often reach agreement or consensus in responses, the method is not meant to provide statistically significant data, but instead to generate answers, information and ideas from experts relevant to the subject at hand (Gordon, 2009).

It is anticipated that this case study will provide an understanding of the benefits of this methodology. It will provide a concrete understanding as how it can be used to assess midwifery (and other) service provision, particularly in environments where limited or imprecise data is available, as is often the case in low resource countries.

2.5.2. Afghanistan case study methods: The use of the Tanahashi framework with a Delphi approach

This research sought to understand the barriers and bottlenecks in care provision relevant to the midwifery workforce and service utilization and provision of reproductive and maternal health services. In order to identify and investigate the existing challenges, a Tanahashi framework with a Delphi approach was used. Participants included directors and staff from the Ministry of Public Health, representatives from professional associations, local and international non-governmental organizations (NGOs), donors, service providers (doctors, midwives), and representatives from local and international branches of several multilateral organizations. These participants were selected on the basis of their expertise working in maternal health in Afghanistan. Members of both the health economic and human resources departments were asked to participate.

These stakeholders were divided into five groups of 4-6 participants. Participants were included in a group exercise to discuss the availability, accessibility, acceptability, quality of the midwifery workforce based on the Tanahashi framework. They were asked to indicate graphically and estimate the

percentage reduction of the impact on coverage attributed to each of the areas of availability, accessibility, acceptability, contact (quality of contact) and effectiveness. The result was an estimate of effective coverage after the aforementioned factors were taken into consideration. Analyses were completed from the perspective of the target population (i.e. women of child-bearing age and pregnant women) and each group was asked to complete the exercise twice; once for the urban population and once for the rural population. Comparing outcomes for rural versus urban populations was an important component of the research as it was anticipated that rural populations would have far lower effective coverage than urban populations.

After all five groups had completed the exercise the 10 responses were collected and ranges and means were tabulated for both the rural and urban populations. The findings of this research are presented in chapter three.

2.6.Tanzania

2.6.1.Tanzania case study : The relevant context of the case study

Chapter four of the thesis continues with the task of problem identification. Specifically this research chapter speaks to the quality of care, utilizing a case study from Tanzania. This chapter seeks to address the questions: ***Are midwives in low resource countries providing the quality maternal and reproductive health services that are needed? What gaps exist?***

The assessment is an analysis of the midwifery education system and the quality of care provided by recent graduates in the Lake region of Tanzania. In Tanzania, midwifery training is part of nursing training. That is to say that all nurse graduates can choose to practice as midwives. In response to the nation's maternal and reproductive health worker shortage, the Tanzania Ministry of Health and Social Welfare's (MoHSW) "*Curriculum Information for Ordinary Diploma Program in Nursing (Level 4-6)*" (United Republic of Tanzania, Ministry of Public Health and Social Welfare, 2008) was modified in 2008. The modification included shortening the nursing and midwifery programs as to increase the speed with which new midwives could be produced. This will be explained in greater detail in chapter four.

The study took place in Kagera and Mara, two of the six regions that comprise the Lake zone of Tanzania. The Lake Zone is the area surrounding Lake Victoria. The Lake zone population is mostly rural

(City Population , 2012). Table 5 includes national maternal and reproductive health indicator data from Tanzania. Maternal and neonatal health indicators are below the national average for Tanzania in the Lake zone.[3]

Map 5. Tanzania

Source: Wherig, 2012

[3] Mara Region has 115 neonatal deaths per 1000 live births, and Kagera Region has 89 neonatal deaths per 1000 live births.

Table 5. Tanzania maternal and reproductive health data

Indicator	National Data	Urban Data	Rural Data
% population urban	31%		
TFR	5.2		
% population female	50.3		
MMR	410		
Unmet need for family planning		18.9%	27%
SBA		83%	42.3%
ANC1		57.7%	42.9%
ANC4		54.8%	39.1%
Facility Births		82%	39.1%
Abortion Law	Illegal.[4]		
Current met need for midwifery	74%		
Estimated met midwifery need for 2030	97%		

Sources: National Bureau of Statistics (NBS) Tanzania and ICF Macro, 2011; World bank, 2016; WHO, 2015; Kearns et al., 2014); UNFPA, ICM and WHO, 2014.

The Tanzania case study focuses exclusively on pre-service education. While the findings are specific to Tanzania and limited to one region of Tanzania in particular, the challenges and findings presented are not unique to Tanzania and can be considered relevant for many low-resource countries. Table 6 highlights each research area and offers an explanation of research activities involved in each area.

[4] * Allowed in some cases for physical or mental health of the mother

Table 6. Research activities Tanzania midwifery study

Research topic	Research Activity
Curriculum review	Curriculum mapping against ICM education guidelines, with ICM curriculum mapping tool.
Job responsibilities of recent graduates	Surveys of 91 recent graduates, mapping reported job activities with scope of practice for midwifery in Tanzania
Competence of new graduates	Skills testing of 91 recent graduates in four key areas
Teaching staff	Qualitative surveys with 10 teaching staff
Clinical practice sites	Qualitative surveys with xx clinical preceptors and 4 administrators, site assessments of the four schools

Source: Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015

2.6.2. Tanzania case study methods: a mixed method approach for analysis

The assessment was conducted in four midwifery schools two in Mara and two in Kagara regions of the Lake zone. The research activities were conducted by four research teams comprised of six to eight members including local staff from international donor organizations, national and international midwifery clinicians and educators and a representative from the Ministry of Health and Social Welfare (MoHSW).

The assessment was completed with a mixed methods approach, the specific methods including sample sizes, will be explained for each activity in continuation. As this activity was to be done for and in collaboration with the MoHSW all activities were completed with standardized tools which were then presented to key stakeholders (including MoHSW staff) for modification and approval. The tools were adapted from International Confederation of Midwives (ICM) materials and the ICM materials and the MoHSW's *Guideline for Continuous Quality Improvement in Health Training Institutions* (2011). This second document was developed by the MoHSW and addresses school infrastructure requirements.

Along with another colleague from my organization, I was asked to design and coordinate an assessment of the current midwifery training program as well as recent graduates from this same program from the four schools. I did not actually collect the field data that contributed to the assessment. Instead my ACNM/DGO colleague participated with research teams for the data collection. The four teams (one for each of the schools assessed) were comprised of local health officials including MoHSW employees, colleagues from the local collaborating organization (Jhpiego Tanzania), and colleagues from my own organization (ACNM, DGO). My colleague and I designed the study and data collection tools to be used during the study. I was responsible for getting the research tools approved by the Tanzanian MoHSW members and key stakeholders, completing all quantitative analysis and some qualitative analysis, the dissemination of the findings in Tanzania and for final oversight of the completed assessment report.

The specific methods for each of the five research activities were as follows:

1. *Curriculum Review:*

   A review of the curriculum was completed using the International Confederation of Midwives (ICM) *Curriculum Mapping Tool*, which was developed in accordance with the ICM *Essential Competencies for Basic Midwifery Practice* (ICM, 2010). This tool provides an extensive list of topics that per their guidance should be included in any midwifery curriculum worldwide. While the ICM does not directly approve or refuse any country´s curriculum, it provides these guidelines and mapping tools to assist countries in the creation of curriculum that is appropriate for the training of the cadre of midwives. The data relating to the curriculum review will be abridged as it is a very lengthy and technical. The total curriculum containing multiple accessory modules and teaching guides amounts to over 1000 pages.

2. *Job responsibilities of recent graduates:*

   Having a clear scope of practice that delineates the responsibility of each cadre is of vital importance in health services. Ideally the scope of practice of each cadre will guide health systems administrators in the planning of worker distribution, as well as financial planning. The scope of practice should also be used as a guide when developing the educational curriculum created to train each cadre. However in low-resource countries it is not unusual for official (state-approved) scopes of practice to be nonexistent, outdated or not followed. In the case of Tanzania an official scope of practice was drafted in 2013. In August of 2014 when this study

was conducted, the scope of practice had still not been approved by the MoHSW. For the purpose of this study, the draft Scope of Practice, awaiting approval by the MoHSW was used.

For this research activity 91 graduates were interviewed. These graduates had all been trained using the updated 2008 curriculum. Of the 91 participants 38 were certificate (as opposed to diploma) midwives. The sample was a convenience sample of midwives that graduated after 2010, identified by the regional office of the international donor agency with cooperation from the schools. The sample included a mix of diploma and certificate graduates. With exception of 20 midwives, who were recruited from Dar Es Salaam, all participants worked in the Lake region. The group from Dar Es Salaam was added to show any potential contrast that may be found between midwives working in the poorer lake region and those working in the capital city. This was expected to highlight any differences between urban and rural settings.

For the completion of this activity, the participating recent graduates were given a list of 83 activities that according to the draft National Scope of Practice for Midwives should have been activities that they completed regularly in their employment as midwives. Participants were asked to identify only the tasks that they complete regularly in their current employment. The responses were then analyzed and averages for each work activity were calculated. This activity was designed to provide insight into the actual practice of midwives in their daily routines.

3. Competence of recent graduates:

The same 91 recent graduate participants also took part in the completion of Objective Structured Clinical Examinations (OSCEs) in six areas that were identified as skills are critical to address common causes of maternal/newborn mortality and morbidity in Tanzania. The six topics were as follows:

- Family planning: role play--counseling a woman who requests oral contraceptives
- Antenatal complications: applied knowledge--ability to recognize and provide immediate management of severe pre-eclampsia
- Partograph: applied knowledge—ability to discriminate partograph findings and categorize them as normal, a cause for alert or requiring immediate action

- Intrapartum complications: applied knowledge—ability to recognize and manage prolonged latent phase of labor, protracted/prolonged active phase of labor, failure of the fet al head to descend

- Newborn Resuscitation: clinical—demonstration of resuscitation steps
- Postpartum complications: applied knowledge—ability to interpret physical and laboratory findings to recognize someone at risk for or who may be experiencing late postpartum hemorrhage

The OSCEs were validated to measure ICM competencies in midwifery. The OSCE scenarios were reviewed by the entire field research team, and training was conducted to insure standardization of scoring across the researchers.

4. Teaching staff:

In an effort to get a sense of the teaching staff at the midwifery schools, as many tutors as possible were interviewed. The interviews were based on ICM materials and the MoHSW's *Guideline for Continuous Quality Improvement in Health Training Institutions* (2011). Across the four schools, ten tutors were interviewed. Only midwifery tutors that were midwives were considered, as technically only midwives should be teaching midwifery in Tanzania. This low number of eligible tutors reflects the reality at the schools. Several schools had non-midwives teaching midwifery in order to compensate for the staffing shortages. The tutors were interviewed in group interviews using a standard set of open-ended questions.

5. Clinical practice system

The clinical practice system is the system that each school has in place for the training of clinical skills to the midwifery students. This system includes the clinical teaching that students receive within the schools, including the skills laboratories and practice models within each school. It also includes the clinical sites (hospitals/clinics) where students go to practice and the clinical instructors, often called preceptors, who interact with, supervise and teach students in the clinical sites. The research activities for this section included site visits to each of the schools and their skills labs as well as visits to the clinical sites. Again the modified ICM materials and the MOHSW's *Guideline for Continuous Quality Improvement in Health Training Institutions* (2011) were used (United Republic of Tanzania, Ministry of Health and Social Welfare, 2011).

Questions regarding the clinical training systems were included in the interviews with tutors and administrators mentioned above.

2.7. Ghana

2.7.1. Ghana case study: The relevant context of the case study

Chapter five includes a case study based in Ghana and responds to the question: ***What training improvements will better prepare midwives to provide quality maternal and reproductive health services?***

Map 6. Ghana

Source: Wherig, 2012.

Ghana, like many African countries, has struggled to meet the Millennium Development Goal 5 (MDG 5) of reducing maternal mortality by 75%. The shortage in health workers is often blamed for the failure (Bhutta ZA, Lassi ZS, Mansoor, 2010) to meet this target. In response, policy makers in Ghana have made strides to create a policy environment that facilitates an increase in the midwifery workforce.

From 1992 to 2002 the government recognized the right of citizens to healthcare through policy. The national Human Resources for Health Strategic Plan of 2007-2011 stressed the importance of improving deployment and retention strategies. It recognized the need for changes in the educational processes to include continuous professional development of workers (in-service education), improved systems for accreditation as well as regulation and licensing of health workers (Campbell et al, 2013). The government´s effort to increase workforce numbers yielded a great return, as the number of professional midwives increased by 185% between 1990-2009, adding an estimated 1400 midwives to the workforce (Campbell et al., 2013). While this is a significant increase, the 2014 State of the World's Midwifery report estimates that the current midwifery workforce only meets 30% of the country's actual need (UNFPA, ICM and WHO, 2014). Table 7 presents key maternal and reproductive health indicators for Ghana.

In Ghana, access to desired family planning is a key concern. Data from 2011 shows that only 35% of women that are married/in union use any contraception (modern or otherwise) (Cleland et al., 2006). In addition to care during pregnancy and birth, the provision of family planning services is an important component of midwifery care in Ghana. The reduction of unintended pregnancies and births is a key for lowering rates of maternal mortality (Cleland, et al., 2006). Long term family planning (LTFP) methods are rarely used. Only .6% of women use an intra-uterine device (IUD), 8.8% use injectables and 1.8% use implants (Ghana Statistical Service, 2011). Barriers to the use of modern or LTFP mentioned during this program evaluation included a lack of provider expertise, an uninformed public and fears about the side-effects of LTFP.

Contraceptive use is less common among poorer Ghanaian women resulting in a higher number of unintended pregnancies than to women with greater economic resources (Ghana Statistical Service, 2011), but access to safe abortion is more common in socially advantaged groups. Although Ghanaian law has permitted abortion under specific circumstances since 1985, unsafe abortion, like unmet need for family planning, remains an important barrier to decreasing maternal mortality. A recent Guttmacher report stated that only 6% of women in Ghana seeking abortion were aware of the legal status of abortion. Approximately 45% of abortions in Ghana take place in unsafe conditions and unsafe abortion is the second greatest cause of maternal mortality in Ghana, accounting for 11% of maternal deaths (Guttmacher Institue, 2011). Unsafe abortion is more common in women without financial

support from a partner, poorer and younger women. Abortion is also more common for women who are in their 20s, childless and have never been married (Guttmacher Institute, 2011).

Table 7. Ghana maternal and reproductive health data

Indicator	National Data	Urban Data	Rural Data
% population urban	53%		
TFR		3.4	5.1
% population female	50.3%		
MMR	319 [216-458]		
Unmet need for family planning	30%		
SBA		90.1%	60.2%
ANC1		93.6%	84.5%
ANC4		92.3%	82.9%
Facility Births		90.2%	59%
Abortion Law	Legal with restrictions		
Current met need for midwifery	30%		
Estimated met midwifery need for 2030	81%		

Sources: World Bank, 2016; WHO et al., 2014; Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF International, 2015; Women on Waves, 2016; UNFPA, ICM and WHO, 2014

Meeting the need for family planning is a known strategy for reducing maternal mortality. However, if midwives are not prepared to offer quality family planning services (lack of provider expertise), women cannot benefit. As a need for long term family planning (LTFP) as well as comprehensive abortion care (CAC) was identified in Ghana, my current employer (American College of Nurse Midwives, Department

of Global Outreach), was called upon to create and implement a program in three midwifery schools in Ghana. The program focused on the education of future midwives with regard to long-term family planning such as hormonal implants and intra-uterine devices as well as comprehensive abortion care (CAC) including manual vacuum extraction (MVA). This program was implemented in two phases and will be described in detail in chapter five of this thesis. The program was intended to be pre-service education program. However, as long-term family planning is not widely used in Ghana, and classroom tutors as well as clinical preceptors, who are actively practicing as midwives, had little or no previous experience with these methods and were therefore included in the program as well as the case study presented in chapter five.

2.7.2. Ghana case study methods: A mixed methods approach for project evaluation

This case study is slightly different from the others, in that most of the data collection was carried out by local staff that participated in the project. Most of the data comes from either monitoring systems that were put in place with staff in Ghana or through final evaluation activities that again were carried out by the staff in Ghana. Unfortunately the data collection that took place throughout the project was somewhat inconsistent. The monitoring and evaluation system for the first 19-months of pilot was different from that of the second phase of the program. To that end, the research design for the final program evaluation was in part determined or limited by what data had been collected in the initial phase of the program. There was another, very complicated structural flaw with this research design, that being the timing of data collection and analysis. Data collection occurred during the final weeks and months of local staff contracts and in most cases data files were turned into me as one of the final activities or the final activity of the local staff. What's more, all quantitative work had to be translated into English from native languages before I could use it and this added more time from when the research team finished working on the data collection and when I could begin data analysis. This timing made it impossible for me to contact the research team to clarify any doubts I may have had or to request any information that was missing as their working contracts had ended. For example, I do not have final numbers of participants from the structured group interviews that were conducted. I know that all groups had between six and ten people, but I did not receive the final sign-in log. However, not having precise information about the number of participants in the qualitative data (the sample size) is the most common and greatest piece of missing information in the data set.

Within each of the three schools a convenience sample of preceptors participated in structured group interviews regarding how the program impacted the clinical services they offer. Finally, clinical caseload reviews were completed to explore changes in access (expansion of services offered) from two quarters (six months) prior to the training until 4 quarters (1 year post-training). Table 8 is a table showing each of intervention activities and the corresponding evaluation activity.

The following is a description of the methods employed for each of the research activities

1. *Structured interviews:*

Structured group interviews were conducted with groups of preceptors and tutors from the three schools. Structured group interviews were also conducted with students from Bolgatanga and Kumasi. However students from Tamale were not available during the evaluation data collection period. The methodology was similar to that of focus group methodology, however I am not calling them focus groups as they were carried out by staff that did not receive full focus-group training. However, a standard guide was developed and used for each type of group (i.e. students, preceptors). Structured group interviews were recorded, transcribed and then analyzed for key themes. Relevant quotations were also extracted. Interviews were conducted with an administrator (principal) of each of the schools as well. Again, a standard interview form was created allowing for expansion as desired by the interviewee.

In all cases the sample was a convenience sample based on participant availability. Due to the nature of the funding cycle for the project, the evaluation period unfortunately coincided with school vacations. This complicated the availability of participants, particularly in more rural areas such as Tamale, where students live on campus during the school year, but may live in remoter area in the vacation months.

Table 8. Ghana project intervention and evaluation activity

Intervention Area	Intervention Activity	Evaluation Activity
School infrastructure	Renovations including library, computer laboratory, skills laboratory and tutor offices	Structured group interviews with school tutors, students and administrators
Teaching system	Skills updates for tutors	Structured group interviews with tutors
	Teaching and coaching skills training for tutors	Structured group interviews with school tutors.
		OSCEs (skills testing) of students
	Computer training for tutors	Structured group interviews with school tutors
	eLearning package	Structured group interviews with school tutors, students, and administrators.
Clinical Practice System	System for preceptor selection	Structured group interviews with school tutors, preceptors
	System for clinical site selection	Structured group interviews with school tutors
	System for communication between tutors and preceptors	Structured group interviews with school tutors
	Clinical skills updates for preceptors	Structured group interviews with preceptors caseload reviews preceptors
	Teaching and coaching skills training for preceptors	Structured group interviews with preceptors

Source: Original elaboration based on ACNM, 2013

2. OSCEs:

Skills testing was completed through the use of Objective Structural Clinical Examination (OSCE) testing. OSCE is a method for assessing clinical skills through objective testing and direct observation of clinical performance utilizing simulation or test stations. The individual being evaluated is expected to perform determined clinical skills according to a determined set of procedural steps within a determined amount of time. Those being examined rotate through various stations for the evaluation of several skills in one testing period (OSCEhome, 2014). OSCEs were completed for IUD insertion, Implant insertion and MVA.

In part due to the fact that this program was executed in two phases, OSCEs were not managed uniformly. To that end, data from OSCE testing should be interpreted with a reasonable amount of caution. The most appropriate utilization of the scores is as an appreciation of the trend of change. In Kumasi tutors were not tested at the beginning of the program so there are no pretest scores. Additionally, Kumasi students were not uniformly pretested. Instead students from the various cohorts were tested at the end of their family planning units. As testers and stations may have varied slightly through the years, these results should also be read with caution. Additionally, the OSCE test that was originally used in Kumasi was altered in phase II, so that the OSCE test results from Kumasi during Phase I of the program are not comparable to those from students from Bolgatanga and Tamale. The completion of OSCE pretesting with tutors and preceptors was very inconsistent across the program and therefore post-testing was generally not done for those groups. Therefore there are no OSCE scores for tutors and preceptors included in this thesis. It is also worth noting that the testing procedure and scoring used for Ghana varies greatly from the testing and scoring used in Tanzania. For that and other reasons the results will be presented differently and the two groups of information are not comparable.

3. Caseload studies:

In order to assess a potential change in service provision we sought to evaluate preceptors' long-term family planning and CAC caseloads before and after receiving training. For each of the three schools, the same convenience sample of midwifery preceptors shared their caseload logs for review. The caseload logs show how many of each case type were attended to by each

midwife per month. Data regarding caseloads for IUD insertion, implant insertion and MVA were gathered for the two quarters prior to receiving training and four quarters (one year) afterwards. In order to provide a clearer estimation of the trend, the number of cases was averaged for each quarter for each person.

3. AFGHANISTAN: UNDERSTANDING BARRIERS AND GAPS IN MIDWIFERY SERVICE PROVISION.

3.1. Midwifery and maternal and reproductive health in the Afghan context

During the Taliban rule, the education of girls was forbidden, in Afghanistan. This created a severe shortage in female health workers (Turkmani et al., 2013) which was particularly damaging to maternal and reproductive health in Afghanistan, as cultural norms require that women seek clinical services exclusively from female providers.

In 2001, in response to the extreme shortage of reproductive health workers, international donor agencies including USAID, the World Bank and the European Commission collaborated with Afghanistan´s Ministry of Public Health (MoPH) to support two types of pre-service midwifery schools: Health Science Programs (IHS) that aim to place midwife graduates in hospitals and Community Midwifery Education (CME) programs that recruit women selected from rural areas for training and re-placement as midwives in their own communities that are desperately under-served rural areas of Afghanistan (Zainullah et al., 2013).

The CME training program began as a small pilot from 2002-2004 (Turkmani et al., 2013). By 2010 there were 34 midwifery schools in Afghanistan (Zainullah et al., 2013) and by 2010 there were over 2500 midwives up from 467 in 2002 on the Ministry of Public Health (MoPH) Human Resources register (Zainullah et al., 2013). The impact of the increased work force has been widely noted. While all data from Afghanistan should be regarded with a certain degree of skepticism due to the limits to effective data collection, the 2010 Afghan Mortality Survey (created by DHS) reports great improvement in the state of women´s health (Zainullah et al., 2013). In 2002 the MMR was estimated to be 1100, whereas in 2010 it was estimated to be 396 (Zainullah et al., 2013). While most countries signed on to the MDGS in 2000, Afghanistan signed on the MDGs five years later than other countries and therefore was technically afforded until 2020 to accomplish their goals (Government of the Islamic Republic of Afghanistan, 2012).

3.2 Universal Health Coverage in Afghanistan

In addition to the focus on pre-service education for midwifery in rural areas, the national and international response to Afghanistan's health crisis also concurrently included the creation of a national health system (Sandefur, 2013; Turkmani et al., 2013). In 2003 a national Basic Package of Health Services (BPHS) was developed, followed in 2005 by the Essential Package of Health Services (EPHS). The BPHS is slated to provide primary care services that are community oriented, while EPHS focuses on the provision of care at the hospital level (Sandefur, 2013; Mansoor et al., 2013).

Unlike many other low-resource countries, with the Basic Packages Afghanistan already has a framework for Universal Health Coverage (UHC). This makes Afghanistan an interesting case for the study of UHC and midwifery services in low resource countries. UHC is particularly important for maternal health as research has shown that if UHC for maternal health interventions (including family planning) was achieved (95% coverage of the population), maternal mortality could decrease by as much as 83% in low income countries over a 15-year period (Homer et al, 2014). Additionally, the drive for UHC is key as it steps beyond the medical paradigm to also address health care in terms of human rights and equity.

3.3 Evaluating midwifery services

While studying midwifery in Afghanistan as part of the HBCI, it became clear that a methodology that would identify the factors that inhibit or prevent further growth and acquisition of universal coverage was necessary. Service coverage indicators showed important gaps in midwifery service coverage, but that qualitative research would be needed to understand why so few women got antenatal care, or accessed family planning.

It is common for maternal and reproductive health policy and intervention planning to be formed in function of research that focuses exclusively on indicators. The same is true for most studies of midwifery services or maternal and reproductive health status. Often service indicators such as ANC1 or percentage of deliveries that take place in a health facility are given paramount importance, and Hodgins *et al* contend that that the evaluation of maternal health is often further reduced to a single indicator, SBA. Assuming that rates of SBA tell the whole story about maternal and reproductive health

is particularly erroneous and as discussed in the introduction of this thesis, the association between SBA and maternal mortality is inconclusive (Scott and Ronsmans, 2009). It has not been confirmed that SBA results in improved health (Hodgins, 2013). As we will see later in this thesis, university or training certificate does not necessarily guarantee that a provider is competent. A variety of factors such as the level of education available in the country, the ability to train practical skills or the maintenance of skills strongly influence provider competence. The focus on skilled birth attendance fails to consider other contextual factors that may impact a woman´s ability to access quality care and assumes that a "single delivery approach" (the same approach for all women regardless of context or circumstances) is appropriate (Hodgins, 2013).

Decisions regarding health workforce staffing, including how many midwives are needed, are also generally based solely on quantitative metrics void of any participatory or qualitative research. For example the practice of only using metrics that consider the number of skilled birth attendants (midwives, nurses and physicians) per 1,000 population, and/or the number of providers per 100,000 population in Emergency Obstetric and Newborn Care (EmONC) facilities is very common. However, more attention should be paid to the factors that impact the relationship between these indicators. For example, the activities most commonly performed by a specific midwife are often context specific. Appropriate estimates of the number of midwives needed should be calculated in a way that takes into account the percentage of time that a midwife spends providing maternal health services as opposed to other activities. The number of midwives should then be determined in terms of clinical Full Time Equivalents (FTEs) (UNFPA, ICM and WHO, 2014) as opposed to relying on a ratio of midwives to population. A rural midwife may spend part of the day handling administrative duties and then in prenatal care or family planning appointments until called away for a birth. This means only a portion of her day is spent on clinical care, whereas a midwife working in an urban health facility may spend all of her day conducting births.

