

COMMUNITY MIDWIVES IN YEMEN: THE CHALLENGES IN A FRAGILE SITUATION

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Community midwives in Yemen: the challenges in a fragile situation

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

By:

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Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements. The thesis **Community midwives in Yemen: the challenges in a fragile situation is** my own work.



Signature:

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List of Abbreviations

BEmONC	Basic Emergency Obstetric and Newborn Care
CHW	Community health workers
CME	Community Midwifery Education
CMW	Community Midwives
DHS	Demographic Health Survey
GDP	Gross Domestic Product
HeRAMS	Health Resources Availability Mapping System
HIHS	Higher Institute of Health Sciences
HIMS	Health Information and Management Systems
HR	Human Resources
HRH	Human Resources For Health
HRIS	Human Resources Information System
IAWG	Inter-Agency Working Group
ICM	International Confederation of Midwives
IDPs	Internally displaced people
LMIC	Low and middle-income countries
MoH	Ministry of health
MoPHP	Ministry of public health and population
MW	Midwife
MSI	Marie Stopes International
NGO	Non-Governmental Organization
NMP	National Midwifery Program
NHS	National Health Strategy
RH	Reproductive Health
RHTG	Reproductive Health Technical Group
SBA	Skilled birth attendant
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Glossary

Community midwife:

Midwifery service provider who is nationally recognized as a skilled birth attendant and has successfully completed a formal midwifery education and is deployed to a rural or underserved area (1).

Midwife:

An accredited healthcare professional who has been regularly admitted to a midwifery educational program and has successfully completed a nationally recognized midwifery course in the country in which it is located and has acquired the requisite qualifications to be registered and legally licensed to practice midwifery (2).

Skilled birth attendant:

An accredited health professional e.g. midwife, doctor or nurse, who has been trained to proficiency to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period. Also able to manage, identify and refer when complications occur in women and newborns (3).

Murshidat:

Young women who were trained as health educators and whom offer preventive services (4).

Fragile and conflict countries:

Countries in which the formal government cannot or will not deliver core functions to the majority of its population, Fragile and conflict states involve both clear crisis (e.g. organized conflict, violent disruption of socio-political processes) and underlying fragmentation (e.g. contested political settlement, state predation, failure to ensure basic rights and services). Net effects include loss of regime legitimacy, control of the use of force and provision of security and inability or unwillingness to provide for basic livelihood conditions (5).

Abstract

Community midwives (CMWs) play an important role within the health system of Yemen. The majority of population live in rural and underserved areas, in which CMWs mostly are the only available health workers. Yemen since 2014 engulfed in an armed conflict which has affected the health care delivery. It has led to a humanitarian crisis which affected millions of Yemenis for the past few years.

This literature review is conducted, to analyse and critically discuss CMWs in health system in the fragile situation of Yemen. Reviewing some interventions and strategies from similar settings to improve the CMWs situation and enhance the health care system in Yemen.

Within the framework of the health system in Yemen, CMWs, face a lot of challenges in term of production, availability, mal-distribution, recruitment and retention. There are some policies and strategies to regulate health workforce in general, yet there are still many gaps existing in CMW financing, monitoring, coordination with stakeholders, weak structure within MoPHP and lack of CMWs' strategies. In the light of the current chaotic situation CMWs do more work than is expected of them. This is in addition to the presence of two ministries of health and the monthly payment cut which have negatively affected them

To improve CMWs' situation, it is recommended to adapt and activate the CMWs' national strategy. Conduct in service training and task shifting along adapting the existing job description according to the current health needs. Establish a midwifery council within MoPHP structure and contract the unemployed CMWs. Pre-arrange deployment and support the public and private health institutes for pre-service education. Finally ensure paying salaries and rural allowance through donors.

Key Words: Community Midwives, Fragile, Yemen, Human resource, Policy
Word Count: 12 861

Gamal Badr Al-Aghbari / Yemen

Introduction

Before I joined this master's program, I worked for 8 years in Yemen with two local and international organizations. I was involved mainly in building the capacity of community midwives (CMWs) through participating in implementing different training programs that focused on family planning. I travelled to more than 15 governorates in the country, to meet the community midwives either before the trainings' selection, or after the completion, to conduct monitoring visits. What I found was a huge demand for more CMWs and I closely observed how they practiced their vital job before and during the conflict. Since 2011 CMWs in many rural areas are the only health care providers available.

Community midwives had a great deal of attention by former governments especially from 1995 – 2010 resulted into a huge increase in their number. Additionally, the reproductive health strategy 2011-2015 asserted on the crucial role of community midwives to achieve this strategy.

In 2011, Yemen was one of the Arab countries that faced political and security instability due to the Arab Spring uprising, that lasted for one and half year, in which it had a direct impact on many aspects of people's lives including health. In 2014 the country engaged again in a civil war that has not lasted yet. As a result, almost everything in the country was partially collapsed. According to reports from all local or international organizations, it is confirmed that many health facilities either were closed or destroyed, also many health professionals left their places for security or other reasons. This situation raised work's burden and responsibilities on community midwives, especially in rural areas, where there are currently no health providers, except the community midwives, to provide health services.

I have chosen to do my thesis on community midwives to explore the challenges they face during the fragile situation of Yemen. I attempt to analyze the available policies and strategies to identify and examine the gaps that arose due to the deteriorated situation in the country. My goal is to provide recommendations to both ministries of health and other stakeholders to adapt in order to enhance the current status of community midwives.

Chapter 1: Country Background

This chapter provides information about the background of Yemen. It describes the current political situation, the health system and community midwives.

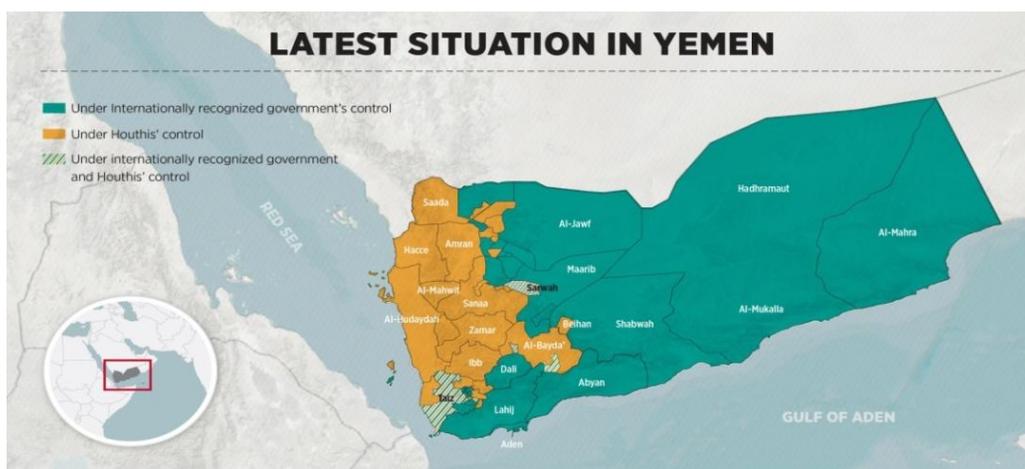
1.1 Geography:

Yemen has a unique geographical location, being at the southern part of the Arabian Peninsula, covering a surface area of 555,000 km². Yemen is characterized by an irregular and challenging topographic features that accounts, in a large part, for the dispersion of the population, over more than 130 000 settlements (6,7). Yemen is divided administratively, into twenty two governorates, which are subdivided into 333 districts, which are further subdivided into 2,210 sub-districts, and then into 38,284 villages (8).

1.2 Political situation and humanitarian crisis:

The 2011 uprisings' past events created a situation of political instability until the conflict of 2014. Since then, the country has been experiencing a humanitarian crisis: essential government services, such as health services, education, electricity social welfare and water supply, have been negatively affected, compounded by a huge increase in commodity prices. This has exacerbated severely and widespread chronic vulnerabilities, especially with regard to food security, nutrition, and access to healthcare. Such situation has impacted mostly the vulnerable groups of children and women (9). The country now has two governments' one in control of Sana'a city (the capital city) and some governorates in the north (the orange part in the map).

Figure 1 : MAP OF Yemen 2017



Source: Anadolu Agency. Map of Yemen, Latest situation 2017. (10)

The other government- which is recognized internationally- controls Southern Yemen and all governorates in the east (the green part of the map). However, as the war continues moving toward Sana'a the capital city in the north, this might anticipate a change in the coming months. According to Yemen's humanitarian response plan of 2017, around 18.8 million people are estimated to require humanitarian assistance to meet their basic need of which, 10.3 million (44%) are in acute need and more than 2 million suffered displacement within Yemen. Recently around 1 million refugees returned to their areas of origin which became safer than before (9). Food security also has become a major problem in Yemen, which affects 14.1 million people, that do not have sufficient resources to access nutritious food necessary for a healthy and productive life (11).

1.3 Socio-demographic context:

Yemen is a young country with a population of 27,426,000 according to 2016 projections, 44% of is under 15 years old and 66% of this population lives in rural areas, with a density of 35 per km square.(6,12,13)..Life expectancy in Yemen is 64 years (M: 63, F 65)(14). The crude birth rate is 32/1000 population and the crude death rate is 7/1000 population (14). According to a demographic health survey (DHS) in 2013, Yemen has a high total fertility rate of 4.4 births per woman, with a marked difference between rural and urban areas (5.1 & 3.2 children/woman respectively). In Yemen, births are too closely spaced; around 30% occur within 24 months after a previous birth, the median age at the first marriage is 18.2 years (13).

1.4 Education:

The DHS 2013 survey showed that 42% of women and 23% of men do not have any education (13). The literacy rate among adults is 65% while it is 86% among youth (15). There is also a clear disparity between the youth literacy rate (15 – 24 years) among males 96.4% and females 76.8% (16). This situation is deteriorating for both boys and girls since the 2014 conflict, which represents a setback in basic education. Many schools all over the country were occupied by either internally displaced people IDPs or armed forces, some schools remained inaccessible or closed due to conflict-based security concerns and others are totally damaged (17).

1.5 Economic status:

Yemen is one of the poorest countries in the Arab region and ranked 168 out of 188 in the Human Development Index 2016 (18). According to the World Bank 2016, the Gross Domestic Product per capita is (GDP) 990\$. The largest sector in Yemen is public services 61.4% of GDP, followed by the industrial sector 30.9% and agriculture 7.7% (8). However, the economy of the country has contracted sharply since 2015, by approximately 40 %, and it is estimated now that 60% of the population live below the poverty line (19).

The current deterioration of the economics, due to the conflict, drives the household incomes downward and left millions of Yemenis unemployed. Adding to that some important institutions, such as the Central Bank became dysfunctional in the late 2016 (19).

1.6 Socio-culture and gender:

Yemen is a conservative society that is dominated mainly by men. There is a huge discrimination between men and women in all life aspects where women are subjected to many gender inequalities. Women experience different forms of physical and sexual abuse, such as domestic abuse, deprivation from education, early marriage and female genital mutilation (20,21). Furthermore, because of misunderstanding and poor interpretation of the Islam as well the traditional norms, women have a poor social status and low education (11).

1.7 Health System:

The structure of the health system in Yemen remains the same since the health system reform in 2000. However, due to the current circumstances and as it is explained earlier, the country has two ministries of health; each one is controlling several governorates. The MoPHP in Sana'a (northern government) has a full structure, a minister and four deputies while in Aden the ministry (southern government) is recently established and has only a minister and only one deputy. In a contact with the deputy minister of health in the south, he asserted that they control everything in the south and the situation there is better than the north.

The health system in Yemen consists of four levels:

First level: This includes health units and centres, these provide basic packages of health services and their main duties are to provide prevention services.

Each health unit covers 5000 inhabitants and has four staff members: one CMW, one medical assistant, and two health guides (22). The Total number of health units is 3047, and 881 health centres (6).

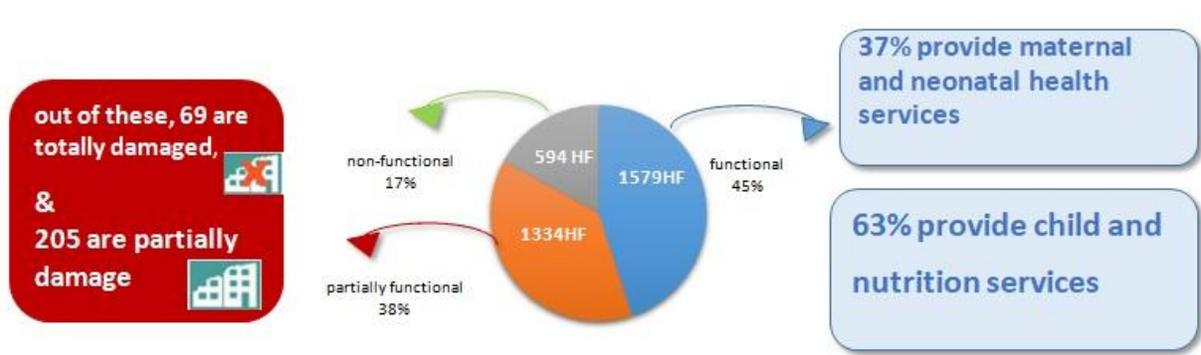
Second Level: This includes services provided by district and governorate hospitals that provide treatment, to those are being referred from health units and centres. The number of governorate hospitals is 53 and there are 182 district hospitals (23).

