THE STATE OF THE
WORLD'S MIDWIFERY

ANALYSIS OF THE MIDWIFERY WORKFORCE IN SELECTED ARAB COUNTRIES

REPRODUCTIVE HEALTH

PREGNANCY

CHILDBIRTH

POSTNATAL

UNFPA

CONTRIBUTORS AND ACKNOWLEDGEMENTS

ABBREVIATIONS AND ACRONYMS

AAAQ	availability, accessibility, acceptability, quality
ASRO	Arab States Regional Office
CS	caesarean section
EmONC	emergency obstetric and newborn care
HRH	human resources for health
ICM	International Confederation of Midwives
ISCO	International Standard Classification of Occupations
LMD	license, masters, doctorate
MDG	Millennium Development Goal
MNH	maternal and newborn health
MNCH	maternal, newborn and child health
NORWAC	Norwegian Aid Committee
SBA	skilled birth attendance
SDG	Sustainable Development Goal
SoWMy	State of the World's Midwifery
SRMNH	sexual, reproductive, maternal and newborn health
UNFPA	United Nations Population Fund
WHO	World Health Organization

Cover photo: A midwife in Somalia happy after assisting with the birth of twins. *(UNFPA)*

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FOREWORD

Arab States have made significant progress in improving sexual, reproductive, maternal and newborn health (SRMNH) over the past 15 years, with mortality rates reaching historically low levels as we conclude the Millennium Development Goal era and enter the post-2015 Sustainable Development Goals era. New and more far-reaching goals, targets and indicators will be published later this year. The Arab States region should aspire to maintain, and in some areas accelerate, recent progress.

With strong leadership and adequate resources, we can prevent the vast majority of maternal and newborn deaths in this region and safeguard the health and well-being of our women and newborns, by improving the availability, accessibility, acceptability and quality of SRMNH services. This can only be done with an adequate, skilled and competent midwifery workforce. This report paints a comprehensive picture of the current state of the region's midwifery workforce and provides clear pointers for its future development in the framework of sound SRMNH policies.

This region is diverse, including countries with an excellent SRMNH track record and countries that still have a long way to go to improve SRMNH. Analysis in this report draws on data from 13 of these countries, at different stages of development, with different health systems and different midwifery workforce strategies. The report provides an up-to-date and comprehensive body of research to stimulate policy discussion and evidence-based decision-making at national and subnational levels to enable Arab states to ensure that women fully exercise their reproductive rights and that they and their newborns obtain the care they need.

Many countries in the Arab region currently face political, economic and social challenges. In some countries, humanitarian crises associated with massive displacement of women and children have caused significant setbacks to previous improvements in SRMNH. It was difficult to collect reliable data from war zones and conflict areas, but we were able to gather accounts highlighting the essential and life-saving services that midwives provide to women in these settings.

I am very pleased that this report coincides with the launching of the second round of the United Nations Secretary-General's *Every Woman Every Child* initiative for the period 2016–2030. The country profiles and in-depth analysis of the state of midwifery in the region presented here provide an excellent basis for Arab States to implement this global initiative in the region.

I commend this report to all involved in the organization and provision of SRMNH services in the Arab States region.

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EXECUTIVE SUMMARY

This report takes its inspiration from the United Nations Secretary-General's *Every Woman Every Child* initiative and his call for countries to do everything possible to protect the lives and futures of all women and children. It follows the approach used for the *State of the World's Midwifery 2014* report, but focuses on 13 selected Arab countries in the United Nations Population Fund (UNFPA) Arab States region: Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Palestine, Somalia, Sudan, Tunisia and Yemen.

Moroccan midwife cares for a newborn baby.
(UNFPA)

This report has been coordinated by the UNFPA Arab States Regional Office. It is primarily intended to provide an evidence base to support policy dialogue at national and regional levels, to assist countries in the region to meet the challenges of the post-2015 agenda on sexual, reproductive, maternal and newborn health (SRMNH). A strong midwifery workforce is essential to the success of UNFPA's strategies for improving SRMNH (increased coverage of skilled attendance at birth, family planning, postnatal care and emergency obstetric care). Understanding the current state of the midwifery workforce is necessary to allow countries to identify the specific challenges, gaps and bottlenecks which need to be addressed in order to strengthen this workforce, and to consider suitable strategies for overcoming them.

In this report "midwifery" is defined as "the health services and health workforce needed to support and care for women and newborns, including their sexual and reproductive health, and especially pregnancy, labour and postnatal care". The definition extends beyond providing care during childbirth, and is not confined to those with the job title "midwife"; all health professionals engaged in SRMNH care have a part to play, and are therefore included in the workforce addressed by this report.

A strong midwifery workforce is essential to the success of UNFPA's strategies for improving SRMNH

The evidence and analysis in this report are structured according to the four domains that determine whether a health system and its work-force are providing effective coverage, i.e. whether women are obtaining the SRMNH care and ser-vices they want and need. These four domains are: availability, accessibility, acceptability and quality.

Availability: This report provides country-specific estimates of the need for SRMNH services, which can be converted into estimates of the need for the midwifery workforce. Midwives, when educated and regulated to international standards, have the competencies to meet 95% of the need for SRMNH services in the 13 countries featured in this report. However, midwives and nurse-midwives make up only 34% of the full-time equivalent SRMNH workforce in the 13 countries.

Based on current population levels and epide-miological conditions, it is estimated that the midwifery workforce in these 13 countries needs to provide just over 200 million consultations per year for family planning, antenatal and postnatal care and to attend 7.9 million births per year. The SRMNH workforce is estimated to be sufficiently large to meet all of the need in 3 of the 13 coun-tries. In the remaining countries, estimates of the level of met need range from 22% to 98%.

The analysis reveals that a simple headcount of SRMNH workers is insufficient to estimate the availability of SRMNH services, because many cadres do not work full-time on SRMNH. Similarly, the use of job titles to assess the availability of midwifery workers can be misleading: for example, not all health workers with the job title "midwife" are competent to perform all midwifery tasks. Therefore, an apparently high level of availability can mask significant gaps in the care that the mid-wifery workforce is able to provide.

Many of the participating countries found it dif-ficult to provide the necessary data on SRMNH

◉⟿ KEY MESSAGES

① **THE 13 COUNTRIES INCLUDED IN THIS REPORT REFLECT THE DIVERSITY ACROSS THE ARAB REGION:** some countries have very low rates of maternal and neonatal mortality and very large health workforces, whereas others have very high mortality rates and workforces that are too small to provide basic SRMNH care to all those who need it.

② **ONLY 3 OF THE 13 COUNTRIES** have a midwifery workforce that is sufficiently large to meet the need for the 46 essential interventions for sexual, reproductive, maternal and newborn health (SRMNH).
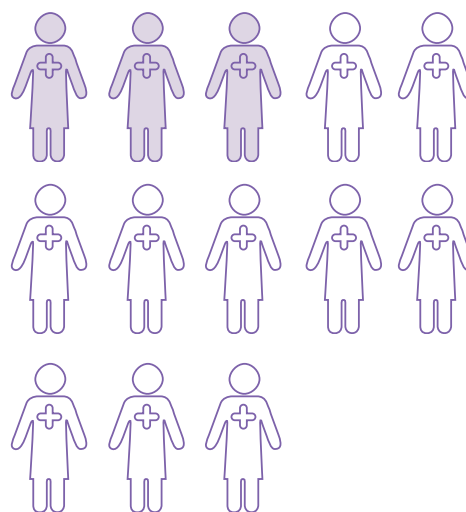
workforce availability for this report. It is therefore important that systems for collecting, collating and analysing workforce data are improved in all countries, so that workforce policy and planning can be properly evidence-based. The accurate collection of a minimum of 10 data items is recommended: headcount, percentage time spent on SRMNH, roles and responsibilities, age distribution, retirement age, length of education, number of students enrolling per year, education attrition rate, number of graduates per year, and voluntary attrition from the workforce.

Accessibility: Although all 13 countries recognize the importance of financial accessibility and have a policy of offering at least some essential elements of SRMNH care free of charge at the point of access, none provides a national "minimum guaranteed benefits package" for SRMNH that includes all of the essential SRMNH interventions. Gaps in the essential interventions include those designed to prevent or treat the most common causes of

maternal and neonatal mortality and morbidity, e.g. calcium supplementation to prevent hypertension, safe abortion, low dose aspirin to prevent pre-eclampsia and corticosteroids to prevent respiratory distress syndrome in preterm babies.

Due to lack of geographical data on the locations of health facilities and health workers, this report does not attempt to estimate the level of geographical accessibility of SRMNH services. Accessibility is generally estimated to be lower in rural areas than in urban areas so, even if a country has a workforce which is sufficiently large to meet 100% of the need, it cannot be assumed that the need is met in all parts of the country. Improving geographical accessibility requires making all urban and rural areas more attractive to the midwifery workforce as places in which to live and work (e.g. by improving transport, housing, utilities and education) and improving health infrastructure and health systems in underserved areas.

3 The size of the midwifery workforce is an essential building block for effective coverage of SRMNH services, but **EFFECTIVE COVERAGE DEPENDS ALSO ON ACCESSIBILITY, ACCEPTABILITY AND QUALITY.** Countries with insufficiently large workforces must focus on increasing the availability of midwifery services, and all countries should address the identified challenges to the provision of SRMNH care that is accessible, acceptable and high-quality.
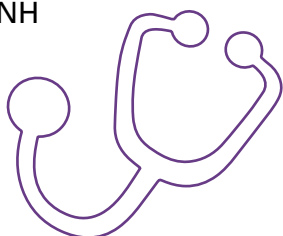
4 Countries are endeavouring to expand and deliver equitable midwifery services, but **COMPREHENSIVE, DISAGGREGATED DATA** for determining the availability, accessibility, acceptability and quality of the midwifery workforce **ARE NOT AVAILABLE.**
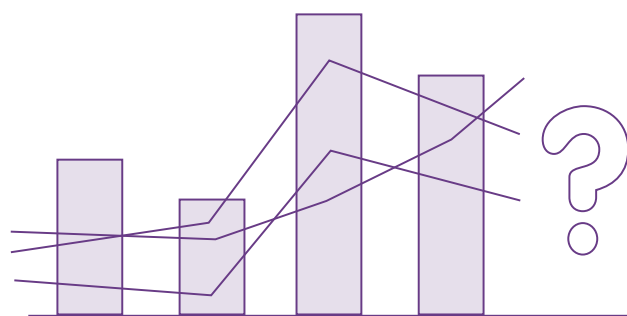
Geography is one aspect of equitable access; wealth is another. There is evidence that, in many countries of this region, the wealthier sectors of society enjoy higher levels of accessibility to SRMNH services than the poorer sectors. There is a balance to be struck between over- and under-medicalization: in some countries, those living in poverty cannot access emergency care such as caesarean sections when needed, yet in some countries the caesarean section rate (particularly among the rich) is so high as to trigger concerns about the possible impact on mortality and morbidity rates.

Another issue affecting some countries in the region is how to make SRMNH services accessible to refugees and internally displaced persons. This is a challenge both in terms of ensuring that the affected women and newborns have equal opportunity to access SRMNH care, and in terms of ensuring that the provision of this care does not over-stretch the receiving country or region's

SRMNH services, so that the rest of the population can still access the same level of care.

Acceptability: Eight of the 13 countries covered by this report stated that at least one national policy document specifically addresses how the country will deliver SRMNH care that is sensitive to social, cultural and traditional needs, e.g. in relation to age, gender, ethnicity, religion and language. However, very few were aware of any recent studies of public perceptions of midwives and midwifery practice in their country, so the extent to which the care provided is acceptable is largely unknown.

Most countries identified at least one reason why a woman might be uncomfortable seeking care from a midwife. The main reasons identified were lack of understanding of midwives and their competencies (e.g. viewing them as assistants to physicians, rather than as competent independent practitioners) and a perception that it is more

🗝 KEY MESSAGES

⑤ Accurate data on the midwifery workforce enable countries to plan effectively. This requires **A MINIMUM OF 10 PIECES OF INFORMATION THAT ALL COUNTRIES SHOULD COLLECT:** headcount, percentage time spent on SRMNH, roles, age distribution, retirement age, length of education, enrolments into, attrition and graduation from education, and voluntary attrition from the workforce.

⑥ In order for the midwifery workforce to work effectively, **FACILITIES NEED TO BE EQUIPPED TO OFFER THE APPROPRIATE SERVICES,** including for emergencies (safe blood, caesarean sections, newborn resuscitation).

prestigious to consult a physician than a midwife. This indicates a need for better public information about the role and competencies of midwives and/or support for professional associations to promote the known benefits of midwife-led care. It is notable that only 6 of the 13 countries apply legislation which recognizes midwifery as a regulated profession. The creation (where it does not exist) and application (where it does exist) of such legislation would be an important public acknowledgement of the worth of midwives.

Quality: There are many dimensions to quality of care. The International Confederation of Midwives has identified education, regulation and association as the three pillars of a strong, high-quality midwifery profession, and this report focuses mainly on these three aspects of quality.

Countries in this region generally have standardized curricula for those being educated to join the midwifery workforce, but most experience some challenges in delivering the curriculum content. The most common challenges are: difficulty of recruiting suitably qualified teaching staff, lack of opportunities for teaching staff to keep their practical skills up to date, insufficient or poor quality equipment and insufficient opportunities for students to gain practical experience in health facilities.

Nearly all of the 13 countries have at least one organization with responsibility for regulating midwifery practice. The existence of such an organization is necessary, but not sufficient, to ensure effective regulation. For example, only about half of the countries featured in this report said that their regulatory organization is responsible for setting standards of professional ethics, accrediting education providers or investigating alleged misconduct or incompetence. Similarly, only half have a licensing system for midwives, and only two countries make continuing professional development a condition of re-licensing.

7 Legislation, regulation and licensing of midwifery allow midwives to provide the high-quality care they are educated to deliver and thus protects the health of women and newborns. High-quality midwifery care for women and newborns saves lives and **CONTRIBUTES TO HEALTHY FAMILIES AND MORE PRODUCTIVE COMMUNITIES**.
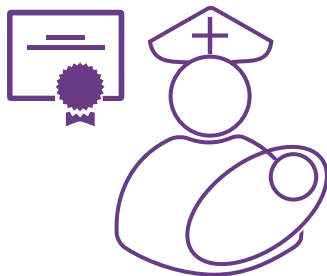
8 Midwives who are educated and regulated to international standards can provide **95% OF THE ESSENTIAL CARE NEEDED** for women and newborns in the 13 selected countries. Midwives make a unique contribution to the process of "normal" birth and thus the avoidance of over-medicalization. Midwifery-led models of care free other health workers to focus on other health needs. Thus, **MIDWIFERY CAN MAKE A HUGE CONTRIBUTION TO THE AGENDA OF ENDING PREVENTABLE MATERNAL AND NEWBORN DEATHS**, and improving the health and well-being of women and children.