Beyond looking at number of workers or clinical visits completed it is important to understand what care a woman is receiving. Too little is understood about what is occurring in antenatal visits that may impact maternal mortality, or why a woman makes it to only one ANC visit instead of the advised four. Are all midwives providing the same services in an antenatal visit, are all providing care at the same quality level? What are the barriers to access? What are the economic costs and benefits for the woman and her family? These key questions are missed in policy discussions that focus on indicators per population

and lead to erroneous needs assessment as well as inappropriate workforce planning. In order to assure effective coverage, and quality service provision planners must go beyond counting clinical encounters and interventions. They must also understand why and how a woman does or does not acquire necessary midwifery services for maternal and reproductive health.

3.4 Monitoring and evaluation of Universal Health Coverage and midwifery services

The World Bank and the World Health Organization make the case for the need for regular monitoring and evaluation of progress toward UHC. In their 2014 publication, "Monitoring Progress towards Universal Health Coverage at Country and Global Levels", the organizations put forward the need for a common approach to the evaluation of UHC progress assessing coverage both in terms of service coverage and financial protection (WHO and World Bank, 2014). The report calls attention to the need for systematic monitoring of the progress towards UHC utilizing a uniform framework that can be applied at the national level and then used for international comparison. The authors urge that any expanded frameworks used for monitoring should focus on indicators that are relevant, can be adjusted for effectiveness and quality, and are widely available. While few indicators will meet all three of these criteria; it is suggested that countries are accustomed to studying the Millennium Development Goals (MDG) indicators and these ought to be considered. There is also a great need to look for indicators that provide information regarding quality of care, and that can be disaggregated to evaluate equity across socio-economic and demographic stratifiers such as level of wealth, geography (rural vs. urban) and gender. The methodology proposed in this chapter meets all of these requirements.

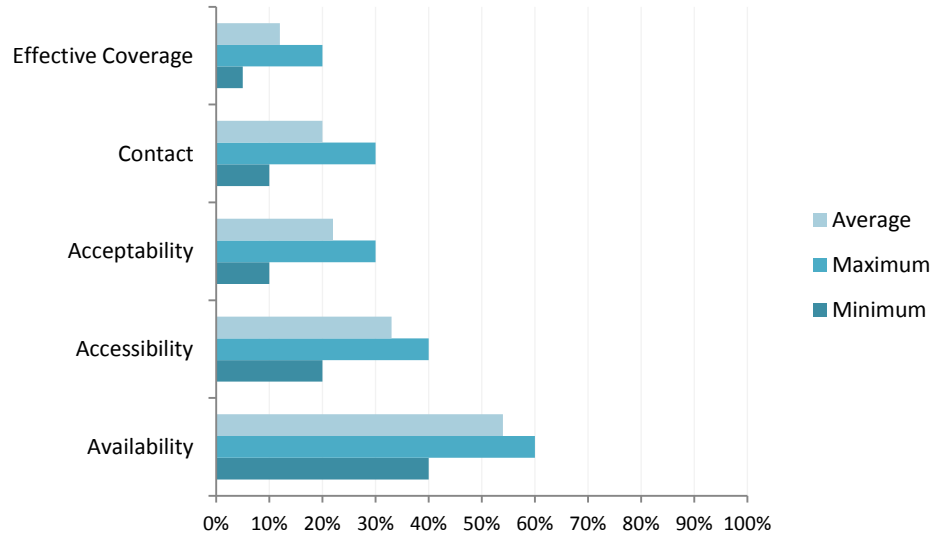
Assessments of UHC must take into account the need and demand for maternal health service, considering the existing patient pathways, meaning the actions a patient must take in order to get the care she is seeking, and the ideal service availability. The WHO/World Bank report (2014), stipulates that as opposed to relying on one-dimensional indicators, a more effective framework that also investigates barriers and enablers to achieving ideal service availability should be employed. Similarly, it is important to understand the impact of these barriers to potential equity in utilization and quality of services. Again, I believe this case study is an example of how such barriers can be examined.

In addition to evaluating tracer indicators such as those outlined by WHO/WB, standard methods of qualitative research may provide key context-appropriate information in the evaluation of UHC at national and global levels. In this case study a modified Tanahashi model was employed to consider effective coverage of midwifery services in Afghanistan, with a focus on the AAAQ of the midwifery workforce.

3.5 Findings: Tanahashi framework applied to midwifery services in Afghanistan

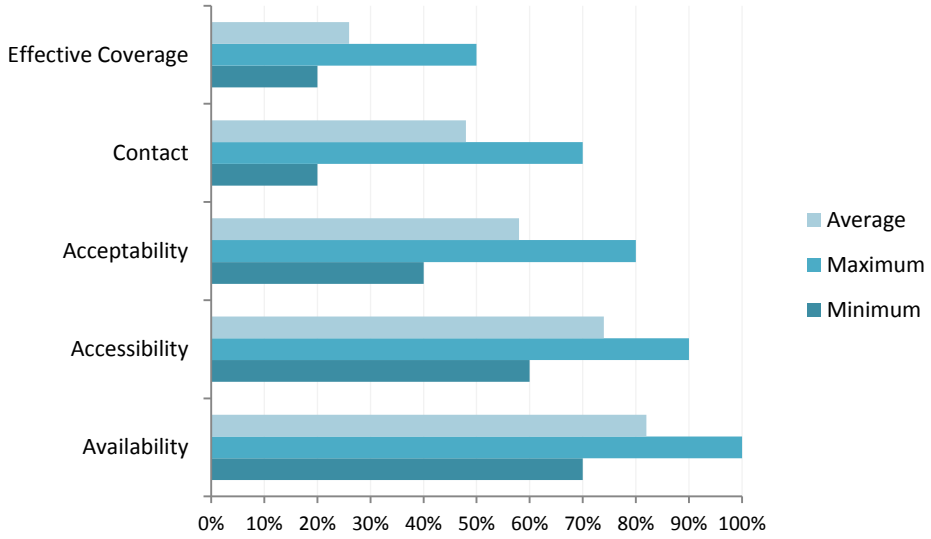
The results can be viewed in Figures 9a and 9b. The experts present a picture of maternal health in Afghanistan, which identifies differences between crude and effective coverage. Particularly in the rural areas, barriers are estimated to have a very drastic impact on effective service delivery. Across the five groups there was some variation, however, after discussing the median and the range, the panel of experts was largely in consensus over the findings.

Figure 9a Tanahashi exercise on midwifery service provision in Afghanistan. Representation of scores, rural



Source: Original elaboration in collaboration with ICS Integrare, based on original data collected in September 2012, Kabul Afghanistan

Figure 9b Tanahashi exercise on midwifery service provision in Afghanistan. Representation of scores, urban.



Source: Original elaboration in collaboration with ICS Integrare, based on original data collected in September 2012, Kabul Afghanistan

Table 9 shows the minimums, maximums and median scores for the Tanahashi research activity for both the urban and rural scenarios. The results are depicted in a scale ranging from 1 to 10, where a score of 10 is a perfect score, analogous to 100%. As may be expected deductions were far greater in rural areas. At the end of the exercise, effective coverage is estimated to be 12% of population coverage in rural areas and 26% of population coverage in urban areas.

As observed in both Table 9 and Figures 9, final consensus showed that unless barriers and bottlenecks are addressed, the effectiveness of coverage in Afghanistan is severely reduced in both rural and urban areas. Particularly in rural areas, availability of providers is a key issue in maternal health. Experts estimated that nearly 50% of coverage efforts were lost by the lack of availability of midwives in rural areas. Again this gives evidence to the strong rural/urban divide as experts reduced less than a 20% reduction for availability in urban areas. Further investigation will be needed to explore why availability in rural areas is so poor. It could be that there are simply not enough CME programs to supply all of the midwives needed, or it may be that health centers are not placed where most needed. This finding

Table 9. Tanahashi exercise on midwifery service provision in Afghanistan. Synopsis of scores, rural and urban.

RURAL

	Minimum	Maximum	Average
Availability	4	6	5.4
Accessibility	2	4	3.3
Acceptability	1	3	2.2
Contact	1	3	2
Effective Coverage	.5	2	1.2

URBAN

	Minimum	Maximum	Average
Availability	7	10	8.2
Accessibility	6	9	7.4
Acceptability	4	8	5.8
Contact	2	7	4.8
Effective Coverage	2	5	2.6

Source: Original elaboration in collaboration with ICS Integrare, based on original data collected in September 2012, Kabul Afghanistan

Similarly the accessibility of emergency care is a key factor in rural Afghanistan. Experts cited a lack of providers able to perform cesarean sections in rural areas as a life-threatening challenge. This analysis also revealed that the competency of the current workforce is a key barrier as is the lack of appropriate skill mix in facilities. Additionally with rough terrain, extreme climate conditions as well as security concerns, it is clear that issues of accessibility in rural Afghanistan require multi-sectorial attention, including urban planners and local security forces, in order for quality maternal and reproductive health services to be available to all.

A particularly interesting finding is that of contact, which in the Tanahashi model refers to the experience of the patient with the midwife and includes components of quality. In the urban setting the score goes from 5.8 at after reductions for acceptability to 4.8 after reductions of contact. This is a decrease of 10% from the original 100% assumed at the beginning of the exercise. In the rural setting the score goes from 2.2 to 2, meaning only 2% less than before after taking off the reduction for contact. This finding would indicate that women in rural areas are comparatively more satisfied with their contact with providers including the quality of care they receive. Again, this is an area that should call the attention of health authorities and program planners and should provoke further investigation into this finding to confirm that it is accurate and why it may be.

3.6 Discussion: the use of Tanahashi framework for the monitoring and evaluation of midwifery services in the post-2015 context

It is currently common practice to base maternal and reproductive health interventions on health indicators such as MMR and service indicators such as ANC1 and SBA without looking at the cause behind these statistics. While studies of indicators such as ANC1 or SBA undoubtedly reveal the lack of access to midwifery services in Afghanistan, the data obtained through use of the Tanahashi framework take the research one step further in providing a more complete picture and highlighting areas for future investigation.

As low resource countries such as Afghanistan push forward to increase the number of midwives and prepare midwives as the frontline providers of maternal and reproductive health, it is important that intentional, well planned actions be taken as to not waste scarce resources and time. It is fundamental

to understand the current, context specific barriers and challenges. Additionally it is ideal if information can be obtained at subnational level and disaggregated by rural and urban.

Using only indicator data fails to capture the full story; it provides the *what* without looking at the *why (Hodgins, 2013)*. This is particularly true in Afghanistan where there have been great strides in increasing the number of midwives and improving maternal and reproductive health. However, the state of maternal and reproductive health continues to be extremely poor. Utilizing the Tanahashi framework it is revealed that the cumulative effect of bottlenecks and barriers in availability, accessibility, acceptability, contact and effectiveness whittle away at the impact of coverage scale-up. In the case of Afghanistan there are significant barriers in each of these areas, and therefore each of them must be addressed in order for midwifery services and women's maternal and reproductive health to improve.

As seen in the case of Afghanistan, unless factors that affect the current shortcomings in maternal health service provision are appropriately addressed, even in the context of UHC service provision, the return on scaling up the midwifery workforce will result in severely diminishing returns. Methods of measurement that rely on indicator data may likely miss the mark in the Afghan context, where data collection is impeded by various factors such as security, infrastructure and local capacity in regions of the country.

Program planning and interventions based solely on indicator data such as ANC and SBA will not be successful in addressing the root causes of the failure of midwifery services to provide quality care and successfully meet the maternal and reproductive health needs of women. These measures generally provide too little attention to the role of workforce in providing accessible, acceptable, high-quality, effective care that meets service needs.

In the post 2015 SDGs, an effort to achieve UHC for maternal and reproductive health and to improve the quality of midwifery services, should be monitored for progress and to identify challenges and bottlenecks. Monitoring efforts must explore barriers and bottlenecks to access to care throughout the patient pathway, so that the reality that each woman encounters is understood. This goes beyond measures of crude coverage, such ANC and SBA, to the consideration of effective coverage of health interventions (WHO and World Bank, 2014) and the quality of the midwifery services rendered. The Tanahashi framework, utilizing expert opinion to explore accessibility, availability, acceptability and the

patient experience of contact in the system provides invaluable insights for the creation of interventions that improve the quality of midwifery services and increase maternal and reproductive health particularly in low resource environments.

Additionally, while health research ideally "contributes to policy that may eventually lead to the desired outcomes" (Hanney et al., 2003), research findings are more likely to be incorporated into policy and program planning when there are multiple quality connections between the research process and the decision makers. The reputation and capacity of the research completed is also of significance. That is to say when methods such as Delphi are used and include the participation of decision makers, assuming it is perceived as high quality research, it is more likely that the research findings will be incorporated into program and policy planning. As such, the research that was completed in Afghanistan and is presented here was an ideal methodology for obtaining vetted/agreed/concerted expert opinion as well as policymaker buy-in.

Particularly in low resource countries, the Tanahashi framework can be used to provide essential information about the delivery of midwifery services. It is a research methodology that incorporates a standardized study method that can be duplicated regionally, nationally and taking into consideration rural and urban settings as was done in this case. The Tanahashi framework takes into consideration all of the relevant factors that impact midwifery service delivery and captures the nuances of each context. The inclusion of methods such as the Tanahashi framework for evaluation of midwifery services provides essential information that is necessary to fully understand the realities of midwifery service provision in environments such as Afghanistan.

4. TANZANIA: CHALLENGES IN THE FORMATION OF A QUALITY MIDWIFERY WORKFORCE

4.1 Midwifery and maternal and reproductive health in Tanzania

In Tanzania, only 4-5% of births are attended by doctors whereas 40-50% of births are attended by midwives. Tanzania has made progress in improving maternal mortality, as the maternal mortality ratio was 910 deaths per 100,000 live births in 1990 and as of 2013 it was estimated to be 410 per 100,000 births (WHO, 2015), however Tanzania remains one of the highest burden countries for maternal death.

At the beginning of the MDG period, the short supply of skilled birth attendants was an important obstacle to reducing maternal mortality. In 2008, the government of Tanzania proposed "to establish a dispensary in every village, a health center in every ward and a hospital in each district." That means that the government would need to greatly increase the number of health workers in order to staff the 5162 dispensaries and 2074 health centers established to meet this goal. The government launched the Primary Health Service Development Programme, which included strategies for human resources for health including "increasing output for the key health providers according to the establishment levels" and "increasing the output in the existing training institutions by 100%." In order to meet this health worker need, the midwifery curriculum was revised in 2008. Prior to this revision there were two main pathways to a career in midwifery. There was a three-year Certificate program and a four-year diploma program. While there are differences in the title, the scope of work completed by certificate and diploma midwives is generally the same.

4.2. Increasing the number of midwives in Tanzania

In 2008 the MoHSW decided to shorten both the certificate and diploma midwifery programs by one year in an effort to increase the speed with which new, additional midwives could enter into the workforce. In the revised curriculum the Programme Rationale and Philosophy section includes the following information regarding the revision "It has been also observed that nursing training has been taking a long time unnecessarily; the profession has many cadres, of which others are overlapping, bringing about confusion, both in practice and career path development. The rationale for this program

is to achieve more responsive nursing and midwifery education and training system, aligned with health sector employment needs" (United Republic of Tanzania, Ministry of Health and Social Welfare, 2007). Ostensibly the notion of shortening the program has achieved its goal of increasing the number of midwives in the work market. In Tanzania, the efforts to increase the numbers of midwives was initially viewed as successful in some regards; according to the 2014 State of the World´s Midwifery report, Tanzania currently has 74% of the midwifery workforce it needs and at the current rate of production Tanzania is expected to meet 97% of it´s midwifery workforce needs by 2030.

However, as the first cohorts of midwives finished the newly shortened programs and began to enter the workforce, anecdotal reports began to surface regarding the low quality of care being offered by new graduates. Deficits in clinical skills were noted. As a result of these concerns a study of the midwifery training programs and an evaluation of the skill level of recent graduates, those who had attended the shortened program, was requested.

In the next section of this chapter, I present the results of the study conducted in August of 2014. The research was very complete and included both assessments of training institutions where the revised curriculum is being used as well as assessments of new graduates that are currently practicing. The full scope of the study and the methods that were used were described in detail in chapter two of this thesis.

4.3 Findings: the assessment of midwifery education and midwifery service provision by recent graduates in the Lake zone of Tanzania

4.3.1. Curriculum Findings

A curriculum should provide an outline of all the topics and skills taught in a program and delineate the general program content. The curriculum review was completed using ICM documents, guidelines and mapping tools designed to identify gaps in curriculum content. Extensive gaps were found during the curriculum review, the details of which go beyond the scope of this thesis. However, the key areas/items for improvement are briefly listed below:

1. The curriculum is missing content based on the ICM International code of ethics for midwives.
2. Not all of the essential competencies for midwives are taught in the program. The essential competencies are defined by the ICM (see the introduction of this thesis).
3. The minimum length of a direct entry midwifery education program is three (3) years according to the ICM guidelines. The Tanzania certificate midwifery program is one year too short. While the diploma program lasts three years the time allotted for clinical experience does not fully meet requirements. Technically certificate midwives should not be allowed to be considered midwives in accordance to ICM standards.
4. The caseloads required for each student in the Tanzania program are less than those suggested by ICM. For example, ICM recommends that each student attend 50 labors and births prior to graduation, whereas the Tanzanian program does not require include that as a requirement.
5. The clinical education system requirements lack key details such as description of what kind of clinical site is required (outpatient versus labor ward etc.). Nor is there a description of how students are evaluated during clinical experiences.
6. There is not enough time or content for teaching the essential competencies for midwifery, nor are skills checklists included.

Several of the competencies are not included in the curriculum at all (Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015, 2015). Additionally, during casual conversations, clinical staff who had been working with students since prior to the curriculum revisions were asked to share any observations they may have regarding the differences they have noted in the performance level of the students since the change in curriculum. Again this is anecdotal evidence, but it is interesting to note that these clinicians felt a marked difference could be

perceived. The greatest concern, voiced nearly universally by all of those questioned was that the new certificate program, students were not trained to handle complications of labor and therefore would not be capable of handling any of the obstetric complications they may face when alone in clinical practice. Midwifery students that go through the diploma program have 22 hours more of didactic (classroom) learning when compared to those in the certificate program as well as an additional 132 hours for clinical practice that the certificate students do not get.

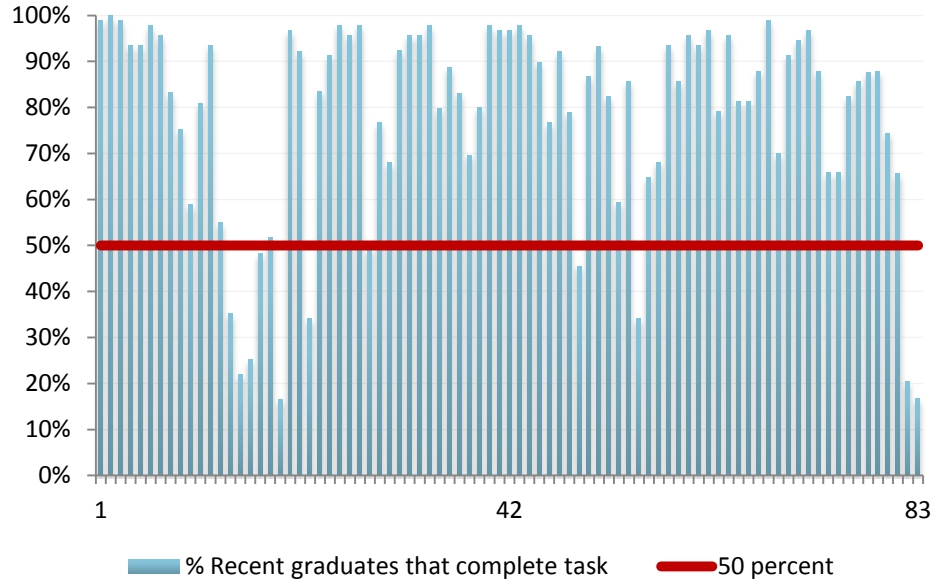
These curriculum findings are scathing and should be viewed as extremely troubling. Of particular concern in is finding number four. Tanzania currently has an entire cadre of midwifes, certificate midwives, which by international standards should not be considered midwives.

4.3.2. Scope of practice Findings

Utilizing the 2013 draft scope of practice for midwives, a list of 77 clinical activities or interventions that midwives should complete regularly as part of their service delivery was created. These interventions were further broken down into 83 specific clinical tasks. The complete list of 83 tasks can be found in Appendix IV. This list was presented to 91 recent graduates, all from the Lake zone with the exception of 20 graduates from Dar Es Salaam. The same scope of practice was applied to both diploma and certificate midwives.

An evaluation of the scope of practice is important for the assessment of midwifery services in order for women's needs to be met. Midwives should be practicing within their full scopes of practice so that women may receive the full complement of services that they may need. This speaks to the availability of services in a Tanahashi or AAAQ framework. Figure 10 shows the percentage of graduates that stated they perform each of the tasks in their current job. Lines reaching 100% indicate that all of new graduates perform the task, and 0 indicate that none of the new graduates perform that task in their current job. The blue line is drawn at 50% so that tasks that are performed by less than 50% of the new graduates are highlighted. These same tasks are listed in Table 10.

Figure 10. Percentage of recent graduates that perform the 83 tasks by task, Lake zone, Tanzania



Source: Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015

The recently graduated midwives do complete the majority of the tasks in the draft scope of practice in their current job. This is positive news. However, the chart below highlights the tasks that less than 50% of new graduates perform. There should be further investigation to understand why these tasks are less commonly performed. It may be that they are clinically advanced skills or skills that require equipment that may not be widely available such as microscopes or ultrasound machines. Completion of these tasks is also dependent on the clinical caseload that each midwife has, or the incidence of a condition. For some of the tasks below, such manual vacuum aspiration, a technique that can be used in abortion, it is to be expected that abortion is not as common as other tasks such as normal delivery. Therefore, it may be for that reason that less than 50% of the graduates perform these tasks. Moving forward, these tasks should be assessed one by one as to understand the incidence of need for them. If they are determined to be tasks that are needed regularly, further assessment will be needed to ascertain if the midwives know how to perform these tasks and if they have the materials necessary to perform these tasks.

Table 10: Tasks that less than 50% of employed new graduates perform, Lake zone, Tanzania

Task	Percentage that perform the task in their current job
Screen for breast cancer	35%
Screen for cervical cancer	22%
Use the microscope to perform simple screening tests	25%
Insert and remove intrauterine contraceptive devices	48%
Evaluate fetal status using ultrasound.	34%
Administer pharmacologic therapies for pain relief during labor.	49%
Perform vacuum extraction	34%
Perform manual vacuum aspiration (different from below, not necessarily for pregnancy)	20%
Perform manual vacuum aspiration of the uterus up to 12 completed weeks of pregnancy	17%

Source: Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015

4.3.3. Competence of new graduates Findings

The competency of the new graduates is the area that possibly the most disturbing finding. It is important to note that it is a convenience sample, however when it comes to skills testing, usually only those clinicians that believe they will do well on skills testing volunteer to do it. That is to say, it is common that skills testing of a sample of volunteer participants would show higher skill level than the actual level of the larger population.

The pass rate for each of the OSCEs varied based on the type of activity and number of components or actions in each skill performed. Table 11 shows the percentage of participants that successfully passed each of the tested skills.

Table 11: OSCE Pass rate of recent graduate midwives (n=91)

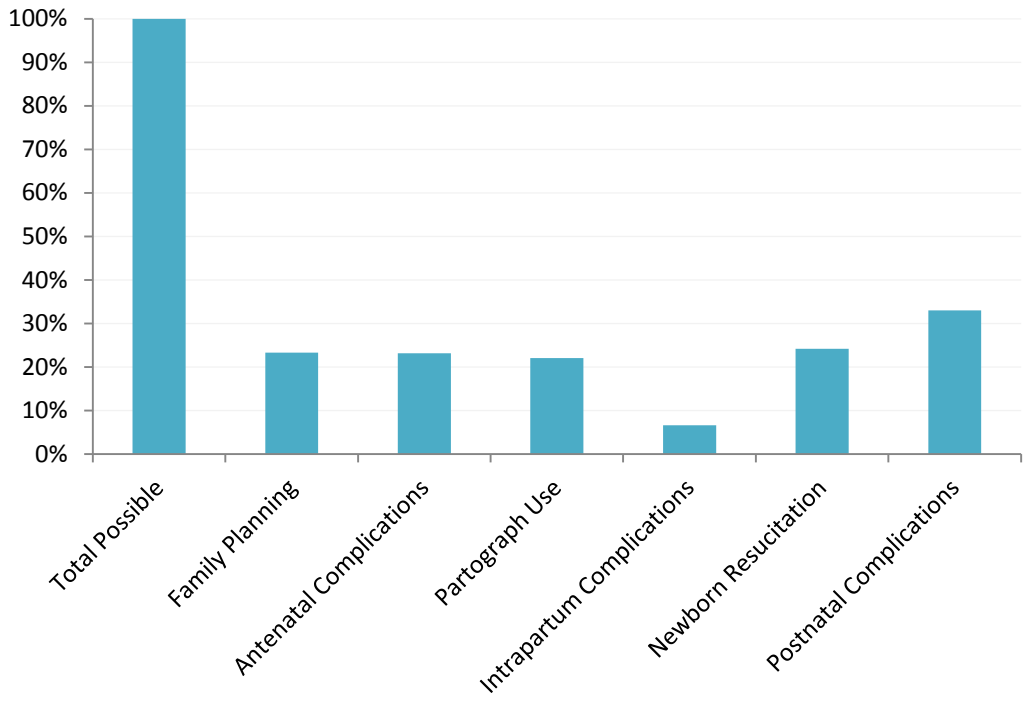
OSCE Topic	Percentage who passed
Family planning[5]	23.3
Antenatal complications	23.1
Partograph	22.0
Intrapartum complications	6.6
Newborn Resuscitation	24.2
Postnatal complications	3.3

Source: Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015

[5] The total sample size for the Family Planning OSCE was73 as one group did not complete the activity (in error).