Tertiary Level: This consists of referral/specialized hospitals that deal with the complicated cases that cannot be treated in the secondary level. Only two are available, one in Sana'a and the other in Aden (22,23).

Fourth level: This includes specialized services and it represents the top of the healthcare hierarchy of the public sector. Centres that provide these services are: Blood Bank, Cardiac and kidney centres, Cancer and rehabilitation centres and are available only in Sana'a and Aden (23).

In 2016, the WHO conducted an assessment of 3507 health facilities in 16 out of 22 governorates. There were 3507 health facilities surveyed, only 1579 (45%) are fully functional and accessible, 1343 (38%) are partially functional and 504 (17%) are not functional. The survey revealed that 274 health facilities were damaged as a result of the violence, 69 facilities were totally damaged and 205 facilities were partially damaged (24).

Figure 2 : Functionality of health facilities in 16 governorates



Source: Availability and Health Facilities Functionality in Final report, 2016 (24)

1.7.1 Health financing

In 2014, the total expenditure for health, prior the crisis, was 3.9 % of the general government expenditure. The out of pocket expenditure was 76.4% and the expenditure on health, per capita, was 80 \$ total (25). Maternal and child health services are free and are funded by the government. Family planning services are free, only in the public sectors, and paid by out of pocket in private sector (26).

1.8 Community midwives in Yemen:

A community midwife in Yemen is a woman who has 9 years of an elementary school education and undertook three years of pre service community midwifery education to graduate as a CMW based on the curriculum that was approved by MOPHP (27).

The CMWs' program started in 1997 with a requirement of 9 years of elementary school and two years pre-service education then extended to 3 years pre-service training in 2012, the curriculum fulfilled the international skilled birth attendant (SBA) standards included the International Confederation of Midwives (ICM) key competencies (1,27).

On the other hand, a technical Midwife is a woman who should finish high school (12 years) before enrolling in three years of pre service technical midwifery education and they mainly work at hospitals. They represent only 10% of total midwives (28).

The total number of CMWs, according to MoPHP in 2014, is 6907 CMWs (29) and they represent 83% of total midwives (28).

Tasks and responsibilities (27):

- Basic Nursing Services and community work (outreach activities).
- Special technical tasks and responsibilities:
 - Antenatal care, health education, individual and group communication, Counselling and family planning services, Providing health care during pregnancy in a health facility or at home, Postnatal care up to six weeks, Provide health care for the newborn/infant, Referral in case of obstetric and neonatal emergency.
- Maintenance of materials and equipments (medicines, tools, appliances, furniture),
- Documentation, record keeping and reporting,
- Supervision and follow-up, administrative tasks and activities
- Participation in research and surveys.

The above Tasks and responsibilities were updated in 2012. However, a report by UNFPA, called "Midwives on the front line in some selected Arab countries in 2016" reported that CMWs in Yemen provided a wider range of health services than they used to in the parts of the country which were affected by the crises (29).

1.9 Health Status:

- Although the health system was considered fragile, there was an improvement in the major demographic indicators in the years before the last DHS that was conducted in 2013 (13) (table 1). There is no update for these figures since 2014, when the conflict in Yemen entered a new phase. The current health status of Yemeni people is complex, around 14.8 million people lack access to basic healthcare; thousands of Yemenis are dying from preventable diseases e.g. Cholera outbreak suspected cases exceeds 200000 (30,31). Malnutrition has increased by 57 % and now affects close to 3.3 million people, 462,000 of which are children under five (32).

-

Table 1 : Major demographic indicators - Yemen

Indicator	Value		
	Total	Urban	Rural
Maternal mortality ratio (per 100,000 LB)	148	97	164
Under-five mortality (deaths per 1,000 live births)	53	44	63
Infant mortality (deaths per 1,000 live births)	43	36	51
Skilled birth attendance	45%	73%,	34%
Facility based delivery (Public sector)	45.5%	30.8	14.7
TFR(15-49)/ woman	4.4	3.2	5.1
CBR: Crude birth rate (per 1,000 population)	33.4	27.4	36.2
Children 12-23 months fully vaccinated (%)	43	59	37
Contraceptive prevalence rate	34%	48%	27%

Source : DHS 2013 (13)

Chapter 2: Problem statement, Justification and Methodology

2.1 Problem statement:

Community midwives are essential elements of the reproductive health programs (33). In Yemen, CMWs are mainly present in rural areas where 66% of the population are living (13). A study, by USAID in 2011, concluded that CMWs are the most important avenue to provide maternal and child health services in Yemen (34).

The number of CMWs jumped from 138 to 4200 CMWs during the period (1995-2010) and reached 6907 in 2014 (35). There is a positive impact of CMWs on the reduction of MMR from 385 deaths/100,000 live births in 2003 to 148 deaths/100,000 live births in 2013. They were not the only influence that has caused this positive shift but they had certainly played a vital role (13,26)

Nonetheless, many reports indicate that the health sector suffers from shortages, mal distribution and coverage of CMWs in Yemen (28,35,36). The UNFPA report in 2012 mentioned that, due to the limited availability of CMWs in the many rural areas and long distances, only 27% out of 84% of home births take place in the presence of skilled birth attendants (SBAs) (36). Besides that, health care services cover only 66% of the country with only 30% of the rural areas (35).

On the other hand, the conflict, that started in 2015, affected the health system in the country and potentially drifted it to a major collapse (37).

More than 50% of the health facilities are non or partial functioning and a large number of CMWs have lost their jobs or had their work spaces destroyed (24). There are around 3.4 million women between 15 and 49 years in need of humanitarian assistance and more than 3.3 million children are facing acute and severe malnourishment (38,39).

Women are reduced access to health services, as a result of insecurity, movement restrictions and missing staff and services (40,41). The need of more trained CMWs became important, they are now on the front line (29). In Yemen, CMWs' education is adversely affected and is largely suspended since 2015(1). Evidences show CMWs planning and management are essential to tackle reproductive health issues during the crisis (29).

With the current fragile environment in Yemen, the question remains: what are the challenges and functions of CMWs in the light of the fragile situation of Yemen?

2.2 Justification:

In Yemen due to the war, and as the situation of women and children gets worse; more than 2 million people are displaced and the majority of them have gone to rural areas (9). Researchers suggest that investment in CMWs will increase the access and improve the reproductive health situation (1).

No studies have been found in Yemen that focused on the CMWs' workforce either before or during the conflict situation of Yemen. Therefore, this analysis will help to address the challenges of CMWs to improve maternal and child health.

2.3 Study objectives

2.3.1 General Objective:

To analyse and critically discuss the community midwives in the health system in the fragile situation of Yemen, in order to provide practical recommendations to address the gaps in policies, strategies and practices to the policy makers, international donors and specialized relief agencies in Yemen.

2.3.2 Specific objectives:

1. To analyze the current situation of community midwives in term of numbers, distribution and coverage.
2. To analyse the system: policies, legal, finance, MoPHP capabilities, coordination & monitoring for the production, deployment and retention of CMWs in Yemen.
3. To critically analyse interventions, evidences based policies and regulation related to CMWs in other similar fragile countries and situations.
4. To make recommendations to policy makers, international donors and specialized relief agencies to adapt the current policies and regulations with the current situations.

2.4 Methodology:

2.4.1 Methods of data collection:

In this study, a literature review was conducted using Pubmed, Google scholar and VU online library. Also desk review was conducted for the available policies, reports, studies and strategies that were obtained via websites such as; MoPHP, UNFPA, WHO and through colleagues in Yemen.

A personal contact with the Deputy Minister of Health in the south, to understand the overall situation and the structure of the new MoPHP.

Around 1 article, 19 reports, strategies and studies from Yemen were found to be used in this study.

For the third objective, only one article was found during the search for literatures regarding CMWs in fragile / conflict context (1). Therefore the references of this article were also examined.

11 articles and reports regarding CMW from Afghanistan, 1 from Somalia, 2 from Mali, 2 from South Sudan and 2 from Sudan were found and used in this study. Also 2 articles of CMWs from Pakistan were used. The search was expanded to Midwives and fragile states / conflict context however, no related articles were found. Finally, the search expanded to CMWs and LMIC to get some different experiences of CMWs, some examples from Asia and Africa were used.

The research table (Table 2) shows all the keywords used in this study

Table 2 : Search table

		Key words for the search were “community midwives”, “fragile” and “conflict” in different combinations with the following terms.		
Type of study	Source	Objective 1	Objective 2	Objective 3
Scientific publications	Pub med, Google scholar, VU online library and Science direct	Yemen, numbers, coverage, distribution, shortages.	Yemen, SBA, finance, pre service education, training, retention, recruitment, production, distributions, deployment and HRIS.	Policy, strategy, midwifery, deployment, distribution, retention, recruitment, production, pre-service education, in service training, monitoring, health workforce, legal framework, HRIS and LMIC.
Grey literature and reports	Websites: MoPHP, Midwives association, WHO, UNFPA, UNICEF, UNOCHA	Yemen, survey, health workers, statistics, numbers, coverage, distribution and shortages.	Yemen, Reproductive health, SBA, HRH, finance, MoPHP, Plan, strategy, policy, coordination, monitoring, pre service education, training, legal framework, retention, recruitment, production and deployment, HRIS.	Policy, strategy, distribution, retention, Career, continues education, recruitment, production and pre-service education.

2.4.2 Inclusion criteria:

Documents and literatures with full access and published after the year 2000, were included in the study. The English language was used during the search for the literatures, also some relevant documents in Arabic language to the study were also included.

2.4.3 Conceptual work:

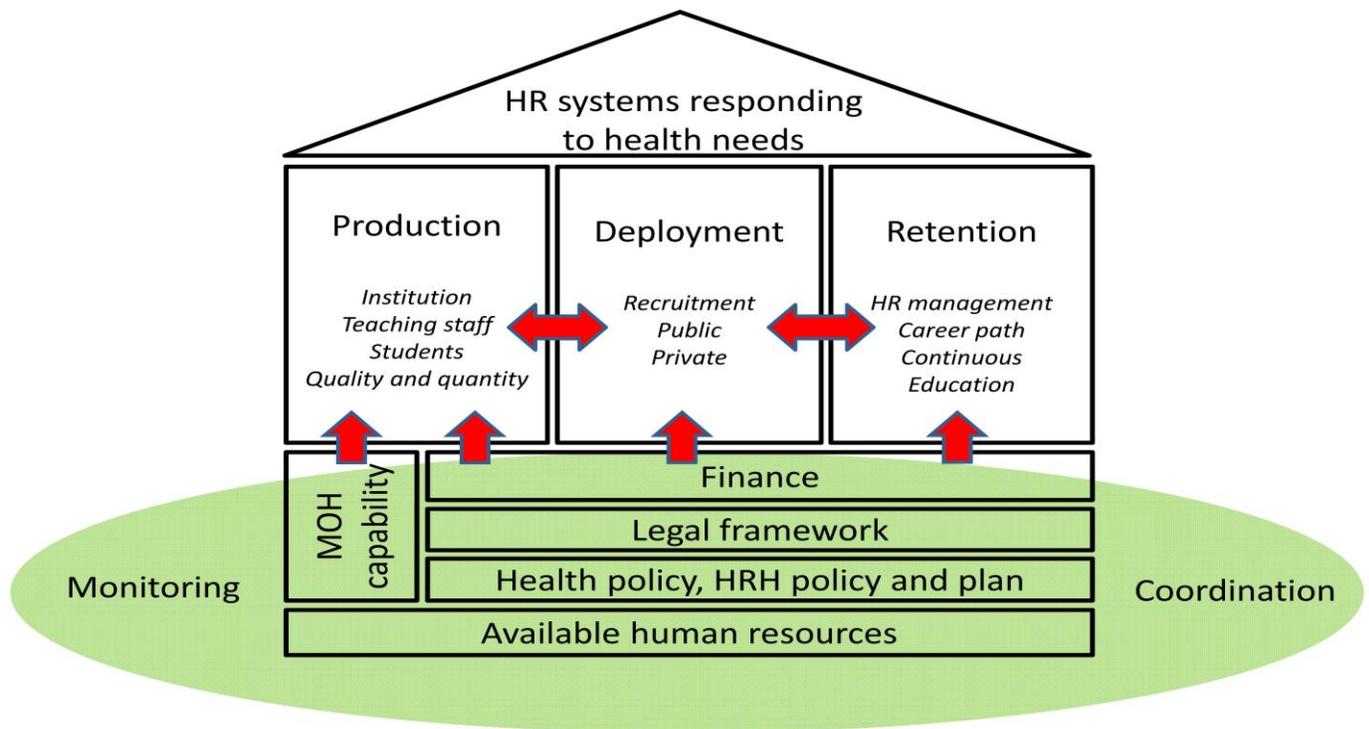
There were sets of frameworks that have been examined in order to guide the flow of the study. First , WHO HRH Action framework (42). Second, Health labour market framework and policy levers for attaining universal health coverage by WHO (43), and the third, the house model for fragile states (44).