95%
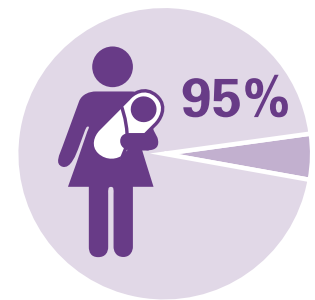
Nearly all countries have at least one professional association, college or union which is open to midwives, nurse-midwives or auxiliary midwives, and nearly all of these are specifically for midwives/nurse-midwives. Nearly all of the professional associations in the region play a role in continuing professional development, advise their government on policy documents and advise members of quality standards.

Conclusion

The availability of the midwifery workforce is essential to the provision of SRMNH services, but the effective coverage of SRMNH services depends as much on accessibility, acceptability and quality as on availability. It should be noted that the country briefs in this report focus solely on the "availability" dimension of effective coverage. Countries with low levels of met need for SRMNH care need to focus on availability as the foundation for improving effective coverage. All countries, whether their met need estimate is high or low, should address the identified challenges to the provision of SRMNH care that is accessible, acceptable and of high quality. Depending on the country context, this may require action in several areas:

• Collecting accurate, timely workforce data

• Filling gaps in the interventions provided free at the point of access

• Reducing geographical and other inequities in accessibility

• Providing better care to refugees and internally displaced persons without adversely affecting the care provided to the rest of the population

• Acquiring knowledge and understanding of the wishes and needs of women and their families

• Changing the perception that consulting a midwife is less prestigious than consulting a doctor

• Increasing the number of suitably qualified midwifery teaching staff

• Creating opportunities for clinical experience during pre-service education

• Strengthening regulation mechanisms.

In September 2013, the United Nations Secretary-General presented a report entitled *A Life of Dignity for All* [1], which set out a vision of every woman and girl achieving "equal access to health services, including sexual and reproductive health and reproductive rights" as part of the increasing momentum towards the realization of universal health coverage.

The second State of the World's Midwifery (SoWMy) report (*SoWMy 2014*) [2] was launched in June 2014. The main objective of that report was to provide an evidence base on the state of the world's midwifery that would:

• support policy dialogue between governments and their partners

• accelerate progress on the health Millennium Development Goals (MDGs)

• identify developments in the three years since the first SoWMy report was published in 2011

• inform negotiations for and preparation of the post-2015 development agenda [3]

SoWMy 2014 focused on the low- and middle-income countries that are included in the Countdown to 2015 reports [4]. The report contained detailed information on the midwifery workforce and enabling environment in each country to inform national efforts to achieve universal, sustained and equitable coverage of sexual, reproductive, maternal and newborn health (SRMNH) care.

The Arab States Regional Office (ASRO) of the United Nations Population Fund (UNFPA) commissioned this report to focus on the state of midwifery in the region. Thirteen countries responded to the survey questions (Table 1). The six countries that were not included in *SoWMy 2014* were asked to complete the same SoWMy questionnaire, which covers the midwifery workforce, education, regulation, professional associations, policy and planning frameworks, and progress since 2011. Their responses were added to those from the seven *SoWMy 2014* countries, to enable an analysis of the state of midwifery in a number of countries representing the diversity of the region.

Just over 14,000 maternal deaths [5], 150,000 neonatal deaths [6] and 120,000 stillbirths [6] occur each year in the 13 countries covered by this report. The region contains considerable

<table>
<tr><td colspan="2">TABLE 1</td></tr>
<tr><td colspan="2">Countries included in this report</td></tr>
<tr><td>Countries included in SoWMy</td><td>Countries added for this regional report</td></tr>
<tr><td>Djibouti</td><td>Algeria</td></tr>
<tr><td>Egypt</td><td>Jordan</td></tr>
<tr><td>Iraq</td><td>Lebanon</td></tr>
<tr><td>Morocco</td><td>Oman</td></tr>
<tr><td>Somalia</td><td>State of Palestine</td></tr>
<tr><td>Sudan</td><td>Tunisia</td></tr>
<tr><td>Yemen</td><td></td></tr>
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diversity, some countries having very high mortality rates (Djibouti, Somalia, Sudan and Yemen) and others very low mortality rates (Lebanon and Oman). The 13 countries account for about 4% of the world's population [7], and about 5% of the world's maternal and newborn deaths [5,6] but just 3% of the world's physicians, nurses and midwives [8]. Four countries (Djibouti, Somalia, Sudan and Yemen) have fewer than one physician and one midwife or nurse per 1,000 population, whereas others (notably Jordan, Lebanon and Oman) have much higher densities of these key health workers (at least 2 physicians and 2.5 midwives or nurses per 1,000 population) [8].

Figure 1 shows the progress that each country has made since 1990 on maternal and newborn mortality. All 13 countries have achieved reduc-

tions in both, with the greatest progress observed in Lebanon and Omar, which were reported to have achieved the MDG in maternal health (MDG 5) of 75% reduction in maternal mortality, while others such as Egypt, Morocco and Tunisia are progressing but still short of reaching the 75% reduction goal. Meanwhile, Somalia is the country with the slowest progress in maternal mortality reduction, both in the region and globally. Most countries have achieved greater declines in maternal mortality than in newborn mortality, the exceptions being Egypt, Jordan, Tunisia and Yemen.

Despite this encouraging progress, in many of the selected Arab countries more needs to be done to improve SRMNH. UNFPA has a three-pronged strategy for reducing maternal mortality and morbidity: (1) increasing access to skilled birth attendants, (2) improving access to family planning services, and (3) increasing access to emergency obstetric care when needed [9]. Additionally, increasing access to postnatal care is a crucial strategy for reducing newborn mortality and morbidity [10]. It is clear that midwifery can make significant contributions to these strategies.

Improvement in midwifery will help to achieve the targets set in the MDGs and will help countries to move towards the provision of universal access to SRMNH care. Global policy and strategy documents such as *Strategies Toward Ending Preventable Maternal Mortality* [11]*, Every Newborn: an action plan to end preventable deaths* [12] and the *Progress Report of the Global Strategy for Women's and Children's Health* [13] call for investment in the SRMNH workforce and the development of midwifery services operating within an enabling environment. For the countries in this report, relevant regional initiatives include the 2013 Dubai Declaration, which committed to accelerate progress towards MDGs 4 and 5 in the Eastern Mediterranean, including a commitment to workforce strengthening [14], the Middle East and North Africa Midwifery Collaborative (inaugural workshop held in 2012) [15], the 2013 Middle East and North Africa

FIGURE 1 **Percentage reduction in maternal mortality ratio and neonatal mortality rate, 13 selected Arab countries, 1990 and 2013**

Country	% reduction in maternal mortality ratio 1990-2013	% reduction in neonatal mortality rate 1990-2013
Oman	77	65
Lebanon	76	67
Egypt	62	63
Morocco	61	50
Palestine	51	42
Sudan	50	27
Tunisia	50	63
Algeria	44	38
Djibouti	43	28
Jordan	42	42
Yemen	41	44
Iraq	37	28
Somalia	34	11
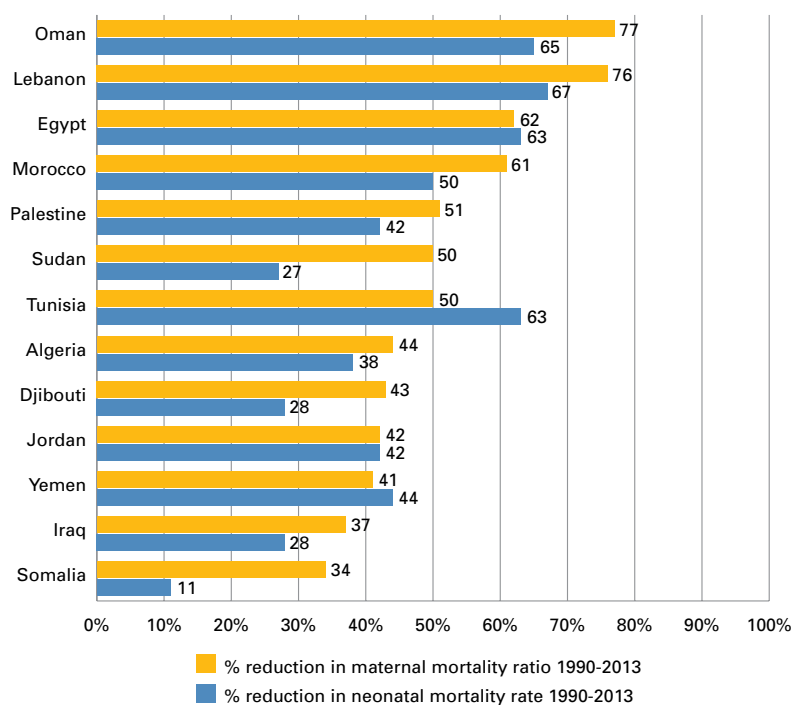
Sources: World Health Organization [5] and Healthy Newborn Network [6]

Regional Consultation on Women's Health and Rights, which recommended the empowerment of midwives within healthcare models in the region [16], and the Arab States regional midwifery conference in Riyadh, Kingdom of Saudi Arabia in 2014.. For countries in Africa, prominent initiatives include the *Campaign on Accelerated Reduction of Maternal Newborn and Child Mortality in Africa* (CARMMA) [17] and the *Maputo Plan of Action to Curb Maternal Deaths in Africa* [18].

A number of new movements and initiatives are maintaining the focus on SRMNH in the post-2015 era: the United Nations Secretary-General's Global Strategy for Women's and Children's Health is being updated for 2016–2030 as the Global Strategy for Women's, Children's and Adolescents' Health. Its launch in September 2015 will coincide with the adoption of the Sustainable Development Goals (SDGs) by the United Nations General Assembly. The SDGs will be applicable to all countries [19], even those with relatively good maternal and newborn outcomes. SDG 3 aims to "ensure healthy lives and promote well-being for all at all ages", and includes specific targets

to reduce the maternal mortality ratio, end preventable deaths of newborns, ensure universal access to sexual and reproductive health services, and achieve universal health coverage including financial risk protection [20]. This report should be considered as a contribution to the policy dialogue regarding the fulfilment of the SDGs relevant to SRMNH.

What is midwifery? The definition of "midwifery" used in this report (as in *SoWMy 2014*) is: the health services and health workforce needed to support and care for women and newborns, including sexual and reproductive health and especially pregnancy, labour and postnatal care. This includes a full package of sexual and reproductive health services, including preventing mother-to-child transmission of HIV, preventing and treating sexually transmitted infections and HIV, preventing unwanted pregnancy, dealing with the consequences of unsafe abortion, and providing safe abortion where it is not against the law. The definition therefore extends beyond providing care during childbirth, and is not confined to those with the job title "midwife": all health professionals engaged in SRMNH care have a part

to play in the provision of midwifery services under the SoWMy definition, and are therefore included in this report.

The job titles used to describe midwives vary by country. In this report, the term "midwife" includes those health professionals who are educated to undertake the roles and responsibilities of a midwife regardless of their educational pathway to midwifery (i.e. whether direct-entry or after basic nursing training). This report does not seek to promote one definition over another, nor to prescribe the terms that should be used to describe midwifery services and the midwifery workforce. Rather, it aims to contribute to the evidence base, using terms that enable comparison across countries, which can inform new policy dialogue and action in support of high-quality midwifery services and the rights of women and their newborns to obtain high-quality health care.

About this report
World Health Organization (WHO) and UNFPA representatives in the seven Countdown countries that were included in the main *SoWMy 2014* report and UNFPA representatives in the six non-Countdown countries added to this report coordinated the completion of the SoWMy questionnaire, which was made available in both French and English. National stakeholders and experts were consulted during the process of questionnaire completion. For the seven countries that were included in *SoWMy 2014*, data collection took place between October 2013 and February 2014, and for the six remaining countries, data collection took place between September 2014 and May 2015

Chapter 2 provides an analysis of the availability, accessibility, acceptability and quality of midwifery services across the 13 countries, and Chapter 3 includes a two-page "country brief" for each country. The country briefs are a mix of current data and needs-based projections for the period from 2012 to 2030. All projections are sensitive to the quality of data informing them, and involve a number of assumptions, including the assumption that human resources are allocated according to the principle of economic efficiency, which may or may not reflect the reality in any given country. The briefs should therefore be used, not as fact-sheets, but as a focus for discussion to review and improve the quality of data, and to stimulate debate about different policy options within countries. An advocacy and communications toolkit on how to use the report to inform policy dialogue at the country level is also available (in English, French and Spanish) [21].

THE CURRENT MIDWIFERY WORKFORCE IN 13 ARAB COUNTRIES

This chapter contains a broad assessment of the state of the region's midwifery, including an account of progress since 2011 (when the first SoWMy report was published). The chapter is based on 13 country responses to the SoWMy questionnaire, so it does not speak for all countries in the Arab region, but it does give an in-depth description of what women and newborns need in the 13 countries, the characteristics of the workforce that should serve them, and a detailed breakdown of what is actually available to them.

Evidence of progress since 2011

Countries were asked to report on new initiatives or significant events affecting the midwifery workforce since 2011, and the results are shown in Table 2. Several countries are addressing SRMNH workforce availability by increasing the number of people being trained and/or addressing geographical imbalances in availability. Several have also recognized the need for better data and strategic intelligence on which to base decisions and instituted new systems and mechanisms to collect and analyse human resources for health (HRH) data. A few countries are tackling financial accessibility by introducing services that are free at the point of access. Likewise, a few countries are trying to increase the acceptability of services by matching services to identified needs. Quality of care is high on the agenda for many countries, with several examples of improvements being made to midwifery education, regulation and/or professional associations.

What women and newborns need

In the 13 countries included in this report, the number of pregnancies is around 11 million per year, and is projected to remain at this level until 2030 (Figure 2). Within the region, countries in different geographical sub-regions exhibit different demographic trends.* Northern Africa accounts for the majority of pregnancies, but the annual number of these is expected to decline between 2012 and 2030, whereas for Eastern Africa and the Middle East the number of pregnancies is projected to show a slight increase. In countries where the number of pregnancies is increasing, the workforce will need to increase at an even faster rate to keep up with the demand for SRMNH services.