The following figure shows the scores for the entire 91 new graduate midwife participants including the Lake region participants as well as those 20 from Dar Es Salaam.

Figure 11 OSCE Scores New Graduates Tanzania (n=91)



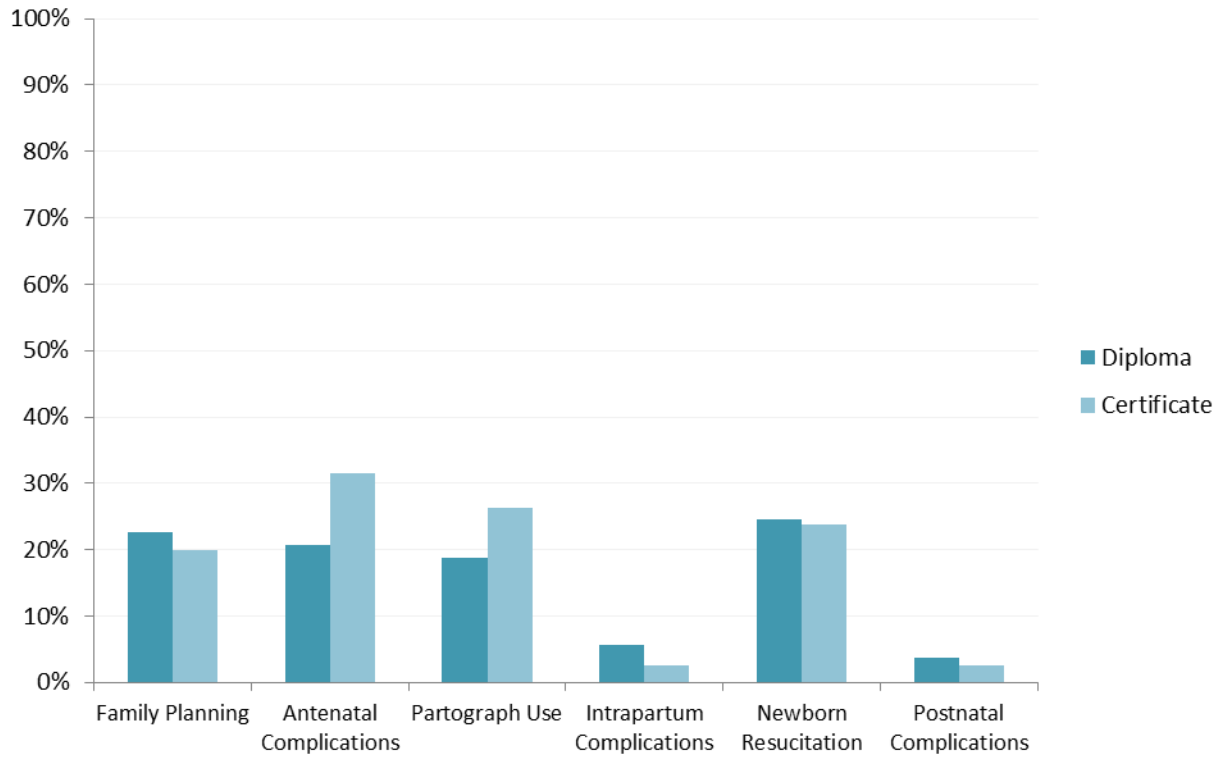
Source: Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015

These scores can only be viewed as troubling. Out of a possible 100%, the only area in which over 25% of participants passed was in postnatal (postpartum) complications. It is particularly troubling to note the exceptionally low scores in the areas of intrapartum and postnatal complications which assessed the ability to recognize and manage prolonged latent phase of labor, protracted/prolonged active phase of labor, failure of the fetal head to descend and postpartum hemorrhage, all critical midwifery competencies for saving lives.

However, based on our limited sample there was not a clear pattern of difference in the performance of certificate and diploma graduates. The graphic below shows that graduates of the diploma program

performed slightly better in the OSCEs relating to family planning, intrapartum complications and postnatal complications compared to graduates from the certificate program who had superior scores in areas of antenatal complications and partograph use. These results could be due to the site of work and clinical experience since graduation rather than any difference in their educational preparation. In both cases, the performance scores are worrisome.

Figure 12. Percentage of Recent Graduates Passing OSCE Diploma vs Certificate (n=91)



Source: Tanzania Pre-service Nurse Midwifery Education Assessment. Final Report, Kagera and Mara Regions, 2015

4.3.4. Teaching staff Findings

Ten midwifery tutors were interviewed during the field visits to the four schools. An initial goal of the assessment was to understand the level of preparation of the tutors. Nine of the ten interviewed had completed three years of nursing education, one year of midwifery and two additional years of tutor preparation as is required to qualify as a midwifery tutor in Tanzania. It was positive that 90% of the

tutors met the official education requirements for being tutors. All respondents were registered as midwives in Tanzania. All of the midwives had practiced as midwives prior to becoming tutors, and on average they practiced six years before becoming tutors (range 2-20 years). Only seven of the ten tutors currently practiced as midwives at the time of the interviews and five of these practiced only when in the clinical area with students. That is to say, only two of the tutors worked as midwives when not supervising students. This finding is not uncommon, but obviously a tutor that also actively works as a midwife will have greater opportunity to maintain his/her clinical skills. On average, those interviewed had been teaching full time for over seven years (range 2.5-28 years).

During the interviews with tutors, all were asked about their preparation/educational pathway to becoming tutors. The tutors said they had learned how to teach clinical skills during their tutor training at the Center for Educational Development in Health, Arusha (CEDHA). Very few of the tutors had attended clinical skills updates or in-service trainings since their initial tutor training. All of the tutors reported using a variety of teaching methods in the classroom, including using audio-visual equipment and encouraging student participation, as opposed to relying on rote dictation as is common in many low-resource countries. Most of the tutors reported that they create their own lesson plans. The official curriculum does include lesson plans created by the MoHSW, but only one respondent out of the ten regularly used the lesson plans that are created for the curriculum by the MoHSW.

According to the Tanzanian midwifery education experts, the guidelines for tutor to student ratio is one tutor to 25 students. However in these four schools, the tutor to student ratio varied from 1:25 to 1:65 depending on the class, well over the established recommendation. Most tutors stated that the ratios varied within their schools and gave approximate ratio ranges, therefore the average for the four schools would be considered to be 1:39. The tutors' estimations proved to be quite accurate as a comparison of the number of tutors at each school. The official student intakes showed a range of 1:22 to 1:64 tutor to student ratio across the schools.

4.3.5. Clinical practice system Findings

The clinical practice system was evaluated through a site visit to the schools as well as structured group interviews with tutors at the schools. Within the schools, the skills laboratories were visited. A key finding related to skills laboratory use (and the student experience in general) was the inconsistent electricity in the schools. This is relevant because it may limit visibility. Many clinical skills require precise visibility and are uniformly conducted with an additional light source, such as a clinical spot light. Additionally, a lack of electricity clearly limits the possibility of using audio-visual devices, which many tutors stated they relied on regularly. Therefore this finding was a potential inconsistency between what was reported and what was seen. Similarly several schools did not have continuous running water or soap near sinks. The lack of water and soap have important implications for infection prevention skills that students should practice in the skills labs and use universally in the clinical sites. As infection is one of the key causes of maternal mortality (WHO, 2015), handwashing should be relentlessly stressed in clinical teaching, even in simulation, where live people may not be used. In general the skills laboratories were small and had few models. One school had a lab so small that only six people could fit in it a time. This is obviously a great impediment when class sizes range from 20-65 approximately. Some schools had no one to assist students in the skills labs when they went for independent practice. Skills laboratories are very important in that with supervision student have the opportunity to practice and demonstrate skills on models. When clinical instructors are present, they can provide students feedback on technique or prevent potentially dangerous practices before students are sent into clinical practice sites (i.e. hospitals and clinics) and attend to live patients. When there are no instructors present, students may potentially teach themselves incorrect techniques and make it their regular and possibly dangerous practice when they are in clinical areas and working with live patients.

With regard to clinical instruction, ideally there would be a system for the selection of clinical instructors that would accompany, supervise and instruct students on site. The term preceptor may also be used for clinical instructor, depending on country context, or even within the same country. In this thesis, the terms will be used interchangeably. Generally, clinical instructors/preceptors are midwives that work within the health facility that is being used as a clinical site and are charged with the additional responsibility of overseeing and guiding students during their clinical practice as well. Classroom tutors do not oversee students in the clinical wards and the instructors that do oversee them usually have fulltime responsibilities as midwives in addition to working with students. In many cases clinical instructors volunteer for the additional responsibility, in other cases they do not have the option of

refusing. In many cases there is no economic reward, such as additional pay, for being a clinical instructor. Tanzania is unusual in that there are often clinical instructors that are hired (and therefore paid) to work in the health facility. In this scenario, the student oversight is expressly included as part of their work responsibilities.

It is advised that there are standard requirements to qualify as a clinical instructor, and that is a system in place for communication between clinical instructor and tutor to monitor student progress. Ideally a student is always precepted by the same clinical instructor so that there is consistency in their learning process, progress can be more easily monitored and they have a clear point of reference within their clinical sites. Similarly clinical instructors should be supported through clinical skills updates and training regarding techniques for clinical skills teaching and coaching. Clinical practice sites are also quite important for student learning.

Unfortunately, during the assessment two of the schools reported that did not have any predetermined clinical instructors. Students were at risk of not having a specific person assigned to oversee their clinical practice. In these cases it maybe that there is close supervision by whatever midwife/clinician happens to be working and is willing to get involved in the student's learning process, but there is no consistency and it is not their specific responsibility. One school reported having one clinical instructor and the fourth school had two clinical instructors/preceptors. One of the schools had offered a one-week training for 48 clinical instructors that would accompany and supervise students at community sites, but 42 of the 48 participants had since moved away. Students were often left alone in clinical sites or informally supervised by busy hospital staff. In these cases, students had no formal or consistent supervision while practicing on patients.

Tutors also stated that many of the sites could not accommodate the large number of students they received, so providing supervision to each individual student was not feasible, nor was the caseload of the site large enough to afford each student adequate opportunity for practice. The national curriculum sets standards regarding minimum case load of each type of patient that each student must care for. Therefore, some students would spend school vacations at larger district hospitals hoping to get the number of cases required for graduation.

Discussions with hospital staff at the sites, provided similar information. The staff reported having between 2-13 midwifery students practicing in a particular service delivery area during one shift in spaces that could reasonably only accommodate 4-6 students working along clinical staff. There was variation in the responses regarding communication between schools and clinical sites with approximately half of those interviewed saying that they engaged in regular communication and held meetings with the schools, tutors, class coordinators and half saying that they did not.

4.4. Discussion: Tanzania: challenges in the formation of a quality midwifery workforce.

This study highlights only some of the challenges to creating a quality workforce of midwives and providing quality midwifery services in low-resources countries. The challenges begin in pre-service education. Midwives are often trained with inadequate teaching staff, in schools with poor infrastructure. As discussed above, several of the schools did not have reliable running water and none had soap in the washrooms. In the region 8% of maternal death is attributed to infection (puerpural sepsis) (Illah et al., 2013). Hand washing is the most basic and yet the most vital step in infection prevention (Mathur, 2011). A midwife washing her hands before your birth may mean the difference between life and death. It is difficult to imagine that these schools were able to effectively drive home that message to their students when antibacterial soap is not being treated as a priority purchase for the school. Additionally, the importance of an environment that is conducive to learning cannot be dismissed. Many of the schools did not have libraries or properly functioning computer labs, and had inconsistent electricity which also negatively impact a student's ability to access the up to date medical resources that are vital for students training in health fields.

However, even in the presence of perfectly resourced buildings and classrooms, the material being taught is vital to the quality of midwife being produced. As is common in low-resource countries the push to increase the workforce has led to cutting corners and creating a curriculum that rushes student through the system not allowing them proper time to learn the material that can potential save lives in a country that suffers so greatly from maternal mortality and morbidity. The current curriculum falls short of meeting ICM guidelines in multiple areas, most notably failing to offer students the requisite time to learn.

At the time of the study the MoHSW was revising the scope of practice for midwifery and it was anticipated that these findings would be of use. Unfortunately, despite the study's findings the MoHSW

does not currently plan to lengthen the period of study required to for graduation from neither the certificate nor the diploma midwifery program.

The job responsibility research activity was limited and did not explore the job responsibilities that less than 50% of the midwives were practicing. It also did not examine which activities midwives were completing that were not included in their scope of practice, meaning practicing beyond their scope of practice. However, this research speaks to a larger, important issue: that of the lack concordance between what midwives are allowed to do in their jobs, or what they are at times called on to do out of necessity and the tasks that they are legally authorized to do. This survey could potentially raise questions for further study and shed light on work environments that limit midwives from practicing to their full competency and full scope of practice (often due to pressure from other members of medical staff, or lack of supplies). It may also conversely shed light on situations where midwives are required to perform tasks that go beyond their approved scope of practice generally due to shortages in other staff that should be completing these tasks. An example of the latter would be a scenario where a midwife completes life-saving obstetrical surgery, which is not in the official scope of practice (although in some countries this is a task assigned to midwives) in the absence of a surgeon in the work place.

The challenges in the school system include insufficient teaching staff and a clinical education system that cannot effectively train students clinically. The value of a skills laboratory cannot be underestimated. Skills labs provide students the opportunity to practice skills on models and mannequins without the risk of doing harm to a patient while they are learning how to complete necessary skills. The use of clinical simulation (role playing scenarios and reacting appropriately) in skills labs gives students opportunity to practice clinical decision-making. The ability to reason, react and plan action when faced with clinical circumstances is of as great importance as knowing how to perform a skill. Similarly, perfectly performing the wrong skill in an obstetrical emergency will do nothing to save lives. Once skills have been nearly perfected in skills labs, clinical practice with real patients under supervision is the next step in clinical education. However, in the case of these four schools students were often left on the wards without appropriate supervision, without a clinical instructor to guide their actions and decisions or to step in during an emergency or in situations that the student may not be able to effectively manage. Clinical practice with real patients is imperative for students, but students left unsupervised may prove to be more of a harm to patients than an asset.

The effect of the failings in the education system was very obvious in the skills testing completed with 91 graduates of the 2008 revised midwifery curriculum programs. The fact that so few of the recent graduates were able to pass skills testing in the six areas recognized as key areas for decreasing maternal mortality sends a clear and troubling message. The school systems are failing the future midwives and inevitably women will pay the price. These findings highlight the extensive need for in-service training and skills updates for providers that are already practicing in conjunction with making improvements in the schools system. The following case study (chapter five) which highlights a comprehensive intervention in Ghana will propose a model that may be useful in low-resource countries where the problems we encountered in the Tanzania case study are common.

Schools are operating with extremely low resources and little or no budget for upkeep. Instructors are often asked to teach to excessively large class sizes. This is a very dangerous concept in clinical instruction as students need to be closely supervised when learning critical life-saving skills. Additionally, as seen in these cases, tutors often have little professional support or opportunity to improve their skill level or learn new teaching techniques. All of these factors lead to an increased number of workers providing low quality care, which does little to improve maternal health or reduce maternal mortality. The cycle continues as these same workers will then possibly serve as tutors or clinical instructors.

This Tanzania case study provides an example of the poor quality of care that may be found as a result of ineffective and under-resourced pre-service education systems. Unfortunately the reality in many low-resource countries is as described above. While Tanzania can and will boast that they have increased workforce numbers and are estimated to meet their projected need for midwives by 2030, under the current curriculum it is unlikely that the quality of midwives produced will increase sufficiently to reduce maternal mortality. What is especially troubling is that those attending the certificate midwife program (which does not meet ICM standards for program length), are those that expected to occupy rural posts where they will often be left alone without any support staff. This offers insight into key challenge faced by the midwifery workforce in low-resource countries. It is not uncommon that the least qualified are often left to work in rural areas where the need is greatest, but support is minimum.

While countries have recognized the seriousness of the worker shortage, in many cases the result has been an increase in the number of workers produced without an increase, or in some cases even a decrease, in the quality of the worker.

5. GHANA: POTENTIAL SOLUTIONS FOR THE IMPROVEMENT OF THE MIDWIFERY WORKFORCE AND AN INCREASE IN SERVICE AVAILABILITY.

5.1. Improving the quality of midwifery services for long term family planning and comprehensive abortion care in Ghana.

To address the problem of low availability of long-term family planning (LTFP) and comprehensive abortion care services (CAC) in Ghana, the Department of Global Outreach at American College of Nurse Midwives (ACNM) embarked on a 19-month pilot project at the Kumasi Nursing and Midwifery Training College (KNMTC) in June of 2009. The overarching goal was to identify and demonstrate replicable methods/approaches for improving midwifery education focusing on LTFP and CAC. The project was multifaceted and included interventions at multiple levels of the midwifery schools system. The schools previously had very poor infrastructure. Similar to what was found in the Tanzania case study presented in chapter four of this these, the schools did not have functional libraries, computer labs or simulation labs. The pilot project therefore began with the renovation of clinical simulation laboratories and computer laboratories and libraries for the midwifery students. Tutors were given training on computers, professional development courses and were trained in updated pedagogical techniques including inter-active classroom techniques, principles of adult learning and student coaching.

An additional and uncommon piece of the project is that it went beyond the immediate school environment to include clinical instructors/preceptors. While in the Tanzania case study, the term clinical instructor is commonly used, in Ghana term preceptor is most often used. Similar to what we found in Tanzania, prior to this project students were often sent to their clinical placements without assigned preceptors. There was limited or no contact between the clinical sites, preceptors and the tutors. This lack of system meant students would have to take the initiative themselves to ask the working midwifery staff for their collaboration and supervision during their clinical rotations. Additionally, there was no continuity of preceptorship, no accountability on the part of students or preceptors and no quality control in the form of clinical updates for tutors. All of this is in line with what we found in the previous Tanzanian case study. An important component of this program was the

creation of a system for preceptorship in each of the schools. In this system, a criterion for preceptor selection was established, students were assigned to specific preceptors and a system for regular communication between preceptors and tutors was created so that preceptors could provide feedback on student progress. Finally, participating preceptors were tracked and asked to attend trainings on clinical instruction technique as well as clinical updates on long term family planning and comprehensive abortion care. The main participants in this program were the tutors, students and preceptors.

After the pilot period, the project was expanded in 2010 for an additional two years and an additional two midwifery schools in northern Ghana, Bolgatanga and Tamale were included. Additionally, a very extensive eLearning program (eLRP) on long term family planning (and comprehensive abortion care was developed. The development of the eLearning program required much of the additional two years of program time and was only fully piloted in Kumasi. However, the tutors in the other two schools Bolgtanga and Tamale, were trained in the eLearning package and were prepared to fully roll out the eLearning component in the next scholastic year, not requiring ACNM´s involvement.

The process for implementing this series of interventions was long and required a great deal of flexibility. The scope of the project was extremely ambitious. The following is a list of the components included in the project:

- School infrastructure: Renovations including library, computer laboratory, skills laboratory and tutor offices
- Teaching system:
    - Skills updates for tutors
    - Teaching and coaching skills training for tutors
    - Computer training for tutors
    - eLearning package
- Clinical Practice System:
    - System for preceptor selection
    - System for clinical site selection
    - System for communication between tutors and preceptors
    - Clinical skills updates for preceptors
    - Teaching and coaching skills training for preceptors

The schools were selected based on geographic location, with Bolgatanga and Tamale being more rural in nature as compared to Kumasi. Kumasi is the largest midwifery program in Ghana with approximately 339 students per year across all phases of study. Bolgatanga is one of the more remote areas of Ghana and their midwifery school has a particular focus on community midwifery, training community nurses to become midwives. Bolgatanga has approximate 130 students spread across the cohorts. Tamale midwifery program had just started at the time that phase II of this project began. Their first cohort held 35 midwifery students.

At the end of the four-year funded period, a study was completed as final program evaluation as a requirement of the funder. Its objective was to measure the effect of the program interventions on the students, tutors and preceptors as well as the perceptions of key stakeholders. I was asked to design this evaluation study. However, I began working with ACNM on this project when only four months remained in the four-year project. The research design, in particular any ability to conduct comparative studies, was limited by the amount and quality of data that had been collected over the previous years as part of the monitoring process. The study was overseen by ACNM´s Department of Global Outreach Ghana Office and all research activities were completed by local staff. The case study that follows all comes from the final project evaluation.

5.2 Findings: Interventions for increasing the quality of midwifery education in Ghana

5.2.1. School infrastructure Findings

One of the key first steps of the project was the renovation of each of the schools. Renovations included the creation of clinical simulations skills laboratories, computer laboratories, upgrading of the schools' libraries and the creation or renovation of offices for the tutors. In addition both tutors and students took computer classes, so that they could make the best use of the newly renovated and outfitted computer labs. Renovation of the schools was a sizeable challenge and required varying amounts of time across the schools. In Bolgatanga, renovations were complicated by a heavily damaged roof in the building where the simulation laboratory was located. Unfortunately the project funds could not be used to repair this roof, so funding for the reparations had to be found before renovation of the simulation laboratory could begin. This meant that students and tutors had less time to make use of the simulation laboratory prior to this evaluation.

In an interview with the Kumasi Midwifery director, she talked about how the introduction of the renovations and new learning materials impacted the school and motivated administration to continue efforts to improve the school setting.

> *"In terms of infrastructure- I was amazed to see all of the improvement. As you can see I am also maintaining what ACNM has started.*
>
> *So many of the tutors keep mentioning that if it weren´t for ACNM they couldn´t have excelled in IT [information technology]. The skills tutors have acquired and the equipment that ACNM has provided like the LCD made teaching much easier.*
>
> *The tutors are now able to access the computer lab and the library. You know based on what the midwifery tutors have learned they are sharing information with the general nursing tutors."*
>
> *Kumasi Midwifery Director*

The student reaction to the renovations and new resources were more varied. In Bolgatanga and Tamale the renovations were finished later in the academic year the students had less time to use the facilities, particularly in Bolgatanga as described above.

> *"At the time we were supposed to do our computer course, the computer lab was not in place, so we have not yet benefited. It came later after we had already finished doing it (the computer class) elsewhere."*
> *Student, Bolgatanga*

Another Bolgatanga student commented that while the library was renovated, access to the library was limited do due a lack of appropriate staff,

> *" … you can borrow a book from there, so the books you need to study is there, but there is no librarian for you to borrow from. Because some of us we prefer studying outside the library, so we need the books to go to a convenient place to study."*
> *Student, Bolgatanga*

Nonetheless, even with limited opportunity to use the computer laboratory, those students that did take advantage of it, were pleased.

> *"With the introduction of the computer lab, we have stopped going to the internet café in town to search for information."*
> *Student, Bolgatanga*
>
> *"I went to the library looking for the Margaret Myles book, and then I found the global family planning book. I was curious to know what was in the library, so it gave me the chance to know what family planning books are in the library."*
> *Student, Bolgatanga*

Another student commented on the convenience of having computers within the schools.

> *"I now get most of my information from the internet."*
> *Student, Bolgatanga*

Group interviews with Kumasi students revealed that the simulation lab was being used a great deal.

> *"Last semester we used the skills lab [simulation lab] once or twice a week during the family planning class."*
> *Student, Kumasi*

As with the students, tutors were also given computer training once the computer laboratories were in place. After classroom renovations were completed, tutors were also given training in teaching and coaching methods, including interactive teaching methods and the use of powerpoint lectures and LCD projectors. Tutors were also trained in the use of simulation, demonstration and skills laboratory use, once the skills laboratories were renovated. The tutors were very enthusiastic about the renovations and corresponding training.

> *"I can talk about the infrastructure wise in the school. The skills lab and the computer lab and the set up of the offices for the midwives which makes learning more comfortable, then you are motivated to come around because the environment is good and you can sit down to do your work well."*
> *Tutor, Tamale*

> *"The school management information system[6] is something I was so impressed of and then once it is up and running it is going to make the life of everything much easier. Just at the touch of a button you can achieve so much."*
> *Tutor, Bolgatanga*

> *"I will talk about when they taught us how to use the computer and internet for information. I only knew typing and that was the end. After the training I can sit and look for information and add it. I didn´t even know how to do power-point presentations. Now I can use power-point presentations; fishing out films, pictures, thing to buttress what I teach."*
> *Tutor, Kumasi*

All of the tutors were in agreement that the simulation laboratories are the infrastructure improvement that had the greatest (positive) impact on their ability to teach.

[6] Information technology systems are also referred to as management systems.

"ACNM came in here with this skills lab, and other skills acquisition in the skills lab, the clinicians [preceptors] are really appreciating the fact that the students come and their performance is far, far better than before."
Tutor, Kumasi

"I think the skills lab is a perfect set-up that once students turn to actually learn a lot and replicate what it is in the ward unlike previously before there was no skills lab. It was there but it wasn´t being utilized; it was there, but it wasn´t functional- so if it wasn´t functional it´s not there."
Tutor, Bolgatanga

"There are now models to actually demonstrate for students to sometime ago you needed certain models for certain demonstrations which we couldn´t actually get access to but now they are there and you can demonstrate with procedures that you actually want students to learn."
Tutor, Tamale

Others remarked that the skills lab had become a source of pride for the school and in the community.

"The last time I was at the teaching hospital one of the guys at human resources said he heard about our skills lab and he wanted to set one up in the hospital so he wants to come and see how we set up so that they can also emulate and have one in the hospital. So at least we know that it has been a learning platform some people are adopting it as a model. We know of others because sometimes they want to go to Tamale to observe your skills lab so that they can replicate. We receive calls from people." "I think the skills lab has also marketed the school. For example UDS is a bigger school but they think that Tamale has a well-organized skills lab and they want to arrange to bring their students here…"
(Tutors, Tamale)

5.2.2. Teaching system Findings

As with the infrastructure findings, the impressions of the tutors from Kumasi may differ slightly from those of the tutors from Bolgatanga and Tamale as Kumasi tutors had four years of program intervention as opposed to those from Bolgatanga and Tamale that had less than two.