Both the WHO HRH action framework and the Health labour market frameworks emphasise more on production (education) but at the same time they emphasise less on retention, recruitment and deployment as they are part of the system and do not have that attention.

This study used the house model framework which was developed by the National Center for Global Health and Medicine, Tokyo, Japan (NCGM) (44). The house model was used to analyze the human resource system in post conflict and fragile countries such as; Afghanistan, the Democratic Republic of Congo, and Cambodia.

According to the NCGM this model (figure 2) is a comprehensive and visible framework (44,45). It covers with more attention the three areas of production, retention and deployment. Those functions will be important to analyze them in the study to explore the situation of the CMWs. Also the foundation of the model (policy, planning, finance and legal framework) will provide a wide analysis of the MoPHP capability toward the production, retention and deployment of CMWs. Coordination, monitoring will also be covered by the model during the analysis.

FIGURE 3 : THE HOUSE MODEL



Source: A Comprehensive Framework for Human Resources for Health System Development in Fragile and Post-Conflict States (44)

2.4.4 Study Limitation:

First, due to the ongoing conflict, there is no up to date data or information, regarding to the CMWs except some web reports by international NGOs. Second, this study relied largely on online data and secondary review of documents and reports that have many gaps. Third, there might be a bias arises from a non accurate translation of the Arabic literature according to the author's understanding.

Chapter 3: Findings

This chapter has three sections:

Section 1: provides insights in the available CMWs in Yemen and also will highlight CMWs financing, legal framework, MoPHP capability, Health policy and HRH policy and plans and finally will provide insights on coordination and monitoring

Section 2: this section will focus on the pillars of the framework which are production, deployment, retention of CMW and responding of HR system.

Section 3: this section will highlight policies / interventions related to CMWs in other fragile settings.

Section 1. Availability of CMWs, CMWs financing, Legal framework, MoPHP capability, Health policy and HRH policy, Coordination and Monitoring.

3.1.1 Availability of CMW in Yemen:

This part gives an overview of CMWs in Yemen where it looks at the CMWs' number, distribution and coverage.

3.1.1.a Number:

In analyzing the number of CMWs, it was noted that there was no database and no health statistics as required. This resulted in disparities in health data and an absence of standardized and integrated statistics and data on the number of CMWs (35).

According to the MoPHP the human resource strategy, Yemen is among the 57 countries in the world where the rate is under 2.3 health workers per 1000 of the population. The percentage of health workers, according to the human resource strategy 2014-2020 to the population is 1.37 health workers per 1,000 of the population and the number of CMWs per 1,000 population is 0.33 (35).

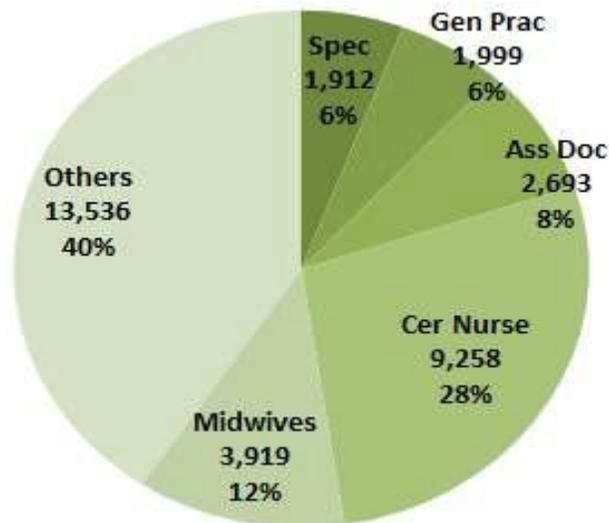
The number of CMWs has increased dramatically since 1997; it jumped from 138 till 4214 in 2011 CMWs (28), as many pre education CMWs' courses have been established in many High Institute Of Health Science branches (26). A midwifery survey that targeted 20 Governorates (out of 21 governorate) for the period 2006-2011 stated that the number of CMWs in the 20

governorates was 4214 which represented 83% of the interviewed midwives (28), which meant that the majority of midwives are CMWs.

The last official documents, issued in Yemen, were in 2014 before the war, mentioned that the number of the CMWs reached 6907 (6,35).

In 2016, during the conflict, a recent report by the WHO and MoPHP, to assess the available function health facilities in 16 out of 21 governorates, stated that there were only around 3919 midwives (all categories and majority are CMWs) were available in these 16 governorates (24). No available data specific for CMWs since 2015, according to this study a severe drop in all categories of midwives personnel happened due to the current conflict compared to the number before 2015.

FIGURE 4 : Availability of health workers, 2016

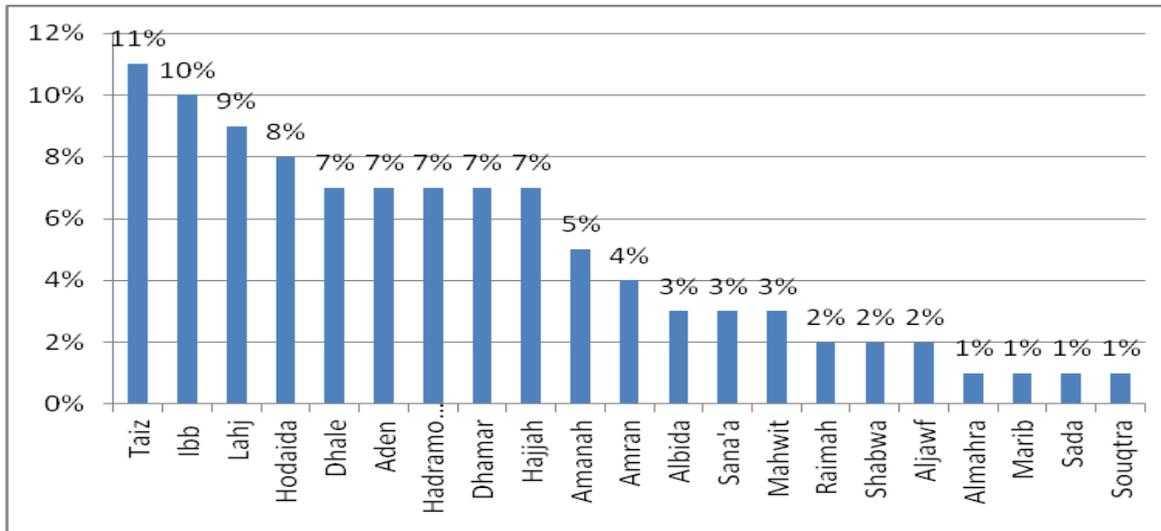


Source: Availability and Health Facilities Functionality in Final report (24)

3.1.1.b Distribution:

The geographical distribution of CMWs in the country is challenging and the presence of CMWs in the different governorates varies from one to another due to several reasons, such as education and socio – economic (22). E.g. Taiz ,Ibb and lahj governorates have high female literacy and they also have the highest CMWs percentage compared to other governorates in the country: 11%, 10% and 9% respectively (28,46). In some governorates the ratios show the vast discrepancy between governorates, which also reflect the density of population in those governorates e.g. Taiz, Hodaida , Ibb and Amanah have 42.8% of the total population of the country and they have high percentages of CMW (8,35).

FIGURE 5 : Percentage of Distribution of all CMW by governorate in Yemen, 2011



Source: Survey of the Status of Midwives 2006-2011 (28)

3.1.1.c Coverage:

According to the last health statistics report by MoPHP in 2014 the total number of health units is 3047 and 881 health centres distributed all over the country (6). The national health strategy 2010-2025 states that many (no specific number is mentioned) of those units and centres are built according to social interventions that are focusing on construction not on health's needs. Many (also no specific number is mentioned) of those health facilities are mal distributed and mal functional (23). As the number of CMWs is 6907 and the total number of population is 27 million (6,35), this means that each CMW will have to cover 3860 persons. However, people in Yemen are scattered across 130000 settlements (7), which makes it geographically difficult to be covered. A report by UNFPA in 2011, states that Yemen needs to double the number of their midwifery workforce to improve the health coverage in rural areas where 70% of the population currently live (47).

The current crisis affected the health coverage in many rural and urban areas; many health personnel including CMWs left their areas, either due to security reasons or because health facilities were closed or destroyed (48,49).

3.1.2 Ministry of Health capability:

It is the responsibility of the MoPHP to perform and to achieve the desired outcomes. Political commitment and institutional capacity, such as the Hu-

man Resource data base and infrastructure are very important for the MoPHP to develop and implement appropriate human resource production, deployment, recruitment and retention strategies to meet the country's health care needs (45).

MoPHP has been facing countless challenges ranging from shortages of health staff to lack of financing (35), the continuous humanitarian crisis affects the MoPHP resources and their coping mechanisms (23).

The northern MoPHP, with its well developed structure, has different sectors, with different departments, that can implement its reproductive health strategy and activities. Also in 2014 a National Midwifery Program (NMP) has been developed, but not launched or activated by a government decree. The MoPHP planned, prior the war, to advocate for a decree to launch the NMP, which will support all interventions that will increase the coverage of CMWs' services and improve their quality, in particular the finalization of the curriculum for midwives (36,50). On the other side, the southern MoPHP is still quite new (established in 2016) with a poor structure and lack of many positions, policies and regulations that makes it difficult to conduct the different reproductive health activities.

Recently, both ministries are relying on donors as the central bank does not function and that salaries have not been paid to civil servants, since last year (49), This situation forces both ministries to follow the donors' agenda, which currently focuses on humanitarian and emergencies interventions.

3.1.3 Legal framework:

According to the safe motherhood law, that has been issued by the Yemeni parliament in 2014, the CMW is a woman that completed basic education (9 years) followed by two to three years of practical and theoretically midwifery education. She then needs to pass the final assessment and obtain a certificate from a recognized entity. Also the law stated that traditional birth attendants (TBA) (they called Jeddah (51)) with a long time experience in this profession in rural areas can be CMWs after obtaining their license from the Health Office (52).

CMWs get their certificates from the MoPHP through the higher institute of health sciences (HIHS) and its branches. There is no license required for the CMWs to practice their job which could affect the quality of services they provide (53). CMWs get their certificates from the MoPHP through the higher institute of health sciences (HIHS) and its branches. The total credit hours that each CMW should study is 84 credit hours (theoretical, practical and clinical) (27). CMWs degree in Yemen is equivalent to a secondary health certificate (27).

This law highlighted the role of CMWs toward providing the appropriate health services to women before and during pregnancy as well after deliv-

ery. These services should be provided to the community members who live in the catchment area that belong to the CMWs (27). However, CMWs currently, with the deterioration in the health system, are providing services beyond their job description to communities as many doctors have left the areas for security reasons (29,48,54)

3.1.4 Finance

In a brief sense, one could anticipate that the reproductive health (RH) program encounters problematic issues when it comes to financing.

The budget of the MoPHP most of the time is delayed and some departments of the ministry did not receive their budgets until the middle of the year. Budgets are clearly inadequate and many departments rely on donor-funded projects to carry out activities(55). The situation since 2015 is getting worse as the central bank is crippled and there is no budget for most government's services (49). The reproductive health strategy 2011-2015 mentioned that the government's financial commitment, to reproductive health activities, was very limited (no specific figures were mentioned), which hinders the sustainability of reproductive health activities including CMW related activities such as production and building capacity (26). The RH program is highly dependent on donors (26). Almost all CMWs pre and in-service trainings are depending on external donors and International NGOs (26). Since 2015 most donors suspended their development funds and focused on humanitarian interventions, and this has affected the continuity of CMWs educational program (1). In 2016 a report by UNFPA about Yemen and other conflicted Arab countries stated that health financing and human resources were immediately affected by the crises (29).

Regarding the CMWs' salaries, CMWs consider their salaries low in comparison to other similar professions (56). According to law no. 19 of 1991 from the civil service, the salary scale has 5 grades and each grade has 2-3 levels; within each level there are 12 ranks. The salary scale of the CMWs should be equivalent to other workers in the government if hired at the same level (57). In a survey, conducted by UNFPA in Yemen, midwives feel that their salaries are not in line with the heavy workloads or the seriousness of their responsibilities. Some CMWs mentioned that they had to find a second job to get enough money to support their families; this situation has negative impacts on the motivation and performance of the CMWs (56). CMWs receive a monthly salary of 40,000 YR which is less than 150 \$ (doctor = 60,000 YR & nurse = 30,000 YR). However, since last year as a result of the conflict and the related economic crisis, salaries are not paid to all civil servants including CMWs (49).