FIGURE 2 **Pregnancies in 13 countries (2012-2030)**
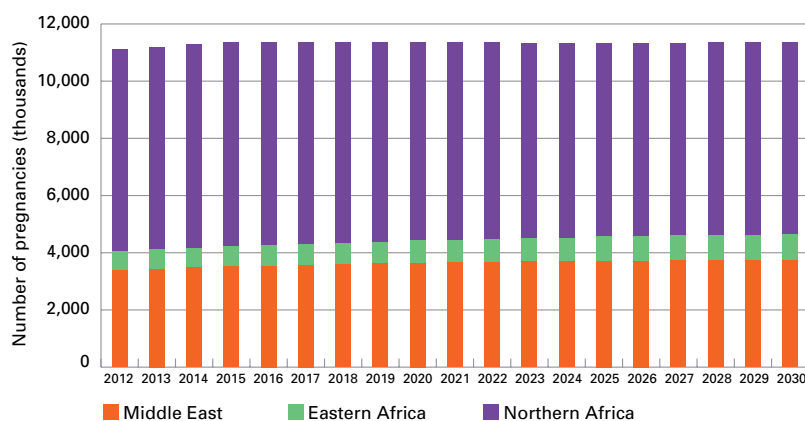
Source: Professor Andy Tatem, University of Southampton, based on methodology described in [22]

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* Northern Africa: Algeria, Egypt, Morocco, Sudan, Tunisia.
  Eastern Africa: Djibouti, Somalia.
  Middle East: Iraq, Jordan, Lebanon, Oman, Palestine, Yemen.

TABLE 2

New initiatives or significant events since 2011 affecting the midwifery workforce

Action	Number of countries	Examples
AVAILABLITITY		
Increased production of health workers (including midwives)	8	• There has been an increase in the annual number of new midwife graduates in Djibouti. • In Palestine, there have been increases in the number of accredited midwifery programmes, the number of student admissions to these programmes, and the number of midwifery faculty members.
Efforts to improve distribution of professionals with midwifery skills	3	• In Somalia, an Essential Package of Health Services introduced in 2014 aims to improve the distribution of health professionals within the country. • In Sudan, efforts are being made to tackle the unequal distribution of health workers with a recent programme to expand the number of primary health workers, including targeted training of 10,000 midwifery technicians.
Opening of new midwifery schools	2	• In Somalia, a new midwifery school opened in 2012. With more schools being built, by the end of 2015 there will be a total of 15 functioning and accredited schools in the country. • Morocco has also built new health worker training institutes.
ACCESSIBILITY		
Actions to improve data and information systems on which to base sexual, reproductive, maternal and newborn health decisions	8	• In Algeria, a maternal death audit system has been set up, as well as a health information system collecting data on all health activities, including those related to maternal and newborn health. • In Somalia, the health management information system is being strengthened with the support of United Nations agencies, and a directly responsible unit has been created in the Ministry of Health. • Palestine has started to develop a Human Resources for Health Observatory, located in the public health institute.
Actions to improve financial accessibility of midwifery services	3	• In Djibouti, a project on free access to maternal and newborn health care is in development. • In Yemen, a performance-based financing programme is being piloted, including free-of-charge maternal health services.
ACCEPTABILITY		
Actions to improve acceptability of midwifery services (e.g. respect and professionalism towards service users, clinic opening hours and waiting times)	3	• In Morocco, actions taken include upgrading hospital maternity wards and birthing houses to make them more respectful to users' needs, with a particular focus on rural and remote areas. • In Algeria, efforts are being made to improve access to specialists, particularly in obstetrics and gynaecology, and to ensure that health workers comply with work schedules.
QUALITY		
Creation or strengthening of professional associations	9	• Palestine reports that the midwifery association has been strengthened both domestically and internationally, and has joined the International Confederation of Midwives. • In Tunisia, between 2011 and 2014, three national associations, one Maghrebian association, a national council (registered as an association) and a trade union have been created in addition to the national association that has existed since 1989.
Development or updating of midwifery curricula	8	• In Egypt, a midwifery curriculum update is ongoing and neonatal resuscitation has been added to the curriculum. • In Lebanon, the curriculum is being adapted at one university to follow a competency-based approach. The new curriculum started in September 2014.
Introduction of new midwifery programmes/ qualifications	7	• In Morocco, the LMD (licence, masters and doctorate) system was introduced for midwifery education at the start of the 2013/14 academic year. • In Oman, the midwifery programme is being upgraded to a post-graduate diploma.
Improvements to the regulatory environment for midwifery	4	• Iraq reports the establishment of a High Midwifery Committee. • In Lebanon the national Midwives Council was established in April 2014.

Pregnancy projections allow more accurate estimation of the future level of SRMNH care required by women and newborns than population figures alone, but need to be tailored to the particular demographic and epidemiological context of each country. For example, the prevalence of HIV/AIDS and other sexually transmitted infections will determine the levels of counselling, testing and treatment required for these conditions, which has implications for the number and skill mix of providers needed in each country. Figure 3 shows an estimate of the midwifery services that women and newborns need in the 13 countries, in terms of numbers of visits with care providers, based on recommended coverage [23] for family planning, antenatal care (at least four visits), skilled birth attendance and postnatal care (at least four visits).

From the estimation of the total number of visits required in each country, the total need for the package of 46 essential SRMNH interventions can be calculated. To move closer to an estimate of the needed workforce, the total need for interventions can be multiplied by the time required to provide these interventions, using the One Health tool [24] based on the knowledge of experts. This enables the need for interventions to be translated into the need for full-time equivalent midwifery workers (Figure 4). Midwives, when educated and regulated to international standards, such as those set out by the International Confederation of Midwives (ICM) and WHO [25–29] have the competencies to deliver 95% of the estimated need in the 13 countries.

Towards universal access

This report explores the extent to which the midwifery workforce in the 13 featured countries has the capacity to facilitate universal access to SRMNH care and thereby achieve improvements to SRMNH. It does this by reference to the concept of 'effective coverage' (Box 1). Effective coverage is defined as the proportion of the population who need an intervention, receive that intervention and benefit from it [30, 31]. It

FIGURE 3   **Number of sexual, reproductive, maternal and newborn health visits needed in the 13 countries, 2012**

Total number of SRMNH visits:
390.3 million
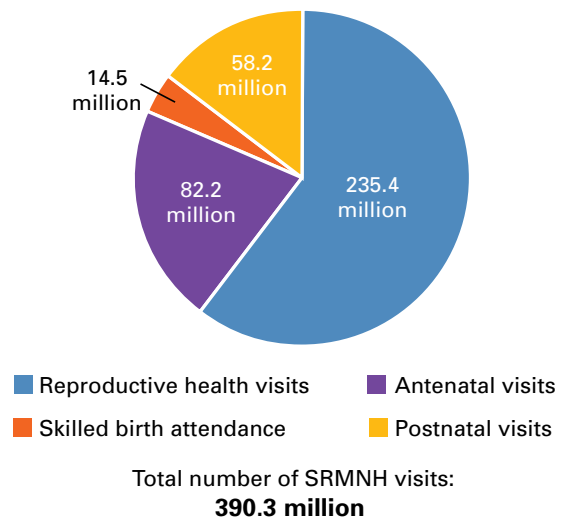
FIGURE 4   **Midwifery workforce: projected need of full time equivalent workers to deliver sexual, reproductive, maternal and newborn health services in the 13 countries, 2012**
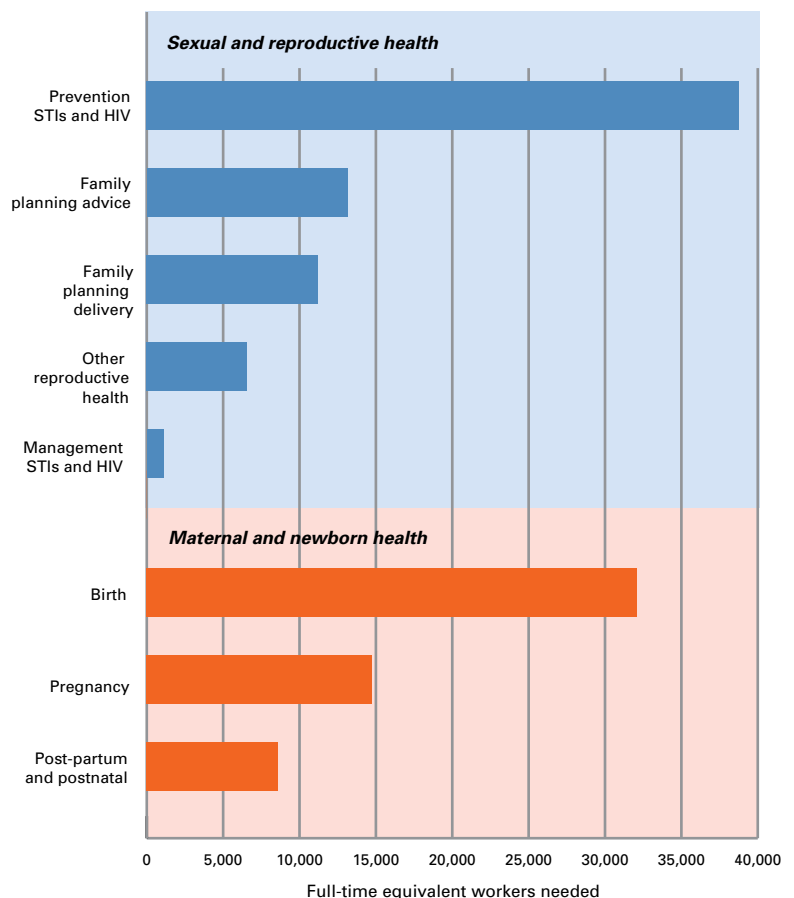
can be measured by the availability, accessibility, acceptability and quality of health services and of the personnel providing those services. This chapter uses these four dimensions to examine the readiness of the midwifery workforce to deliver universal access to SRMNH care.

What is the midwifery workforce?

The participating countries were asked to provide detailed information on the workers who make up the midwifery workforce, including: cadre names, percentage of available working time [42] spent on providing SRMNH services, roles and

Examining the midwifery workforce through the lens of effective coverage

The concept of "effective coverage" was developed by the World Health Organization (WHO) in the 1970s to explore the delivery of health services. In 1978 Tanahashi published a conceptual framework in the Bulletin of the WHO [32], which captured the simple logic of how each domain of availability, accessibility, acceptability and quality influences whether the population obtains health services that meet their requirements. Tanahashi argued that the simplicity of the logic could be applied to consider the effective coverage of all health services, or particular services and components of service delivery: for example SRMNH services and the midwifery workforce.

General Comment No. 14 [33] on the right to health, published in 2000,

mirrored the Tanahashi domains of availability, accessibility and acceptability, adding quality as the fourth domain (AAAQ). Article 12 states that "the right to health in all its forms and at all levels contains the following interrelated and essential elements, the precise application of which will depend on the conditions prevailing in a particular State Party", before listing each of the AAAQ domains and the obligations for all States. The use of the AAAQ domains is therefore of immediate value in exploring effective coverage, but also reinforces the right to health.

The use of the Tanahashi framework to explore human resources for health, and the AAAQ of the health workers who are at the core of service delivery, is enabling

new policy insights across countries [34–37]. Similar insights have been achieved when analysing SRMNH services [30, 38, 39] and the midwifery workforce [40]. New opportunities have thus been created to review barriers, challenges and opportunities in the delivery of effective coverage and are complementary to similar domains to measure quality of care in health systems.

The figure below illustrates the need to focus on measuring whether women obtain health services in relation to need and how the AAAQ of the midwifery workforce influences this. This logic underpins the discussion in Chapter 2, and echoes the latest guidance on monitoring progress towards universal health coverage [41].

Effective coverage as applied to SRMNH services and the midwifery workforce

	NEED	AVAILABILITY	ACCESSIBILITY	ACCEPTABILITY	QUALITY	OUTCOME
	• How many women of reproductive age? • How many pregnancies per year?	SRMNH services are **AVAILABLE?**	SRMNH services are **ACCESSIBLE?**	SRMNH services are **ACCEPTABLE?**	SRMNH services provide **QUALITY CARE?**	Outcomes are subject to the reductions in the AAAQ of SRMNH services
	Add the dimension of people-centred, woman-focused care, with professional teamwork and an enabled environment					
	Woman of reproductive age *seeking* support through reproductive health, pregnancy, labour and birth, & postnatal follow-up	• A midwife is available in or close to the community • As part of an integrated team of professionals, lay workers and community health services	• Woman attends • A midwife is available • As needed • Financial protection ensures no barriers to access	• Woman attends • A midwife is available • As needed • Providing respectful care	• Woman attends • A midwife is available • As needed • Providing respectful care • Competent and enabled to provide quality care	• Woman obtains quality care for all SRMNH services • She and her baby receive quality, follow-up postnatal care

CRUDE COVERAGE — EFFECTIVE COVERAGE — IMPACT

antenatal care increased
postnatal care increased
maternal mortality reduced
neonatal mortality reduced

Source: Adapted from Campbell et al, 2013 [34] Colston, 2011 [30].

A mother and her newborn in Syria. *(UNFPA)*

responsibilities, and length of education in years. The data show extensive cross-country variation in these key dimensions between health workers with similar cadre names. Therefore a more sophisticated classification of health workers is required to determine, for example, who is a skilled birth attendant, beyond simply examining cadre names.

The 13 countries identified 66 different cadres of workers in SRMNH, which were grouped into seven broad categories: midwives, nurse-midwives, nurses, auxiliaries (midwives and nurses), clinical officers and medical assistants, generalist physicians, and obstetricians/gynaecologists. These categories are based exclusively on each cadre's name as provided by the country, and do not reflect the cadre's professional recognition, roles or educational pathways. The rest of this chapter analyses these seven categories.

Figure 5 shows the distribution of the midwifery workforce in the 13 countries, by category of health worker. The first chart shows the composition of the total workforce by headcount: the number of health workers in each cadre. The second chart shows the composition of the SRMNH workforce by full-time equivalents, which is calculated by multiplying the total number of health

workers by the percentage of time they spend on SRMNH. The figure shows the importance of taking into account the percentage time spent on SRMNH by each cadre of worker when determining the composition of the midwifery workforce. Clearly, headcount measures give an inflated idea of the contribution by a cadre to SRMNH care if that cadre spends only a small proportion of its working time on the 46 essential interventions. It

FIGURE 5   **Midwifery workforce distribution in 13 countries, 2012**

ARAB STATES

TOTAL HEADCOUNT

Number of cadres with data on headcount: **63**

3% · 2% · 8% · 33% · 43% · 4% · 7%

FULL-TIME EQUIVALENT ON SEXUAL, REPRODUCTIVE MATERNAL AND NEWBORN HEALTH

Number of cadres with data on headcount and percentage time spent on SRMNH: **53**

14% · 27% · 7% · 11% · 2% · 4% · 35%

- ■ Midwives
- ■ Nurse-midwives
- ■ Nurses
- ■ Auxiliaries
- ■ Clinical officers & medical assistants
- ■ Generalist physicians
- ■ Obstetricians/ gynaecologists

is therefore necessary to convert the headcounts to full-time-equivalent workers. For example, nurses make up 43% of the workforce by headcount, but just 11% of the workforce in terms of full-time equivalents. Conversely, midwives and nurse-midwives make up only 10% of the midwifery workforce by headcount, but 34% of full-time equivalents. It is also notable that physicians account for a much larger proportion of the workforce in these 13 countries than in the 73

Countdown countries (49% and 25% of the full-time equivalent workforce, respectively).