In the course of the group interviews, several key themes emerged. Tutors felt that the program had an important impact on their professional development. Additionally several talked about how the training offered on CAC increased their perceptions about and willingness to perform CAC services.

> *"It is has also opened up other avenues for us, like the professional development plan which we did not have initially so that we had that information that as a professional we should also have a development plan that can help you to move ahead to plan your life. Like in 5-10 years where do I want to be? So if you have a professional development plan you plan accordingly and you implement as your progress in your professional career…It was very difficult, but as part of my PDP was to acquire skills in ICT [information computer technology]. It has enabled me to improve my teaching."*
> *Tutor, Kumasi*

> *"You get to learn about new issues in reproductive health and the statistics that are coming up about maternal and child health. We learn a lot."*
> *Tutor, Bolgatanga*

With regard to the clinical skills updates that took place in the form of training on LTFP including IUD and implant (Jadelle/Implanon) insertion and removal as well as CAC using MVA, most of the tutors commented that the training taught them new techniques or perfected existing skills. Some tutors stated that these skills were entirely new to them.

> *"Yes I think after ACNM introduced mix of the programs on insertion of Jadelle, IUD and all of the trainings so far, it has really equipped me… in fact I appreciate the fact that I really acquired a lot of skills. So I thank ACNM for that."*
> *Tutor, Kumasi*

> *"Actually, I benefited a lot, especially when I went for the clinical update because when I was doing my midwifery training we only observed but this time around I had hands on training in possession of Jadelle and the IUD."*
> *Tutor, Bolgatanga*

"My knowledge, especially practical knowledge in family planning has improved. I had the knowledge in theory, but not the practical component. But with the training I think I have improved a lot in my practical knowledge…"
Tutor, Tamale

In particular the trainings relating to abortion, such as comprehensive abortion care and manual vacuum aspiration (which can be used to complete an incomplete intended or spontaneous abortion, as well as to conduct and early intended abortion), had a particularly large impact on the tutors. The quote below epitomizes the responses from the tutors on this subject.

"But when ACNM introduced MVA, initially we were all like 'Abortion, no.` So if you assign even a tutor to perform an abortion, it´s like 'its my religion' and other things are so contrary to the issue. But when ACNM came in and they introduced MVA and we have a lecture on MVA, it is like 'Oh, MVA, it is not bad; we are here to save lives. `If you don´t do MVA and these women go see the quacks or they push in something and they die, we will be responsible. It´s like whenever you are assigned MVA, you are even eager to do it, because we want to save people´s lives"
Tutor, Kumasi

Tutors also appreciated the training they received on teaching and coaching skills and stated that they found them very useful in the classroom and the skills laboratories.

"… ACNM did something on coaching students and it really helped because if you are coaching students and you are very patient with them and they are not tensed up they are free to give back some feedback. The way ACNM goes about it, I think it is going to help students with clients, because the student is learning so much from how a tutor relates to him in a very professional humane way. So it would reflect when they start working and it really helps."
Tutor, Kumasi

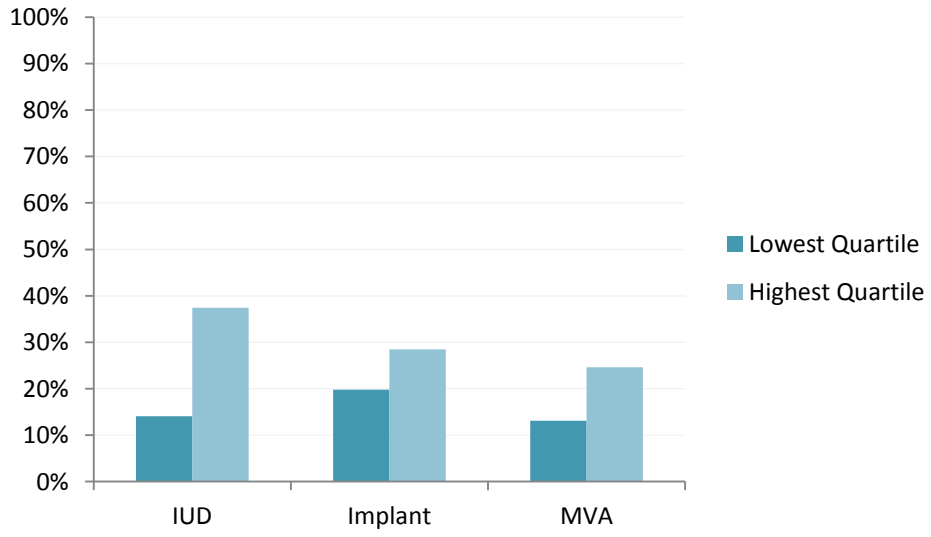
"And then also demonstration skills. I think it has actually helped me because I used to demonstrate for students to see, but now in my demonstrations I allow them to counter demonstrate in front on their colleagues and also I now know that it should be done in parts and then the whole so that students can observe and benefit more from that and I heard that at the ACNM training."
Tutor, Bolgatanga

"If you want to teach the students they must use a checklist. Even though we knew this, we were not doing it consistently…so that has improved on my teaching skills especially when it comes to practicals and then the idea that we have to do a return demonstration and allow the students to do it one by one so they can also acquire skills."
Tutor, Tamale

Obviously the key expectation of this program is that it would increase the students' skill level. OSCEs (skills testing) of students was deemed to be the most appropriate means for measuring the student´s progress. Beginning with those that had minimal contact with the intervention as compared to those that had more extensive contact with the intervention, the OSCE scores can be used as approximations for progress. As discussed in the methodology section, the quality control of the OSCE testing was a great challenge, as is often a reality in the field. For this reason I present these results as the approximation of a trend and demonstrate change over cohorts.

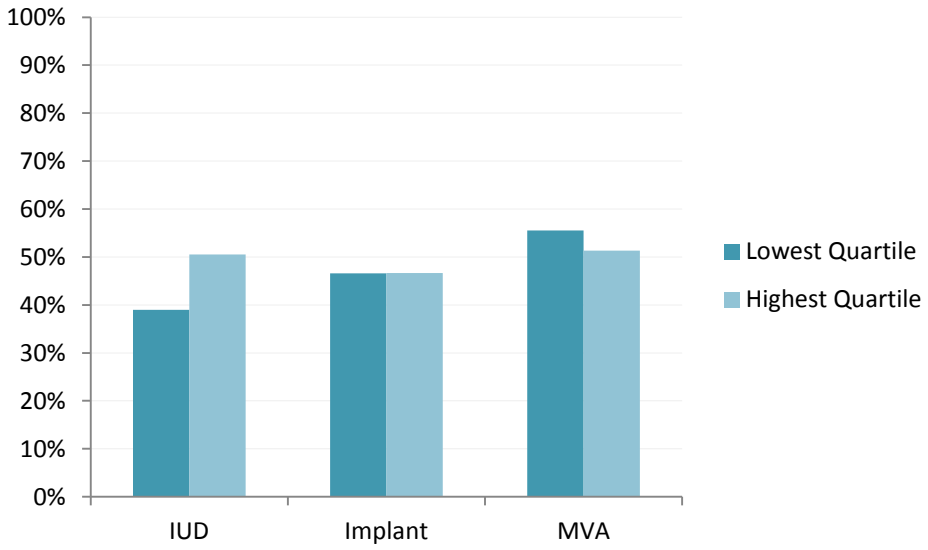
Students were asked to complete OSCE exams prior to training as well as at the end of the school year in Bolgatanga and Tamale, but only at the end of the family planning unit in Kumasi. For each test type, the percentage improvement between pre-test and post-test for the lowest and highest quartiles were calculated for each school. Figures 13 -14 show the percentage change for the student's scores in the lowest and highest quartiles from Bolgatanga and Tamale. The results for Kumasi will be shared later in this research chapter during the evaluation of the eLearning program. With regard to Bolgatanga, students did not show as great improvement. However, this indicates that these students did not have the ability to use their simulation lab until the final months of the program.

Figure 13. Percentage Change in OSCE results for Bolgatanga students (n=44)



Source: ACNM, 2013

Figure 14. Percentage Change in OSCE results for Tamale students (n=35)



Source: ACNM, 2013

It is important to note that the presentation of these OSCE scores varies greatly from the presentation of the scores for Tanzania. In addition to the fact that different skills are tested, in the previous chapter the scores are presented as a percentage of participants that pass the skill. The objective of the OSCE's in this case is different. As the students are still in the process of learning these skills, it is not expected that they would necessarily pass the skills. Instead the goal of the skills testing for Ghana is to show how students' scores across cohorts improve as the project interventions are applied and presumably improve the student skill level.

5.2.3. e-Learning Resource Package (eLRP) Findings

As a final piece to the teaching system intervention ACNM developed an e-Learning Resource Package (eLRP) in collaboration with UCLA's Center for International Medicine. The eLRP was designed to teach students about family planning, long-term family planning, and MVA including both counselling and clinical skills. The eLRP was especially developed to be appropriate in the Ghanaian context. It consists of both simulation and short films, as well as written contents, and knowledge tests. The videos in the eLRP feature local experts, and show role-plays of counselling and treatment sessions with Ghanaian actors dressed appropriately/typically for Ghana. Recognizing that electricity and internet may be scarce in certain areas of Ghana and other low resource countries, the eLRP can be accessed from a USB key. The eLRP was piloted in Kumasi in the final year of the program. For the purpose of this evaluation, structured group interviews were held with tutors and students from Kumasi, and a structured interview was held with the principal of Kumasi Midwifery program. In structured group interviews both the students and the tutors responded positively about the eLRP.

> *"eLearning is a new concept that even the MoH is buying into. At so many forums you go everybody is talking about the fact that we have more students and fewer lecturers, so if we have eLearning packages that we can do in modules, even for those that are not in the classroom, they can have access to lecture materials. We have shifted our paradigm from teacher-centered to student-centered learning. Yes we all want independent and life-long learning… We are helping our students to gradually grasp the concept of life-long learning." (Head-Tutor, Kumasi) "I think it (eLRP) was student-centered learning, unlike previously when we were lecturing."*
> *Tutor, Kumasi*

For many tutors there was a significant learning curve as several did not have previous computer skills.

> *"I was BBC, born before computers, but now I am a current millennium baby; now I am well-versed in ICT."*
> *Tutor, Kumasi*

Nonetheless, tutors felt pleased with the eLearning experience. Many said that the eLRP served them as a refresher course prior to teaching students.

> *"The eLearning has been a great tool for us tutors. Before we have to go teach a particular subject we go through the eLRP DVD… so by the time you go to to the student you are far more confident."*
> *Tutor, Kumasi*

Others stated that when using eLRP in the classroom, they felt they weren´t alone in teaching.

> *"… we are using the DVD which is very participatory; It´s not you alone who is delivering, the students are involved, we ask (them) questions and they can also contribute."*
> *Tutor, Kumasi*

For the students, eLRP was also a new experience,

> *"At first it was tedious. We hadn´t been introduced to it before. Before that the family planning tutor would come and just speak and let you write notes. But this time, it was different. You have to look at your computer, yeah to the resource and other things and so it was a whole new experience for us."*
> *Student, Kumasi*

However, as students had computer training as part of the program, once they grew accustomed to the novelty the innovation was very positive.

> *"It made our learning easier. Yeah because seeing the picture and the performing the task, it becomes so simple."*
> *Student, Kumasi*

Students were asked whether they would prefer to return to traditional teaching methods, if they preferred eLRP learning.

> *"It (eLRP) was easier because we could look at the video and go through the book. We prefer the e-Learning package"*
> *Student, Kumasi*

During the interview with the program director of the Kumasi midwifery program, she also voiced enthusiasm about the eLRP. She also discussed the challenge of adapting to computer learning.

> *"It was good for me to be exposed to e-learning. The challenge now is integrating it into classroom teaching."*
> *Principal of Midwifery, Kumasi*

However, she felt very confident about the eLRP content and the modality.

> *"The package was so rich and detailed so tutors and students were compelled to go through. It was well packaged with course reader, quizzes and study questions. It made the students sit up and supported us with the DVDs and the course readers have helped us."*
> *Principal of Midwifery, Kumasi*

She also expressed pride in her school's accomplishments using the eLRP and advocates for its expansion in Ghana.

> *"I encourage other schools to emulate it. ACNM has led KNMTC to be the first in all of this. Now, our tutors are content experts leading workshops [on eLRP]."*
> *Principal of Midwifery, Kumasi*

The eLRP was only ready for the last year of the program. Since Bolgatanga and Tamale were still adjusting to the other interventions, the eLRP was piloted only in Kumasi. For the sake of clarity the OSCE scores for Kumasi were not included above with those of Bolgatanga and Tamale. As previously mentioned the OSCE´s were done differently in Kumasi, with no pretesting being done and OSCE´s only being completed at the end of the academic year. Therefore, it is not possible to measure progress within a cohort, but between cohorts. The scores reflected below relate only to post or end of family planning education testing for different cohorts. In Kumasi all interventions were in place (with the exception of the eLRP) by the third year.

Table 12 shows the OSCE score from cohorts 1, 3 and 4, expressed as percentage correct of 100 percent. This demonstrates the difference in scores between baseline, all interventions except eLRP and then scores after the addition of eLRP.

Figure 16 concentrates on average score (not maximum and minimum) for each cohort and shows how scores improved over the four cohorts as program components were incorporated or perfected. Figure 17 shows the difference in scores between the lowest quartile and highest quartile of scores for the initial cohort, which had not benefitted from any of the program interventions, and the final cohort which benefitted from all of the program interventions including the eLRP. Figure 18 shows the difference in scores between the lowest quartile and highest quartile of scores for the cohort that piloted the eLRP and the previous cohort which also benefitted from the program interventions but did not use the eLRP is. This offers an estimation of the added value of adding eLRP to the program´s other interventions.

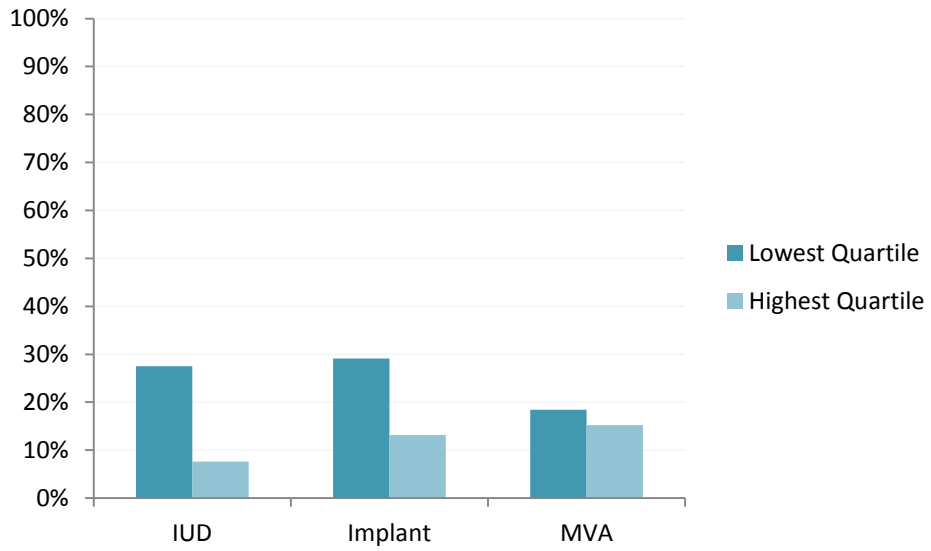
Table 12. OSCE results Kumasi Students, cohorts 1, 3 and 4 as percentage correct

	Cohort 1 (n=59) January, 2011			Cohort 3 (n=93) May, 2012			Cohort 4 (n=64) September 2013 (eLRP)		
	IUD	Implant	MVA	IUD	Implant	MVA	IUD	Implant	MVA
Minimum score	31%	9%	18%	50%	52%	20%	78%	63%	70%
Maximum score	93%	87%	71%	98%	96%	95%	98%	100%	100%
Average score	70.8%	59.9%	50.7%	86.9%	78.4%	91.6%	91.6%	84.4%	89.4%

Source: Final Project Evaluation: Strengthening Midwifery Pre-service education in Family Planning and Comprehensive Abortion Care in Ghana, 2013

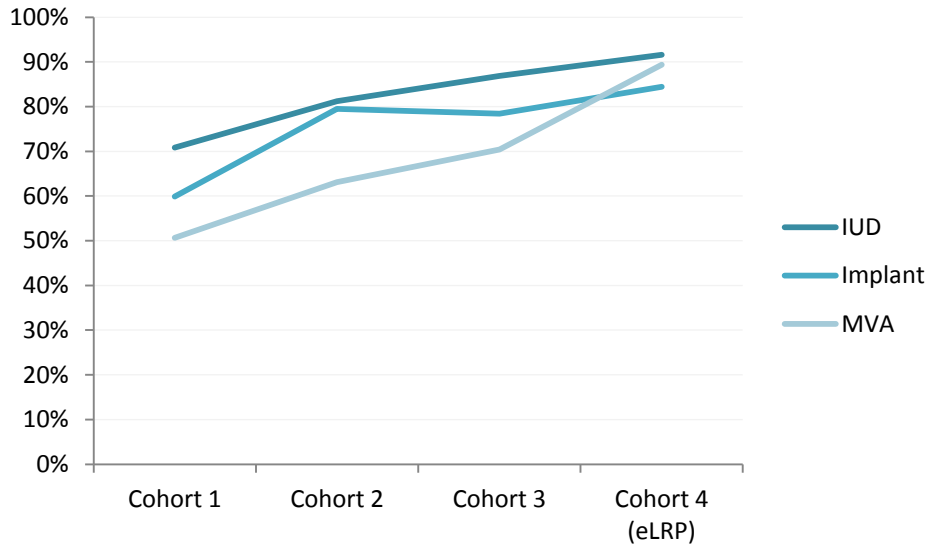
Figure 15, shows the differences in the lowest quartile and highest quartile of scores between cohort 1 (no intervention) and cohort 3 (all interventions except eLRP).

Figure 15. Percentage Change in OSCE results for Kumasi students, cohorts 1 (n=59) and 3 (n=57).



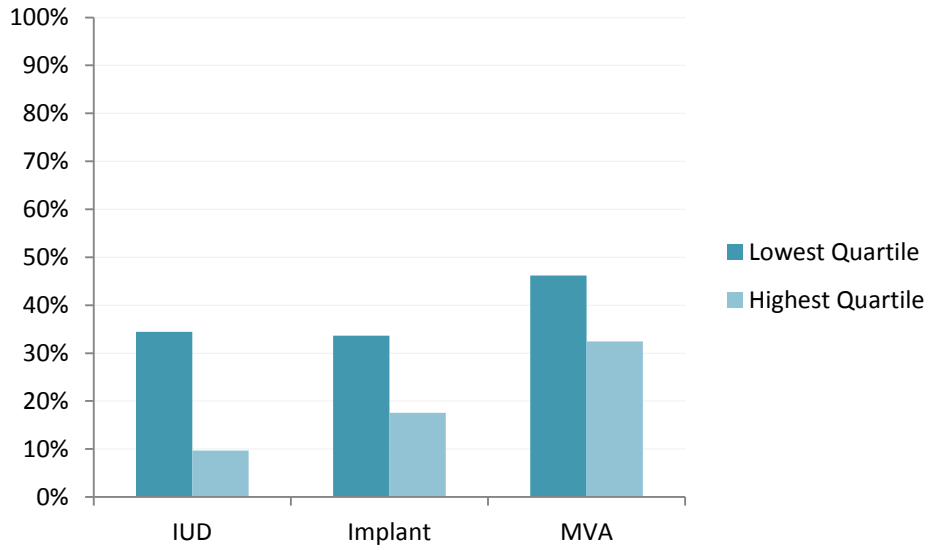
Source: ACNM, 2013.

Figure 16. Incremental change in average scores for Kumasi students Cohorts 1 through 4



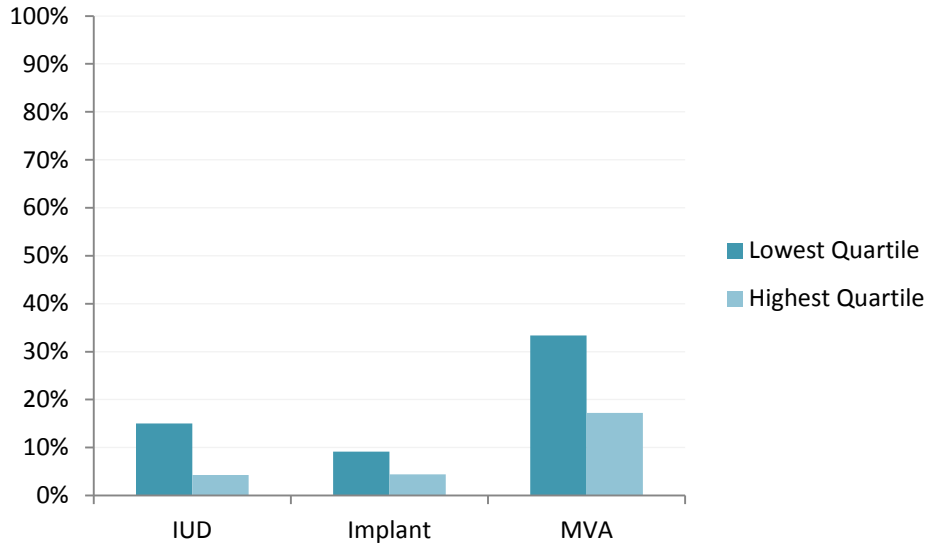
Source: ACNM, 2013.

Figure 17. Percentage Change in OSCE results for Kumasi students, Cohorts 1 (n=59) and 4 (n=64)



Source: ACNM, 2013.

Figure 18. Percentage Change in OSCE results for Kumasi students, with addition of eLRP, cohorts 3 (n=57) and 4 (n=64)



Source: ACNM, 2013.

Figure 18 shows that the eLRP does have some impact. While the difference is not as great in the highest quartiles, important differences can be noted in the lowest quartiles. This leads to the supposition that the eLRP is particularly important for those students that would not have effectively grasped the material content through the other methodologies and interventions. While not presented in the figure above, the eLRP was particularly helpful for those with the very lowest scores. As with regard to IUD the low score by percentage correct increased by 28 percentage points from cohort 3 to cohort 4, from a post-test minimum of 50% to 78%, and in MVA the lowest score increased by a notable 50 percentage points. This demonstrated that the eLRP should be considered as an important tool for increasing the skill level and quality of care offered by new midwives.

5.2.4. Clinical Practice System

In structured group interviews the preceptors from each school were asked about their experiences in the program. Preceptors are staff midwives at the clinical sites where students are sent for clinical practice. One of the initial actions of the program was to locate and create additional clinical sites in an effort to lower the ratio of students per preceptor. The clinical sites were mixed and due to availability some students were placed in maternity wards, where the opportunity to provide contraception was limited. Others were placed at family planning clinic sites where the opportunity to practice general family planning was greater. To offer students the greatest opportunity to practice, they were often rotated through different kinds of sites.

In the structured group interviews questions focused on specific family planning skills and confidence in providing services, how the LTFP training affected their practice and their clinical sites, and how the project and preceptor teaching/coaching training affected their experience with the schools. Preceptors were also asked about what additional support they felt they needed and what barriers they faced in providing LTFP. They were also asked to offer recommendations for moving forward.

The preceptors felt that the program expanded their role in the student´s educational process. Preceptors felt more confident in their own teaching ability, in part due to their own improved skill set, but also due to the teaching and coaching techniques they learned from the ACNM trainings.

> *"Now when you are teaching students you have confidence. The other times we were afraid, especially me that maybe you do something and the student knows it better than you and you will be ashamed, because she will correct you. But now when you are doing it… you know what you are doing…"*
> *Preceptor, Bolgatanga*

> *"As she was saying in those days we were afraid to mention something that the students may say `you don´t know´ but now we were made to understand that if a student asks you anything you don´t know, you can tell the student Í will go find out, then also go find out so that tomorrow we will bring the results together.*
> *Preceptor, Bolgatanga*

> *"We let them know that we are working in collaboration with the school, so whatever they do in clinical will be sent in a report to the school. So it has made them regard us as part of their tutors, instead of before they were just doing whatever they wanted."*
> *Preceptor, Tamale*

Preceptors also described a significant change in their relationships with tutors, and the level of organization and support they received in through the program.

> *"The relationship has changed because at first you will be just in the ward and they will come and bring students from so, so and so school. But now, before the students come, a letter will come to the administration and once they know you are preceptor they will communicate to you that students will be coming and on such date and at times our matron will even make the list available to you and will even make a time table before they come. So communication before the students come has improved."*
> *Preceptors, Tamale*

Tutors also expressed that they were very impressed with the results of the creation of an organized system for clinical practice.

> *"I would say that the success of the preceptorship [training is the greatest change]. You know at first they were not being recognized by the school. We would just send our students there. And they saw them as our students not their students. But … they are now working hand in hand and they also see the students as our students and their students… they are putting in so much effort to train them."*
> *Tutor, Kumasi*

> *"Then you realize that taking clinical decisions and doing a lot of things as a preceptor has really improved after ACNM clinical decision making and conflict management and all that. So now most of the preceptors are taking the opportunity to take tutor [telephone] numbers and inform them when there is any conflict arising in the clinical setting after they had attempted and were not able to settle it. So it has really helped a lot."*
> *Tutor, Kumasi*

> *"Before the preceptorship [training] we didn´t have contacts with the clinical sites and we didn´t know who is capable, what equipment they had. But before the training was done, we went round and found those who could be trained as preceptors and the equipment they had and what they did have…" (Tutor Bolgatanga, Tamale)*

Over the course of the program and during the evaluation period it became clear that the preceptors were among the most positively affected by the program. Since this program is largely a pre-service education program, the very large effect that it has had on participating preceptors is an exciting finding. The structured group interviews revealed key themes relating to preceptors' satisfaction with the program, beyond their role in the student´s education.