3.1.5 Health Policy and HRH policy and plan

There are no strategies to regulate the midwifery workforce in Yemen. The HRH 2014-2020 strategy mentions that there is a weakness in organizing the practice of most health professions: it is noted that the focus is only on doctors, and the absence of a necessary regulation for other health professions, affects the quality of these health services (35).

In 2014 a national midwifery strategy has developed by the ministry of public health to improve the situation of midwifery in the country. This strategy was supposed to regulate midwives training, deployment, retention and supervision. However, this strategy has not been activated through a ministerial decree until now (36).

In the civil service law, there are three articles concerning health workers planning, the article 84 states; "Staff planning is an important process for effective organization and also necessary for utilization of human resources in the present time and future" (57). The other two articles 85,86 of the civil service law explain the responsibilities for staff planning (57).

MoPHP has developed the national guidelines for workforce planning for all levels including primary health care. The MoPHP, governorates and district health offices use these guidelines to determine and estimate the human resources needed. This is based on the population catchment area for primary health care services for new and existing health units and centres (22,58). The local authorities and district health offices usually identify needs of the CMWs based on the planning guidelines. These needs will be communicated to governorate offices who will transfer the needs to the MoPHP office for implementation (59). The MoPHP has to discuss human resource needs with the cabinet. However, the cabinet along the ministry of civil service may not approve the required number of staff due to the limited financial budget allocated from the ministry of finance. As a result of this process, the required number of CMWs to be recruited will be affected. After the approval of required posts, the MoPHP, governorates offices and district health offices, will foster the approved recruited number of health workers including the CMWs in their annual plan.

In spite of the above laws and regulations, in practice, many factors influence this process such as: social interventions (tribal influence) and lack of coordination between different sectors (23). According to the national reproductive health strategy 2011-2015, the institutional capacity of the MoPHP needs to be strengthened to develop and implement such policies (26,36).

As a result of the current conflict in Yemen, updating new policies are needed to tackle many issues regarding the employment of the CMWs. These may include motivating school graduates to enrol in midwifery schools and increase midwifery coverage in the country. There is as well a need to focus

on recruitment of CMWs for the public system through district and governorate councils (36). The current situation also requires policies and regulations that match with the severe needs of CMWs. There is a huge workload that comes as result of the fact that there are thousands individuals displaced to villages where many health facilities are closed and destroyed (48,54). The impact of the crises in Yemen has changed the environment in which the CMWs operate, they have become more autonomous and independent as a result of weak monitoring and supervision (29).

3.1.6 Coordination:

The MoPHP has to coordinate with different stakeholders, governmental, local and international to ensure the implementation of policies and strategies related to RH, of which CMWs are part of. Coordination across different sectors is challenging, at country level, where the political situation is very unstable (45). With the current situation there are uncertain competency and legitimacy structures for both ministries in the south and north, which may affect the coordination with all partners. The population sector in the MoPHP (exist only in the north and not in the south ministry) is the entity that is responsible to coordinate with other stakeholders regarding RH & CMWs.

- Coordination with other MoPHP sectors and other ministries:

Reproductive health (RH) activities are dependent on different sectors (Primary Health Care, the Planning & Development Sector) (26). Weaknesses of the planning and monitoring processes are linked to the division and compartmentalization of the MoPHP into different sectors and also to the predominant project-approach (26). Separation of human resources and planning from the reproductive health services in the current organizational structure of the Ministry of Public Health and Population has negatively affected the coverage by qualified CMWs (36). According to the RH strategy, the RH program has coordinated with the Ministry of Education, but there is still no coordination with other ministries, like the Ministry of Finance and the Ministry of Local Affairs (26). This lack of coordination has already affected CMWs' production, recruiting and deployment.

- Coordination between the central level and the governorates:

At the governorate level, the Reproductive health directors do not have a role in the governorate system and there is no regular fund is available to support their activities, although the RH department has a clear annual work plan (26).

The local administration law of decentralization gives local authorities the real power to implement their programs; the RH strategy indicates that these authorities are not knowledgeable about reproductive health issues (26). Some development partners coordinate directly with the governorates to im-

plement their activities with the CMWs (34). The Population sector at the centre, advocates for involvement of governorate authorities and financial contribution, to implement the national reproductive health services. However, there is no clear mechanism to involve local authorities in management of CMWs (26).

- Coordination with development partners:

The Population sector established an RH Technical Group (RHTG) in 2006 to facilitate the coordination and partnership with the main local and international partners regarding RH activities which include CMWs' activities. This RHTG failed to develop effective solutions, harmonization and alignment for donors and ministry (26). Different regular meetings are organized between the stakeholders such as USAID, Yamaan Foundation (local NGO focused on RH), Midwifery Association and UNFPA to improve the coordination in term of CMWs education and training (26,34). Yet, many development partners work in their own implementation strategy where population sector leadership and role are shaded (26).

In 2016, during the severe humanitarian situation, the population sector, with all local and international NGOs, working in the RH field, established a Reproductive Health Inter-Agency Working Group (RH IAWG). According to the population sector in MoPHP the working group is now the main coordination entity in the humanitarian settings, regarding RH activities (60). This group is working under the health cluster to ensure that all interventions by partners are interlinked and implemented according to the plans. Both groups RHTG and RH IAWG are working in Sana'a with the MoPHP in the north and there is no coordination with the MoPHP in the south.

- The Yemen Midwifery Association:

Is a local NGO, who works closely with the population sector. The Association was established in 2004. It has administrative, financial and technical autonomy (26,34,61,62). The aim of the association was, to strengthen and promote the midwifery profession in Yemen. The association was established with support of USAID, it conducted some surveys and established private businesses for many CMWs in some selected rural areas. The association faced many challenges since the USAID fund is over in 2011 and many midwives members did not pay the membership fees (34). Furthermore, the management of the association already retired midwives, with poor management skills, which hindered the development of this NGO.

3.1.7 Monitoring:

There is a monitoring and accountability department for the whole activities in the ministry system at which a regular follow up should be done (this structure is available in the northern ministry but not in the new southern ministry). There is no legal control for the human resources and private clin-

ics, because all the related laws are not activated yet. Also the private sector does not have any supervisory overseeing regulatory system (22).

There are no standardized tools for monitoring and supervising the services at the national level, nor are there tools to monitor governorates or districts service provisions. This makes it difficult to follow up with the RH activities, including CMWs in terms of services and performance(26,34).

The RH strategy 2011-2015 revealed that the HMIS department is not directly involved in monitoring and evaluation of Reproductive health activities, the HMIS department has no budget for operation and suffers from weak coordination within the MOPHP. Data is very poorly used at all levels and there is no analysis for monitoring or for planning purpose. A budget for monitoring and follow up for all activities is very limited and it is mostly depends on donors (26).

The Human resource information system (HRIS) in the ministry, is poorly staffed, facing a multiplicity of sources of information and the capacity of the software used is limited and cannot include all the needed information (35). CMWs' data is coming from different sources such as; health offices, mid-wives association and the HR department which affects the quality of the information.

The absence of electricity in the country affected this department since 2015. The last update of the MoPHP database, regarding health workforce including CMWs, was in 2014 and it was not updated until now (63).

Section 2: Production, deployment, retention and HR system responding to the health needs

This section will focus on the pillars of the framework: Production, deployment and retention of the CMW.

3.2.1 Production:

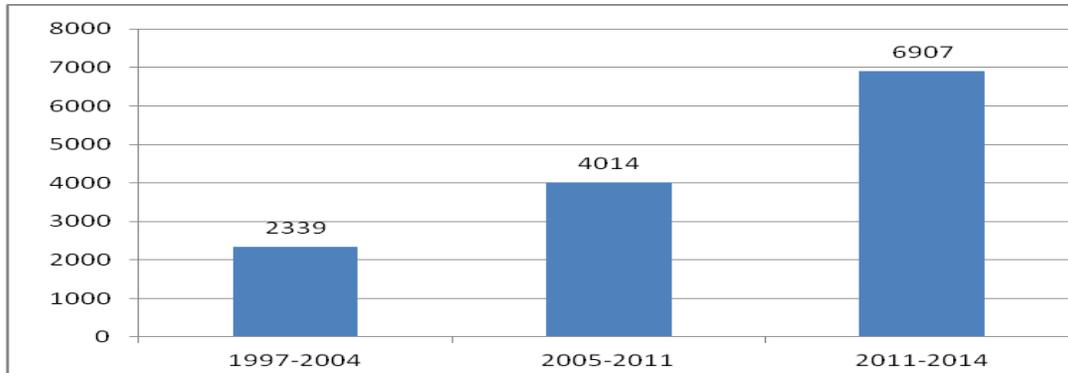
The education of CMWs has started in Yemen in 1997 as a 'two years' course (1,34), and then it was extended to three years in 2013 (27,55). There are only two public health institutes, with their branches within the MoPHP, responsible for pre service training; the first institute in Sana'a is the Health Institute of Health Sciences (HIHS) with its branches and the other is in Aden, which is Dr.Ameen Nasher Higher Institute for Health Science with its branches. These two institutes with their branches are the only responsible bodies within the MoPHP for pre service training of CMWs, the directors of both institutes report directly to the Minister of Health (34,55,64). Currently, as the country has two governments, the director of Sana'a institute reports to minister of health in Sana'a and the director of Aden reports to the minister of health in Aden.

There are 22 branches all over the country, 20 of them are offering three years CMWs education. All the 22 branches were setting out to qualify 20 CMWs every three years so in total around 440 CMWs were planned to graduate every year (26). Currently these branches are not all working due to lack of staff, equipments and funds (65).

There are 38 private health institutes distributed in some cities (Sana'a, Taiz, Aden, Hadramout, Dhamar, Ibb and Hodaida). According to the reproductive health strategy 2011-2015, none of these institutes offer pre service CMWs education but they can be potential education institutes for MoPHP and for the CMWs pre service training (26). In 2012 two private institutes and one private college (two in Sana'a, Alwehda institute, Al-Etehad college and 22May institute in Taiz city) got the license from the MoPHP and ministry of technical education to start the pre service training for CMWs. Around 75 were graduated and the institute in Taiz was closed in 2015 due to the conflict there. It will be difficult in the current fragile situation, for MoPHP, to supervise the private institutes (65).

During the period of 1997 – 2014 and according to the data from MoPHP and the survey that conducted by midwifery association, we can notice the increase of the production of CMWs 1997 – 2014.

FIGURE 6 : Number of Community midwives based on Years of Graduation



Source: Survey of the Status of Midwives 2006-2011, MoPHP 2014 (28,63)

An assessment conducted by MCHIP and MoPHP in 2014, regarding community midwifery pre-service education at 10 Higher Institutes of Health Sciences, indicated that, most of trainers lack the skills – mainly teaching skills – that were included in the new community midwifery curriculum 2013. The institutes lack training materials and great quality clinical environments to conduct the practical trainings. Students were found to be unable to conduct 20 deliveries before their graduation due to the overcrowding of the training site(55,66).

According to the job description that has been updated in 2012, the curriculum of CMWs fulfilled international skilled birth attendance (SBA) standards (1,27), although the implants insertion & removal was introduced in the new curriculum, but still MoPHP prevents the CMWs from providing implants to women even if the implants are available in facilities. Furthermore, teachers and trainers are still using the previous two years curriculum to train the students (34,55,67).

To enrol in the CMWs pre service training, all candidates have to prove a completion of 9 years of education and be at least 18 years old. The selection of candidates should be approved by the governorate Health Institutes, the MoPHP, and the local community. Coordination of all parties and the criteria for selection is not always achieved (51). The availability of candidates in each governorate is a serious issue for meeting the needs, governorates with small numbers of literate women and very often with low educational levels, limit drastically the production in these areas (26).

Finally, as mentioned earlier, CMWs' education is largely suspended due to the dramatic changes in the political and security situation (1).

3.2.2 Deployment:

3.2.2.a Recruitment

Articles number 22-30 that have been issued by the Yemeni cabinet, decrees number 40 of 1991 and 138 of 2003 of the civil service law and the recruitment system to regulate the Recruitment process. These decrees and arti-

cles formed guidelines of recruitment in the public sector (57,59). According to these articles and decrees, every governmental entity is responsible to advertise vacancies and the competition process should be transparent for all applicants. If the applicants feel that the selection was not fair, they can appeal to the ministry of civil affairs. The ministry of civil services will review all selection and decision of recruitment (57,59). At district and governorate level, where the CMWs are mostly working, health offices are responsible for identifying the need of the CMWs in term of number. The MoPHP is responsible to provide technical support to the district and governorate offices during the recruitment and distribution process of the CMWs without any interfere in this process (58,59).

In practice, the Ministry of civil service and the ministry of finance control the recruitment and employment process of health workers within the workforce of the government sector (59).