There is great variability within the cadre categories regarding the percentage time that each cadre spends on providing SRMNH services, as well diversity in length of education, roles and responsibilities. The percentage of time spent on SRMNH was reported for 55 out of 66, or 83%, of cadres. Most categories of midwives, nurse-midwives, auxiliaries and obstetricians/gynaecologists spend 100% of their time on MNH, although this is not the case in all countries. For generalist physicians and nurses, the variability is much greater, due to the fact that these cadres usually have a greater range of responsibilities in general health care. On average, generalist physicians spend 48% of their time on MNH (country estimates varying between 10% and 100%) and on average, nurses spend 67% of their time on MNH (estimates varying between 50% and 100%).

There is also diversity in the extent to which cadres are responsible for carrying out all the tasks within the scope of midwifery practice. The International Labour Organization (ILO) publishes guidance on the International Standard Classification of Occupations (ISCO), specifying

FIGURE 6 **Job descriptions for midwifery cadres: do they include all midwifery tasks specified in International Standard Classification of Occupations (ISCO)?**

- ■ (orange) Job description does not include all midwifery tasks in ISCO 2008 guidance
- ■ (blue) Job description includes all midwifery tasks in ISCO 2008 guidance

ANALYSIS OF THE MIDWIFERY WORKFORCE IN SELECTED ARAB COUNTRIES
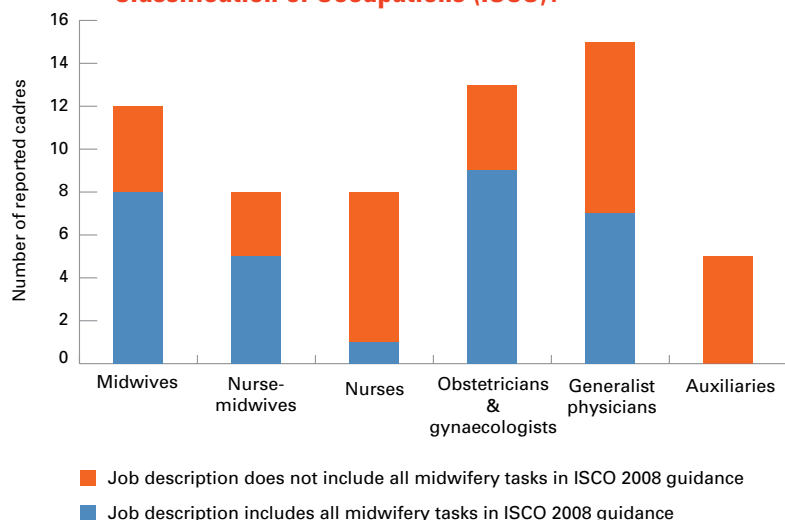
TABLE 3

Midwifery tasks not performed by all midwife/nurse-midwife cadres

Midwifery tasks not performed by all midwife/nurse-midwife cadres	Countries and cadres where midwife/nurse-midwife cadres do not perform this task
Recording maternal and foetal well-being on a partograph and identifying maternal and foetal distress and taking appropriate action, including referral where required	**Iraq:** midwives and nurse-midwives
Identifying any life threatening conditions in the newborn and taking essential life-saving measures, including, where necessary, active resuscitation as a component of the management of birth asphyxia, and referral where appropriate	**Jordan:** midwives
Providing postnatal care to women and their newborn infants, and post-abortion care where necessary	**Sudan:** midwives and nurse-midwives
Identifying illnesses and conditions detrimental to the health of women and/or their newborns in the postnatal period, applying first-line management (including the performance of life-saving procedures when needed) and, if required, making arrangements for effective referral	**Algeria:** midwives
Educating women (and their families) on how to prevent sexually transmitted infections including HIV	**Egypt:** nurse-midwives

the tasks within the scope of midwifery professionals (see Annex 7). For all the cadres reported by the countries in this report, Figure 6 shows how many have job descriptions that include all the ISCO midwifery tasks. For example, out of the 12 cadres of midwife reported by the countries, just 8 have all the ISCO midwifery tasks in their job description. Similarly, just five out of the eight cadres of nurse-midwife have all these tasks in their job description. In other words, cadre names are not always a good reflection of the responsibilities and competencies of the members of that cadre as they relate to midwifery. The most common tasks that midwife and nurse-midwife cadres *do not* perform are shown in Table 3.

There is also great diversity between categories in terms of length of education. The length of education reported for midwives varied between 3 and 5 years, and for nurse-midwives between 1.5 and 5 years, which is in line with ICM standards. Obstetricians/gynaecologists trained for between 8 and 13 years. For auxiliaries the data were more homogenous; their education ranged from 1 to 2 years. Training of generalist physicians ranged from 6 to 8 years.

KEY FINDINGS

Evidence of progress and the composition of the midwifery workforce

▶ Since 2011, countries in the region have taken bold steps to improve midwifery services, but much remains to be done.

▶ Projected changes in the number of pregnancies per year and information about context specific epidemiology provide new insights to inform the necessary size and composition of the midwifery workforce.

▶ Women's need for the 46 essential SRMNH interventions can be quantified: in 2012, this is estimated as 375.8 million visits for family planning, antenatal and postnatal care, and 14.5 million births in the 13 countries of this region.

▶ Midwives, when educated and regulated to international standards, have the competencies to deliver 95% of the estimated need in the 13 countries.

▶ Countries should consider the availability, accessibility, acceptability and quality of the midwifery workforce in order to provide high-quality SRMNH services.

▶ There is remarkable diversity in the type of health workers contributing to the delivery of SRMNH services, including significant differences between national use of cadre names and international standards for roles, education and regulation. Therefore, national cadre names do not form a strong basis for cross-country comparison of the midwifery workforce, or the classification of workers as skilled birth attendants.

Availability

The first dimension of the effective coverage framework is availability, of both workforce and services. An initial rough estimate of availability can be gained from the headcount of all workers in the workforce. The 13 countries reported a total of 323,801 workers engaged in providing SRMNH care. However, the headcount alone does not provide an accurate picture of the real availability of the workforce, as many of these workers spend only some of their time on SRMNH. Figure 7 shows the difference between the headcount of the workforce and the full-time-equivalent workforce. The first column shows the headcount. The second column shows a more accurate estimate of availability, by multiplying the headcount of each cadre by the percentage of time workers spend on providing SRMNH care. For the 53 cadres where percentage time spent on SRMNH was reported, the full-time-equivalent workforce is less than 60% of the entire midwifery workforce.

To determine whether this availability is sufficient to deliver universal coverage, it is necessary to examine each country's particular need for midwifery services. This need will be driven by multiple demographic and epidemiological factors, and cannot be reduced to global benchmarks that promote a minimum number of health workers per 1,000 population, particularly because this minimum number is often interpreted as a "target". Workforce planning in relation to need must take account of the country context.

The country briefs in Chapter 3 present a needs-based analysis of the availability of the current and projected future midwifery workforce for each country. This approach depends on 10 essential pieces of information that all countries should collect (Box 2). The routine collection of these 10 data items is essential to facilitate effective workforce planning. However, only one of the countries in the survey (Palestine) was able

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FIGURE 7   **Midwifery workforce: headcount versus full-time equivalent**
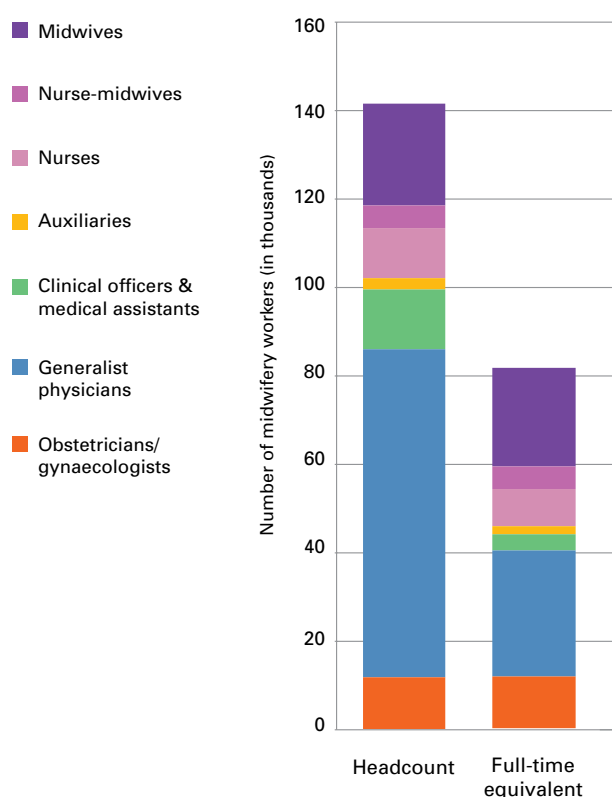
- Midwives
- Nurse-midwives
- Nurses
- Auxiliaries
- Clinical officers & medical assistants
- Generalist physicians
- Obstetricians/ gynaecologists

Number of midwifery workers (in thousands)

Headcount   Full-time equivalent

---

to provide all these data for all SRMNH cadres, and only four countries (Palestine, Lebanon, Morocco and Yemen) were able to provide all these data at least for the cadre of midwives.

Workforce planning requires an understanding of the education pipeline, as this directly determines the future availability of health workers. However, enrolment, graduation and student attrition data from countries in the region are often missing or inconsistent, indicating a possible disconnect between HRH management systems and health education planning systems. Education planning should consider the availability of high-quality training places, across the private and public sectors, taking into account student selection and attrition.

Pathways from education into the workforce must also be appropriately managed. Educating health workers for whom there is no job, or whose postings are delayed, is a poor use of resources. Some countries in the survey reported that graduates may take longer than a year to join the workforce, which can lead to a deterioration of clinical skills. However, the actual percentage of graduates joining the workforce within one year of graduation was not reported for over half of the country cadres.

Data on voluntary attrition, the number of workers leaving the workforce voluntarily each year, are also essential for the effective management of exits from the workforce. However, as Figure 8 shows, these data were not provided for over half of cadres, creating a significant barrier to understanding the availability of the workforce. It is also likely that attrition was underreported for many cadres [44]

The workforce also diminishes as workers reach the age of retirement; the size and effect of these outflows depend on the age structure of the current workforce. However, information on age distribution was only available for 15 out of 66 reported cadres (23%). Eight countries were not able to provide these data for any of their cadres;

FIGURE 8   **Voluntary attrition rate, by cadre**
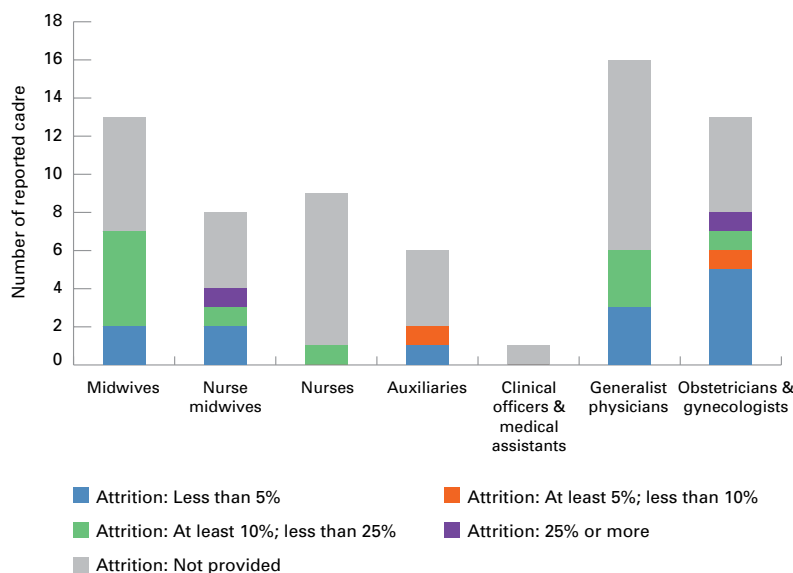
4 countries were able to provide these data for some, but not all cadres; and just one country provided age distribution data for all cadres. For cadres where this information was reported, an ageing workforce is most common among generalist physicians, obstetricians/gynaecologists and nurse-midwives. In Lebanon, 45% of the current workforce of generalist physicians and 40% of the current workforce of obstetricians/gynaecologists are due to retire in the next 14 years; in Palestine 30% of generalist physicians and 29% of obstetricians/gynaecologists will retire within the next 10 years. Some cadres of nurse-midwives are also likely to be significantly diminished due to ageing: in Sudan, all nurse midwives currently in the workforce will have retired within 10 years (the country discontinued its training programme); in Palestine, the same will happen within 20 years; while in Yemen, 96% of nurse-midwives will have retired within 15 years. The scale of these losses adds to the concern that such data are not available in all countries for the majority of cadres: without those data large-scale outflows from the workforce may not be fully anticipated by planners and policymakers. At present, where data are available for midwives, the overall trend is not one of an ageing workforce. In all four countries

Top left: A midwife talks to girls in Somalia about birth spacing *(UNFPA)*

Top right: An antenatal consultation in Morocco *(UNFPA)*

Bottom left: Newborn baby and grandmother in Syria *(UNFPA)*

Bottom right: Mothers and babies at a postnatal clinic in Palestine *(UNFPA)*

for which the age distribution of midwives was reported, the majority of midwives are under the age of 40, possibly due to the fact that midwives are a relatively new cadre in some countries. However, the ageing of the workforce may become a more important issue for policymakers in future decades.

Exploring the availability of midwives

This section focuses specifically on midwives and nurse-midwives. Midwives and nurse-midwives make up 34% of the midwifery workforce across the 13 countries. Although not the only type of health worker needed to provide SRMNH services, they are essential, given their unique contribution to the physiological process of "normal" birth, and the

specific focus of their roles and responsibilities across the entire SRMNH continuum of care [45]. Studies show that investing in midwifery education and deploying these midwives to community-based services could yield a 16-fold return on investment in terms of lives saved and costs of caesarean sections avoided [46]. Furthermore, given the shorter length of training for midwives compared to physicians and other specialists, the impact of scaling-up these cadres can potentially be realized in relatively short time-frames. For this reason policymakers must pay particular attention to these cadres in workforce planning, beginning with attracting students into, and retaining them in, education to become midwives or nurse-midwives.

As Figure 9 shows, most countries in the region (9 out of 13) report that midwifery is perceived as a much more attractive or a more attractive profession than other professions open to people with a similar level of education, while 3 countries report that it is a little less attractive or much less attractive. In the latter cases, national governments, midwifery associations and educational institutions need to promote the profession of midwifery more positively. Some countries have already taken this step: Palestine reports that there has been a concerted effort to promote education and widen opportunities, leading to considerable demand from students to study midwifery.