Before the project, the majority of the preceptors had very limited or no experience with LTFP, although necessary commodities were available in their health centers. Therefore, the trainings on implants, IUDs

and MVA provided them new clinical knowledge and skills. In some clinical sites, these preceptors were the only providers able to provide LTFP and CAC services in their communities.

Preceptors spoke in detail about the new skills they acquired during the program and the accompanying change in their positions in their facilities as they now serve as mentors for other staff. Preceptors also discussed the higher status and respect from the communities they serve.

> *"My confidence level is high, because looking at the number of clients that [we] receive in a day, our acceptance rate is always increasing. People who come for our services don't say bad things against. They always come and when they come for our service, they come along with other people to accept family planning service. Therefore if our service wasn´t to the standard they are expecting, they wouldn´t go and bring other people to also come and accept it. It means they believe in us and they accept our services, so my confidence level is high."*
> *Preceptor, Kumasi*

> *"At first I used to do the Jadelle (implant) and IUD insertion, but the procedure, I was not doing it correctly. But now I have gone for the training and whatnot, it has given me the confidence. "*
> *Preceptor, Bolgatanga*

> *"I think the training helped a lot because in those days it was the doctors who were doing the removal of Jadelle and even the insertion. But it has helped me and my colleague and the students as well to be able to confidently insert and remove. The CAC has helped the whole district because we have few doctors and a patient comes and is bleeding and you don´t need to wait for a doctor to come and do it. Because we have the MVA kits on our units so you will do what you are supposed to do. Maybe it's retained products, and you treat the person and then call the doctor and tell the doctor 'this is what I have done,'` and he will come to review in 24 hours."*
> *Preceptor, Bolgatanga*

> *"With the skill acquisition, IUD for example, I was inserting them without knowing the technique, but now I know there are steps you have to take… unlike those days when we were just putting them in."*
> *Preceptor, Tamale*

> *"We have also improved in the sterilization of our instruments because we were taught to decontaminate and make them sterile, stage by stage, in different containers. This is what we are doing now and it helps."*
> *Preceptor, Tamale*

Several preceptors made it clear that they believe the training has directly contributed to saving lives within their facilities.

"No more unsafe abortions. They come in, and they have their safe abortion. They have the knowledge that when they come in, we are able to provide for them, so they don´t hide to take any drugs [to abort at home]"
Preceptor, Tamale

"I also want to add that we don´t hear of deaths from unsafe abortions because we get most of them Long-term family planning so that they are able to stay still (not get pregnant) until they are ready. We don´t hear much about deaths from unsafe abortions anymore, and we don´t get much of them here. . . unlike before, when we knew this person has caused unsafe abortion and has died and all that. It is a result of the training we have had) "because the service is now there and everybody can access it."
Preceptor, Bolgatanga

"Because of this training we have realized that we don´t even hear about sepsis, about somebody dying of sepsis, because we do it under aseptic technique, and for that matter we have also given out the information to our other colleagues who go to schools (to tell students) to come in for comprehensive abortion care and then talk to them about family planning…"
Preceptor, Bolgatanga

Some preceptors felt uncomfortable or opposed to providing CAC services, but others expressed a change in opinion on the matter related to their training,

"Those days we used to send away clients who came for CAC, but with the training you know that when the client is determined to terminate the pregnancy and you send her away, she may go kill herself somewhere else, so we offer the services to them."
Preceptor, Bolgatanga

"At first when women came in for elective abortions, we used to turn them away, but now we know that if you send them away you have done more harm than good because the person will go and die somewhere or go and do it somewhere with a complication. Now you are going to carry the problem and say I know I should have solved that before that person went away."
Preceptor, Tamale

"At my place we used to get deaths from criminal abortions and others… now they come straight to us, or if they come with incomplete abortions, we do the MVA for them."
Preceptor, Tamale

Preceptors also explained how the training was helping other staff since they felt confident enough to train other providers they work with in Long-term family planning and CAC. It has also improved their stature in the facilities and their relationships with other staff.

"Those who are interested have been able to learn from us. In Walewale, two have been able to learn. So both of them can do it even if I am not around."
Preceptor, Tamale

"Some other midwives in the district have also come for on-the-job training. About five came for Jadelle training."
Preceptors, Tamale

"I have trained my in-charge. She now is doing it."
Preceptor, Kumasi

"I have trained about 20 CHN (Community Health Nurses), but CAC I don´t have any technical people to train because you know CHN staff are not supposed to enter the uterus. So there we are alone."
Preceptor, Kumasi

With regard to how the new knowledge and skills affected their relationships with other staff, the preceptors felt that they were held in much higher regard after completing the training.

"It has made them build some confidence in the midwives, because of the MVA cases we do. When the doctors are not there and you call them, they tell us to go ahead and do it. So we feel we have been delegated duties."
Preceptor, Tamale

"Whenever they get a difficult case they push it to you, that you have gone through the training, so this is your case."
Preceptor, Bolgatanga

The preceptors explained how the trainings, both clinical and counseling, changed their roles within in the community. One group spoke about the radio show that they were now participating in to educate the community on family planning.

"I wanted to add that at Garu Health Center because of the Quality FM (radio station) there we (we) have the power to talk on air about family planning. It being free and we have the knowledge, we have been on that program for four weeks now. We are left with two weeks. It is a six-week program, and because we have the knowledge we can talk very well. If you don´t have knowledge, you can not do as we are doing now. So I think it has helped so much… some NGO is using us as resource persons for this program."
Preceptor, Bolgatanga

Preceptors from Tamale also shared how the program had affected their relationship with the general community and motivated them to begin community education programs.

"[Regarding the decrease in unsafe abortions] It is from the education we give to the peer groups, schools and churches on CAC. We also gathered drug store owners and oriented them,

because the students (not midwifery students, young pregnant students) go to buy Cytotec from them. So anytime the students come to buy Cytotec they refer them to our facility. So because of them we don´t get any criminal abortions again."
Preceptors, Tamale

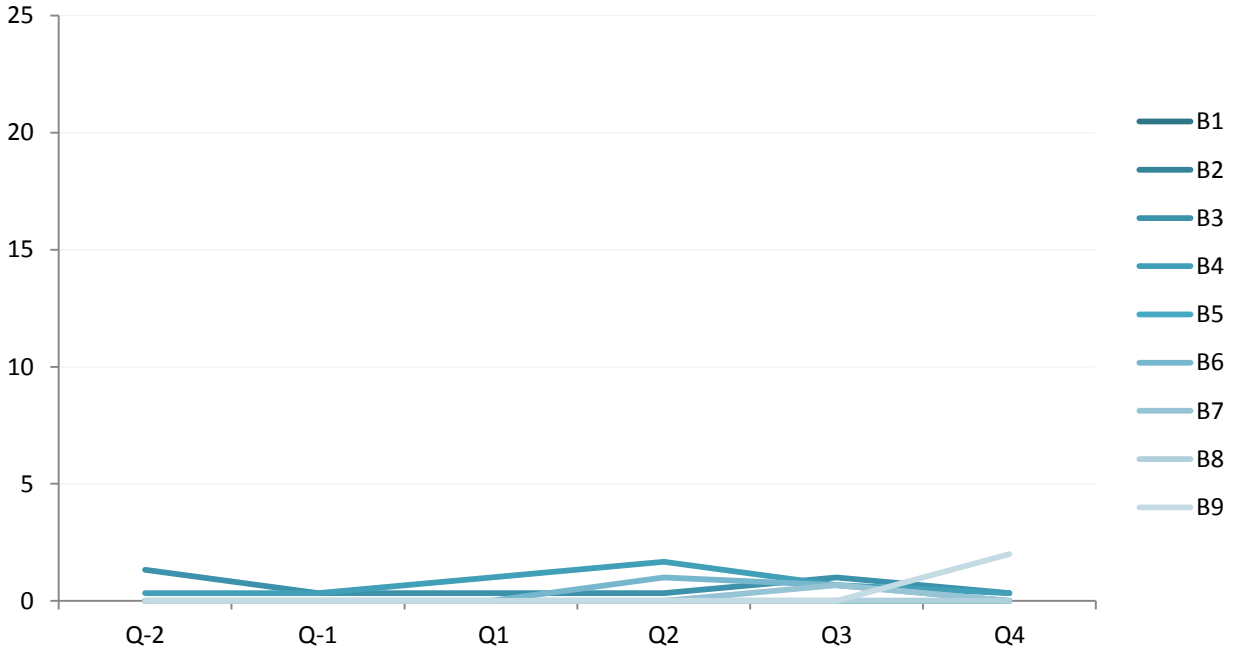
Similarly, preceptors talked about how the program has changed their approach and contact with the client within the facilities. In particular they discussed how they have changed in the manner they treat adolescents.

"In the past we used to turn away 15-year-old girls who came in for family planning, but now with the training we know we have to do it for them to avoid unwanted pregnancies and abortion. Now we have the patience to counsel them well, unlike in the past when we used to shout on them."
Preceptor, Bolgatanga

5.2.5. Caseloads

As mentioned above, in an effort to measure an increase in access as response to the increase of availability of LTFP and CAC methods Figures 19- 27 illustrate the changes in caseload for the preceptors in each of the three school areas for each of the three methods. In the following graphics the time of training is at the end of Q-1, just as Q1 begins. In these graphics the x-axis represents the quarters (two quarters prior to training and four after) and the y- axis shows the number of IUDs and implants inserted or MVAs performed. Each line represents an individual preceptor response, included in the sample from each region. The difference in the number of lines per school is explained by the fact that there was a difference in the number of responses by the various schools. In graphics where there are fewer lines in the graphic than in the legend, as is often the case for the IUD graphics, it signifies that the procedure was not completed in the period surveyed. In order to provide a clearer estimation of the trend, the number of cases was averaged for each quarter for each person. Many preceptors did not have previous training in IUDs, implants and CAC, so their caseloads prior to that point are non-existent.

Figure 19. Bolgatanga Preceptor Caseload IUD up to point of training 0) and after training (0-Q4) (n=9)



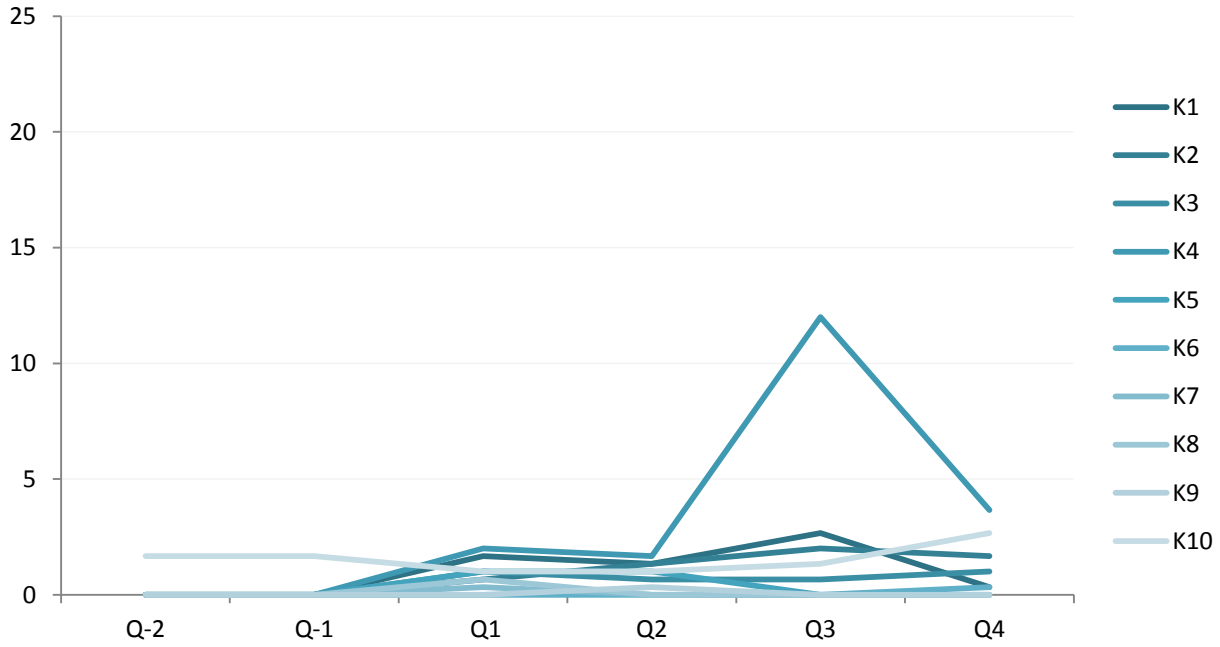
Source: ACNM, 2013.

As seen in these graphics, caseloads of IUD remain fairly low across the three schools catchment areas. Across the regions, preceptors remarked on the slow uptake of IUDs in the community. This was particularly true in Bolgatanga, where preceptors stated that one of the greatest challenges was overcoming "*a lot of misconceptions, especially about the IUD."* according to one Bolgatanga preceptor.

One preceptor added that clinicians may add to the hesitancy to use IUDs,

> *"Some health workers with inadequate knowledge on family planning contribute to the misconceptions."*
> *Preceptor, Bolgatanga*

Figure 20. Kumasi Preceptor Caseload IUD prior to (up to point of training 0) and after training (0-Q4), (n=10)



Source: ACNM, 2013.

Unlike IUDs, implants are fairly widely accepted in Ghana. The figures demonstrate that some preceptors were skilled and providing implant services prior to ACNM training. In fact, those that begin with higher caseloads of implant clients did not demonstrate great increase or change in caseloads for the most part. In fact, as can be seen in Bolgatanga, some had slightly lower caseloads after the training. In some instances this can be attributed to a change in health facility, in others it may possibly be due to the training of co-workers lightening the load for the few providers that previously knew how to provide implant services. Nonetheless, when looking at those that had low or no implant cases prior to the ACNM training, marked increased in caseload are generally noted.

Figure 21. Tamale Preceptor caseload IUD (up to point of training 0) and after training (0-Q4) (n=10)

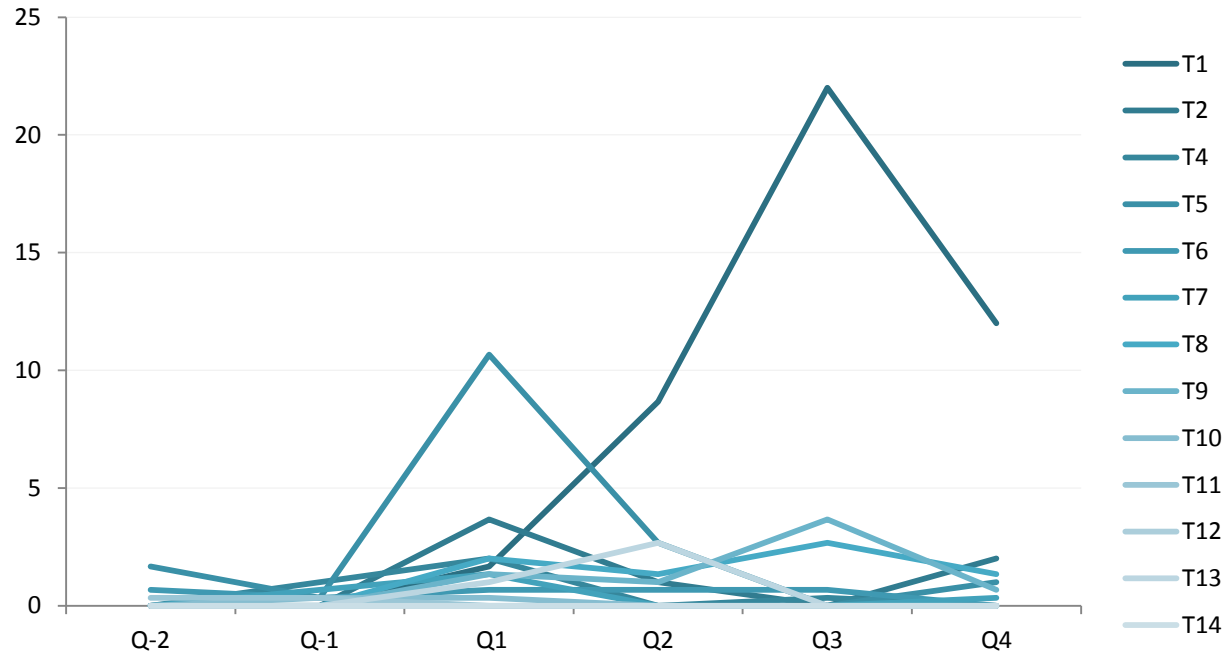
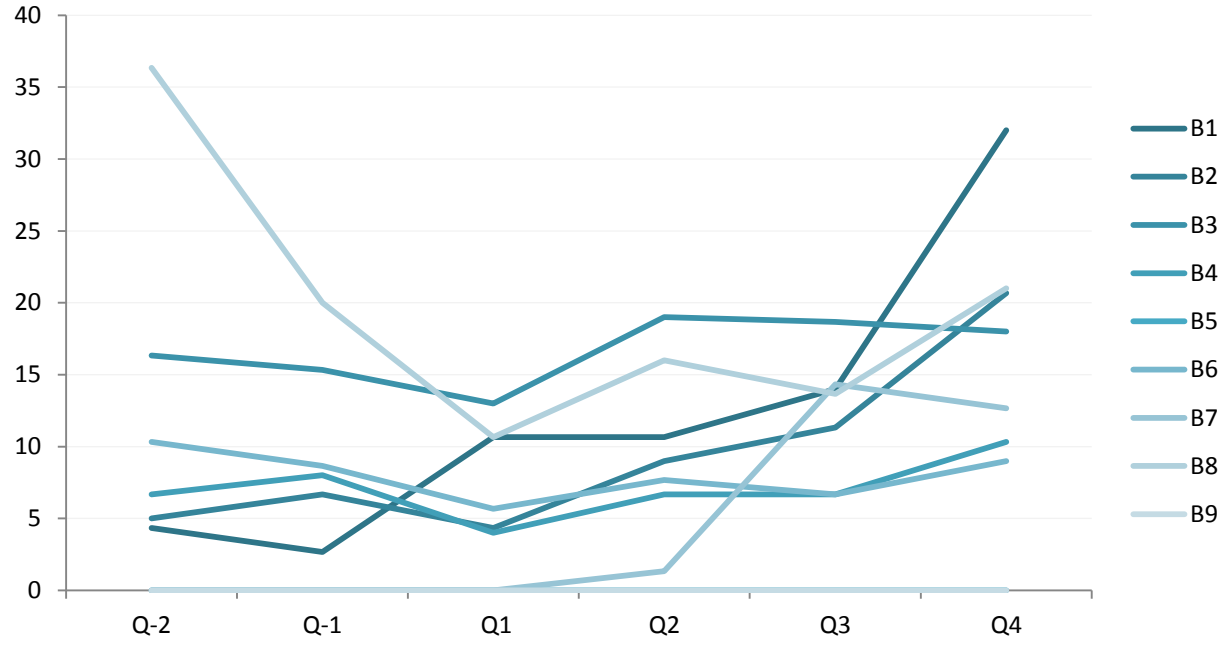


Figure 22 Bolgatanga Preceptor caseload Implant (up to point of training 0) and after training (0-Q4) (n=9)



Source Tables 21, 22 : ACNM, 2013

.**Figure 23. Kumasi Preceptor caseload Implant (up to point of training 0) and after training (0-Q4) (n=9)**

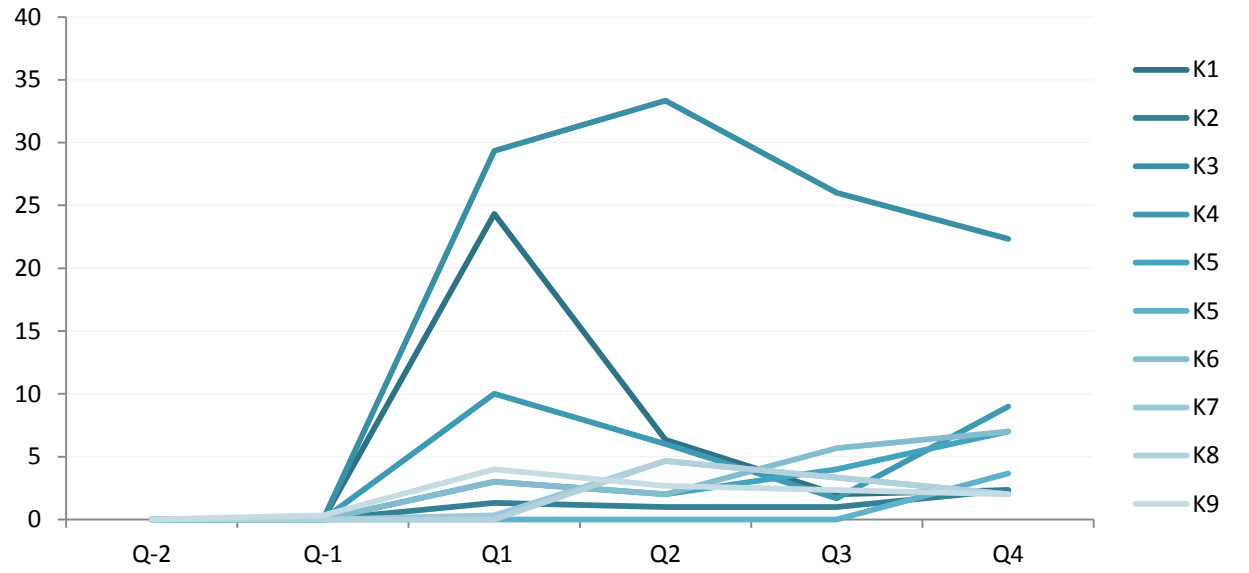
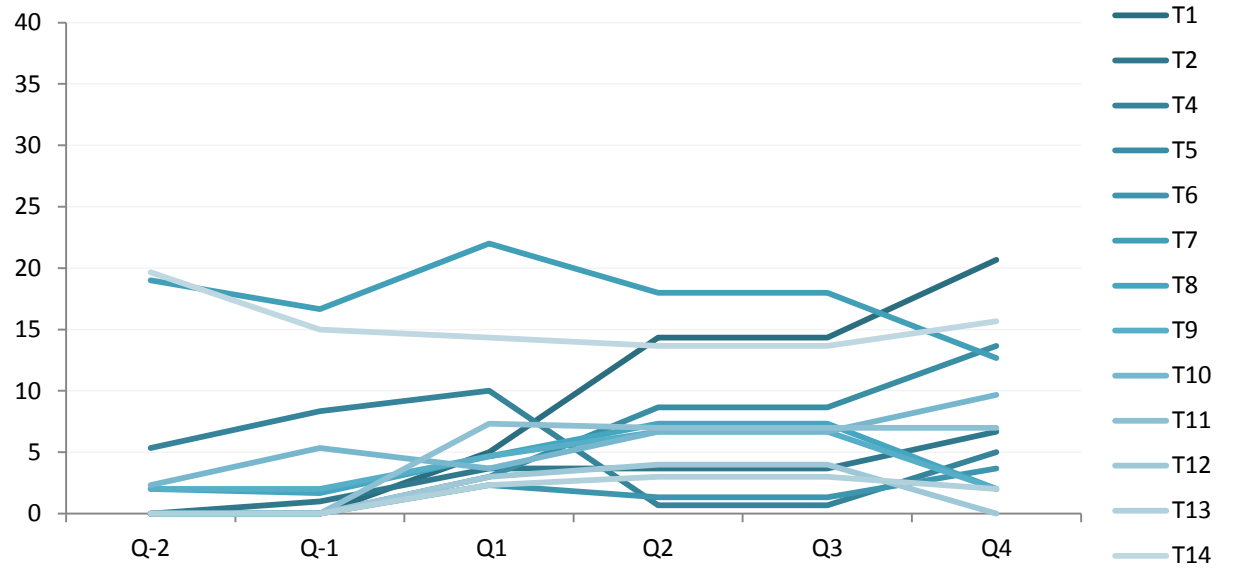


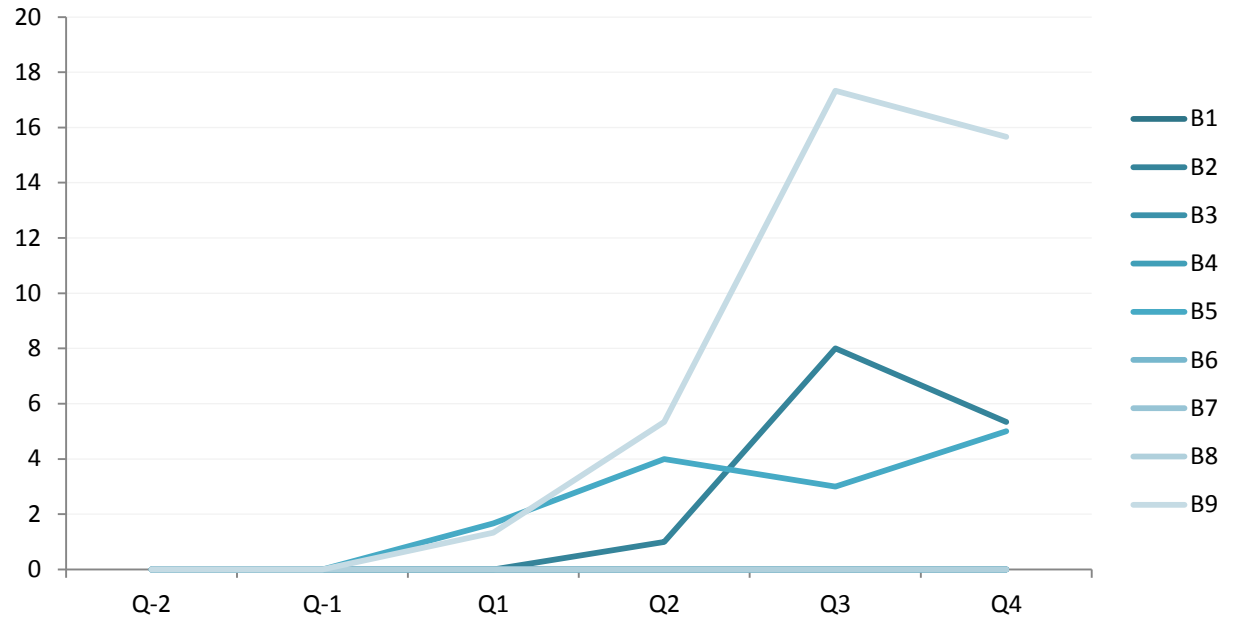
Figure 24. Tamale Preceptor caseload Implant (up to point of training 0) and after training (0-Q4) (n=14)



Source Tables23, 24: ACNM, 2013

Few of the preceptors were providing CAC services before the ACNM program. As seen in the following figures, there were important increases in CAC service provision after the ACNM trainings. However, it is important to recognize that significant barriers to providing CAC services continue to exist.