The human resource strategy 2014-2020 of the MoPHP indicated that there was a lack of coordination between the three ministries, and the recruitment process did not take into account the health needs (35). Both ministries finance and civil service decide the number of posts for each governorate, according to their plans and capability, regardless of the needs of different governorates and without prior coordination with the MoPHP. This poor coordination resulted in thousands of health workers (including CMWs) are either unemployed or concentrated in some governorates in spite of the needs in many governorate health offices (35). 80% of health facilities are in the rural areas but poorly staffed (about 20% of all health human resources) (26,35).

3.2.2.b Selection

The health sector reform and the national reproductive health strategy indicated that CMWs should be selected from the communities where they live and will work after the graduation, this will help to overcome deployment and staffing problems(26,68). A key recruitment enabler was, involving communities in the selection of the candidate, for deployment in source communities (1).

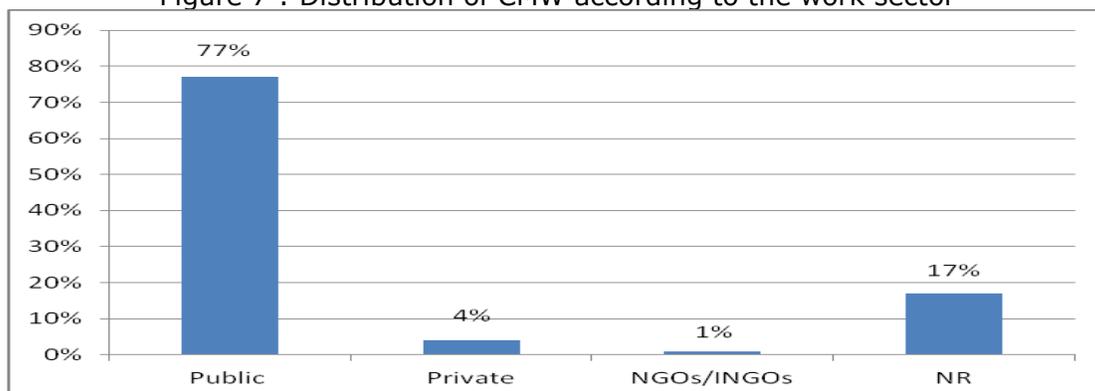
After the implementation of the decentralization, local authority and local health offices had a great role in the selection of potential candidates to be trained as CMWs as well as in the recruitment of CMWs. Nominations and selection of the candidates could be influenced by local leaders with personal, family, political and tribal interests (1).

3.2.2.c Public

A survey conducted between 2006-2011, indicated that the majority of CMWs are public employees 77% (28) (figure 7). Around 32% of them are working in hospitals, 27% are working in health centres and only 20% are working in health units (figures 8). These percentages indicated that many health units in many rural areas are lacking of CMWs and there are chal-

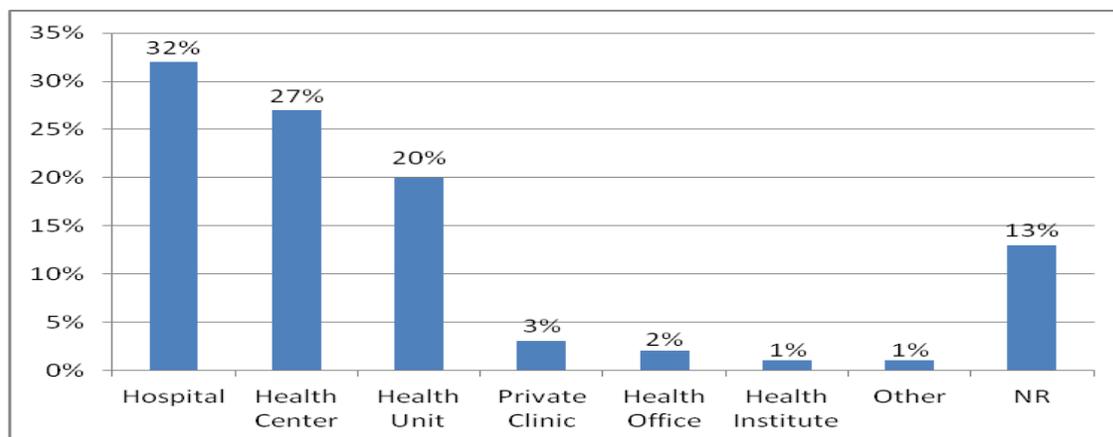
allenges with deployment and retention of CMWs in rural areas. Also the CMW seems to have replaced the technical midwives in some hospitals due to the number of technical midwives as the total midwives in Yemen is only 10%.

Figure 7 : Distribution of CMW according to the work sector



Source: Survey of the Status of Midwives 2006-2011 (28)

Figure 8 : Distribution of CMW based on the type of the work facility



Source: Survey of the Status of Midwives 2006-2011 (28)

In the survey there are significant percentages of not reported (NR) CMW's which may be why they were unreachable or changed their location during the survey period 2006-2011.

The ongoing conflict since 2015 has caused the closure of more than 50% of the country's governmental health facilities and there is no exact figures regarding those CMWs who lost their jobs (48). A WHO assessment, for health services in 2016, for 16 governorates estimated that only 3919 midwives (all categories) are available in these 16 governorates (24).

3.2.2.d Private

To regulate the private work of the CMW, Articles 1- 43 of the Private medical and health facilities law has been issued by the presidential office in 1999 (Source). In the articles, the private CMW should provide quality services with reasonable cost and accessible primary health care services to those who live in rural areas (69).

The midwifery survey (2006-2011) indicated that around 23% of CMWs are unemployed, due to limited governmental posts in rural areas (28). Donors such as; USAID & UNFPA, with cooperation of the midwives association, supported unemployed CMWs technically and financially in rural areas to start their private clinics, distribution of these private clinics are related to the donors' agenda which are not necessarily in line with the needs of those areas. During the period 2009-2016, around 543 CMWs started their private clinics (55,60-62). According to the same survey, in 2011 only 4% of the CMWs have their own private clinics (28), but with the above donor intervention these figures are changed now .

The current insecurity is a big barrier and it challenges deployment, as high-risk areas remain underserved, also it challenges the selection of appropriate candidates, as many are displaced or migrated (1).

3.2.3 Retention:

The cabinet in 1990 endorsed law number 89, which focused on granting an allowance for people who were working in rural areas Articles number 6 and 17 were endorsed in 2002 to ensure that the new health graduates provide services in rural areas between 6 months to two years and they wouldn't not receive their certificates unless they work the compulsory services (59,70). This compulsory service used to be a deployment and a retention policy for health workers for two years in rural areas. In 2006 the government issued a new decree, number 136, that discussed the rules and regulations for granting allowance to rural areas employers (70). According to these laws and decrees the remote and rural areas were classified into three categories, based on the development and geographical location of the areas. The higher allowance is granted to the less developed and the farther away areas.

Before the implementation of the decentralization, the previous strategies were effective, the new health graduates must have done the compulsory service for 2 – 3 years and the other health workers used to get double salary to be retained in the rural areas. But currently with the weak control and loss of enforcement of human resources at the central level, due to the decentralization, it became difficult to follow up the health personnel.

The current strategy, to ensure retaining of CMWs, the MoPHP tends to select (as mentioned before) and train CMWs from rural areas, so these CMWs

will prefer to work in their home town (1,68), besides that, they get 5000 YR (only those in rural areas) = 15\$ as a rural allowance (65) .

Retention is challenging at the district level, especially in far underserved and mountain areas where it is hard to find literate women to be trained as CMWs. The available mechanisms by local authorities to retain CMWs, are to facilitate appropriate accommodation and transportation for those who are working in various areas (26).

There is a program by Marie Stopes international (MSI) called the Rayaheen network, to improve retention and improve services' utilization in some areas where there are no health units. MSI contracts CMWs and supports them technically through different service training courses and provide them with equipments to start their private business and provide services with affordable prices under the supervision of the MoPHP. According to the MSI, this intervention was effective as in 2012 with 180 CMWs who served more than 180,000 women, now the network has more than 300 CMWs providing services in many rural areas with affordable fees (71).

Insecurity is also an overarching barrier to CMWs' retention in fragile and conflict states (1). Currently, in many places in the country, where the conflict is high, many CMWs are forced to leave their areas /clinics due to insecurity, financial reasons and many health facilities closed or destroyed (29,48). However, a UN report mentioned that in some areas of Yemen, CMWs are more likely than doctors to remain on post during crises, and they find themselves expanding their services beyond their job description to cover up the lack of specialized medical personnel (48,54).

3.2.3.a HR management

The Population sector and the HR department in the MoPHP, at the central level, as mentioned earlier are responsible for all activities related to CMWs in term of hiring and development. However, according to the RH strategy 2011-2015 there is still a poor coordination between them (26).

3.2.3.b Career path/ continuous education

The updated job description in 2013 of CMWs mentioned that each CMW has the right for continuous professional development and educational opportunities in her field of work according to the need of the health facility. Also CMWs should have an annual appraisal to evaluate their performances for further promotion and a career path (27).

The national health strategy (NHS) 2010–2025 indicates that continuous education is obligatory and a prerequisite for promotions of all employees in all health institutions. The NHS focused on the availability of a national program to train staff in the latest professional developments (23). However, there is

no clear implementation plan of these policies and strategies on continuous education and career path development.

Service training for CMWs is usually done by an international NGO, and due to the lack of coordination with the ministry, the training sometimes does not relate to health needs. Also an absence of the supervision system of the MoPHP makes it difficult to follow up on those who have been trained (72).

3.2.4 HR system responding to the health needs:

In summary, the current health situation of the country face many problems and the available health personnel mix to respond to these problems is not enough (35). Around 2.2 million mothers and babies are in need of health care and require more CMWs.

The changes in the health needs of the country, required different responses to maintain the health services for that in need. Reduction in accessibility and the availability of health services results in an increase of mortality and morbidity rates (29). The CMWs current roles and responsibilities become more important and crucial especially with the shortages of other health professionals in rural areas. The CMWs accessibility, availability, quality of care and task shifting are very important to ensure the appropriate response of the health system toward the health needs (29).

Section 3. Review of other similar context policies, regulations and interventions

This section highlights policies / interventions related to CMWs from other fragile settings, also some examples from LMIC were used to fill the gaps that needed interventions. The House model framework will also be used for this analysis (44). Some interventions have been evaluated and other, still little known about their effectiveness due to the existence of other influencing factors such as political, social, and economic factors within which the interventions occurred (73).

3.3.1 Human resource availability:

One of the impacts of conflict and humanitarian crises is the reduction of the availability and accessibility of health services, a well-managed health workforce is essential to mitigate against these effects(29). Increasing SBA numbers is important for increasing availability and accessibility also related deployment and retention strategies are also needed to improve and maintain coverage (1). The Afghanistan midwifery strategy 2011-2015 indicated, since the establishment of the CME program coverage of the CMW increased however, the number of CMWs is still low and there is a need for more CMWs (74). Sudan has a national midwifery scaling up strategy 2009, to increase and scale up the midwifery workforce availability. However, the country is still facing shortages in CMWs. Finance constraints, donor dependency as well as government commitment are the main challenges to implement these strategies (75). Somalia, South Sudan, and Mali are fragile countries that also face severe shortages in CMWs (47).

3.3.2 MOH capability:

Ministries of health in fragile/post conflict countries face weak structures, huge financial deficits, high dependence on international donors as well as NGO's (76). In Somalia and South Sudan foreign NGOs and FBOs play an extremely important role in the health sector (77,78). Afghanistan for example, strengthened the capability of the MoH regarding midwives and established a statutory body for all midwives within the institutional framework of the MoH, called Midwives and Nurses Council. The responsibility of this council is to form a licensing body for midwives and to ensure the health and safety of the community is protected by regulating the CMW profession as well as maintaining the quality of midwifery for all users (79).

3.3.3 Legal framework:

In Somalia, South Sudan and Mali, it is not clear if there are laws or legal decrees that regulate the CMWs work. In these countries CMWs must study 2 or 3 years midwifery education (depends on the country) after 8 or 9 years of schooling to be licensed and legalized as CMWs (1,78,80,81). In Sudan, the absence of the legal and regulatory framework for CMWs' services, compromised the guarantee of quality of service provision to the public (75).

3.3.4 Finance:

In fragile or post conflict states, financing CMWs' production, retention and recruitment require high financial commitment. All CMWs' activities are donor dependent in fragile states such as Afghanistan, Somalia and South Sudan (78,80,82). Sustainability of funds and the donor's interest (donors' agenda) are critical factors for CMWs' activities. In Somalia the context sustainability of funds is the main concern of the MoH as production and retention of CMWs requires long commitment (78). In Sudan the CMWs' program is weak, as there is no a political will that would invest in CMWs' education and service provision which make it almost totally donor dependent (75).

Regarding the CMWs' salaries, in Mali the government does not provide salaries for the CMWs. Instead, local community health management committees redistribute out of pocket fees paid by clients to the CMWs with varying degrees of regularity (83).