Status and identity are known to influence the attractiveness of a profession, partly reflected in the accompanying salary levels. Countries provided information on the starting salaries of SRMNH personnel, which were validated using the World Bank database on HRH salaries.[*] Of the 13 participating countries, 11 provided usable salary data for at least some cadres (Djibouti provided no data, and for Somalia there were no recent data that allowed the salaries to be converted into international dollars). Figure 10 shows the salary data for those 11 countries, of which all except Oman are middle-income countries.[**] On average, the salaries of midwives and nurse-midwives are very similar, but it is clear that salaries are considerably higher in upper-middle-income countries than in lower-middle-income countries, especially for generalist physicians. Midwives' salaries are on average 60% higher in upper-middle-income countries.

FIGURE 9   **Perceptions among survey respondents of the comparative attractiveness of a career as a midwife (13 countries)**

Percentage

MUCH MORE ATTRACTIVE — 54%

"The midwife profession is seen as noble and fascinating. It gives the opportunity to experience moments of intimacy with patients." (Djibouti)

A LITTLE MORE ATTRACTIVE — 15%

"Given the Health Ministry's focus on maternal and infant health programs, the amount of available jobs for new graduates at the Training Institute for Health Careers (IFCS) is higher than in other professional branches, which encourages young women to apply to work in this profession." (Morocco)

A LITTLE LESS ATRRACTIVE — 15%

"Midwifery is not considered to be attractive compared to nursing; in fact the midwifery profession lacks visibility and recognition of her role among the Lebanese society and even by health professionals." (Lebanon)

MUCH LESS ATTRACTIVE — 8%

"There are no suitable incentives for midwives." (Jordan)

NO RESPONSE — 8%

FIGURE 10   **Average monthly starting salary by cadre of health worker (international $ purchasing power parity, 2012)**

Monthly starting salary (international $PPP 2012)

Legend:
- Lower-middle-income countries
- Upper-middle-income countries
- All countries

Cadre	Lower-middle-income	Upper-middle-income	All countries
Obstetricians/gynaecologists	1375	2117	2000
Generalist physicians	851	1679	1562
Midwives	608	1008	830
Nurse-midwives	526	913	782
Auxiliary midwives and nurse-midwives	280	572	396

Availability

▶ The real availability of the midwifery workforce can only be measured by reference to the *full-time equivalent*, rather than the *headcount* alone.

▶ Correlating the reported *headcount* of the midwifery workforce with health outcomes will produce findings that do not reflect the real availability, as the full-time equivalent midwifery workforce represents less than 60% of all workers spending time on SRMNH.

▶ Ten pieces of information that all countries should collect on the midwifery workforce are: headcount, percentage time spent on SRMNH, roles, age distribution, retirement age, length of education, enrolments into, attrition and graduation from education, and voluntary attrition from the workforce. Of the 13 countries, only one (Palestine) was able to provide all these data for all midwifery workforce cadres. Another three (Morocco, Yemen and Lebanon) were able to provide all these data at least for the cadre of midwives.

▶ Midwifery education needs to be actively managed to ensure that the future workforce meets the needs of future populations.

▶ Midwifery is widely perceived to be more attractive than other professions open to people with a similar level of education, but not in all countries.

Accessibility

Even if there are enough health workers, adequately remunerated and with the competencies to provide the continuum of care that women and newborns need, people still need to be able to access the care that they provide. Women need to be active decision makers in choosing to access the midwifery workforce, and to be able to reach and afford the care provided, quickly in cases of emergency.

Improving geographical access

The first dimension of accessibility is physical reach. An accessible care system is underpinned by an adequate geographical spread of facilities and health workers, backed up by good transport, information and communication networks. Achieving equitable deployment of the workforce depends at the very least on good information and good planning.

Good information includes knowing where the country's health facilities are located—ideally including geo-referenced location codes—so that detailed analysis can be carried out of how well the supply of SRMNH services meets the demand (as measured by, for example, population size, number of women of reproductive age, number of pregnancies) taking into account travel times, topography, transport networks etc. Recent advances in geo-information and mapping systems [47] offer great potential for improving the strategic intelligence available to those responsible for deploying the midwifery workforce.

Planning should address the allocation of resources according to need. Eight countries reported that they make decisions about where to deploy their midwifery workforce according to both population size and the type of facilities existing in various locations. In some countries, additional factors are also taken into account, e.g. in Morocco preference is given to provinces with poorer performance on SRMNH indicators. Two countries reported that such decisions are taken solely on the basis of the type of facilities available. Three countries provided no specific information about how human resources are allocated.

Of the 8 countries who said that decisions were partly based on population size, 6 provided at least some information about the number of health workers allocated to a certain size of population (e.g. the number of physicians per 10,000 population). Of the 10 countries who said that decisions were at least partly based on the types of facilities requiring staff, just 5 provided any information about the numbers of health workers deployed to each type of facility. This may indicate that several countries lack clarity and/or availability of data about how these decisions are made.

Global guidance on accessibility established in 1997 [48] recommends a minimum of five fully-functioning emergency obstetric and newborn care (EmONC) facilities per 500,000 population. Although this is an established benchmark,

improved information on births and pregnancies has led to discussion about revising these standards, and extending them to include signal functions relating to non-emergency care [49]. Figure 11a shows that, of the eight countries that provided all the relevant data, all except Jordan have designated sufficient facilities as EmONC providers according to this benchmark. Indeed, four countries (Egypt, Morocco, Lebanon and Somalia) greatly exceeded it, raising questions as to whether there is too much emphasis on the provision of EmONC and whether (a) this is appropriate in countries with limited resources, and (b) it may contribute to over-medicalization of SRMNH care (Box 3). Just 6 of the 12 countries provided data on the number of health facilities with midwifery-led units as defined in the glossary to the survey (see Annex 1): Morocco and Jordan said that 100% of health facilities had a midwifery-led unit, Tunisia 70%, Djibouti 49%, Egypt 5% and Oman 0%.

Figure 11b also shows that, of the eight countries that provided all the relevant data, four (Tunisia, Jordan, Somalia and Egypt) designated all health facilities providing labour and birth services as providing EmONC, and another two (Lebanon and Morocco) designated the large majority as doing so. However, designation as an EmONC facility, meaning that it *should* be able to provide emergency life-saving interventions and resources with the necessary staff, equipment, drugs and supplies, can be dramatically misleading: in reality a facility may not be in a state of readiness and fully functioning [2]. While designation can be used as a policy tool to prioritize resource allocation and service improvement, readiness needs to be actively managed (by ensuring that health facilities have the necessary human and other resources) and functionality needs to be regularly monitored to ensure that all women and newborns have access to EmONC when required.

The data on accessibility provided for the survey apply only at national level. There is evidence to suggest that, in many countries, accessibility varies according to where people live, access deficits being particularly associated with residents of remote and rural areas [56]. Box 4 describes a Palestinian initiative that aims to improve accessibility (as well as acceptability and quality) of midwifery care for rural women and newborns.

Improving economic access

In many countries financial barriers are known to have a significant impact on accessibility

FIGURE 11a **Number of EmONC facilities per 500,000 population**
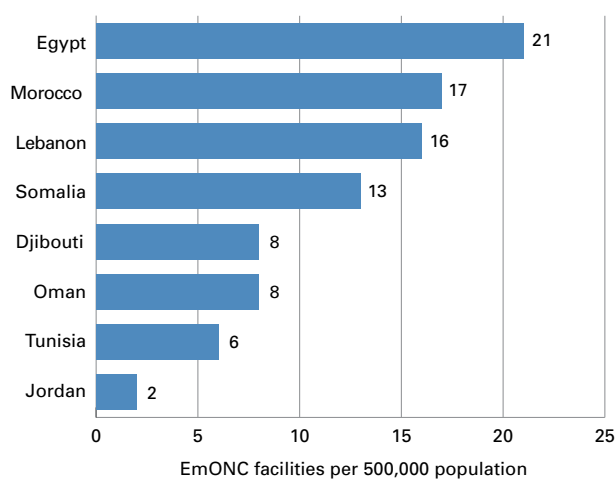
FIGURE 11b **Percentage of health facilities designated as providing Emergency Obstetric and Neonatal Care (EmONC)**
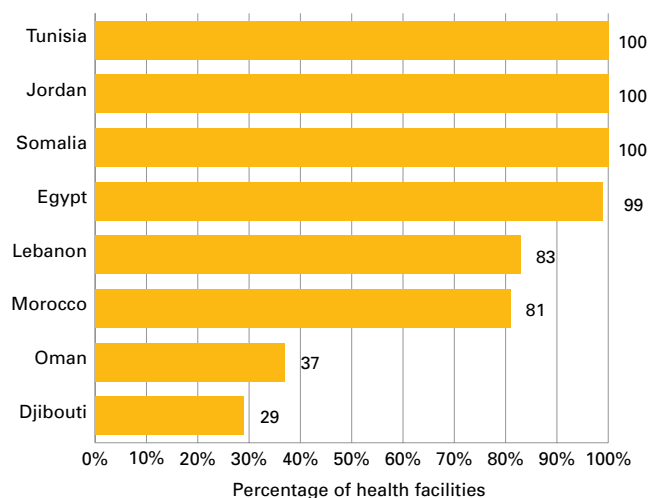
Over- and under-medicalization of childbirth

The medicalization of childbirth is now a reality in many countries. Economic growth has often been accompanied by increases in interventions such as caesarean sections (CSs), leading to concerns over the impact on mortality and morbidity rates, and the costs of health care [45].

A 2010 global study highlighted the significant number of unnecessary CSs each year. Although there is no consensus about the appropriate CS rate, the minimum threshold is generally considered to be 5-10%, and evidence suggests that rates above 15% result in more harm than good [50–52]. Of the 13 countries in this report, only Djibouti and Sudan have a CS rate between 5 and 15%, and rates range from 5% in Yemen to 52% in Egypt.

Of the countries with skilled birth attendance of over 80% and with data about the cadre of birth attendant, only Algeria and Djibouti have a high proportion of births attended by midwives. By contrast, women in Egypt, Iraq, Jordan and Tunisia are predominantly attended by doctors, and the CS rate is over 20%.

Within some countries, the richer population quintiles are more likely to have a higher CS rate (e.g. in Sudan the CS rate is 1% among the poorest 20% of the population and 22% among the richest) and more likely to be attended by a doctor (e.g. in Jordan 66% of women in the poorest 20% of the population are attended by doctors, compared with 93% of women in the richest 20%). This shows the propensity for births to be more medicalized for wealthier groups, who are often the most healthy and therefore should be least likely to need medical intervention.

Midwife-led care is one strategy that is increasingly being implemented in high-income countries to reduce rates of unnecessary intervention. The philosophy is "normality, continuity of care and being cared for by a known, trusted midwife during labour. The emphasis is on the natural ability of women to experience birth with minimum intervention" [53]. Midwife-led units based in or next to hospitals have relatively high rates of spontaneous vaginal birth and relatively low rates of interventions, with equally good infant outcomes [54]. There is no evidence that any of the countries in this report provide midwife-led models of care (some are considering this for the future [55]) although this could be an effective way of addressing over-medicalization and/or preventing it from becoming a problem in future.

Populations with CS rates that are too low (e.g. 1% in poorest quintile Yemen) equally require urgent attention to build and strengthen the midwifery workforce as well as the health system, services and access to surgical skills, blood transfusions and other commodities.

Source: Professor Caroline Homer (University of Technology, Sydney) and Dr Sarah Neal (University of Southampton)

Mother and newborn baby in a refugee camp in Tunisia.
(UNFPA)

[57–59] so it is encouraging that all 13 countries reported the existence of a minimum guaranteed benefits package for SRMNH, defined as "a set of health services that the government has committed itself to making available to all, free at the point of access". The package prescribes a minimum list of interventions or services; others may be added as part of the package, but the minimum list is guaranteed.

Accessibility is influenced by the content of the benefits package as well as its existence. Guidance has been issued on 46 SRMNH interventions that are deemed essential to meet the basic need for SRMNH care [23]. Figure 12 shows that, of the 12 selected Arab countries providing data on this question, none has a package that includes all 46 of these essential interventions.

Improving accessibility, acceptability and quality of care through continuity of midwifery care in rural areas of Palestine

In 2012, the Palestinian Ministry of Health, with support from the Norwegian Aid Committee (NORWAC), launched a new model of midwifery care for rural areas. At that time, nearly all professional midwives worked exclusively at urban hospitals, providing assistance during labour and delivery, but little antenatal and postnatal care was provided by midwives. Under the new model, however, midwives working in public-sector hospitals are allocated to rural villages, provided with a car, and tasked to spend one day per week visiting their village to provide family planning services and antenatal and postnatal care to the village's women and newborns. Thus, each village has continuity of care from the same midwife, who becomes a known and trusted person in the community, leading to increased acceptability of midwifery care. To ensure that staffing levels in the labour and postnatal wards were not adversely affected, NORWAC provided initial funding for additional midwives to be recruited to work in the hospitals.

Early consultation found most midwives to be enthusiastic about the new model, but others felt uncomfortable about the level of responsibility. To help with this, all attended workshops and seminars to refresh their knowledge and make sure they were fully aware of the Ministry of Health's policies and protocols for antenatal and postnatal care. Obstetricians were also invited to these events, so that their questions and concerns could be addressed.

Implementation began in 2013, involving 16 villages around the cities of Nablus and Jericho. After a year of operation

Midwife on her way to provide SRMNH care in Palestinian village.
(Berit Mortensen, NORWAC)

in these villages, 44% more women had received antenatal care. The project has recently expanded to include an additional 28 villages around the cities of Bethlehem and Hebron, and there are plans to cover the whole of Palestine, a region at a time.

As well as improving the accessibility of SRMNH care for rural women, the project has resulted in better links between different levels of the health system, because the midwives work in both primary and secondary care settings.

Research to examine the impact of the initiative is under way, but already there are signs that it is having a positive effect on the status of both the women using the services and the women providing them. It sends a message to women in the community that their own health needs are important, and the midwives are able to provide care for

issues that were previously neglected, such as post-partum sexual or continence problems. It also increases the status and autonomy of the women working as professional midwives.

Some challenges remain, particularly with respect to hiring sufficient numbers of midwives to meet the need. Military checkpoints on the roads can lead to delays in getting to the villages, leaving less time for midwives to attend women and newborns. When making home visits, some midwives have found more social acceptance if they take a colleague with them. Despite these challenges, this project is an example of a midwifery-led model leading to increased accessibility, acceptability and quality of antenatal and postnatal care in rural areas, made possible by political commitment from the Ministry of Health and financial and professional support from NORWAC.