Figure 25. Bolgatanga Preceptor caseload MVA (up to point of training 0) and after training (0-Q4) (n=9)



Source ACNM, 2013

Figure 26. Kumasi Preceptor caseload MVA (up to point of training 0) and after training (0-Q4) (n=10)

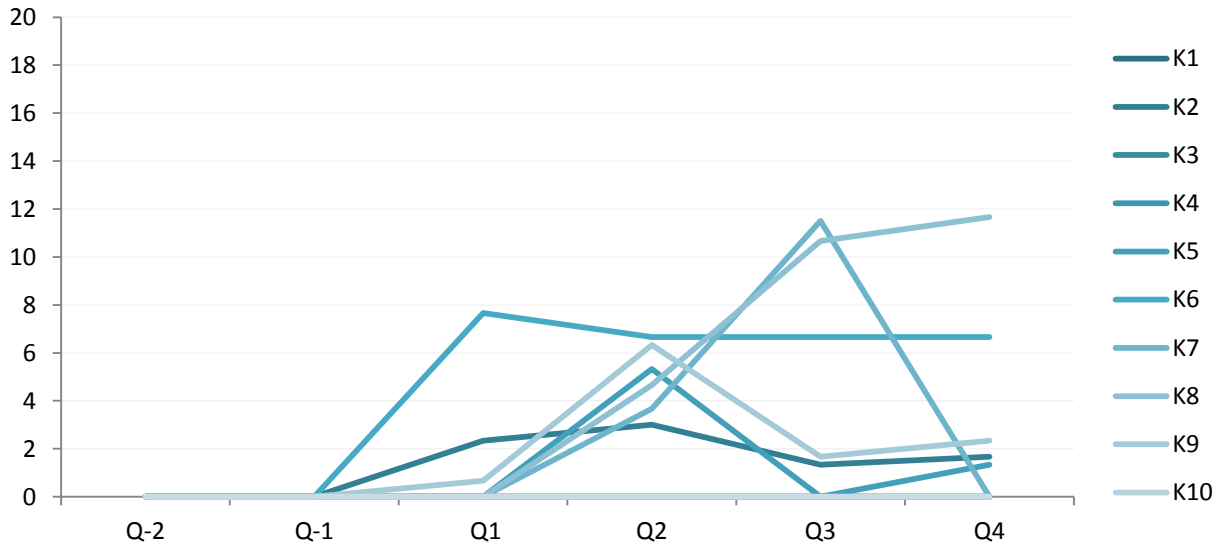
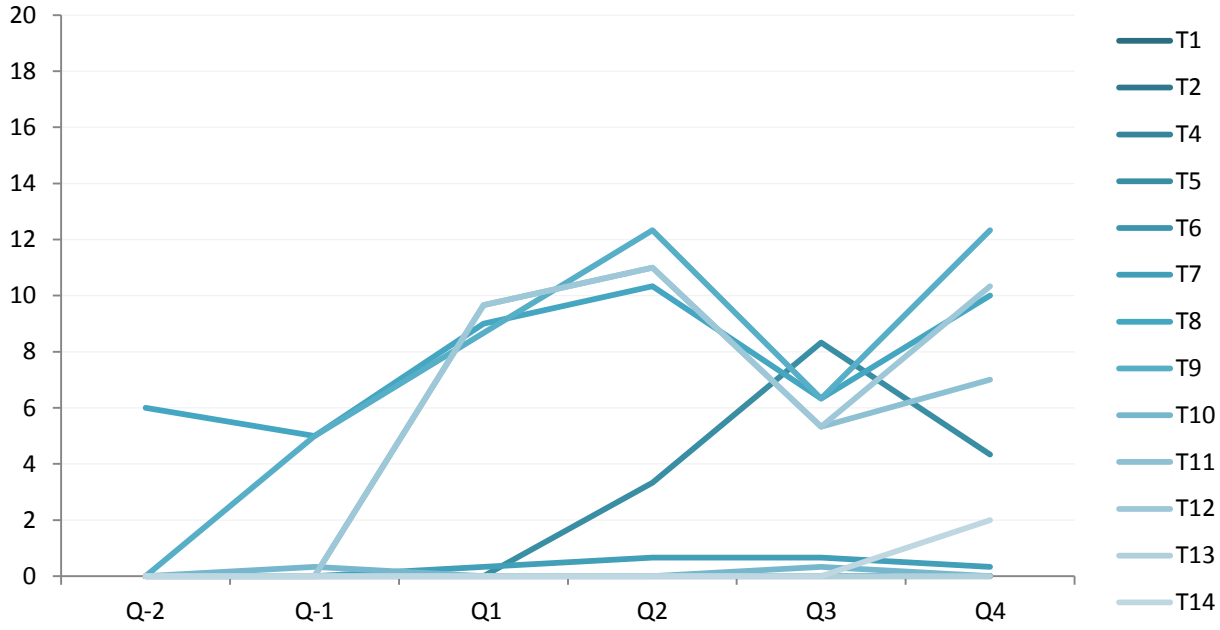


Figure 27. Tamale Preceptor caseload MVA (up to point of training 0) and after training (0-Q4) (n=10)



Source Tables 26, 27: ACNM, 2013

5.3 Discussion: Interventions for increasing the quality and availability of midwifery services

In Ghana, as in many countries in Sub Saharan Africa, an increase in midwives, is critical for the improvement women´s access to health services and the improvement of maternal and reproductive health. While Ghana has made great strides to increase the maternal health workforce and increase pre-service education opportunities, as in Tanzania, the initial focus was on numbers of graduates, not on the quality of graduates, further perpetuating problem of quality. In *Quality considerations in midwifery pre-service education: Exemplars from Africa,* published in 2010 researchers studied multiple aspects of pre-service midwifery programs in Africa and concluded that quality must be considered as a key concern in pre-service education. This concern for quality is key when considering both classroom and clinical instructors as well as the implementation of competency based teaching strategies (Fullerton et al, 2011). This focus on quality, in addition to increased numbers of providers is also in line with the post-2015 agenda and the push for Universal Health Care (UHC), where quality measures are recognized as key components of health system monitoring and evaluation.

The intervention highlighted in this Ghana case study is actually a package of interventions, demonstrating how efforts to improve midwifery must be multifaceted and must take a wide approach. This project included competency based education, innovative eLearning methodology as well as competency based education as was previously discussed in chapter two of this thesis. However, this project is particularly unique as it takes a combined in-service and pre-service approach. Ensuring that the current workforce serving as preceptors is well-trained to provide effective care and teach skills to students is critical for creating a workforce capable of providing quality care.

An increase in the number of midwifery students without an equal focus on quality of the education and precepting received will ultimately compromise care and produce greatly diminished returns in provision of reproductive health services. In many cases such as the Tanzania case study presented in chapter four, an important first step to improving the quality of the midwifery workforce would be assessing the skills of tutors and preceptors and making sure that they have the necessary clinical competency to teach. Competent graduates cannot be produced in a system where tutors and clinical instructors/preceptors themselves do not have the skills to provide quality care.

While there has been debate regarding whether there is greater value in providing pre-service versus in-service education, this is one example of pre-service education with a coordinated in-service component

for tutors and clinical instructors. The evidence I provide in this thesis supports this model as it produced improved skill level of students and improved the quality and availability of service delivery.

In the qualitative assessment in the Ghana case study, both tutors and preceptors stated that once they felt more comfortable in their skill level, they were better able to teach, but also more willing to provide services. In many ways, family planning, which is not immediately life-saving provides an excellent opportunity to study how a providers comfort level with a clinical skill or practice impacts the availability of the service. Many of the preceptors stated that they had received some previous training in long term family planning (LTFP) and comprehensive abortion care (CAC) services, but most said that it was not until this intervention that they felt truly comfortable with those skills. In turn, once their comfort levels rose so did their caseload, meaning that the availability of the services increased, as did the quality. This project was able to increase the availability of family planning methods in the communities served by preceptors from the three schools. This is an important stride toward meeting the unmet need for family planning and safe abortion in these communities and is expected to eventually have an impact on maternal death as well. Studies have shown that meeting need for family planning could "avert as much as 32% of maternal deaths" (Cleland et al., 2006).

The package of interventions carried out in Ghana is unusual for its comprehensive approach. While many programs focus specifically on either pre-service or in-service, choosing between one or the other only responds to half of the problem. This research chapter has focused on the production and productivity of midwives, with special attention to their education.

The Ghana case study builds on these concepts and provide solutions to address the gaps and barriers discovered in the Tanzania case study. In fact, the Ghana case study in many ways could seem a response to what was evidenced in Tanzania, however the program began and was concluded nearly two years prior to the assessment in Tanzania. The Ghana project was developed in function of an assessment and gap analysis completed specifically for the Ghana project. Each country has its own unique challenges that must be addressed specific to its own needs. Additionally, within a country needs differ based on geography, urban versus rural and the diverse economic and cultural characteristics that may be found within any single country. Nonetheless it is clear that there are often similarities in gaps and barriers to the provision of appropriate, quality care in low-resource countries.

6. CONCLUSIONS

6.1. Synthesis of Findings

This thesis began with an introduction that included a brief discussion of the many factors that impact maternal health. An entire thesis could be written about each one of the many factors listed in the first chapter of this thesis, and at the very least a superficial understanding of these factors is necessary to understand the context in which midwives in low-resource settings work. However, if challenges to midwifery were confined to biological and socio-economic factors listed in chapter one, the creation of the list of correcting interventions and their implementation would likely be an easy fix. Unfortunately, the challenges faced by midwives go beyond the state of health of the women they serve and extend into larger heath systems contexts. It is expected that the material presented in the chapters of the thesis has shed light on the fact that the biological state of women´s health is only a small piece of the puzzle. This is best illustrated by the High Burden Country Initiative framework that is detailed in chapter two of this thesis. The five domains provide a comprehensive view of the complex network of domains that impact midwifery service provision. This thesis looks largely the first two domains of that framework, with the greatest attention on Domain B, as follows:

B. Midwifery workforce. This domain relates to the production and performance of the midwifery workforce. This includes pre-service education and in-service training capacities in the public and private sectors and the availability (including distribution and attrition), competencies, responsiveness and productivity of health workers (ICS Integrare, 2012).

In the beginning of this thesis, I stated that the hypothesis was as follows: In coming years maternal and reproductive health services will increasingly be provided by midwives. There is currently a global midwifery shortage and concerns have been raised about the quality of the current global midwifery workforce. I hypothesize that an essential first step is to understand the current challenges and deficits in service provision and training. Once challenges are understood, interventions to improve the quality and availability of midwifery services must include improved training systems for both student midwives as well as midwives that are currently working.

Throughout the literature pertaining to the improvement of maternal health and the improvement of midwifery services in low resource countries there is agreement regarding the importance of beginning with the completion of an assessment for each particular setting (ICS Integrare, 2012). In this thesis I have presented three case studies: two examples of completed assessments, one in Afghanistan and one in Tanzania, and finally a case study from Ghana showing an innovative, comprehensive model for educational and training intervention that could lead to important improvements in the quality of midwifery services.

I presented a case study from Afghanistan in the third chapter. In this case study, the Tanahashi framework was used to evaluate midwifery service provision. An important scale up of the midwifery workforce has taken place in Afghanistan over the last 15 years, and with the increase in the midwifery workforce, maternal and reproductive health have improved. The Tanahashi framework provided a vehicle for understanding the important gaps that continue to exist. As is common in low-resource countries the disparities between urban and rural were notable, with rural areas having an estimated 12% of effective coverage in a hypothetical situation of perfect coverage such as would be the case under UHC.

The Tanahashi framework would not be expected to serve as a stand-alone analysis, but as part of a larger evaluation that includes both qualitative and quantitative research. When we look at indicator data from Afghanistan such as low rates of skilled birth attendance in rural areas (42.1%) (Islamic Republic of Afghanistan Ministry of Public Health, 2016), the information provided from the use of the Tanahashi framework helps to identify some of the reasons why these numbers may be so low. Additionally, it can be used for identifying priorities in programming for the improvement of maternal and reproductive health. In the case of rural settings the initial decrease for availability was nearly 50%. This provides a target area for future intervention.

Chapter four continued with problem identification, as the case study from Tanzania looked at both the availability of services offered through the scope of practice mapping activity, as well as the quality of services being offered through skill testing of practicing of midwives. Obviously, the skills testing results, with less than 25% of practicing midwives passing the skills tests is cause for alarm. If the scores had been high in all areas but one, the test may have served to identify a particularly difficult skill or a skill that is not taught properly or practiced enough, but the poor results in all of the tested areas speak to

the overall poor clinical capacity of the practicing midwives that graduated after 2010. While the Lake zone is largely rural, it is worth noting that the midwives practicing in Dar Es Salaam, the urban capital did not fare better, with similarly low results. This demonstrates, that at least in this area, there is not a rural/urban divide, but a wide spread problem with the overall skill level. These findings provide some insight into why the MMR for Tanzania is as high as it is, despite having approximately 70% of the needed midwifery workforce.

The second portion of the assessment focused on the training institutions and provided some insight into the cause of the low skill level of practicing midwives. Training institutions are often expected to operate with too few teaching resources, within poor infrastructures and with too many students per teacher. Similarly, clinical education systems were found to be disorganized, leaving students without appropriate supervision or accountability while they learn on actual patients. As seen in this case study the Lake region in Tanzania, the end result is improperly trained midwives that offer low quality, possibly dangerous, care.

Assessments such as these are integral to the correct identification of barriers to quality midwifery care. These first two case studies are both examples of methodologies that can be used to identify the barriers and gaps in midwifery service provision. While there are commonalities and patterns that can be observed across low- resource countries, generalizations cannot be made. It is important that country-specific, ideally local, assessments be made prior to programming and intervention design takes place.

The third case study picked up where the previous case studies leave off and looked towards solutions to the challenges faced by midwives in low resource countries. The case study presented from Ghana addressed midwifery training. The true complexity of responding to all of the challenges faced by midwives can be appreciated by recognizing that the program designed to meet only educational challenges included multiple interventions in one single project. It is rare that an educational intervention program have adequate funds and resources to include this many components in a single program. This program was innovative as it included both pre-service and in-service components. This program also took place in mostly rural schools, seeking to increase availability and quality of services where they are usually lacking the most. The pre-service components improved the school's physical infrastructure as well as improving the tutor's clinical and teaching skills. Additionally, the focus on the

professional growth of the tutors through computer lessons, journal club sessions and the provision of resource such as libraries, computer labs and offices increase tutor morale and interest in their teaching profession. By offering training to the clinical preceptors that worked with the students, both the level of training for the students and the quality of care being offered by preceptors when working as midwives (not necessarily preceptors) improved greatly. Additionally, the availability of long term family planning services in the community increased as preceptors grew more comfortable providing services after skills updates. The program was also innovative for its inclusion of technology. While eLearning is becoming more common globally, this program was one of the first created for midwifery education in Ghana.

Multi-level intervention models such as this should become the norm. One level interventions, such as creating a simulation lab without training the teaching staff in coaching and teaching techniques does not provide the full benefit of creating a simulation lab and improving teaching techniques. The benefits of providing multiple interventions at once have a synergistic effect and create an improved learning *system*. In the cases presented in this thesis, it is common that skill level of teachers themselves is low, therefore it is illogical to think that interventions that don't first address their skill level and their teaching capacity will be effective for students. Similarly, it is of limited use to train educators and improve the quality of training for students only to send them to work in health facilities where senior staff are offering low-quality care. Placed in an environment where poor quality care is the norm, it is highly unlikely that a new midwife will maintain a quality skill level. However, if the same midwife is placed in a facility where co-workers practice at high quality, it creates a space for continued growth and improvement. For this reason, the pre-service and in-service intervention mix may create exponential returns providing a great increase in quality and in availability of services in communities.

As seen through case studies, the challenges are enormous. However, in the case of countries such as Afghanistan, the progress that has been made is great. Building on successes, on approaches and models that have been proven to work, we can focus less on being intimidated by all that remains to be done and instead choose to feel inspired by the future opportunities for success. The next section of this chapter includes an example of the potential impact of midwifery in the resolution of these challenges.

6.2. The potential impact of midwifery

In June 2014, the Lancet, a premier international medical and health journal, released its first series on midwifery. This series included four articles that specifically focused on midwifery. It was the first time that a medical journal of its caliber formally recognized midwives as the primary provider for maternal health globally. I participated in this series as a contributing author on the second article *The projected effect of scaling up midwifery* (Homer et al., 2014). My contribution was largely limited to background material and not analysis. For this reason I am not including it as a research chapter of this thesis, but instead would like to discuss the article in these conclusions as a potential glimpse into the future.

Effectively, this article can be considered an estimate of the potential impact that quality midwifery services can have on maternal and reproductive health. If all of the challenges presented in the Tanzania case study of chapter four and all other factors as presented in the Afghanistan case study of chapter three were addressed, how could midwifery services really affect maternal and reproductive health?

This research was not intended to be specific to any particular country and instead relied on model country types. For the creation of the country types 78 low and middle income countries were selected. These countries included all 58 countries in *The state of the world's midwifery 2014* report as well as all additional Countdown 2015 countries (Homer et al., 2014). These countries were ranked according to their human development index (HDI) and divided into three equal groups of 26 countries. The groups provided the statistics to be used in each country type and were then classified as: low HDI, low to moderate HDI, moderate to high HDI (Homer et al., 2014). Each country type was then treated as a single country. From there the Lives Saved Tool (LiST) was employed to model the impact of scaling up midwifery across the three groups (country types) (Homer et al., 2014). The LiST tool begins a model utilizing data regarding a population´s current health and mortality status as well as their current level of health care interventions (Homer et al., 2014). As the populations used in these analyses were constructed for the purpose of these analyses, health indicators to be used as a baseline for modeling were created by using the average mortality rates and ratios, HIV prevalence rates, contraceptive prevalence rates, total fertility rates and rates of health intervention coverage for the 26 countries in each group. The software focuses on coverage of interventions as opposed to coverage of midwives or even coverage of workforce. Therefore a list of interventions that are usually included within the scope of practice of midwives, as per the International Confederation of Midwives (ICM), was created and

those were included in the analysis at five different coverage levels. A list of these interventions is included in Appendix V. The five main analyses presented in the article that were run described the potential impact of increased midwifery coverage at 0) no change in current coverage rates, 1) modest scale-up, 2) substantial scale up, 3) universal coverage and 4) the negative scenario of attrition of the work force. The modeling was run to demonstrate the potential change in lives saved from using 2010 as the baseline year and 2025 and the end year. Modest scale-up was defined as 10% increase in coverage in each of the 3-5 year periods and substantial scale up was a 25% increase in each of the 3-5 year periods. Universal coverage was considered to be a 95% coverage of each intervention by 2025 and the fifth scenario (attrition) showed what would happen if there was a 2% reduction in coverage in each of the 3-5 year periods (Homer et al., 2014). Table 13 shows these five scenarios.

Table 13. Five scenarios of coverage included in "*The projected effect of scaling up midwifery*", 2014

Scenario	Coverage
0. No change from current	No change in coverage rates
1. Modest change in coverage	10 % over 3-5 year periods
1. Substantial scale up	25% increase over 3-5 years
2. Universal coverage of all interventions	95% coverage of each intervention
3. Attrition back from current status	2% reduction in each of 3-5 year periods

Source: Homer, et al, 2014.

The LiST software is considered a tool for estimating child survival, however it also includes measure of maternal mortality (Decormier, 2011). In the full article *The projected effect of scaling up midwifery (2014),* includes data on stillbirth and neonatal mortality as well. However, since this thesis does not include child or neonatal health and has not discussed stillbirth, I will present only the data regarding maternal death. As can be seen in Table 14, the scaling up of midwifery services would have an

important impact on maternal health. Under UHC, there would be over an 80% reduction in maternal deaths in low resource (low HDI) countries by 2025 (Homer et al, 2014). That goes beyond the MDG5 goal that was unreachable for so many low resource countries. Even a 25% increase in 3-5 year increments would result in cutting the number of maternal deaths in half by 2025. Universal health coverage UHC of midwifery services would make an important impact across all levels of resource (HDI), as even in the high HDI group maternal deaths are reduced by nearly 70% (Homer et al., 2014).

However, it is also very important to look at scenario 4, the scenario of attrition, as well. At the close of the MDG period, we saw that some countries actually had worse MMRs than when they began. Scenario 4, provides similar results, with a 2.3% increase in maternal deaths should the midwifery workforce decrease. The impact of a loss of midwives is most notable, with regard to percentage, in the high HDI group where maternal deaths would increase by 11.1% (Homer et al., 2014). It is also worth noting that as the moderate to high HDI group began with much fewer deaths than the other groups, even a smaller number of lives saved results in a larger percentage of lives saved.

While this modeling exercise provides some insight, being a model, it cannot possibly and does not account for all of the factors that contribute to midwifery services as detailed in the five domains of the HBCI framework. One limitation of the LiST software that is particularly relevant to the themes of this thesis is the lack of controlling for quality that is inherent in the LiST. "Quality of care cannot be modeled as a direct input into LiST. However, LiST was designed to assume that as coverage of delivery care services increases, there will be a corresponding increase in quality…. In the model, quality increases substantially faster when institutional delivery is greater than 95% than when it is between 50% and 95%. Similarly, quality increases faster between 30% and 50% than between 0% and 30%" (Homer et al., 2014).

Another limitation is that the LiST tool focuses on lives saved (as the name implies), namely the number of maternal, fetal, and neonatal deaths averted. This is another instance where the mortality is treated as the sole indicator of health. It does not offer any insight into the actual state of health or wellness, nor does it offer any information about morbidity.

Just the same, this analysis provides a goal, showing the impact that midwifery services could have on maternal health. The modeling shows how even small and medium increases would create change,

Table 14. Results from LiST Modeling included in "*The projected effect of scaling up midwifery*", 2014

	Scenario 0 No change	Scenario 1 10% increase every 3-5 years		Scenario 2 25% increase every 3-5 years		Scenario 3 UHC (95%) by 2025		Scenario 4 -2% every 3-5 years	
Group	Number of deaths	Number of deaths	Percentage of deaths	Number of deaths	Percentage of deaths	Number of deaths	Percentage of deaths	Number of deaths	Percentage of deaths
A: Low HDI									
Maternal deaths	300	200	27.4%	150	49.7%	50	81.5%	300	-2.3%
B: Moderate HDI									
Maternal deaths	150	100	35.9%	40	75.4%	30	77.5%	150	-5.5%
C: Moderate to high HDI									
Maternal deaths	50	20	62.7%	15	68.0%	15	69.8%	50	-11.1%

Source: Adapted from Homer, et al, 2014.

although not nearly enough change. It also shows the potentially huge impact that could be felt if midwifery services were offered in the context of UHC with 95% coverage. It is this latter level of change (UHC) that is needed in low resource countries. The message that women's lives can be saved with the expansion in the coverage of quality midwifery services is very concrete.

6.3. The future for midwifery and improving maternal and reproductive health

As the Millennium Development Goals deadline was 2015, the UN Open Working Group began working in 2013 on a new set of goals for the post-2015 agenda. In July 2014, the United Nations announced the new program called the Sustainable Development Goals (SDGs) (Silver and Singer, 2014; UN, 2015). A statement released in September 2015 called "Transforming our world: the 2030 Agenda for Sustainable Development" the United Nations took a human rights anti-poverty approach. The document preamble begins as follows "This Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. We recognise that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development (UN, 2015)." The Sustainable Development Goals include 17 goals and 169 targets. Unlike the MDGs, the SDGs do not separate out maternal health, instead goal number 3 pertains to health in general as "Ensure healthy lives and promote wellbeing for all at all ages." Target 3.1 addresses maternal mortality establishing the goal to "By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births" (UN, 2015).

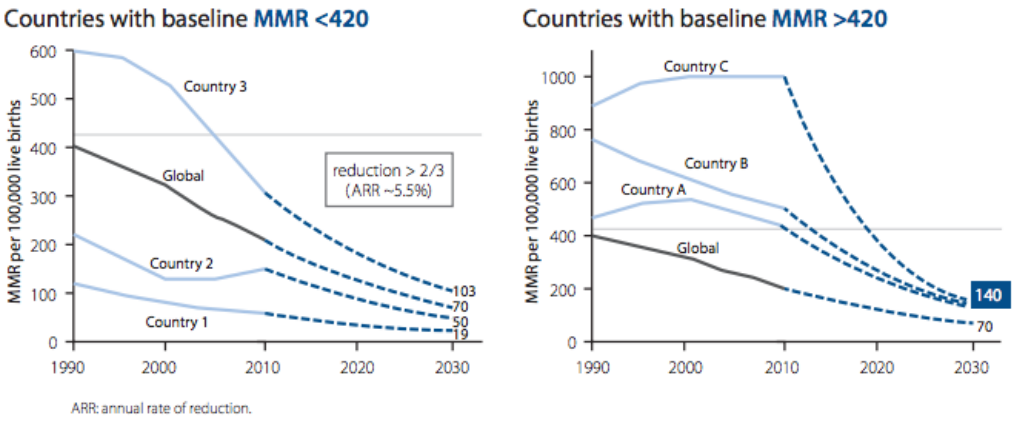
Target 3.1 was developed with the participation of various stakeholders, under the leadership of the Ending Preventable Maternal Mortality Working Group (EPMM) mentioned in the introduction of this thesis (Maternal Health Task Force, 2014). The EPMM is an open working group that is facilitated by the World Health Organization, the United Nations Population Foundation (UNFPA), United Nations Childrens Fund (Unicef), United States Agency for International Development (USAID) and the Maternal Health Task Force (MHTF) (Maternal Health Task Force, 2014).