3.3.5 Policies and strategies:

Afghanistan is a good example for a country that has strategies and policies, specifically for MW (including CMW): National Policy and Strategy for Nursing and Midwifery Services (2011–2015) and the Midwives and Nurses Council Strategic Plan (2014-2018). The availability of strategies and regulation of CMWs were one of the tools that helped the CMWs to adapt to the fragile situation that led to an improved health status of mothers and newborns in Afghanistan (79).

Conflict may require the work to be reorganized and jobs to be redesigned to ensure that health personnel perform sufficiently and meet the changes in service needs (76). According to report by the UNFPA about midwives in some conflicted Arab countries in 2016, task shifting has been shown to be an effective strategy to expand capacity in crisis contexts, but also this can be worked out if these CMWs have the competencies to perform the new tasks at a high standard (29). Same report by UNFPA, stated that MW/CMW

from Iraq, Syria and Somalia are able to provide a wide range of services if legislation and/or job description are changed (29).

In Afghanistan task shifting was used as a strategy to increase service utilization of the CMWs, however, CMWs reported being asked to perform activities outside their training without being paid (84).

3.3.6 Monitoring:

3.3.6.a HR information system functions:

Without updated CMWs information data, it is difficult to plan, monitor and implement any related strategy and intervention. In a fragile / post conflict situation it is important to have this information to decide the extent to which pre-service education and scale-up strategies will meet the demand of health services (76). An evaluation study, conducted in three low-resource countries; Uganda, Rwanda and Swaziland, mentioned that using data from HMIS has improved HRIS management's decision in making to develop an effective strategy; they developed the capacity of their staff at different levels to ensure the dissemination and use of accurate data (85).

3.3.7 Coordination:

Coordination between MoH and different stakeholders, either local or donors, is very important to the success of CMWs' programs. In Afghanistan and according to a study funded by the World Bank in 2013, the strong coordination and engagement of different stakeholders, played an important role to develop community midwifery educations that have great impact in the reduction of maternal mortality in Afghanistan (86).

In Somalia, with the absence of a central government, donors and health sector stakeholders, developed a mechanism to guide and coordinate external assistance to the countries coordination of International Support for Somalia, RH working group then created to manage all RH activities including CMW (78).

3.3.8 Production:

Pre service education, to produce CMWs, has different criteria of eligibility from one country to another. Pre service education programs in Afghanistan, Pakistan and Somalia requires candidates to have at least 9 years of school education (78,87,88). In Afghanistan the program started in 2002 with a

condition of 6 years school due to the low number of educated females; this later changed in 2008 to 9 years of school. Female candidates in Pakistan and Afghanistan must take an entrance exam and they should be married and not less than 18 years (89–91). The average required education in Mali is between 7 to 9 years (81) and in South Sudan the criteria required from candidates to complete secondary school with an average of 50% pass in science subjects (77). In Sudan CMWs should have completed secondary education before entering the program. Furthermore, candidates must not be pregnant or breast-feeding during the training program (1,75). These different requirements are asked in most countries to ensure the quality of the training and trainees and to optimize retention (89).

Curricula in some countries like Afghanistan, Sudan and Somalia are standardized to the International Confederation of Midwives (ICM) essential competencies for basic midwifery practice, which includes a full package of Basic Emergency Obstetric and Newborn Care (BEmONC) and Manual vacuum aspiration (1,87,92,93). The curricula in some countries such as Afghanistan, Sudan and Mali have some topics beyond midwifery and are related to community practices, such as health promotion, child health and broader reproductive health issues (1,81,86), in Afghanistan also the content of curricula provides the skills needed in small clinics where the CMW may be the only health provider (79).

The lack of qualified trainers, funds, equipments and clinical practices; all these factors affect the education capacity in many fragile countries. For instance Afghanistan, Somalia, Sudan and South Sudan suffer from the lack of trainers and poor training skills as well the dependency on external funds (1,77,94). The biggest problem for production of CMWs is the low number of literate women with sufficient educational levels from rural areas, to be qualified for the pre service education. The Community midwifery education (CME) program in Afghanistan had an experience (not evaluated) to adapt with this situation by providing literacy training to the trainees and their families, however this intervention required a lot of resources (94).

Increasing the number of midwifery schools was also a strategy in Afghanistan to increase the production of the CMWS, according to the MoH report in 2014. The strategy was initially good as 4600 CMW were produced but the number of schools dropped in 2013 from 32 to 22 due to the lack of funds (79).

Bangladesh has an innovative intervention to increase the number of CMWs. They recruited women who already served in a different capacity in their communities (female health assistants and family welfare assistants) and trained them on selected essential midwifery skills and abilities. The Bangladesh Nursing Council provided certification as CMWs for trainees who completed the training. The impact of this intervention was good according to

the study. The number of births attended by trained health providers and referrals to health centres and district hospitals of women with complications increased (95).

Contracting midwives and other health workers in rural areas has been shown to be an effective intervention to overcome shortage. 151 midwives (and 214 other health workers) were contracted during 2006-2008; the contracts lasted 1 year and were renewable. The impact of intervention has led to the reopening of 122 PHC units in Senegal (96).

3.3.9 Deployment:

For fragile/post conflict settings, some studies highlighted the problem of mal-distribution of different cadres of health workers between more and less secure areas or between urban and rural. Studies conducted in Sudan, Afghanistan, Pakistan, Mali, Kenya and Thailand showed that community candidate selection and rural recruitment are good strategies to increase the deployment in the rural areas and also for community acceptance and retention (81,89,97,98).

A study in DRC indicated also the use of rurally-located education to increase the deployment in rural areas (99).

A lesson from Afghanistan, a community midwifery education program is pre arranged deployment agreement in which the candidate is nominated by the community leaders and selected by a committee from the local MoH staff (selection committee guarantees that the graduate CMWs would be deployed in the local health facility) which linked to an increase of the employment opportunities in rural areas and availability of midwifery services (1,87). Another strategy was also implemented in Afghanistan to deploy midwives where they are most needed. CMWs are designated to a duty station at the time of recruitment, a study showed that 96% of community-nominated midwifery graduates were employed in these particular duty stations (79).

3.3.10 Retention:

Financial incentives, professional and personal support, Bonding schemes, training, and a clear job description have been used as a retention strategy in many developing countries (100).

Single interventions are not always effective, as the retention factors are complex and intricate. Therefore strategies to retain health workers in rural areas should include combined interventions (101).

In Afghanistan, despite the insecurity and cultural issues in many rural areas that affect CMWs retention, a number of strategies have been used to improve CMWs' retention, including advocacy for family and community support for midwives, working in rural facilities, providing accommodation, education for children, and jobs for the accompanying male family member (Mahram). Furthermore, The effectiveness of these interventions is not yet reported (84).

Pakistan has initiated retention policies that pay a certain amount of money (2000 PKRs) on monthly basis immediately after CMWs are deployed, also a referral allowance and appreciation awards to the best performer, were provided as monetary incentives for retention strategy. This strategy according to an article makes CMWs more accountable and responsible and also increase the services to the target population (89). Another program in Pakistan, as a retention strategy for CMWs, was Community-based savings groups (CBSGs). The aim was to achieve financial sustainability for CMWs to retain in that community (91). However, the success of the intervention is not known.

A study indicated that Pakistan also implements a bond scheme strategy for CMWs deployment and retaining. CMWs are required to sign a commitment for three years of service delivery after completion of the program and their diplomas are held in pledged for the duration of that time, however, this strategy, according to the study, put CMWs under pressure as they were not able to get additional income and the majority of them come from poor families (89).

Also in Pakistan an intervention called saving mothers and newborn in communities (SMNC) aimed to develop CMW capacity and empower them financially to retain in rural areas. However, still little is known about its effectiveness (102).

Different studies in some LMIC discussed different retention strategies. A study in some west African countries mentioned the availability of a clear career path for a CMW is used as a retention strategy in rural areas (95). Other studies in Tanzania and Sierra Leone indicated that, conducting short courses training, was considered to be an important factor for retention in rural areas for the CMW (98,103). In Vietnam job stability, regular income and continuing education were the main retention factors in rural areas. However, low income and allowances were the main discouraging factors (97).

Table 3 : CMW practices, policies, challenges in Yemen and good practices from other fragile / LMIC countries

Issue	Current Practice	Policy	Good practices	Challenges
No CMW policy & strategy	n/a	n/a (draft national midwifery strategy not activated yet)	MW workforce strategies (Afghanistan)	-MoPHP commitment
No midwifery regulatory body	RH department responsible for technical aspects and HR department for recruitment and deployment	n/a	Midwives council (Afghanistan)	- MoPHP commitment;
lack of doctors in rural areas	n/a	n/a	Task shifting	-MoPHP commitment - CMW capacity; -Workload & Unpaid tasks beyond CMW training; - Supervision,
HRIS	Development of database for HR	n/a	Development of HRIS (Swaziland , Uganda and Rwanda)	-MoPHP commitment -Lack of trained staff, -Financial constraints
Financing / Salaries	Government pays to Public servants (no salaries since 2016)	Ministry of finance and ministry of labour policies	local community health management committees redistribute out-of-pocket fees (Mali)	-economic collapse -poor families
Coordination	RH Technical Group (RHTG) and	Health policy	Creating a coordination group consist	- MoPHP commitments -donors' agenda

	RH Inter-Agency Working Group (RH IAWG)		all health stakeholders (Somalia)	
Strategies for CMW Production /Shortage	<ul style="list-style-type: none"> -Only the 2 main HIHS branches conduct pre service education. -Exception started to be given to private institutes. - Contract number of unemployed CMWs via donors 	Governmental HIHS in south & north with their branches are the only institutes allowed to teach CMW.	Building capacity of health institutes (Afghanistan)	<ul style="list-style-type: none"> -financial resources -security
			Recruited women who already served in a different capacity in their communities (Bangladesh)	<ul style="list-style-type: none"> - financial resources -Capacity of targeted women
			Contracting unemployed CMW (Senegal)	<ul style="list-style-type: none"> - financial resource- -Supervision
Deployment	Recruitment of approved posts is done at the central level. Deployment and Selection done at the district level.	No policy for CMW deployment	pre arranged deployment agreement (Afghanistan)	<ul style="list-style-type: none"> -CMW and communities' commitment. -Social intervention -Security
			CMW are designated to a duty station at the time of recruitment (Afghanistan)	<ul style="list-style-type: none"> - Social intervention -coordination between different authorities
			Community candidate selection and rural recruitment (Sudan, Somalia, Afghanistan, Mali)	<ul style="list-style-type: none"> - Social intervention - lack of regulation

Retention	<p>At central level government only paying rural allowance for CMW.</p> <p>Nothing at district level with the exception of some interventions in some areas by providing transportation or housing to CMWs.</p> <p>- MSI support around 300 CMWs (Rayaheen networks) to provide services in their areas.</p>	Financial allowance, Compulsory services	Regular income, referral allowance; & appreciation awards (Pakistan, Vietnam)	-Limited financial resources
			-Bonding scheme. (Pakistan)	- Difficulties in law enforcement
			-Clear career path (West African countries)	- Lack of regulations
			-Continuous education. (Tanzania and Sierra Leone)	- Financial constraints.
			- Community-based savings groups (Pakistan)	- Poor rural families. - supervision
			- Empower CMW technically and financially (SMNC) (Pakistan)	-Limited financial resources -donors dependency - supervision

Chapter 4: Discussion

This chapter discusses gaps related to the CMWs within the health system and available evidence of interventions and policies and how they relate to the Yemeni context.

4.1 Policies, strategies and MoPHP capabilities

The recent human resource for the health policy 2014-2020 and the national reproductive health strategy 2011-2015, highlighted briefly the role as well as the gaps related to the CMWs in terms of production, deployment, retention coordination, monitoring and financing. One of the main issues of that faces CMWs in Yemen is that the current draft of the national midwifery strategy since 2014 has not been available and not activated yet. In other fragile countries like Afghanistan, the availability of CMWs' policy and strategy played a significant role in improving CMWs' situation in terms of availability of the CMWs, regulation, coverage, deployment, retention and practices.

The CMWs are practicing beyond their job description in many rural areas during the conflict in Yemen as they became the only available health workers in those areas. In fragile/post conflict settings, task shifting proved to increase the utilization of CMWs. CMWs have a basic medical background, compared to community health workers (CHW) who are working only in health promotion in the country, hence, specific task shifting to CMWs of certain activities, according to current health needs e.g. treatment diarrhoea, malnourishment, cholera treatment, would improve the health service utilization. However, task shifting requires training district health officers for supervision and for the long term require revising the CMWs job description. CMWs' capacity, workload and unpaid tasks, beyond CMWs' training, are the main challenges to implement this intervention.

The biggest issue now faces the health system is the parallel coexistence of two ministries of health with unequivocally structured and their great dependency on donors which affect all activities related to RH including the CMWs. The absence of midwives' regulatory body, particularly for the CMWs, like other health professionals makes it a challenge to cope with the changes in the country. CMWs are managed by the RH department with all RH activities. The evidence from the literature mentioned that establishing a midwifery council, within the framework of MoH, helps to maintain the quality of CMWs services and protects communities through regulating CMWs licensing.