Source: personal communication with Dr Amal Abu-Awad (Palestinian Ministry of Health), Berit Mortensen (NORWAC) and Samar Maghari (NORWAC).

FIGURE 12

Percentage of essential SRMNH interventions included in minimum guaranteed benefits package

Country	Percentage
Algeria	93
Tunisia	91
Djibouti	91
Jordan	89
Morocco	89
Palestine	87
Iraq	87
Lebanon	85
Somalia	85
Sudan	80
Yemen	67
Egypt	57

Percentage of interventions
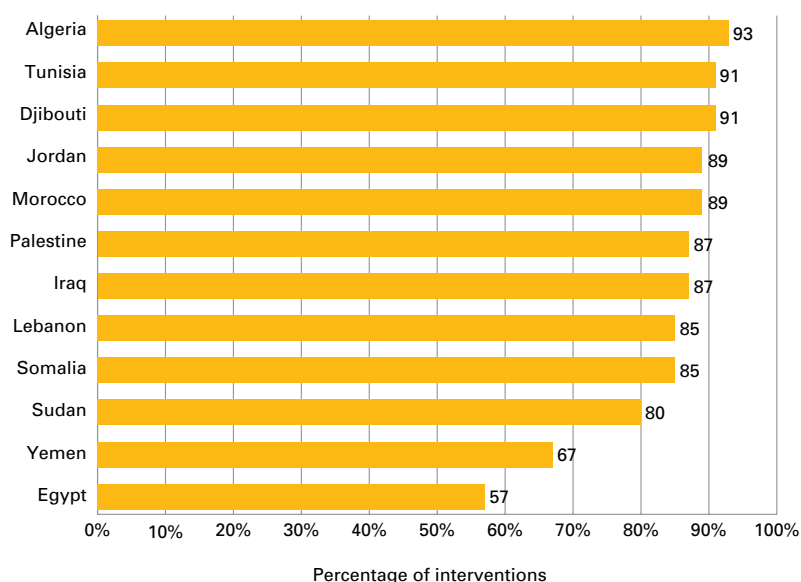
Table 4 lists the interventions that are least commonly included in the packages of the countries providing data, showing that the main gaps relate to antenatal interventions. Addressing these gaps could save lives. Hypertensive disorders, obstructed labour and unsafe abortion have been identified as leading causes of maternal death [60], yet calcium supplementation and low-dose aspirin to prevent pre-eclampsia, interventions for cessation of smoking, reduction of malpresentation at term with external cephalic version, and safe abortion are among the interventions commonly excluded from minimum benefits packages. Similarly, although preterm birth is a leading cause of newborn death [10], kangaroo mother-baby care and antenatal corticosteroids to prevent respiratory distress syndrome in preterm babies are among the interventions most commonly missing.

TABLE 4

Essential interventions least commonly included in countries' minimum benefits packages

Intervention	Countries **without** this intervention in minimum benefits package
PRE-PREGNANCY	
Family planning (surgical methods)	Djibouti, Egypt, Lebanon, Palestine, Sudan, Yemen
ANTENATAL	
Calcium supplementation to prevent hypertension	Djibouti, Egypt, Iraq, Morocco, Palestine, Sudan, Tunisia, Yemen
Safe abortion	Djibouti, Egypt, Iraq, Lebanon, Morocco, Palestine, Sudan, Yemen*
Prevention and management of malaria with insecticide treated nets and antimalarial medicines	Algeria, Egypt, Iraq, Lebanon, Morocco, Palestine, Tunisia**
Interventions for cessation of smoking	Algeria, Djibouti, Egypt, Iraq, Somali, Sudan, Yemen
Reduction of malpresentation at term with External Cephalic Version	Egypt, Iraq, Jordan, Lebanon, Morocco, Palestine
Screening for and treatment of syphilis	Egypt, Jordan, Lebanon, Sudan, Yemen
Low dose aspirin to prevent pre-eclampsia	Algeria, Egypt, Jordan, Sudan, Yemen
Corticosteroids to prevent respiratory distress syndrome in preterm babies	Lebanon, Morocco, Yemen
POSTNATAL (newborn)	
Kangaroo mother care for preterm (premature) babies and for babies weighing less than 2,000 g	Egypt, Jordan, Palestine, Somalia, Sudan, Tunisia, Yemen

* Abortion is illegal in Egypt and Lebanon. In the other countries it is allowed under certain circumstances (e.g. if the woman's life is in danger) which implies that it should be available in the minimum benefits package.

** There is no prevalence of malaria in these countries, with the exception of Algeria which presents rare indigenous cases. http://www.cdc.gov/malaria/travelers/country_table/a.html

Of the 13 countries covered by this report, 9 report that at least one of their national policy documents specifically addresses how the country will reduce or remove financial, geographical and other barriers to accessing SRMNH care (the exceptions are Egypt, Palestine, Tunisia and Yemen).

Equity of access

As well as physical and financial accessibility, many women face additional barriers to accessing midwifery services and the midwifery workforce, e.g. because of their socioeconomic position or area of residence (Box 5). Countries need to focus on equity, a fundamental part of the post-2015 development agenda, so that marginalized groups, such as rural dwellers, the poor, adolescents, migrants and tribal communities, do not continue to be effectively excluded from SRMNH care.

An issue affecting some Arab countries is how to provide SRMNH services to refugees and internally displaced persons, both in terms of ensuring that these women and newborns have equal opportunity to access SRMNH care, and ensuring that the provision of this care does not overstretch the receiving country or region's SRMNH services such that the existing residents

can still access the same level of care. Box 6 discusses these issues in relation to displaced Syrian and Iraqi peoples living in Jordan and Iraq.

To tackle inequity of access, countries need strategic intelligence to identify existing inequities, and effective planning to address them. Of the 13 countries covered by this report, 9 say that at least one of their national policy documents specifically addresses how the country will increase access to SRMNH care for vulnerable and disadvantaged groups, such as those living in remote areas, adolescents, ethnic minority groups and those living in poverty (the exceptions are Algeria, Egypt, Palestine and Yemen). Responses to the questions on workforce planning and deployment (see above) also indicate that some countries plan their SRMNH workforce deployment according to population distribution, but few do so according to levels of need for SRMNH services, which is not always directly correlated with population size. The country profiles in this report estimate the level of met need for SRMNH services at national level, and it is recommended that countries perform similar estimates for specific regions or subpopulations, so that inequities can be systematically highlighted and addressed.

Baby born in Jordanian refugee camp.
(Ra'ad Addayleh, UNFPA)

BOX 5

Inequities in coverage of skilled attendance at birth

According to the most recent available nationally representative survey data,* eight of the 13 countries covered by this report have almost universal coverage of skilled birth attendance (SBA) (over 90% of births attended by a physician, nurse or midwife). The exceptions are Sudan (23%, one of the lowest coverage rates in the world), Somalia (33%), Yemen (44%), Morocco (74%) and Djibouti (87%). However, in these five countries the national figures mask considerable inequities, with coverage rates much lower in rural than in urban areas, and among the poorest 20% of the population compared with the richest 20%. The same pattern is observed for other SRMNH indicators such as coverage of antenatal care and met need for family planning [61].

The graphs below show the scale of the inequity; of particular note is that Djibouti's rate of 87% SBA coverage appears very positive, yet only 55% of women in rural areas give birth with a skilled attendant, compared with 98% of women in urban areas. In Somalia, urban women are four times as likely as their rural counterparts to give birth with a skilled attendant, and the richest 20% are seven times more likely than the poorest 20% to do so. In Morocco, nearly all women in the richest 20% give birth with a skilled attendant, compared with just 38% of the poorest 20%.

For some countries it is possible to examine time trends because the surveys have been repeated at intervals. The graph below shows Morocco's excellent progress in improving access to skilled attendance between 1992 and 2011. However, the poor are still lagging behind by a large margin.

* Multiple Indicator Cluster Surveys (MICS), Demographic and Health Surveys (DHS) and other nationally representative sample surveys in UNICEF and WHO databases. Coverage estimates are from 2010 or later except for Lebanon (2004), Somalia (2006) and Oman (2009).

Source: Dr Sarah Neal and Dr Amos Channon, University of Southampton; UNFPA-ASRO policy brief [61]

Skilled birth attendance by urban/rural residence (for countries with less than 90% total coverage)
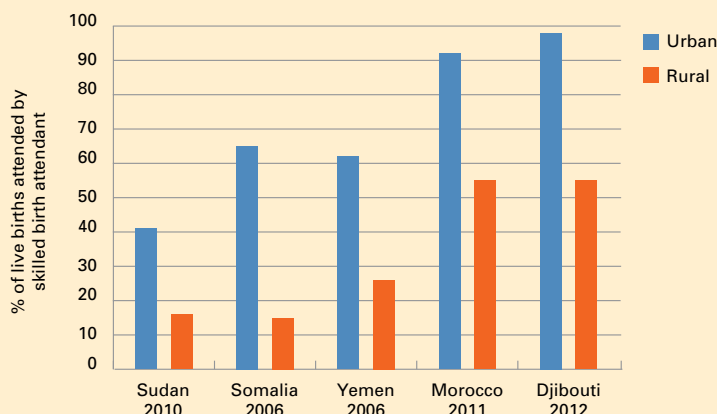
Skilled birth attendance by wealth quintile (for countries with less than 90% total coverage)
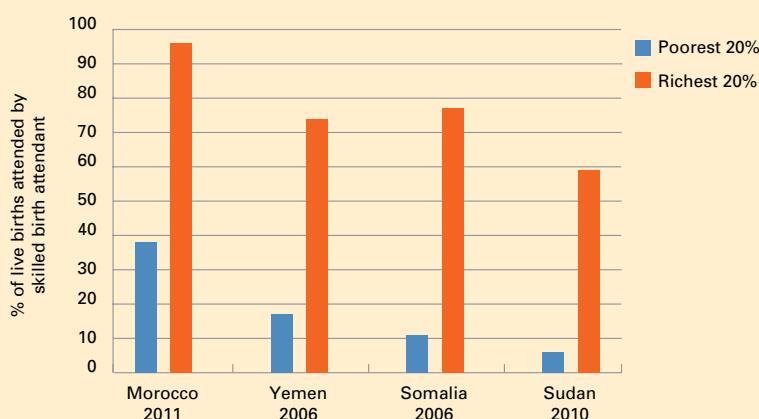
Skilled birth attendance trends in Morocco by wealth quintile, 1992-2011

Providing SRMNH services to refugees and internally displaced persons

Recent conflicts in Syria and Iraq have resulted in millions of people taking refuge in neighbouring countries, or being displaced within their own countries. For example, over the 4 years since the start of the civil war in Syria, it is estimated that nearly 4 million Syrians have fled the country, of whom a significant number are currently living in Jordan. Among these are over 150,000 women of reproductive age and 11,000 pregnant women [62]. Significant numbers have also migrated from Syria to northern Iraq. Additionally, the ongoing conflict in Iraq has led to massive internal displacement: more than 300,000 civilians were displaced during the first three months of 2015, bringing the total estimated displaced population to 2.5 million. Displacement is expected to increase further in 2015.

In both of these countries, large numbers of displaced people are living in camps. Zaatari camp in Jordan has 80,000 Syrian residents, making it the second largest refugee camp in the world, and effectively the fourth most populous city in Jordan. There are four health clinics in the camp, operated by Jordan Health Aid Society and supported by UNFPA. The clinics provide services across the whole continuum of SRMNH care, and are staffed by a wide range of cadres including midwives, nurses, obstetrician/gynaecologists and paediatricians. They opened in 2012, and started providing birth services in 2013, referring complex cases to nearby hospitals.

Between 180 and 200 women visit the Zaatari camp clinics each day, and one has recently celebrated its 3,500th birth. As a matter of government policy, SRMNH services are provided free of charge to Syrian refugees. Women using SRMNH services in refugee camps in both Jordan and Iraq report that the provision of this care has given them confidence; some were reluctant to get pregnant due to uncertainty over whether they would be able to access high-quality SRMNH care, but having been made aware of the services provided, they were reassured that it was safe to go ahead.

The influx of refugees has severely strained Jordan and Iraq's capacities to provide high-quality SRMNH services, and the number of health workers per head of population has decreased [63, 64]. Even before the Syrian crisis there was a shortage of female doctors in Jordan (data provided for this report show that fewer than 1 in 5 Jordanian generalist physicians is female) and it was a challenge to deploy health workers to the under-served southern parts of the country. The arrival of such large numbers of refugees has exacerbated this situation, and it remains a challenge to deploy sufficient female health workers to the camps.

UNFPA implementing partners are tasked with the recruitment of health workers to staff the camp clinics. Midwives and obstetrician/gynaecologists are recruited from a variety of sources including the public- and private-sector health systems and recent retirees. Many actively seek to work in the camps in order to contribute to an international humanitarian initiative. Some qualified health workers have also been recruited from the displaced communities.

UNFPA supports the provision of acceptable and high-quality SRMNH care in the camps by facilitating training sessions, consulting with service users about their needs, supporting the development of guidelines (e.g. for referral mechanisms) and supervisory tools, and training staff to use these tools.

Source: personal communication with Tamara Alrifai (UNFPA), Dr Shible Sahbani (UNFPA), Ruba Hikmat (UNFPA), Zeina Horani (UNFPA),

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🔑 KEY FINDINGS

Accessibility

▸ The majority of countries in the region deploy their midwifery workforce using facility-based planning or workforce to population ratios; these may be inconsistent with needs and access to care.

▸ Human resource information systems linked to geographical information systems would enable new insights into people's ability to access skilled and competent health-care providers.

▸ The provision of EmONC services could benefit from new approaches to designate, make ready and monitor those facilities that are capable of providing life-saving care.

▸ All 13 countries have a national "minimum guaranteed benefits package", but none covers all the essential interventions.

▸ Many countries face significant challenges in providing equitable access to skilled birth attendance, particularly for those living in poverty or in rural areas.

▸ Countries can take immediate action to improve their strategic intelligence on accessibility of the midwifery workforce.

Acceptability

Even if care is available and accessible, effective coverage of SRMNH care is reduced if either the care or the workforce is unacceptable to women, their families or communities. Even in countries with high levels of coverage of antenatal care and skilled birth attendance, lack of respect for service users and/or lack of sensitivity to social or cultural needs can be a disincentive to access [65]. Acceptable care requires that all health facilities, goods and services should be ethical, respectful, culturally appropriate and safe [33]. Respectful care should be sensitive to gender and life-cycle requirements, and designed to ensure confidentiality and improve the health status of service users.