"The EPMM targets and strategies call on countries, global partners, donors and implementers, and all decision makers to take a people-centered, context-specific, rights-focused approach, grounded in implementation effectiveness and accountability, to plan for maternal and newborn health and mortality reduction in the post-2015 period" (Maternal Health Task Force, 2014).

It is important to note that the goal of only 70 maternal deaths per 100,000 live births is a global average, not necessarily country specific. It will impact countries differently based on their 2010 baseline MMR:

- "Countries with a baseline MMR < 420 in 2010 (the majority worldwide) should reduce its MMR by at least two thirds by 2030.
- Countries with baseline MMR >420 in 2010 should not have an MMR greater than 140 by 2030.
- Countries with baseline MMR < 10 in 2010 should aim to achieve equality in MMR for vulnerable populations at the subnational level" (WHO, 2015)

Figure 28. Ending Preventable Maternal Mortality targets



Source: WHO, 2015

Strategies toward EPMM (2015) takes a human rights and health equity perspective towards addressing maternal health as well as shifting the optic away from focusing on emergency care for the small numbers of women who need it to looking at care that focuses on wellness and making that care available to all women. The United Nations Human Rights Council (HRC) has made official statements affirming that high rates of maternal mortality and morbidity should be viewed as violations of human rights. The HRC resolution proposes that maternal mortality is not solely a health issue, but a "manifestation of various forms of discrimination against women" (WHO, 2015) Strategies for EPMM (2015) utilizes the human rights principle of "progressive realization" which "calls for progressive measures within maximum available resources, including immediate steps that must be taken irrespective of resource constraints (e.g. ensure equality and non-discrimination)" (WHO, 2015).

In this model, preventative care takes a prominent position that it was previously lacking in pre-2015 models, which often focused on emergency and essential interventions. These interventions are still crucial, but preventative services and wellness care should not be ignored in their presence. Instead normal reproductive processes are promoted, ensuring that appropriate quality services are available and recognizing the crucial importance of back-up emergency treatment when appropriate. Strategies for EPMM (2015) also bring a new emphasis on respectful care- an area that has received great attention in recent years with the creation of groups such as the White Ribbon Alliance and their launch of a global campaign for respectful maternity care in 2011 (The White Ribbon Alliance, 2013).

Similar to my case study from Afghanistan, Strategies for EPMM calls for the consideration of availability, accessibility, acceptability and quality (AAAQ) of maternal health services. Services must be offered in a way that functions within local conditions. That is to say the care should be "people-centric (driven by people's aspirations, experiences, choices and perceptions of quality)" (WHO, 2015).

Unlike many previous campaigns for maternal health the EPMM goes beyond maternal mortality and specifically addressed maternal morbidity. Maternal morbidity is defined as: "any health condition attributed to and/or aggravated by pregnancy and childbirth that has a negative impact on the woman's wellbeing" (Firoz et al., 2014). Strategies toward EPMM report (2015) addresses maternal morbidity with the following paragraph:

"It is estimated that for every maternal death, 20–30 more women experience acute or chronic pregnancy-related morbidities, such as obstetric fistula or depression, which impair their functioning and quality of life, sometimes permanently. The true scope of the problem is unknown due to lack of accurate systems for measurement. A WHO-led Maternal Morbidity Working Group has agreed on a consensus definition for maternal morbidity ('any health condition attributed to or complicating pregnancy, childbirth or following pregnancy that has a negative impact on the woman's well-being or functioning') and is working on the development of a measurement tool. Countries must develop plans for tracking and treating maternal morbidities, and should use standard definitions and metrics whenever possible" (WHO, 2015).

Strategies for EPMM (2015) also provides guidance regarding human resources for health. Again, this document reflects the recent recognition that midwives are the premier providers for maternal health.

"Evidence suggests that 87% of essential maternal and newborn health care services can be provided by midwives, subject to them being educated and regulated to international standards and working in well-equipped enabling environments. Furthermore, it is projected that universal coverage of essential maternal, newborn and family planning interventions that fall within the scope of midwifery practice could avert 83% of all maternal and neonatal deaths and stillbirths" (WHO, 2015). The findings that midwifery could avert 83% of all maternal and neonatal deaths and stillbirths comes directly from the Lancet article The projected impact of scaling up midwifery (2014) presented this thesis. That article is contributing directly to future policies and guidance for midwifery practice in the global health arena.

As governments and ministries of health react to the current movement toward expanding midwifery services, many countries, particularly low resource countries will look to international health organization for guidance. To that end, the ICM has created a Midwifery Services Framework (MSF) designed to:

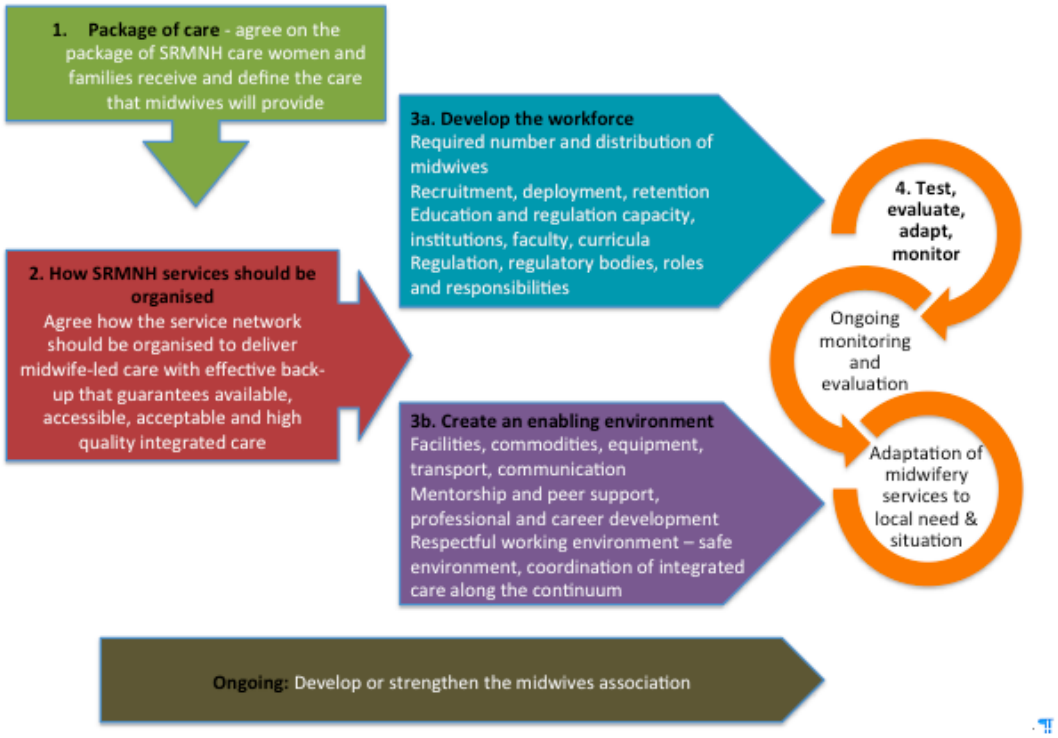
- "Provide detailed guidance on how to set up or develop midwifery services that fit a country's specific health system, health workforce, and population needs.
- Operationalise the common understanding of the fundamental role that midwifery services play in improving women's and children's health
- Build on the current commitment to reducing maternal, newborn and child mortality and morbidity with a practical approach to making access to midwives available to all families.
- Position ICM as a technical leader in advancing the availability of quality midwifery services to all women and families" (ICM, 2015).

The framework itself is a series of steps toward implementation and maintenance of a midwifery services system to be used at a national level, while emphasizing the importance of local, disaggregated information. Prior to beginning the implementation of the midwifery services, assessments such as those carried out in this thesis are advised (ICM, 2015). In particular, step 3a which addresses the development of the workforce is most relevant to the Tanzania and Ghana case studies I presented in the previous chapters. I provide the entire Midwifery Services Framework graphic above to provide the context for the work completed in this thesis. While each of the assessments completed in this thesis took several months and the interventions were implemented over several years, they are but pieces of

a larger, coordinated system of actions that must be coordinated for the created of effective midwifery services.

Initiatives and guidance documents such as the High Burden Country Initiative, Strategies for Ending Preventable Maternal Mortality, Sustainable Development Goal 3.1, the Midwifery Services Framework and the Lancet series demonstrate the current environment for midwifery, particularly in low resource countries.

Figure 29. Midwifery Services Framework 2015



Source: ICM 2015

This is a key moment for midwifery. As expressed by the authors of the Lancet series on midwifery, "The high-quality maternal and newborn care described in this Series should be at the heart of all subnational, national, regional, and global efforts to improve women's and children's health and wellbeing, and it needs a core position within the post 2015 agenda. The knowledge and methods are available to achieve quality maternal and newborn care. Political will and commitment are increasing,

women's and families' voices are growing louder, and economic growth and education for girls are on the rise. The opportunity to transform health, education, and social systems and to make maternal, newborn, and child health a reality for all, is here" (ten Hoope-Bender et al., 2014). Never before has there been such an awareness of the state of maternal health and the role of the midwife in improving it. Particularly in low resource countries, the time for midwifery is now, as said by the authors above, the opportunity it here, it is ours to take advantage.

6.4. Limitations and future areas for study

This thesis is limited in a variety of ways. The first being that it focused on a limited number of aspects of midwifery or the components that impact midwifery service delivery, mainly training. I endeavored to demonstrate that midwifery service provision is multifaceted and its success depends on synchronized, coordinated cooperation from multi-disciplinary sectors. In this thesis I offered little discussion of the role of governance and financing, instead I focused more directly on the development and support of the midwifery workforce. However, it must be acknowledged that without proper financing, commodities, safe work environments, political support through advocacy on the part of professional associations, political legislation and regulation, as well as appropriate recruitment, deployment and retention of the midwifery workforce, it is not possible to improve maternal health or support midwifery care for women.

A second limitation is that I focused on woman´s health, reproductive and maternal health, completely ignoring the newborn. In the post 2015 agenda, there is a push to consider neonatal, adolescent, sexual, reproductive and maternal health as single entity. However, the research I had completed did not extend to neonatal health as this line of thinking was not previously mainstream. Similarly, much of the existing data sources have treated them as separated entities.

My work was focused in two very specific sections of the world Sub-Saharan Africa and South-central Asia (Afghanistan). It may have been more complete to look at an example from Latin America as well. Currently, Latin America is generally not viewed as an area with a high burden of maternal mortality when compared to Sub-Saharan Africa or parts of Asia. However, statistics within certain populations in specific countries, such as indigenous women in Guatemala (Franco de Mendez, 2003) do have alarmingly poor reproductive and maternal health. It would have been interesting to provide data from this region as well as to evaluate the universality of the messages provided in this thesis.

Another significant limitation is the precision with which data collection took place in the Ghana case study. I was ultimately responsible for the evaluation design, however due to a lack of funding and time, selection of researchers was limited to pre-existing staff and data collection training took place when I was not able to be in the country. Local capacity was limited in the three areas where we were working, but local staff had been acquired for other aspects of the program. For example, the director, and lead for data collection in Bolgatanga, is an excellent clinician and very skilled in teaching clinical skills, but not necessarily very computer literate. Therefore her ability to effectively collect data with speed and precision was possibly limited. The time available for training local staff in qualitative research methods was limited, although they did have the consistent presence of senior local staff during data collection period. While these circumstances undoubtedly compromised the quality of the data, I do believe that the general trends can be observed and considered valid. More importantly these challenges are common in field work. This thesis presents the reality of data collection that is often encountered in the field. However, it is important that these activities be completed by local staff, as in part these research activities contribute importantly to local capacity building. Each new experience and opportunity for training lessens the need for foreign technical guidance and works against dependency. What´s more local staff is particularly important for qualitative research as participants may feel more comfortable conveying their answers to non-foreigners. This is particularly true in Ghana where there are many local languages. Having foreign staff (like myself) complete the research activities would have required many more hours of translation and back translation.

While capacity was significantly higher for the data collection that occurred in in Tanzania, similar problems were faced in some of the research activities. Not all local staff were researchers, and for political reasons some health administrators were called on to participate in the data collection. While research methods training was given, it is likely that the precision would have been higher if all of the studies had been conducted by full time researchers as opposed to administrators that were trained to conduct these research activities while balancing their other professional responsibilities. Additionally, it was important in both Ghana and Tanzania that midwives took an active role in the research. Midwifery is being brought to the forefront of maternal health on a global level. With the creation of the Lancet series it is anticipated that the study of midwifery will have new relevance in health literature. As the SDGs specifically call out midwifery (UN, 2015) it can be anticipated that particularly in low-resource countries the body of literature regarding midwifery services will increase. I believe that it is important that midwives take the lead in our own research. Frameworks such as the High Burden Country

Initiative framework for the study of the midwifery workforce and the Midwifery Service Framework provide structures for future study as well as create roadmaps for the implementation and strengthening of midwifery services. It is key that the study of midwifery is not kept in the hands of non-midwives. This is an important opportunity to pull the profession and professional midwives to the table where larger policy discussions take place.

The Lancet series on midwifery (2014) identified areas for increased research in midwifery. As the world becomes increasingly global and migration has become an international way of life (be it local or international), the distribution of health providers is a key concern. Low resource countries face significant brain drains, where the most educated leave the country to head to countries where they have greater pay, support and possibility for professional growth (Nguyen, 2008). While the bulk of the population may be spread out across rural areas, it is common to find providers including midwives wanting to live and be concentrated in urban centers. For this reason programs such as the CME midwifery program developed in Afghanistan, is so important to maternal health and effective midwifery service provision. It is understood that there is a need for an increase in the number of midwives, there is also a need for an increase in the productivity of the midwifery workforce. ten Hoope-Bender, et al. (2014) estimated that even if the number of midwives were doubled, without an increase in productivity in the year 2035 there would only be 36% of the midwifery coverage needed globally (ten Hoope-Bender, 2014). Finally, there is a very important need to look at the over-medicalization that is occurring in maternal health. This is not just a problem for high resource countries. As access to life-saving intervention such as cesarean section in low resource environments increases, there is a tendency to increase their use beyond the actual need.

This is a very challenging time for midwives in low resource countries. It is also a moment of amazing opportunity. This thesis focused on the improvement of maternal and reproductive health in low resource countries, through the improvement in the quality and availability of midwifery services where they are needed most. Currently literature provides tools and frameworks for the study and understanding of the challenges that midwives face and case studies provide innovative models to address these challenges. After coming short in the MDGs, the current international dialog and initiatives place great importance on the role of midwives for reproductive and maternal health. Never has there been such attention on midwifery and its instrumental role in maternal health. This is an important moment for midwives and for women and families everywhere.

REFERENCES

Africa Progress Panel. *Maternal Health: Investing in the lifeline of healthy societies and economies*. Geneva, Switzerland.; 2010. Available at: http://www.who.int/pmnch/topics/maternal/app_maternal_health_english.pdf.

Ahmed S, Li Q, Liu L, Tsui AO. Maternal deaths averted by contraceptive use: an analysis of 172 countries. *Lancet*. 2012;380(9837):111–25.

Anderson T. How can child and maternal mortality be cut ? *British Medical Journal*. 2010;340(January):240–2.

Barros A., Victora C. Measuring Coverage in MNCH: Determining and Interpreting Inequalities in Coverage of Maternal, Newborn, and Child Health Interventions*. PLoS Medicince* 2013;10(5).

Bartlett L, Mawji s, Whitehead, S et al. Where giving birth is a forecast for death: Maternal mortality in four districts of Afghanistan 1999-2002. *Lancet*. 2005, 365. 864-870

Bongaarts J.A framework for analyzing the proximate determinants of fertility. *Population and Development Review*. 1978; 4(1): 105–132.

Braveman P, Gruskin S. Defining equity in health. J Epidemiol Community Health. 2003;57Bryce J, Arnold F, Blanc A, et al. Measuring Coverage in MNCH: New Findings, New Strategies, and Recommendations for Action. *PLoS Med*. 2013;10(5).

Bryce J, Arnold F, Blanc A, et al. Measuring Coverage in MNCH: New Findings, New Strategies, and Recommendations for Action. *PLoS Medicine*. 2013;10(5).

Bryce J, Victora C, Berman P, et al. *Countdown to 2015. Fulfilling the Health Agenda for Women and Children The 2014 Report*.; 2014. Available at: http://www.countdown2015mnch.org/documents/2014Report/Countdown_to_2015-Fulfilling the Health_Agenda_for_Women_and_Children-The_2014_Report-Conference_Draft.pdf.

Bhutta ZA, Lassi *ZS, Mansoor N. Systematic Review on Human Resources for Health Interventions to Improve Maternal Health Outcomes: Evidence from Developing Countries. Karachi: The Aga Khan University; 2010:1–89.*

Campbell J, Buchan J, Cometto G, et al. Human resources for health and universal health coverage: fostering equity and effective coverage. *Bulletin of the World Heal Organozation*. 2013;91(11):853–863.

Campbell OMR, Graham WJ. Strategies for reducing maternal mortality: getting on with what works. *Lancet*. 2006;368(9543):1284–99.

Central Statistics Organization (CSO), Ministry of Public Health (MoPH), and ICF International. Afghanistan Demographic and Health Survey 2015: Key Indicators. Kabul, Afghanistan, and Rockville, Maryland USA: 2016; Available at: http://dhsprogram.com/pubs/pdf/PR77/PR77.pdf

City Population. 2012. Tanzania: Wards in the Lake Zone. Available at: http://www.citypopulation.de/php/tanzania-lake-admin.php

Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. *Lancet*. 2006;368(9549):1810–27.

Clift C. Is Universal Health Coverage Good for Health? *Universal Health Coverage and the post-2015 Development Agenda*.; 2012. Available at: https://www.worldwewant2015.org/node/299639.

Cohen RL, Alfonso Y, Adam T, Kuruvilla S, Schweitzer J, Bishai D. Country progress towards the Millennium Development Goals: adjusting for socioeconomic factors reveals greater progress and new challenges. *Global Health*. 2014;10(1):67.

Countdown to 2015. About Countdown.Maternal/Newborn/IPTP indicators. 2015. Available at: http://www.countdown2015mnch.org/about-countdown/countdown-data

Crowe S, Utley M, Costello A, Pagel C. How many births in sub-Saharan Africa and South Asia will not be attended by a skilled birth attendant between 2011 and 2015? *BMC Pregnancy Childbirth*. 2012;12(1):4.

Diamond-Smith N, Potts M. A woman cannot die from a pregnancy she does not have. *International Perspects on Sexual and Reproductive Health*. 2011;37(3):155–8.

Dussault G, Franceschini MC. Not enough there, too many here: understanding geographical imbalances in the distribution of the health workforce. *Human Resources for Health*. 2006;4(1):12.
Franco de Méndez N. Maternal Mortality in Guatemala: A Preventable Tragedy. 2003. Available at: http://www.prb.org/Publications/Articles/2003/MaternalMortalityinGuatemalaAPreventableTragedy.aspx.

Firoz T, Chou D, Dadelszen P Von. Measuring maternal health : focus on maternal morbidity. *Bulletin of the World Health Organization,* 2014:1–6.

Frehywot S, Vovides Y, Talib Z, et al. E-learning in medical education in resource constrained low- and middle-income countries. *Hum Resour Health*. 2013;11(4). Available at: http://www.human-resources-health.com/content/11/1/4.

Fullerton JT, Johnson PG, Thompson JB, Vivio D. Quality considerations in midwifery pre-service education: Exemplars from Africa. *Midwifery*. 2011;27:308–315.

Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF International. 2015. 2014 Ghana Demographic and Health Survey (DHS). Available at: http://dhsprogram.com/pubs/pdf/SR224/SR224.pdf

Global Health Workforce Alliance, World Health Organization. Scaling Up , Saving Lives. 2008:123.

Gordon TJ. The Delphi Method. In: Glenn JC, Gordon TJ, eds. *Futures Research Methodology* .The Millennium Project; 2009:1–29.

Government of the Islamic Republic of Afghanistan. *Afghanistan Millennium Development Goals Report - Afghanistan MDGs 2012 Report*. Kabul, Afghanistan; 2012:129.

Graham WJ, Bell JS, Bullough CH. Can Skilled Attendance at Delivery Reduce Maternal Mortality in Developing Countries? 2000. Available at: http://www.jsieurope.org/safem/collect/safem/pdf/s2934e/s2934e.pdf

Graham WJ, Campbell OM. Maternal health and the measurement trap. *Social Science and Medicine*. 35(8):967–977. Available at: http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&DbFrom=pubmed&Cmd=Link&LinkName=pubmed_pubmed&LinkReadableName=Related Articles&IdsFromResult=1411704&ordinalpos=3&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum.

Greene ME, Merrick T. Poverty Reduction: Does Reproductive Health Matter?; 2005. *The International Bank for Reconstruction and Development / The World Bank; 2005 (Health, Nutrition and Population (HNP) Discussion Paper).*

Gruppen LD, Mangrulkar RS, Kolars JC. The promise of competency-based education in the health professions for improving global health. *Human Resources for Health.* 2012:1–7.

Guttmacher Institute. Abortion in Ghana, *Fact Sheet*. 2013. Available at: http://www.guttmacher.org/pubs/FB-Abortion-in-Ghana.pdf.

Hanney SR, Gonzalez-Block MA, Buxton MJ, Kogan M.2003. The utilisation of health research in policy-making: concepts, examples and methods of assessment. *Health Research and Policy Systems*. 2003;1:1:2.

Harvey SA, Blandón YCW, McCaw-Binns A, et al. Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward. *Bulletin of the World Health Organization*. 2007;85(10):783–790.

HBCI (High Burden Country Initiative) Secretariat and Technical Working Group. H4+ High Burden Countries Initiative. National Assessments - midwifery workforce: Operational guidance and assessment framework. 2012;1–34.

Hodgins S. Achieving better maternal and newborn outcomes: coherent strategy and pragmatic, tailored implementation. *Global Health Science Practice*. 2013;1:2:146–153.

Homer, C., Friberg, I.,Dias, M., ten Hoope-Bender, P.Sandall, J., Speciale, AM., Bartlett, L. The projected impact of scaling up midwifery. *Lancet*. 2014;384(9948):1146–1157. Available at: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60790-X/abstract.

Horton, Richard et al.The power of midwifery, *The Lancet*, 2014;384(9948): 1075 - 1076 Available at: https://secure.jbs.elsevierhealth.com/action/showCitFormats?pii=S0140-6736%2814%2960855-2&doi=10.1016%2FS0140-6736%2814%2960855-2&code=lancet-site

ICS Integrare. H4 + High Burden Countries Initiative Midwifery Workforce Assessments. 2012. Available at: http://integrare.es/wp-content/uploads/2012/09/HBCI_Comms_Note_Q1_11Apr12_FINAL-ABLAYOUT.pdf.

Illah, E., Mbaruku, G., Masanja, H., Kahn K. Causes and risk factors for maternal mortality in rural Tanzania--case of Rufiji Health and Demographic Surveillance Site (HDSS). *African Journal of Reproductive Health*. 2013;117(3):119–130.

OSCEhome, Integrated Comprehensive Clinical & Communication Skills Approach For Patient Interviews & OSCE. What is Objective Structured Clinical Examination, OSCEs? 2014. Available at: http://www.oscehome.com/What_is_Objective-Structured-Clinical-Examination_OSCE.html.

International Confederation of Midwives. *Essential Competencies for Basic Midwifery Practice 2010*. ICM; 2011. Available at: http://www.unfpa.org/sowmy/resources/docs/standards/en/R430_ICM_2011_Essential_Competencies_2010_ENG.pdf.

ICM (International Confederation of Midwives). ICM International definition of the Midwife. 2014. Available at: http://www.internationalmidwives.org/who-we-are/policy-and-practice/icm-international-definition-of-the-midwife/.

International Confederation of Midwives. *Midwifery Services Framework. Guidelines for developing SRMNAH services by midwives*.; 2015. Available at: http://www.internationalmidwives.org/assets/uploads/documents/Manuals and Guidelines/MSF for field-testing, 17Mar15.pdf.

Islamic Republic of Afghanistan Ministry of Public Health, Afghan Public Health Institute, Central Statistics Organization (CSO), ICF Macro, Indian Institute of Health Management Research (IIHMR), World Health Organization Regional Office for the Eastern Mediterranean (WHO/EMRO). *Afghanistan Mortality Survey 2010*. 2011. Calverton, Maryland: APHI/MoPH, CSO, ICF Macro, IIHMR, WHO/EMRO.

Kearns A, Hurst T., Caglia J., Langer A., Focused Antenatal Care in Tanzania. Delivering individualised, targeted, high-quality care. 2014. Available at: https://cdn2.sph.harvard.edu/wp-content/uploads/sites/32/2014/09/HSPH-Tanzania5.pdf

Lincetto O, Mothebesoane-anoh S, Gomez P, Munjanja S. Antenatal Care. In: *Opportunities for Africa's Newborns. Practical data, policy and programmatic support for newborn care in Africa*.Vol 2.; 2013:51–62. Available at: http://www.who.int/pmnch/media/publications/oanfullreport.pdf.

Malarcher S. A view of sexual and reproductive health through the equity lens. *Social Determinants in Sexual and Reproductive Health informing Future Research and Program Implementation*. 2010:1–12. Available at: https://extranet.who.int/iris/restricted/bitstream/10665/44344/1/9789241599528_eng.pdf#page=9.

Mansoor GF, Hashemy P, Gohar F, Wood ME, Ayoubi SF, Todd CS. Midwifery retention and coverage and impact on service utilisation in Afghanistan. *Midwifery.*2013 Available from: http://www.ncbi.nlm.nih.gov/pubmed/24016552

Maternal Health Task Force. Post-2015: What's next for maternal health? *Topics*. 2015. Available at: http://www.mhtf.org/topics/post-2015-whats-next-for-maternal-health/. Accessed April 1, 2016.