For monitoring and planning purposes, data collection, regarding CMWs, has many problems. Evidences from fragile states, regarding data functions and HRIS, were limited however; literature was found from three African countries showed that implementation of HRIS helped in the use of data to de-

velop human resource evidence-based interventions. Applying this strategy in Yemen requires commitment of the MoPHP; it will also face difficulties, due to the limited number of qualified personnel working in the system, financial constraints to update the system, difficulties in locating them and movements due to the war.

4.2 Production, deployment and retention

The lack of strategies and regulation, improper planning, financial constraints and the insecure situation resulted in difficulties and gaps in terms of availability, production, distribution, deployment, coverage and retention of the CMWs.

One of the core issues of the health system is the presence of female health workers in general. The social norms have negatively influenced the enrolment of females in schools, especially in rural areas. This influences the number and distribution of CMWs within the health system as governorates with high literate women have more CMWs and the opposite. Providing literacy training to the trainees and their families was an intervention in Afghanistan, to increase the number of literate girls. However, this intervention needs a lot of resources, good coordination with other stakeholders and a long term plan which is difficult in the current situation of Yemen.

The governmental health institute branches in different remote cities are not working and there is lack of financial support to resume CMWs' teaching. In Afghanistan the number of health institutes increased with the support of donors in different cities which led to improving the girls' enrolment as they became close to their hometowns. Later the number of health institutes dropped due to lack of funds from donors. Financial constraints and security may affect the implementation of this intervention. Added to the public health institute there are 38 private institutes (no CMW education) distributed in many cities and recently the northern MoPHP accredited two private institutes to teach CMWs.

Shortages and losses of the CMWs in rural and underserved areas, due to different reasons, affected the health service utilization. Evidence shows recruited and trained women, who already served in different health capacities in their communities, were effective to increase the number of CMWs and improve the health services. Female health workers with limited training and capacity like: murshidat, are already available in many rural and underserved areas, however, the capacity of those murshidat, the close supervision and the financial resources are important for the success of this intervention.

Also contracting number of unemployed CMWs during the conflict, in some rural areas, was a cost effective intervention, conducted by the UNFPA in Yemen with coordination of the MoPHP. This intervention has been effective

in other countries as evidence from Senegal. The intervention is feasible since it has already experience on the ground. Yet, it requires good coordination with health district offices, financial resources and an ensured budget after the war for sustainability.

The gaps in the available policies and regulations, in term of the deployment of CMWs, as well the commitment of communities during the selection process, affected the distribution of CMWs to the needed rural communities. Evidences from Afghanistan, showed that both pre-deployed arrangement and designated CMWs to a duty station, at the time of recruitment practices, played a role to improve the deployment in rural areas. In Yemen with the current crisis, insecurity and destroyed health facilities negatively affect CMWs' deployment.

The current security situation, the irregular monthly income, lack of supervision, the poor living condition in rural and underserved areas, makes retention strategies very difficult. The CMWs have not received their salaries from the central government for about a year now, which greatly affected their lives and work. In another context from Mali, CMWs get paid their salaries from redistributing out-of-pocket fees that are paid by patients through a local committee. Villagers in Yemen have different resources that are usually used instead of money to exchange with other benefits such as health services, so CMWs can get paid.

Some practices in other fragile context and other low resources countries such as; bond schemes, clear career paths, continuous educations, referral allowances, appreciation awards and job stability were applied as retention strategies for the CMWs in rural areas. Yemeni CMWs are facing a lot of challenges and more workload without a stable income, which may affect applying any retention strategies now. However, in the long term plan, practices like bond schemes, referral allowances, appreciation awards and continuous education are promising strategies and challenging, given the limited management capacity at central and district levels and financial commitment.

To improve the financial status of the CMWs and encourage them to stay in rural and underserved areas, intervention from Pakistan, called Saving Mothers and Newborn in Communities (SMNC) was applied, aimed to improve the CMWs technically and financially in rural and underserved areas. In Yemen there is already a similar program working since 2012 on the ground (Rayaheen network by MSI). CMWs through this private business provide services with affordable fees which are already agreed earlier with the MoPHP to help them to sustain and work in their areas even without donor. Yet, supervision is a challenge as it requires budget to be performed by health officers.

Selecting and recruiting the CMWs from rural communities, were retention and deployment strategies in Yemen and other countries as those CMWs are likely to work and settle in their home towns. Nevertheless, other factors may affect negatively this strategy like; insecurity, lack of income, no career development and poor working conditions. This strategy alone is facing many challenges and it has to be accompanied by another intervention like continuous training and incentives to be more effective.

4.3 Framework discussion:

The house model covers many human resource issues and helped in analyzing the CMWs within the health system, focusing on production, deployment and retention. However, the framework does not cover some issues like; Job satisfaction, work security, safety and performance management, which are not covered in this thesis.

4.4 Limitations of findings:

Despite trying to contact officials in the northern MoPHP to get the draft of the national midwifery strategy to analyse it, they however refused to send it as it was still a draft and not activated yet.

The health situation in Yemen got worse since December 2016, especially with the cholera outbreak. This miserable situation affected the communication during the collection of some data and information from both ministries and others sectors

Chapter 5: Conclusion and Recommendation

5.1 Conclusion:

When we talk about community midwives, we touch the bases of the most important element of health care in rural and underserved areas in Yemen, especially in the current fragile situation.

The analysis and findings of this thesis, reveal that the CMWs situation in Yemen, has many challenges and gaps.

There are different issues related to the CMWs' production, distribution, recruitment and retention. These can be summarized in the following: the loss of coordination between different stakeholders, the weak structure of CMWs within the health system and the absence of policies and strategies to regulate their work, which is more apparent now with the existence of two ministries of health in Yemen.

In Yemen, the majority of CMWs' activities are donor dependent. Yet, this current condition has been negatively affected due to the deterioration of the current situation in the health system. This led both donors and both ministries of health to focus on more humanitarian and emergency issues

There were some good practices regarding CMWs prior to the war, such as; developing a national midwives program and a draft of a national midwifery strategy which was a promising step for the CMWs to regulate and empower their work, although both of them are not activated yet. There were also some good practices in term of production and retention.

Although there is a paucity of scientific literature of good practices in fragile settings regarding the CMWs, the experience from other available countries, presents good lessons such as; availability of a CMW strategy, the establishment of midwifery council and contracting unemployed CMWs and pre-arranges deployment, that can be used in Yemen.

The current policy environment in the country is divided between two competitive ministries of health, which makes it difficult to implement many activities simultaneously in different parts of the countries. UN agencies with other International NGOs and donors play important roles in health services provision so the recommendation will be directed to both ministries as well to them.

5.2 Recommendations:

Given the current critical situation of the country, the recommendations will be divided into short and long terms.

Short term recommendations as the health situation is very critical:

For both MoPHP to:

1. Approach donors to allocate budget from the current international humanitarian assistance to support CMWs. MoPHP should coordinate with donors to ensure paying the salaries and rural allowances regularly to the CMWs for a certain time until the MoPHP resumes paying salaries to the CMWs.
2. Task shifting of certain services and skills according to current health needs e.g. treatment of diarrhoea, malnourishment and cholera to the CMWs accompanied with supervision training to district health officers.
3. Conduct in-service training to CMWs according to the current community health needs and health situation of the country under the supervision of the MoPHP. These trainings will be also needed for the task shifting strategy.
4. Contract unemployed CMWs (with support of donors e.g. UNFPA) in rural areas where there are no employed CMWs and link them to the health offices for follow up and supervision.
5. Coordinate with different INGOs (such as: MSI and UNFPA) to continue support CMWs technically and provide them equipment to start their private businesses in rural and underserved areas.

Long term recommendations:

For both MoPHP to:

6. Adapt and activate the national midwives strategy of 2014 and revise the current CMWs' job description to be consistent with the current health situation (expansion of responsibilities).
7. Establish a Midwifery Council within the structure of both ministries supported by UNFPA. This council will be responsible for all CMWs' regulations, giving license, ensuring the quality of service and quality of pre-service and in service training.

8. Train female community health workers (murshidat) with the required skills to provide services as CMWs in rural and underserved areas.
9. Support the public health institute branches financially to resume pre service education. Also, the MoPHP needs to evaluate the pre service education in the two private institutes. The accreditation to private health institutes can be scaled up if it shows good results.
10. MoPHP needs to apply a prearranged deployment agreement to ensure CMWs deployment and recruitment in local health facilities.

For relevant ministries and stakeholders to:

11. Advocate for female education in rural communities to increase the girls' enrolments in schools and intensify the number of literate women in these areas. This will accordingly increase the number of the girls' enrolment in midwifery education.

For donors, research agencies and MoPHP:

12. There are big gaps in the studies, information and data regarding the CMWs in Yemen. Further studies and researches should be conducted on the CMWs such as; survey about the available services including mapping.

References:

1. Miyake S, Speakman EM, Currie S, Howard N. Community midwifery initiatives in fragile and conflict-affected countries: A scoping review of approaches from recruitment to retention. *Health Policy Plan.* 2017;32(1):21–33.
2. UNFPA, ICM, WHO. Midwifery in the Community lessons learned. December 2006, Tunisia.
3. World Health Organization department of reproductive health and research. Making pregnancy safer: the critical role of the skilled attendant. A joint statement by WHO, ICM and FIGO. Geneva, Switz WHO [Internet]. 2004;1–18. Available from: <http://whqlibdoc.who.int/publications/2004/9241591692.pdf>
4. Regt MDE. Pioneers or Pawns? Women Health Workers in Yemen. 1998;2–3.
5. Taylor SA. Fragile and Conflict-Affected States: Exploring the Relationship Between Governance, Instability and Violence. *Stab Int J Secur Dev* [Internet]. 2014;3(1):Art. 28. Available from: <http://www.stabilityjournal.org/article/view/sta.dy/230>
6. Minister of Public Health and Population, annual statistical health report 2014. In. Available from: <http://www.moh.gov.ye/arabic/docs/Report2014.pdf>
7. WHO. Saving the lives of mother and children, rising to the challenge, Yemen. 2013.
8. Republic of Yemen, National Information Center [Internet]. Available from: <http://www.yemen-nic.info/index.php>
9. UNOCHA, Humanitarian Response Plan January-December 2017. Response Plan [Internet]. Available from: http://reliefweb.int/sites/reliefweb.int/files/resources/2017_HRP_YEMEN.pdf
10. Anadolu Agency. Map of Yemen, Latest situation [Internet]. 2017. Available from: <http://aa.com.tr/en/info/infographic/3452>
11. FAO. FAO in the 2016 humanitarian appeals - Saving livelihoods saves lives. 2016;
12. Population projection, 2016, Central Statistical Organization. 2016 [Internet].

- Available from: <http://www.cso-yemen.org/cgi-sys/suspendedpage.cgi>
13. Ministry of Public Health and Population, Yemen National Health and Demographic Survey 2013.
 14. World Bank Open Data, Republic of Yemen. Available from: <http://data.worldbank.org/country/yemen-rep>
 15. UNESCO-UIS. Adult and Youth Literacy. National, regional and global trends, 1985-2015 [Internet]. 2013. 132 p. Available from: <http://www.uis.unesco.org/Education/Documents/literacy-statistics-trends-1985-2015.pdf>
 16. UNICEF. At a glance: Yemen , basic indicators [Internet]. Available from: https://www.unicef.org/infobycountry/yemen_statistics.html
 17. Save the Children. Futures on the line, Yemen ' s children missing an education. 2016;
 18. UNDP. Human Development Report 2016. United Nations Development Programme. 2016. 193 p.
 19. World Bank. Yemen's Economic Outlook- April 2017, Recent Developments. Vet J [Internet]. 2017; Available from: <http://pubdocs.worldbank.org/en/777611492266548883/Yemen-MEM2017-ENG.pdf>
 20. Doumato EA. Saudi Arabia. Women's Rights in the Middle East and North Africa: Progress Amid Resistance. 2010.
 21. UNFPA. Women Development Strategy, The Supreme Council for Women, Women National Committee, Yemen. 2008;
 22. WHO. Health Systems Profile - Yemen, Regional Health Systems Observatory-EMRO. 2006;
 23. Health P. Ministry of Public Health and Population. National Health Strategy (NHS) 2011-2025. Sana'a- Yemen. 2011.
 24. Herams U. Service Availability and Health Facilities Functionality in Final report October 2016 Table of contents Governorate summaries. 2016;(October):0-41.
 25. WHO. Eastern Mediterranean Region Framework for health information systems and core indicators for monitoring health situation and health system performance 2016. 2016;1-16. Available from:

http://applications.emro.who.int/dsaf/EMROPUB_2016_EN_19169.pdf?ua=1&ua=1

26. Ministry of Public Health and Population. National Reproductive Health Strategy 2011 - 2015. Sana'a - Yemen. 2011.
27. Ministry of Public Health and Population, Community Midwives ,Job Description, Sana'a - Yemen September2012. 2012;(September).
28. National Yemeni Midwives Association. Survey of the Status of Midwives in 20 Governorates in Yemen 2006 – 2011. Funded by USAID , UNFPA and WHO, Main report. 2011.
29. UNFPA. Midwives on the front line: Midwives on the front line, Delivering midwifery services in difficult times. 2016.
30. United Nations Office for the Coordination of Humanitarian Affairs. Humanitarian Bulletin: Yemen. 2017;(21):1–5.
31. who. Humanitarian Health Action [Internet]. Available from: <http://www.who.int/hac/crises/yem/en/>
32. World Bank. The World Bank In Yemen [Internet]. 2017. Available from: <http://www.worldbank.org/en/country/yemen/overview>
33. WHO. More midwives needed to improve maternal and newborn survival. 2013. p. <http://www.who.int/bulletin/volumes/91/11/13-02111>.
34. USAID. Yemen Basic Health Services Project (2006-2010), Final Report . 2011;(March).
35. Ministry of Public Health and Poblution, Yemen Human Resource for Health strategy 2014 - 2020. sana'a - Yemen, 2014.
36. UNFPA. Country Program Action Plan 2012 - 2015, Between UNFPA and The Government of Yemen.
37. WHO. Health System in Yemen close to collapse [Internet]. 2015. Available from: <http://www.who.int/bulletin/volumes/93/10/15-021015/en/>
38. UN. Yemen: year of conflict puts 3.4 million women of reproductive age at risk, UN reports. Yemen: year of conflict puts 3.4 million women of reproductive age at risk, UN reports. 2016. p. <http://www.un.org/apps/news/story.asp?NewsID=53581>.
39. UNICEF. Yemen conflict: A devastating toll for children [Internet]. 2017. Available from: https://www.unicef.org/infobycountry/yemen_85651.html