Of the 13 countries, 8 said that at least one national policy document specifically addresses how the country will deliver SRMNH care that is sensitive to social, cultural and traditional needs, e.g. in relation to age, gender, ethnicity, religion and language. The exceptions are Algeria, Jordan, Oman, Palestine and Yemen. Examples of policies include the National Implementation Plan for Maternal, Neonatal and Infant Health in Djibouti, the National Health Plan and Maternal and Child Health and Reproductive Health Strategy in Iraq, and the 2012-2016 Action Plan to Accelerate the Reduction of Maternal and Neonatal Mortality in Morocco. Lebanon's policy focuses on hiring female SRMNH care providers in areas with religious or gender sensitivity. In Tunisia, the maternal mortality reduction strategy is implemented through socio-economic health committees, at regional and local levels. These committees are responsible for studying potential contextual obstacles to providing care. Egypt's health plan sets out the principle of providing services to all people, irrespective of their religion, gender or ethnicity.

Improving acceptability involves listening to women and their communities, and building their preferences into policy and training initiatives and feedback loops. However, just

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TABLE 5

Reasons why women might be uncomfortable seeking SRMNH care from a midwife/nurse-midwife

Reason	Countries mentioning this reason
Lack of information and understanding about midwives and their competencies	Djibouti, Lebanon, Morocco, Somalia, Tunisia
Physicians are seen as more prestigious/cultural preference for doctors	Lebanon, Morocco, Palestine, Tunisia
Poor geographical accessibility	Djibouti, Somalia
Only those seeking home birth want a midwife	Iraq, Morocco
If there has been a previous bad experience of poor or disrespectful care from a midwife	Algeria, Tunisia
There are no independent midwives	Lebanon, Tunisia
Poor financial accessibility/people cannot afford fees	Somalia
Lack of availability of midwives	Somalia
Financial incentives to consult physicians instead (e.g. midwife-led models of care are not covered by financing mechanisms)	Lebanon
Health system restrictions on midwives practising to their full scope	Lebanon
If the pregnancy is complicated or higher-risk, women will prefer to see a doctor	Tunisia
No reasons	Egypt, Jordan, Sudan, Yemen
No response	Oman

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four countries (Egypt, Morocco, Palestine and Yemen) reported that public perceptions of midwives/nurse-midwives and midwifery practice had been studied in their country, and in some cases the studies were conducted many years ago.

The survey asked countries to report any reasons why a woman might be uncomfortable seeking care from a midwife or nurse-midwife; the results are shown in Table 5. Eight countries offered at least one reason, the most common being that the public does not fully understand the midwife's role (e.g. "community members consider midwives as physicians' assistants, rather than as competent independent practitioners"), leading to a preference for doctors. Linked to this is a perception, mentioned by four countries, that obtaining care from a doctor conveys more prestige ("Wealthy populations prefer to use the services of gynaecologists for prestige reasons"). This indicates a need for better public information about the role and competencies of midwives, and/or support for professional associations in these countries to promote the benefits of midwife-led care. It is important to bear in mind that public perceptions of midwives and midwifery can be very closely bound up with public perceptions of women, since most midwives are women and those using their services are predominantly women [66]. This suggests that further analysis of the gendered role of the midwifery workforce would be helpful.

Problems of availability and accessibility are mentioned by some countries, as are instances of previous negative experiences with a midwife or nurse-midwife, emphasizing that accessibility and acceptability (see above) are key foundations for effective coverage of midwifery care.

Acceptability

▶ More robust research is needed on women's perceptions of and attitudes to the midwifery workforce, especially midwives/nurse-midwives.

▶ Only four countries are aware of studies documenting public attitudes towards the midwifery workforce and their practice, which limits the understanding of acceptability.

▶ The majority of countries report that they have developed policies to promote care that is sensitive to social, cultural and traditional needs; these policies need to be implemented and monitored.

▶ Eight countries can list at least one reason why a woman might be uncomfortable seeking care from a midwife: this shows a need for better public dialogue and education about the roles of and benefits offered by midwives.

Baby born to Syrian refugee in Jordan
(Ra'd Addayleh, UNFPA Jordan)

Midwifery students
in Somalia.
(UNFPA)

Quality

Even if the SRMNH workforce is available, accessible and acceptable to the population, poor-quality care can substantially limit its effectiveness. Evidence from settings that have provided 100% institutional care at birth shows that maternal mortality and morbidity can remain high unless quality is addressed [67]. There are many aspects to quality of care [68] including staffing levels, resources and work environment, and many reasons for variations in quality, of which the competencies of the workforce is only one component. Nonetheless, the SRMNH workforce is a valuable starting point for considering quality of care, particularly its education and regulation, and the role of professional associations. ICM has identified education, regulation and association as the three pillars of a strong midwifery profession [69]; all three must be strong if countries are to provide high-quality midwifery care. Such care is also dependent on an enabling policy environment, which is also discussed in this section.

Education

The perceived gaps in midwifery education in the region relate mainly to the availability of resources and infrastructure, rather than to an absence of tools and mechanisms such as standardized curricula. The main challenges for providing high-quality midwifery education to midwife and nurse-midwife cadres are perceived to be the availability and quality of teaching staff, equipment and lack of practical experience for students (Figure 13). The 13 Arab countries included in this report provided data on educational challenges for a total of 16 midwife and nurse-midwife cadres. Difficulties in recruiting sufficient teaching staff were reported as a problem for 10 out of 16 cadres; similarly, difficulties in recruiting suitably qualified teaching staff were reported for 12 out of 16 cadres. Another concern is that faculty and teachers are not able to keep their skills and knowledge up-to-date, as reported for 12 cadres. This limits the quality of the education provided, and means that learning often relies too heavily

on lectures rather than practical experience, so that new graduates do not always acquire the full range of skills and competencies. Respondents also mentioned insufficient availability of or poor-quality teaching equipment (this was a problem for 12 cadres) and insufficient opportunities for students to gain practical experience in health facilities (also reported for 12 cadres). However, survey respondents do not believe that curriculum content is a significant problem in midwifery education: respondents reported that curricula do not cover core midwifery competencies for only 4 out of 16 midwife and nurse-midwife cadres. This indicates that the main focus in most of the selected Arab countries in this report should be not on the curriculum content, but on how to deliver it.

In terms of the clinical practice requirement in education programmes, the number of births a midwife must conduct under supervision prior to graduation varies from 12 in Jordan to 100 in Djibouti and the Sudan (Algeria and Somalia did not provide a response). As a guideline, ICM suggests 50 supervised births [25] although some students will require more and some fewer than this. Figure 14 shows that six Arab countries specify fewer than 50 supervised births, and that midwife cadres tend to attend more supervised births than nurse-midwife cadres (means of 52 and 42, respectively).

Most midwife and nurse-midwife cadres have a national curriculum that is followed by all schools (Table 6), but two countries with midwives (Iraq and Somalia) said that there was no standard curriculum for their trainee midwives. ICM recommends that curricula be reviewed every five years [25], and Table 6 shows that nearly all countries with midwife cadres report having updated the curriculum within that timeframe; the only exception is Palestine. This is a stronger performance than for other SRMNH cadres, but this is partly due to there being more data missing for those cadres, and possibly also due to some countries having introduced midwife cadres relatively recently. It is important for countries that have

FIGURE 13 **Perceived challenges to providing high-quality education to midwives and nurse-midwives**
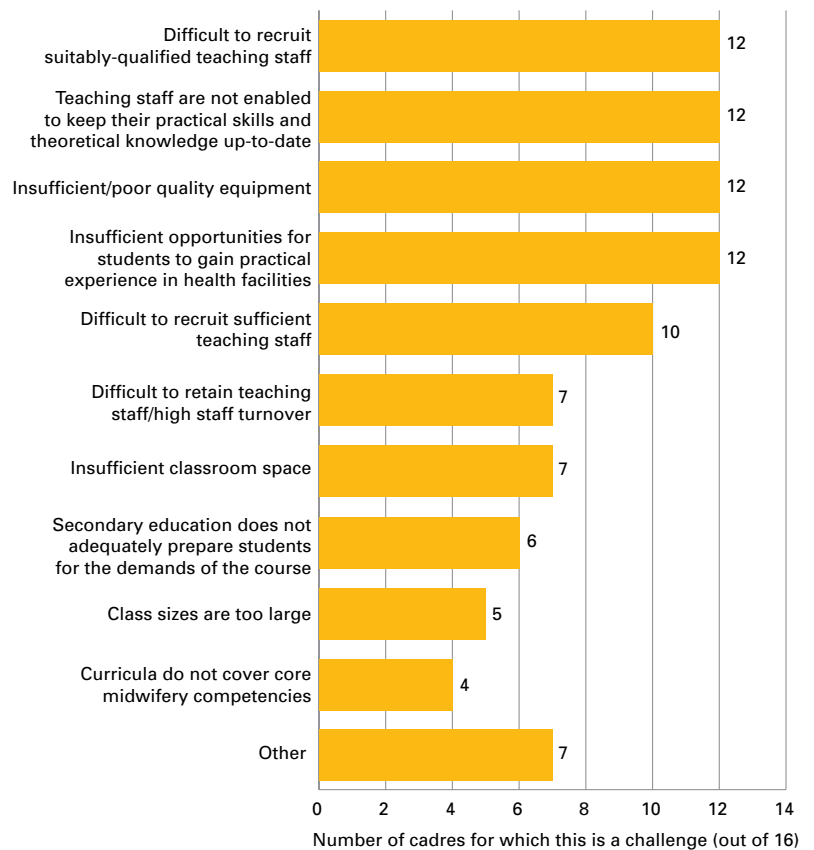
FIGURE 14 **Minimum number of births to be conducted under clinical supervision before graduation**
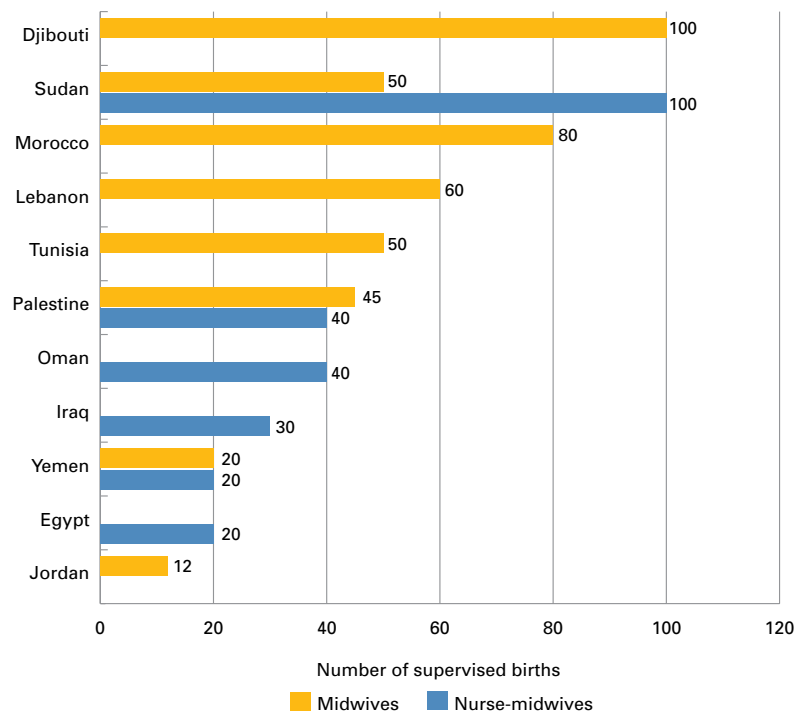
TABLE 6

Standard education curricula for midwifery and nursing cadres

	Number of countries with this cadre	Standard curriculum, followed by all schools	Standard curriculum, followed by some schools	No standard curriculum	No response	Standard curriculum updated within last 5 years
Midwives	11	8	1	2	0	8
Nurse-midwives	9	5	1	0	3	1
Nurses	6	3	0	3	0	1

BOX 7

Training midwives as clinical supervisors, to improve quality of care

The first cohort of midwives will soon graduate from a new one-year clinical supervision course at the Islamic University in Gaza, Palestine. The cohort consists mainly of midwives, but also includes some nurses specializing in maternity care. Financial support from the Norwegian Aid Committee (NORWAC) allowed the course to be offered without the need for students to pay fees.

The curriculum contains both theory and practice, with a strong emphasis on the development of practical supervision skills. It also includes management and leadership skills, human resources management, mentorship and preceptorship, principles of teaching, ethics and law, contemporary childbirth practice, research in maternity practice, and psychology in maternity practice. Over three semesters (one year) students spend 270 hours in the classroom and 420 hours in field training.

The aim of the course is to produce a group of midwifery leaders with the knowledge and self-confidence to bring about improvements to quality of SRMNH care, and who are empowered to make the necessary changes to systems and organizational culture. After graduation, they will return to their previous workplaces and be provided with the tools and support needed to implement new clinical supervision systems. It is recognized that a culture change will be needed in many workplaces, which will require the graduates to share their newly acquired knowledge and skills, and to influence attitudes and practices. It is anticipated that much of this can be achieved without significant financial outlay, and it is expected that the graduates will help and support each other by sharing experiences and ideas.

The idea for the course was conceived in 2010, as an initiative that could help to improve the quality of midwifery care. There followed a lengthy period of raising the profile of the concept of supervision and its attendant benefits, involving discussion with numerous stakeholders: the Ministry of Health, clinical leaders, midwives, human resources departments, and health facility managers. It was important for the initiative to address the needs as perceived by in-country stakeholders, and to be led from within the country, even though professional and financial support came from elsewhere.

Having generated sufficient interest, the contract to provide the course was put out to tender. The acceptability of the course and its graduates to others working in the health system is important, so the reputation of the academic institution(s) offering the course was an important consideration. For the same reason, the course had to be accredited by the relevant government ministries. There is already demand for expansion of the initiative, for both midwives and nurses. Discussions are ongoing regarding the enrolment of a second cohort of midwifery supervisors.

recently introduced midwife cadres to ensure that the curriculum is regularly reviewed and updated where appropriate.

The main focus of the questionnaire was on pre-service education, but quality of care depends also on continuing professional development and in-service training, to update the workforce's clinical knowledge, and on a clear career development path, to encourage ambitious workers to remain in the profession. Box 7 describes a new initiative in Palestine to train midwives as clinical supervisors.

Legislation, regulation and licensing mechanisms

Supporting and protecting midwives by law (providing a legal right to practise) is an important acknowledgement of their worth. Nine of the 13 countries featured in this report

have legislation that recognizes midwifery as a regulated profession, but in three of them (Morocco, Palestine and Sudan) the legislation is not applied. The four countries without such legislation are Djibouti, Oman, Somalia and Yemen; of these, only Djibouti reports that such legislation is being created.