Mathur P. Hand hygiene: Back to the basics of infection control. *Indian Journal of Medical Research*. 2011;134(5):611–620.

McConville B. White Ribbon Alliance. Music to our ears. 2014. Available at: http://whiteribbonalliance.org/opinions/music-ears/.

Michelle A. Kelly, MN, , Margaret Fry P. Masters Nursing Students' Perceptions of an Innovative Simulation Education Experience. *Clinical Simulation in Nursing*. 2013;9(4):e127–e133.

Mulligan J, Nahmias P, Chapman K, et al. Improving Reproductive, Maternal and Newborn Health : Reducing Unintended Pregnancies Evidence Overview. *RMNH Evidence Survey*. 2010;2:1–118.

Mbizvo MT, Say L. Global progress and potentially effective policy responses to reduce maternal mortality. *Int J Gynaecology and Obstetrics*. 2012;119 Suppl:S9–12. Available at: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=prem&NEWS=N&AN=22883916

National Bureau of Statistics (NBS) Tanzania and ICF Macro. Tanzania Demographic and Health Survey 2010. Dar es Salaam, Tanzania: 2011; Available at: http://dhsprogram.com/pubs/pdf/FR243/FR243[24June2011].pdf

Nguyen L, Ropers S, Nderitu E, Zuyderduin A, Luboga S, Hagopian A. Intent to migrate among nursing students in Uganda: Measures of the brain drain in the next generation of health professionals. *Human Resources for Health*. 2008;6(1):5.

O'Connell T, Rasanathan K, Chopra M. What does universal health coverage mean? The *Lancet. 2014;* 201:13–5. Available from: http://linkinghub.elsevier.com/retrieve/pii/S0140673613609551

Okoli C, Pawlowski SD. The Delphi method as a research tool: an example, design considerations and applications. *Information Management*; 2004;42:15–29.

Olsen O, Clausen J a. Planned hospital birth versus planned home birth. *Cochrane database Systematic Reveiw*. 2012;9(9)

Pervin J, Moran A, Rahman M, et al. Association of antenatal care with facility delivery and perinatal survival -- a population-based study in Bangladesh. *BMC Pregnancy Childbirth*. 2012;12(1):111.

Quick J, Jay J, Langer A. Improving women's health through universal health coverage. *PLoS Medicine*. 2014;11(1)

Renfrew MJ, McFadden A, Bastos MH, et al. Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care. *Lancet*. 2014;384(9948):1129–1145. Available at: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60789-3/abstract.

Sandefur J. Here ' s the Best Thing the United States Has Done in Afghanistan. *The Atlantic.* 2013. Avilable at: http://www.theatlantic.com/international/archive/2013/10/heres-the-best-thing-the-us-has-done-in-afghanistan/280484/

Scott S, Ronsmans C. The relationship between birth with a health professional and maternal mortality in observational studies: a review of the literature. *Tropical Medicine and International Health*. 2009; 14(12):1523-1533.

Silver KL, Singer PA. SDGs: Start with maternal, newborn, and child health cluster. *Lancet*. 2014;384(9948):1093–1094.

Speakman EM, Shafi A, Sondorp E, Atta N, Howard N. Development of the Community Midwifery Education initiative and its influence on women ' s health and empowerment in Afghanistan : a case study. *BMC Women's Health.* 2014:1–12.

Tanahashi T. Health service coverage and its evaluation. *Bulletin of the World Health Organization*. 1978;56(2):295–303.

Tanzania Preservice Nurse Midwifery Education Assessment.2015 Final Report, Kagera and Mara Regions.

Techtarget. distance learning (e-learning). Available at: http://whatis.techtarget.com/definition/distance-learning-e-learning. Accessed April 3, 2016.

ten Hoope-Bender P, de Bernis L, Campbell J, et al. Improvement of maternal and newborn health through midwifery. *Lancet*. 2014; 1226–1235. Available at: http://linkinghub.elsevier.com/retrieve/pii/S0140673614609302.

Thaddeus S, Maine D. Too far to walk: Maternal mortality in context. *Social Science and Medicine*. 1994;38(8):1091–1110.

Transitional Islamic Government of Afghanistan Ministry of Health. *A Basic Package of Health Services for Afghanistan, 2003/1382*. Kabul; 2003.

Tsegay Y, Gebrehiwot T, Goicolea I. Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: a cross-sectional study. *International Journal of Equity in Health.* 2013;12:30.

Turkmani S, Currie S, Mungia J, Assefi N, Javed Rahmanzai A, Azfar P, et al. "Midwives are the backbone of our health system": Lessons from Afghanistan to guide expansion of midwifery in challenging settings. *Midwifery.* 2013. 29(10):1166–72. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23916402

UN (United Nations). The Millennium Development Goals Report. *Change*. 2010. Available at: https://visit.un.org/millenniumgoals/2008highlevel/pdf/MDG_Report_2008_Addendum.pdf.

UN (United Nations). The Millennium Development Goals Report. 2014:1–59. Available at: http://www.un.org/millenniumgoals/2014 MDG report/MDG 2014 English web.pdf.

UN (United Nations). Transforming our world: the 2030 Agenda for Sustainable Development, *Sustainable Development Knowledge Platform* (2015). Available at: https://sustainabledevelopment.un.org/post2015/transformingourworld

UN (United Nations). UN Platform on Social Determinants of Health. *Health in the post-2015 development agenda : need for a social determinants of health approach Joint statement of the UN Platform on Social Determinants of Health*.; 2015:1–18. Available at: http://www.who.int/social_determinants/advocacy/UN_Platform_FINAL.pdf?ua=1.

UNICEF (United Nations Childrens Fund). 2014. Global Databases. Available at: data.unicef.org

UNICEF (United Nations Childrens Fund). Millennium Developement Goals. *About the Goals*. Available at: http://www.unicef.org/mdg/index_aboutthegoals.htm.

United Nations Department of Economic and Social Affairs. Population Division. *World Fertility Patterns 2013*. New York; 2014. Available at: http://www.un.org/en/development/desa/population/publications/pdf/fertility/world-fertility-patterns-2013.pdf

UNHR(United Nation Human Rights). Open Working Group on Sustainable Development Goals, 6th Session Interactive exchange on “Human rights, the right to development, global governance”: Keynote Remarks by Ms. Navi Pillay United Nations High Commissioner for Human Rights delivered by Mr. Iva. *Disp News*. 2013. Available at: http://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=14148&LangID=E.

UNFPA (United Nations Population Fund). *State of Afghanistan ’ s Midwifery 2014*.; 2014. Available at: http://countryoffice.unfpa.org/filemanager/files/afghanistan/2014/reports/midwifery_report_2014_english.pdf.

UNFPA (United Nations Population Fund) Zambia. Recruiting Retired Midwives: An Innovative Approach to Increase Skilled Deliveries in Rural Zambia -. 2015. Available at: http://zambia.unfpa.org/news/recruiting-retired-midwives-innovative-approach-increase-skilled-deliveries-rural-zambia.

UNFPA (United Nations Population Fund), ICM (International Confederation of Midwives), WHO (World Health Organization). The state of the world’s midwifery 2014: A universal pathway. A woman's right to health. New York: United Nations Population Fund; 2014.

United Republic of Tanzania, Ministry of Health and Social Welfare, 2007. Mpango Wa Maendeleo Wa Afya Ya Msingi (MMAM), 2007-1017. 2007.

Wherig. 2012. Where is Afghanistan? Available at: Available at http://www.whereig.com/afghanistan/

Wherig. 2012. Where is Tanzania? Available at: is Tanzania (2012) Available at: http://www.whereig.com/tanzania/

White Ribbon Alliance. Respectful Maternity Care. 2013. Available at: http://whiteribbonalliance.org/campaigns2/respectful-maternity-care/.

Willyanne Decormier Plosky, John Stover and BW. *The Lives Saved Tool A Computer Program for Making Child Survival Projections*.; 2011. Available at: http://www.jhsph.edu/research/centers-and-institutes/institute-for-international-programs/_documents/manuals/list_manual.pdf.

Women on waves. (2016) Ghana: Abortion Law. Available at: https://www.womenonwaves.org/en/search?qs=ghana

Women on waves. (2016).. Afghanistan: Abortion Law. Available at: https://www.womenonwaves.org/en/page/4830/afghanistan--abortion-law

Women on waves. (2016).. Tanzania: Abortion Law. Available at : https://www.womenonwaves.org/en/search?qs=Tanzania

World Bank, Data. (2016). *Population, female (% of total).* Available at: http://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS

World Bank, Data. (2016). *Total Fertility Rate.* Available at http://data.worldbank.org/indicator/SP.DYN.TFRT.IN

World Bank, Data. (2016). *Urban population (% of total).* Available at: http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS

World Bank, UNICEF (United Nations Child's Fund), WHO (World Health Organization), UNFPA (United Nations Population Fund). Trends in Maternal Mortality 1990-2010. 2012. Geneva; p. 1–72.

WHO (World Health Organization). Antenatal care coverage (%). *WHO*. 2006:34–35. Available at: http://www.who.int/whosis/whostat2006AntenatalCareCoverage.pdf.

WHO (World Health Organization). Does the world have enough midwives?Maternal, newborn, child and adolescent health. *Maternal, newborn, child, Adolescent Health*. 2016. Available at: http://www.who.int/maternal_child_adolescent/news_events/news/2015/role-of-midwives/en/.
WHO (World Health Organization). *Every woman every child: from commitments to action: the first report of the independent Expert Review Group (iERG) on information and accountability for women's and children's health*.; 2012:1–80.

WHO (World Health Organization). *Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention*. Geneva: World Health Organization; 2010. http://www.who.int/hrh/retention/guidelines/en/index.html.

WHO (World Health Organization). Media centre. Maternal mortality. 2013:1–4. Available at: http://www.who.int/mediacentre/factsheets/fs348/en/#.

WHO (World Health Organization). Maternal, newborn, child and adolescent health. 2016. Available at: http://www.who.int/topics/midwifery/en/.

WHO (World Health Organization). MDG 5 Improving Maternal Health. 2015. Available at: http://www.who.int/topics/millennium_development_goals/maternal_health/en/.

World Health Organization. Reproductive health. 2016. Available at: http://www.who.int/topics/reproductive_health/en/.

WHO (World Health Organization). *Strategies toward ending preventable maternal mortality (EPMM)*. Geneva; 2015. Available at: http://who.int/reproductivehealth/topics/maternal_perinatal/epmm/en/.

WHO (World Health Organization). *Tracking Universal Health Coverage: First Global Monitoring Report*.; 2015. Available at: http://apps.who.int/iris/bitstream/10665/174536/1/9789241564977_eng.pdf.

WHO (World Health Organization). United Republic of Tanzania. Country Profile. 2015. available at: http://www.who.int/gho/countries/tza.pdf?ua=1&ua=1

WHO (World Health Organization). *Unsafe abortion. Global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008.* Geneva, Switzerland; 2011. Available at: http://apps.who.int/iris/bitstream/10665/44529/1/9789241501118_eng.pdf.

WHO (World Health Organization). WHO Health Systems. Equity. *Global Health Promotion.* 2015. Available at: http://www.who.int/healthsystems/topics/equity/en/.

WHO (World Health Organization). *WHO Heath Topics*. 2013:1–2. Available at: http://www.hst.org.za/publications/876.

WHO (World Health Organization). *World Health Report 2000. Health Systems: Improving Performance*. Geneva, Switzerland; 2000. Available at: http://www.who.int/whr/2000/en/whr00_en.pdf. (WHO/EMRO). World Health Organization, Regional Office for the Eastern Mediterranean. 2015. Child Health and Development. Preservice Education. Available at: http://www.emro.who.int/child-health/IMCI-preservice-training/what-is-it

WHO (World Health Organization), World Bank. Monitoring Progress towards Universal Health Coverage at Country and Global Levels. Framework, Measures and Targets. 2014 http://apps.who.int/iris/bitstream/10665/112824/1/WHO_HIS_HIA_14.1_eng.pdf?ua=1.

WHO (World Health Organization), UNICEF (United Nations Childrens Fund), UNFPA (United Nations Population Fund), World Bank Group, and UNPD (United Nations Population Division). Maternal Mortality Estimation Inter-Agency Group, Maternal mortality in 1990-2015. Afghanistan. Available at: http://www.who.int/gho/maternal_health/countries/afg.pdf

WHO (World Health Organization), UNICEF (United Nations Childrens Fund), UNFPA (United Nations Population Fund), World Bank Group,. Maternal mortality in 1990-2015. Afghanistan. 2015:1–5. Available at: http://www.who.int/gho/maternal_health/countries/afg.pdf.

WHO (World Health Organization), UNICEF (United Nations Childrens Fund), UNFPA (United Nations Population Fund), World Bank Group, and UNPD (United Nations Population Division). Trends in Maternal Mortality: 1990 to 2010. Geneva: WHO; 2012:1–59.

Zainullah P, Ansari N, Yari K, Azimi M, Turkmani S, Azfar P, et al. Establishing midwifery in low-resource settings: Guidance from a mixed-methods evaluation of the Afghanistan midwifery education program. *Midwifery;* 2013 1–7. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24290947

Zurayk H, Khattab H, Younis N, El-Mouelhy M, Fadle M. Concepts and measures of reproductive morbidity. *Health Transition Review*. 1993;3 (1):17–40. Available at: http://www.ncbi.nlm.nih.gov/pubmed/10148796.

APPENDIX I. COUNTDOWN TO 2015 INDICATORS

1. Total population
2. Total under five population
3. Births
4. Birth Registration
5. Total under five deaths
6. Neonatal deaths as a % of all under 5 deaths
7. Neonatal mortality rate
8. Infant mortality rate
9. Still birth rate
10. Total maternal deaths
11. Lifetime risk of maternal deaths
12. Total fertility rate
13. Adolescent birth rate
14. Under five mortality rate
15. Maternal mortality rate

16. Demand for family planning satisfied

17. Antenatal care - at least once

18. Antenatal care 4+ visits

19. Skilled attendant at delivery

20. Postnantal care for baby

21. Postnantal care for mother

22. Intermittent preventive treatment for malaria

23. C section rate

24. Neonatal tetanus vaccine

25. Women with low BMI

26. Percent of HIV+ pregnant women receiving ARVs for PMTCT

27. Eligible HIV+ pregnant women eligible receiving ART for their own health

28. Immunization – measles

29. Immunization - DTP3

30. Immunization - Hib3

31. Immunization – rota

32. Immunization - PCV3

33. Care seeking for symptoms of pneumonia

34. Diarrhoeal disease treatment - receiving ORT or increased fluids with continued feeding

35. Diarrhoeal disease treatment - receiving ORS

36. Malaria prevention - sleeping under ITNs

37. Malaria treatment - 1st line treatment

38. Wasting

39. LBW

40. Early initiation of breastfeeding

41. Introduced to solid, semi-solid or soft foods

42. Vitamin A two dose coverage
43. Underweight

44. Stunting

45. Exclusive breastfeeding

46. Type of drinking water source

47. Types of sanitation facilities

APPENDIX II. WORLD HEALTH ORGANIZATION AND THE PARTNERSHIP FOR MATERNAL, NEWBORN AND CHILD HEALTH KEY POLICIES AND TRACER INDICATORS

1. AP1. Proportion of pregnant women who have a preparedness plan for birth and complications

2. AP2. Proportion of pregnant women who were screened for anemia

3. AP3. Proportion of pregnant women who were screened for syphilis

4. IS1. Existence of a separate ward for labor and childbirth

5. IS2.Availability of health professionals with midwifery skills on duty in the labor and childbirth ward

6. 1S3. Availability of soap and running water or alcohol-based hand rub on the labor and childbirth ward.

7. IS4. Uninterrupted availability of oxygen supply in labor and childbirth ward during last three months

8. IP1. Proportion of women with prolonger labor

9. IP2. Proportion of women with companion present during labor and childbirth

10. IP3. Proportion of women in the past 3 months for whom a partograph was completed

11. IP4. Proportion of women in the last 3 months that received oxytocin immediately after the birth of their infant

12. IO1. Proportion of women with severe systemic infection or sepsis after delivery in the facility

13. IO2. Proportion of maternal near-misses of all women giving birth

14. IO3. Fresh stillbirth rate

15. PP1. Ratio of maternal deaths reviewed

16. PO1. Proportion of maternal deaths as a result of hypertensive disorders in pregnancy

17. NS1. Proportion of health care facilities with maternity service that have functional bags and masks for newborns

18. NS2. Designed area for sick newborns requiring extra care (in labor and childbirth or pediatric ward)

19. NS3. Availability of health professionals and midwifery skills trained in neonatala resuscitation on duty in the labor and childbirth ward

20. NS4. Proportion of facilities in which KMC is operational, by level of facility and type of KMC service

21. NP1. Proportion of births assisted by a health worker trained in and equipped for newborn resuscitation

22. NP2. Proportion of neonatal deaths audited

23. NP3. Proportion of infants born to HIV-infected women given antiretroviral prophylaxis to reduce the risk factor for mother-to-child transmission in the first 6 weeks

24. NP4. Proportion of newborn with suspected or confirmed neonatal infection receiving antibiotics

25. NP5. Proportion of newborns with visible jaundice within 24 hours of birth receiving phototherapy

26. NO1. Proportion of newborns who were breastfed within 1 hour of birth

27. NO2. Proportion of deaths among infants who received KMC, by birth weight category

28. CS1. Existence of separate ward for pediatric care in facility

29. CS2. Availability of soap and running water or alcohol based hand rub in the pediatric ward

30. CS3. At least one pediatric case audit conducted in the past three months

31. CP2. Proportion of children with diarrhea who are correctly rehydrated

32. CP3. Children monitored three times per 24 hours with recording of vital signs

33. CO1. Fatality rate among hospitalized children under 5 years old

34. CO2. Case fatality rate for pneumonia

35. CO3. Case fatality rate for diarrhea

36. GS1. Facility has functional ambulance or other vehicle for emergency transport of clients that is stationed at or operates from the facility

37. GS2. Toilet or latrine available for patients

38. GS3. Toilet or latrine available for visitors

39. GS4. Facility has a functioning computer with internet connection

40. GS5. Safe disposal of sharps

41. GS6. Constant supply of listed commodities

42. GP1. Triage available for women and children

APPENDIX III. WORLD HEALTH ORGANIZATION EIGHT COVERAGE INDICATORS FOR MATERNAL AND CHILD ACCOUNTABILITY

1. “Met need for contraception (proportion of women aged 15-49 years who are married or in union and who have met their need for family planning—ie, who do not want any more children or want to wait at least two years before having a baby, and are using contraception)

2. Antenatal care coverage (percentage of women aged 15–49 years with a live birth who received antenatal care by a skilled health provider at least four times during pregnancy)

3. Antiretroviral prophylaxis among HIV-positive pregnant women to prevent vertical transmission of HIV, and antiretroviral therapy for women who are treatment eligible

4. Skilled attendant at birth (percentage of live births attended by skilled health personnel)

5. Postnatal care for mothers and babies (percentage of mothers and babies who received a postnatal care visit within two days of childbirth)

6. Exclusive breastfeeding for six months (percentage of infants aged 0–5 months who are exclusively breastfed)

7. Three doses of the combined diphtheria, pertussis and tetanus vaccine (percentage of infants aged 12–23 months who received three doses of diphtheria/ pertussis/tetanus vaccine)

8. Antibiotic treatment for pneumonia (percentage of children aged 0–59 months with suspected pneumonia receiving antibiotics).”

APPENDIX IV.TASKS FROM MIDWIFERY SCOPE OF WORK, TANZANIA

1. Reproductive health Quick check
2. History taking
3. Perform physical examination
4. Take or refer for laboratory investigations
5. Conduct reproductive health education to adolescents, women and families
6. Provide emergency contraception medications based on local policies, protocols, law or regulations.
7. Conduct pre conception counseling based on individual situation, needs and interest.
8. Screen for HIV
9. Screen for TB
10. Screen for breast cancer
11. Screen for cervical cancer
12. Use the microscope to perform simple screening tests
13. Insert and remove intrauterine contraceptive devices
14. Insert and remove contraceptive implants
15. Perform acetic acid visualization of the cervix and interpret the need for referral and treatment
16. Counsel for health promotion
17. Provide specialized midwifery care for clients with special needs
18. Evaluate foet al status using ultrasound.
19. Conduct antenatal care including care for women with special needs e.g: adolescents, HIV-positive, mentally ill and sickle cell clients
20. Detect and treat pregnancy complications
21. Conduct a focused assessment- quick check, take a specific history and maternal vital signs in labour perform physical examination in labour
22. Perform a complete abdominal assessment for foet al position and descent and assess the effectiveness of uterine contractions
23. Perform a complete and accurate per vaginal examination for dilatation, descent, presenting part, position, status of membranes, and adequacy of pelvis for birth of baby vaginally
24. Administer pharmacologic therapies for pain relief during labour.

25. Administer pharmacologic therapies during labour for augmentation.
26. Requests and or carry out basic laboratory investigations.
27. Provide for bladder care including performance of urinary catheterization when indicated promptly
28. Monitor and document progress of labour using the partograph
29. Identify abnormal labour patterns and initiate appropriate and timely intervention and/or referral
30. Conduct clean and safe delivery
31. Administer local anaesthetic to the perineum when episiotomy is anticipated or perineal repair is required
32. Perform an episiotomy if needed and repair
33. Perform appropriate hand maneuvers for a vertex birth
34. Perform appropriate hand maneuvers for face and breech deliveries
35. Institute immediate, life-saving interventions in obstetrical emergencies (e.g., prolapsed cord, malpresentation, shoulder dystocia, and foet al distress) to save the life of the foetus, while requesting medical attention and/or awaiting transfer
36. Manage a cord around the baby's neck at birth
37. Assessment of newborn with APGAR score
38. Conduct active management of the 3rd stage of labour
39. Inspect the placenta and membranes for completeness
40. Inspect the vagina and cervix for lacerations
41. Repair 1st and 2nd degree perineal or vaginal lacerations
42. Manage postpartum haemorrhage, including perform internal bimanual compression of the uterus to control
43. Prescribe, dispense, furnish or administer selected, life-saving drugs (e.g., antibiotics, anticonvulsants, antimalarials, antihypertensives, antiretrovirals)
44. Perform manual removal of placenta
45. Perform aortic compression
46. Identify and manage shock
47. Insert intravenous line, draw blood for laboratory testing
48. Arrange for and undertake timely referral and transfer of women with serious complications to a higher level health facility,

49. Perform adult cardio-pulmonary resuscitation
50. Identify, manage and refer obstetric emergencies appropriately
51. Perform vacuum extraction
52. Identify and refer clients with 3rd and 4th degree perineal or vaginal lacerations
53. Identify and refer client with cervical lacerations
54. Assess physical and emotional changes during postpartum period
55. Describe the physiological process of lactation and common variations
56. Perform initial assessment starting with quick check for signs and symptoms of life threatening conditions
57. Provide quality care within the first 6hrs; check vital signs, bleeding, uterine involution, initiation of early breast feeding, vaccination and prophylaxis
58. Care within 24hrs; nutritional support, elimination, rest, vital signs, health education and counseling danger signs, early and exclusive breast feeding, hygiene, cord care
59. Within 7 days check lochia, breast feeding and breast problems, healing of perineal wounds
60. Demonstrate correct position and attachment during breast feeding
61. Manage postpartum emergencies e.g. PPH, Pre Eclampsia/Eclampsia, fevers
62. Assessment within 42 days of mother
63. Counseling regarding post-partum family planning
64. Conduct immediate assessment and management of the newborn
65. Conduct immediate assessment and management of the newborn: Dry and keep warm baby including skin to skin, Initiate breastfeeding, Cord care, Help babies breath (HBB when necessary), APGAR SCORE, Prevent infection, Screen for any risk conditions and arrange for referral
66. Apply appropriate method in LBW e.g. KMC
67. Provide newborn vaccine and immunization according to national policy
68. Conduct health education on normal growth and development, including danger signs
69. Providing information, education and counseling on health promotion and prevention of disease for newborn
70. Providing appropriate care for baby born to an HIV positive mother.
71. Provide comprehensive post abortion care services
72. Provide appropriate family planning methods and counseling in post abortion care following national protocols

73. Detect signs and symptoms of sub involution or incomplete abortion and complications
74. Prescribe, dispense, administer medicines post abortion
75. Perform MVA
76. Perform manual vacuum aspiration of the uterus up to 12 completed weeks of pregnancy
77. Use the microscope to perform simple screening testing
78. Insert and remove intrauterine contraceptive devices
79. Evaluate foet al status using ultrasound.
80. Administer pharmacologic therapies for pain relief during labour.
81. Perform vacuum extraction
82. Perform MVA
83. Perform manual vacuum aspiration of the uterus up to 12 completed weeks of pregnancy

APPENDIX V. FULL LIST OF INTERVENTIONS INCLUDED IN *THE PROJECTED EFFECT OF SCALING UP MIDWIFERY (2014)*

Before conception (family planning)

Contraceptive prevalence rate

Around the time of conception

1. Folic acid supplementation
2. Ectopic pregnancy care management
3. Safe abortion services
4. Post-abortion care

After conception (antenatal care)

1. Tetanus toxoid
2. IFTp
3. Multiple micronutrient supplementation
4. Calcium supplementation
5. Balanced energy supplementation
6. Syphilis detection and treatment if needed
7. Diabetes care management
8. Screening for and management of pre-eclampsia with MgSO
9. Care management of malaria in pregnancy
10. Screening and management of fetal growth restriction
11. PMTCT

During labor and birth

1. Clean birth practices
2. Immediate assessment and stimulation
3. Skilled birth attendance
4. Neonatal resuscitation
5. Antenatal corticosteroids for preterm labor
6. Antibiotics for pPRoM
7. MgSO, for eclampsia
8. Active management of the third stage of labor
9. Induction of post-term labor
10. **Post-partum and newborn care**
11. Thermal care and clean postnatal practices
12. Kangaroo mother care
13. Maternal sepsis case management
14. Breastfeeding promotion
15. Hospital-based care for sever newborn infection

Source: Homer et al., 2014