40. WHO. Yemen Humanitarian Response Plan 2016 [Internet]. Available from: <http://www.who.int/hac/crises/yem/appeals/en/>
41. Footer KHA, Rubenstein LS. A human rights approach to health care in conflict. *Int Rev Red Cross* [Internet]. 2013;95(889):167–87. Available from: http://www.journals.cambridge.org/abstract_S1816383113000349
42. WHO. HRH action framework. 2008;(July):2008. Available from: <http://www.who.int/hrh/tools/en/>
43. Bollinger R, Sousa A, Scheffler RM, Boerma T. A comprehensive health labour market framework for universal health coverage. 2013;(April):892–4.
44. Fujita N, Zwi AB, Nagai M, Akashi H. A Comprehensive Framework for Human Resources for Health System Development in Fragile and Post-Conflict States. 2011;8(12).
45. Fujita N, Nagai M, Souka I, Diouf N, Shimizu T, Fujita N, et al. The Role of a Network of Human Resources for Health Managers in Supporting Leadership for Health Systems Strengthening in Francophone African Countries The Role of a Network of Human Resources for Health Managers in Supporting Leadership for Health System. 2016;8604(May 2017).
46. Ministry of Education Y. Adult Education Programs in the Republic of Yemen for The Sixth International Conference on Adult Education. Unesco. 2009;(May):1–30.
47. Carr C, Fauveau V, Fogstad H, Garden B, Johnson P, Laski L, et al. The State of the Wolrd’s Midwifery , Delivering Health, Saving Lives. UNFPA, 2011. 2011;180.
48. UN. What Midwives need to continue their heroic, life-saving work in crisis settings [Internet]. 2017. Available from: <http://ye.one.un.org/content/unct/yemen/en/home/news-centre/news/what-midwives-need-continue-their-heroic-life-saving-work-crisis-settings.html?platform=hootsuite>
49. Yemen Rapid Assessment Report for December 2016 : Measuring the impact of the public sector wage suspension on basic service delivery in the healthcare and education sectors. 2016;(December).
50. Ministry of Public health and Population [Internet]. Available from: <http://www.moh.gov.ye/english/index.html>

51. Penney DS. Meeting women's health needs in Yemen: a midwifery perspective. *J Midwifery Womens Health* [Internet]. 2000;45(1):72-8. Available from: <http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=107002686&site=ehost-live&scope=site>
52. Council of Representatives of Yemen. Parliament. Safe Motherhood Law. 2014.
53. UNFPA. The state of the world's midwifery. A Universal Pathway, A Woman ' S Right To Health. 2014;
54. UNICEF. A day in the life of a community midwife in Yemen [Internet]. 2016. Available from: https://www.unicef.org/infobycountry/yemen_92074.html
55. Baabaad N, Al-raiby J, Office C, Farrell J. Yemen Situation Analysis , USAID. 2012;
56. Midwives voices, midwives realities. Findings from a global consultation on providing quality midwifery care, WHO , 2016.
57. Ministry of Public Health and PoPulation. Human Resources Development: policies that provide incentives for better performance of health staff in rural and remote area, Yemen. 2003;
58. Badr AA. Ministry Of Public Health and Population. Human Resources for Health (HRH) Analysis-Yemen. 2012;
59. AlSurimi k. Human Resource for Health Profile, WHO Workforce Observatory, Sana'a -Yemen. 2009;
60. UNFPA Yemen Humanitarian Response Funding Proposal. 2017;(March).
61. Ministry of Public Health and Population, Midwives Association [Internet]. Available from: <http://www.moh.gov.ye/English/midwives.html>
62. Yemeni National Midwives Association [Internet]. Available from: http://yemenmidwife.org/?page_id=218
63. Minister of Public Health & Population. Human resource data base 2014 [Internet]. 2014. Available from: http://www.moh.gov.ye/arabic/docs/Human/Yemen_HRH_observatory/19-08-2014.pdf
64. Dr.Ameen Nasher Higher Institute for Health Science, Aden , Yemen [Internet]. Available from: <http://anhihs.com/>

65. Personal contact with manager of training and quality of care at Yamaan Foundation.
66. MCHIP. Report of the Baseline Assessments of Midwifery Pre-service education at 10 Higher Institutes of Health Sciences Sana'a and Aden and their branches, 2014.
67. HPN. The humanitarian situation in Yemen. 2014;(61).
68. Health Sector Reform in the Republic of Yemen Strategy for Reform. 2000;40(2):181-9.
69. Private medical and health facilities law, Yemen. 1999;
70. MoPHP. Ministry of Public Health and Population. Legalization and laws for medical, pharmacist,dental. 2006.
71. Marie Stopes International Yemen, Rayaheen, Community midwives network, concept paper. [Internet]. Available from: <http://www.mariestopes-yemen.org/services>
72. USAID. Yemen Basic Health Services (BHS) Project, mid term evaluation. 2009;(September).
73. Huicho L, Dieleman M, Campbell J, Codjia L, Balabanova D, Dussault G, et al. Increasing access to health workers in underserved areas: A conceptual framework for measuring results. Bull World Health Organ. 2010;88(5):357-63.
74. Strategic plan for the Ministry of public health (2011-2015), government of the Islamic Republic of Afghanistan. 2011;2011-5.
75. Republic of Sudan, Federal Ministry of Health National, National Strategy Document For Scaling-up Midwifery in the Republic of the Sudan. 2009;
76. Roome E, Raven J, Martineau T. Human resource management in post-conflict health systems: review of research and knowledge gaps. Confl Health [Internet]. 2014;8(1):18. Available from: <http://conflictandhealth.biomedcentral.com/articles/10.1186/1752-1505-8-18>
77. Tveit B, Evjen O, Buyanca L, Kårstad H. Developing Nurses/Midwives Education in South Sudan – a Pre Study. 2014;
78. Sorbye IK. A situation analysis of Reproductive Health in Somalia. 2009;(April).
79. Raja F. State of Afghanistan's Midwifery 2014, United Nations Population Fund

- (UNFPA). 2014; Available from: http://countryoffice.unfpa.org/filemanager/files/afghanistan/2014/reports/midwifery_report_2014_english.pdf
80. Fellow P, Lema ME. Road Map for Community Midwifery in Southern Sudan. *Methodology*. 2010;(June):1–62.
 81. Warren N, Norr KF, Keeney GB. Matroniya: The Lived Experiences of Rural Auxiliary Midwives in Koutiala, Mali. *Health Care Women Int* [Internet]. 2012;34(6):482–98. Available from: <http://dx.doi.org/10.1080/07399332.2012.673659>
<http://www.tandfonline.com.proxy.library.emory.edu/doi/full/10.1080/07399332.2012.673659#.VBnsvflfh4>
<http://www.tandfonline.com.proxy.library.emory.edu/doi/pdf/10.1080/07399332.2012.673659>
 82. USAID. Program Evaluation of The Pre-Service Midwifery Education Program in Afghanistan. Final Phase One Report. 2009;
 83. Hurley EA, Warren NE, Doumbia S, Winch PJ. Exploring the connectedness of rural auxiliary midwives to social networks in Koutiala, Mali. *Midwifery* [Internet]. 2014;30(1):123–9. Available from: <http://dx.doi.org/10.1016/j.midw.2013.03.002>
 84. Mansoor GF, Hashemy P, Gohar F, Wood ME, Ayoubi SF, Todd CS. Midwifery retention and coverage and impact on service utilisation in afghanistan. *Midwifery* [Internet]. 2013;29(10):1088–94. Available from: <http://dx.doi.org/10.1016/j.midw.2013.07.021>
 85. Daniel H, De. Evaluation of the Capacity Project's Human Resources Information Systems (HRIS) Strengthening Process in Swaziland , Uganda and Rwanda. Consult Kairie Morgan Consult. 2009;(July).
 86. Mohmand KA. Community midwifery education program in afghanistan. 2013;(August).
 87. 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* [Internet]. 2014;30(10):1056–62. Available from: <http://dx.doi.org/10.1016/j.midw.2013.10.026>
 88. 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.
89. Niazi N. A Comparison and Analysis of Community Midwifery Education Programs in Afghanistan with other Countries. 2015;
 90. Mansoor GF, Hill PS, Barss P. Midwifery training in post-conflict Afghanistan : tensions between educational standards and rural community needs. 2012;(January 2011):60–8.
 91. Noorani QA, Azam I, Shaikh BT, Ranasinghe T, Abbas S, Wali S, et al. Role of community based savings groups (CBSGs) enhancing the utilization of community midwives in chitral district of Pakistan. *BMC Pregnancy Childbirth* [Internet]. 2013;13(1):185. Available from: <http://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-13-185>
 92. International confederation of midwives, Essential competencies for basic midwifery practice. 2013;(Icm):1–11.
 93. 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. 2014;14(1):1–12.
 94. Wood ME, Mansoor GF, Hashemy P, Namey E, Gohar F, Ayoubi SF, et al. Factors influencing the retention of midwives in the public sector in Afghanistan: A qualitative assessment of midwives in eight provinces. *Midwifery* [Internet]. 2013;29(10):1137–44. Available from: <http://dx.doi.org/10.1016/j.midw.2013.07.004>
 95. Roskam E, Pariyo G, Hounton S, Aiga H. Increasing skilled birth attendance through midwifery workforce management. *Int J Health Plann Manage*. 2013;28(1):62–71.
 96. Pascal Zurn , Laurence Codjia, Farba Lamine Sall J-MB. How to recruit and retain health workers in underserved areas: the Senegalese experience. *Bulletin of the World Health Organization*. 2010;
 97. Henderson LN, Tulloch J. Incentives for retaining and motivating health workers in Pacific and Asian countries. *Hum Resour Health* [Internet]. 2008;6(1):18. Available from: <http://human-resources->

health.biomedcentral.com/articles/10.1186/1478-4491-6-18

98. Gamal AM, Team E. Sudan.UNFPA|Assessment of the Effective Deployment , Retention and Performance of the Graduate Village Midwives (VMWs) 2008-2010. 2011;(November):2008–10.
99. Murphy GT, Goma F, MacKenzie A, Bradish S, Price S, Nzala S, et al. A scoping review of training and deployment policies for human resources for health for maternal, newborn, and child health in rural Africa. *Hum Resour Heal HumResourHealth*. 2014;72.
100. Araújo E, Maeda A. How To Recruit and Retain Health Workers in rural and Remote Areas in Developing Countries: a guidance note. The World Bank. 2013.
101. World Health Organization. Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations. World Health Organization, 2010.
102. Mumtaz Z, Cutherell A, Bhatti A. Saving mothers and newborns in communities: strengthening community midwives to provide high quality essential newborn and maternal care in Baluchistan, Pakistan in a financially sustainable manner. *BMC Pregnancy Childbirth* [Internet]. 2014;14(1):131. Available from: <http://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-14-131>
103. Wurie HR, Samai M, Witter S. Retention of health workers in rural Sierra Leone: findings from life histories. *Hum Resour Health* [Internet]. 2016;14(1):3. Available from: <http://www.human-resources-health.com/content/14/1/3>