In all countries except Djibouti there is at least one organization with responsibility for regulating midwifery practice. This is usually the Ministry of Health or corresponding government department, but in Somalia and Sudan it is a government-approved regulatory Board or Council. The existence of a regulatory body is necessary, but not sufficient, to ensure effective regulation. Survey respondents were asked to state the responsibilities of their regulatory organization (in order to facilitate a comparison with ICM's global standards [27]). Table 7 shows that

Functions and responsibilities of regulatory bodies

Functions and responsibilities of the regulatory bodies	Countries with a regulatory body performing this function
Registration of practising midwives (nurse-midwives)	Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Palestine, Sudan
Setting standards for midwifery practice	Algeria, Iraq, Jordan, Lebanon, Morocco, Oman, Palestine, Sudan
Ensuring the quality of education	Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Sudan
Establishing the scope of midwifery practice	Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Sudan
Assessing competency prior to registration	Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Palestine, Sudan
Setting standards for education	Algeria, Iraq, Lebanon, Morocco, Oman, Palestine, Sudan
Continuing professional development	Algeria, Iraq, Jordan, Morocco, Oman, Palestine, Sudan
Protection of the professional title "midwife"	Algeria, Iraq, Jordan, Lebanon, Morocco, Oman, Sudan
Verification of midwives (nurse-midwives) joining the workforce from other countries	Algeria, Iraq, Jordan, Lebanon, Morocco, Oman, Sudan
Applying sanctions to midwives (nurse-midwives) found guilty of misconduct	Algeria, Iraq, Jordan, Morocco, Oman, Palestine, Sudan
Investigating alleged misconduct or incompetence	Egypt, Iraq, Jordan, Lebanon, Morocco, Oman, Sudan
Setting standards for professional ethics	Algeria, Iraq, Jordan, Morocco, Oman, Sudan
Advising the government on maternal and newborn health-care policy	Algeria, Egypt, Iraq, Morocco, Oman, Sudan
Accreditation of education providers	Algeria, Iraq, Jordan, Lebanon, Morocco, Oman

the main responsibilities are registration of practising midwives, setting standards for midwifery practice, ensuring the quality of education, establishing the scope of midwifery practice, and assessing competency prior to registration. Fewer than half of the countries report that the regulatory organizations are responsible for setting standards of professional ethics, advising the government on SRMNH care policy, or accrediting education providers.

The scope of practice for different cadres of the midwifery workforce should be laid down by regulatory mechanisms, but these are not always effective. For example, Figure 15 shows that in some countries midwives perform some of the seven basic EmONC signal functions without being authorized to do so, perhaps because they are the only health-care provider present when the need arises. A more widespread issue in the region is that midwives in some countries, although authorized to perform certain functions, in practice do not do so; this is particularly common for newborn resuscitation using a bag and mask. This could be for different reasons, such as inadequate train-

ing, lack of an enabling environment, or lack of confidence in midwifery staff to perform certain signal functions.

Midwives are authorized to provide at least one type of family planning product in 10 of the 13 countries, the three exceptions being Egypt, Iraq and Oman. However, in only five countries (Algeria, Djibouti, Lebanon, Tunisia and Yemen) are midwives authorized to provide all four types listed in the questionnaire: contraceptive injection, contraceptive pill, intra-uterine device and emergency contraception (commonly referred to as the "morning-after pill"). Additional investment in family planning services can yield great benefits for the health and well-being of the population (Box 8).

Neither women nor midwives are protected or supported without appropriate regulation, registration and licensing. Licensing systems exist in 6 of the 13 countries, and are being developed in 3 others (Djibouti, Oman and Somalia), leaving 4 countries with no system and no plans to create one (Algeria, Morocco, Tunisia and Yemen). In all countries with a licensing system, a midwife must have a licence to practise. A licensing system is an important first step, but does not guarantee effective implementation, as evidenced by the finding that only 3 countries (Iraq, Jordan and Palestine)

Neither women nor midwives are protected or supported without appropriate regulation, registration and licensing. Licensing systems exist in 6 of the 13 countries, and are being developed in 3 others

FIGURE 15   **The seven basic EmONC signal functions: midwives' authorized and actual roles**
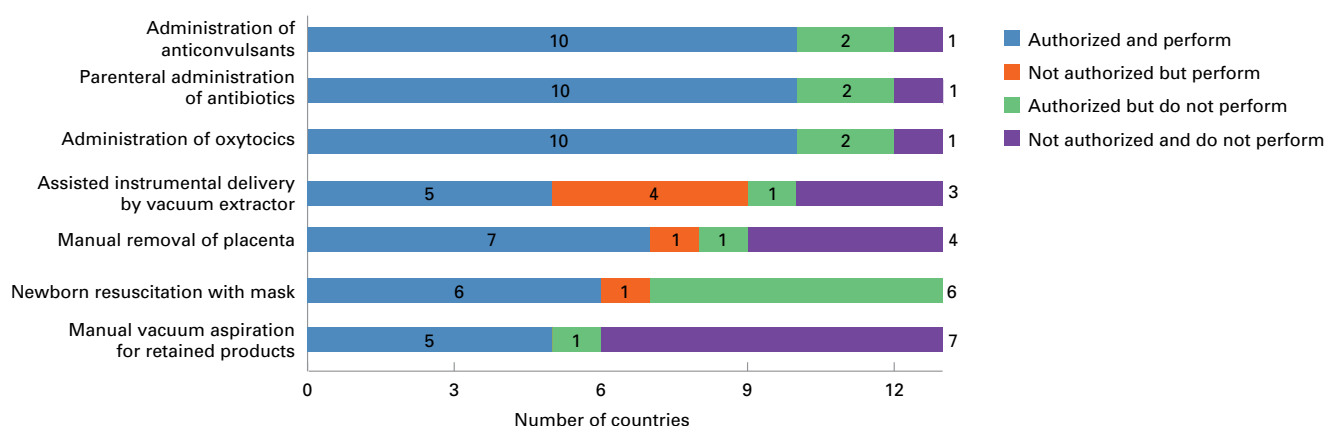
have a system of regular re-licensing, and only 2 (Iraq and Sudan) make continuing professional development a condition of re-licensing.

A register of licensed midwives exists in 7 of the 13 countries, of which 5 are electronic and 2 are paper-based. A further 5 countries (Algeria, Djibouti, Oman, Somalia and Yemen) have plans to create a register, leaving only Tunisia with no register and no plans to create one. Only in Lebanon is the register updated at least once a month.

Professional associations

According to the ICM, "midwives associations need to be strong and empowered organizations. They are powerful stakeholders for their country's Ministry of Health and can work collaboratively and advise the Ministry of current trends in maternal and newborn child health (MNCH)" [75]. It is therefore encouraging that all countries except Oman report the existence of at least one professional association, college or union that is open to midwives, nurse-midwives and auxiliary midwives. Of the 12 remain-

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BOX 8

The impact of investing in family planning

One of the most effective ways to improve maternal health outcomes is to reduce unmet need for family planning [70]. Additional benefits include improvements in health, schooling and economic outcomes [71]. The 2012 London Summit on Family Planning generated commitments to expand access to effective contraception for an additional 120 million women and adolescents who have unmet need for contraceptives in 69 of the world's poorest countries by 2020 [72]. The impact and return on investment is clear [73], but what are the workforce implications? Key points for policy and planning are as follows.

Fewer pregnancies mean an immediate decrease in population need for maternal and newborn services in the immediate future (0–15 years). As the total fertility rate declines, there will be less need for antenatal care, skilled birth attendance, emergency obstetric care and postnatal care. This will reduce the volume of essential interventions required, with steady decreases year on year, mostly within the scope of practice of midwives and obstetricians, thus creating opportunities to increase the quality and coverage of services.

Fewer pregnancies also mean a reduction in the number of women of reproductive age in the longer term. Demographic trends are a key determinant of workforce requirements. Starting 15 years after the initial investment in family planning, and accelerating rapidly for 25 years thereafter, there will be fewer women of reproductive age and therefore a decrease in the overall need for sexual and reproductive health services.

Of the 46 essential interventions for SRMNH, sexual and reproductive health services have the largest impact on health workforce requirements. All women of reproductive age need universal access to sexual and reproductive health care. Not all of them will become pregnant and fewer will need emergency obstetric care. Hence a greater volume of services (and a correspondingly larger health workforce) is required for sexual and reproductive health interventions than for emergency obstetric care. The composition and skill mix of health personnel needed to deliver community-based sexual and reproductive health services, including family planning, will ideally be tailored to national settings and, where needed, can include the integration and provision of HIV/AIDS services.

Girls are a central component of the wider "health workforce". Addressing the unmet need for contraceptives and family planning requires engagement with adolescents, teachers, parents and communities who therefore all form part of the expanded "health workforce" for sexual and reproductive health. In addition, children of women who have access to family planning and health services are healthier and better educated than children of women without such access [73]. So increased family planning will reduce the number of children per woman, allowing more of them to go to school, which increases the number of high-school graduates (potential health-care workers), produces social, economic and health benefits, and can reduce future demand on health services [74].

Lay workers, auxiliary midwives and pharmacists are key to meeting the need for family planning and containing costs. The Optimize for MNH [59] guidelines provide evidence for new approaches to family planning services. According to these guidelines, lay health workers can initiate and maintain the provision of injectable contraceptives, with targeted monitoring and evaluation. Auxiliary midwives can effectively provide oral contraceptives, condoms, hormonal injections, contraceptive implants and intrauterine devices. These roles could be led by women within communities, resulting in more employment opportunities, and greater potential for normative change, while at the same time enabling midwives, nurses and doctors to dedicate more of their time to increase the coverage and quality of SRMNH services.

FIGURE 16 **Functions of professional associations open to midwives**

Number of associations performing each function

Function	Number
Continuing professional development	23
Advising government on most recent national SRMNH or policy document	21
Advising members of quality standards for SRMNH care	20
Advising/representing members accused of misconduct or incompetence	18
Negotiating work or salary issues with the government	11
Other	8

🔑 KEY FINDINGS

Quality

▸ Pervasive gaps in the availability of infrastructure and resources adversely affect midwifery education.

▸ Key challenges for high-quality midwifery education include availability and quality of teaching staff, lack of equipment, and lack of opportunities for students to gain practical experience.

▸ The number of births a midwife must conduct under supervision prior to graduation varies across countries, and may fail to meet international competency standards.

▸ All countries except one have at least one regulatory body, but many lack consistently applied legislation that recognizes midwifery as a regulated profession, and effective regulatory processes.

▸ All countries except one report at least one professional association open to midwives. Ten of the 13 countries were able to provide data on the numbers of midwife members.

▸ Alignment and cohesion of policy and planning instruments in SRMNH and HRH are essential to deliver effective coverage of midwifery services: five countries reported that the targets in the HRH plan are based on or linked to the SRMNH service coverage targets in the national SRMNH or health plans.

▸ Of the 41 policy documents reported, 66% contain plans that are costed, with national health plans the most frequently costed.

ing countries, 6 report one such association (although in the case of Egypt it is a government ministry), 3 (Jordan, Lebanon and Morocco) have two associations, 2 countries (Algeria and Iraq) have three associations, and 1 country (Tunisia) reported the existence of six associations, one of which is a confederation of seven subnational associations.

All countries except Egypt and Oman have at least one association with the word "midwife" in its title, which is important for the recognition of midwifery as an independent profession.

All countries except Algeria and Iraq were able to provide data on the number of registered members in each association. Those two countries account for 6 of the 24 associations; the remaining 18 associations have 42,450 registered members, of whom 26,990 (64%) are currently practising in country. Additionally, although Iraq was not able to provide data on the number of registered members, it did provide numbers of practising members, which brings the total number of practising members to 40,640 (not all are midwives/nurse-midwives: some associations are also open to other health workers).

Figure 16 shows that nearly all of the region's 24 professional associations play a role in continuing professional development, advising government on policy documents and advising members of quality standards. Just 11 (from Algeria, Jordan, Lebanon, Morocco, Palestine and Tunisia) are involved in negotiating work or salary issues with their government.

Policy and planning
Cohesive policy and planning instruments are essential to deliver effective coverage of high-quality midwifery care. Across the 13 countries, respondents reported 41 different policies, plans and statutes for organizing, delivering and monitoring SRMNH services (over three per country on average). All countries reported at least one policy/plan/statute currently in force: 11 report a national health plan, and 11 have a national

SRMNH plan/strategy/roadmap or similar. National HRH plans were reported in 7 countries, and of these, 5 reported that the targets in the HRH plan are based on or linked to the SRMNH service coverage targets in the national SRMNH or health plans.

The policies, plans and statutes reported by respondents tend to be recent (68% were published on or after 2012) and the majority were still current at the time of data collection, covering a period up to or beyond 2014.

Costed plans are important in order to help guarantee the allocation of resources to deal with priority SRMNH issues. Of the 41 policy documents reported, 27 (66%) contain plans that are fully costed, with national health plans the most frequently costed. Of the 13 countries, 6 said that their existing policy documents specifically address how the country is going to improve all three elements of accessibility, acceptability and quality of services. However, it is important to note that the existence of a policy document does not guarantee that it is being effectively implemented.

Conclusion

A strong midwifery workforce is essential to reduce maternal and newborn mortality and morbidity, and to maximize SRMNH and well-being. In order to provide universal, effective coverage of midwifery services to all women and newborns, regardless of wealth, place of residence or age, action is needed to address the availability, accessibility, acceptability and quality of these services. Most countries have taken action to make the necessary workforce available, but it is clear that more needs to be done in many countries. Furthermore, all countries must take into account the percentage of time spent on SRMNH care when assessing how well availability matches the level of need. This information, along with other workforce data, is required to provide strategic intelligence to inform policy and planning processes. Countries can use this intelligence to manage the education of the midwifery work-

force, adequately remunerate SRMNH workers, and effectively promote a career in midwifery, so that the future workforce meets the needs of the future population.

Countries should also improve the accessibility, acceptability and quality of care. Accessibility can be addressed by using geographical information systems and equity-based planning tools, as well as ensuring that national minimum guaranteed benefits packages include all essential SRMNH interventions. Acceptability should be recognized as an important element of care: steps should be taken to reduce disrespectful care, and to promote care that accords with the principles of the White Ribbon Alliance's charter [65], accompanied by robust research on women's perceptions of and attitudes to the midwifery workforce. Finally, improvements to SRMNH will be limited unless quality of care is addressed through midwifery education, regulation and association. Countries wishing to gain a more detailed understanding of the availability, accessibility, acceptability and quality of their midwifery workforce may be interested in conducting a comprehensive SRMNH workforce assessment. A Handbook has been developed for this purpose by a number of organisations [76]. This assessment allows countries to go beyond the information presented in the country briefs of this report, to calculate, among other things, sub-national estimates of need, densities of health workers and gaps in supply, detailed information on the national policy and financing context, a country-specific analysis of which SRMNH cadres provide which essential interventions along the SRMNH continuum of care, a health labour market analysis examining constraints and bottlenecks, and country-specific costed policy options and estimates of impact.

Figure 17 shows how the apparently high level of workforce availability in this region can be deceptive if the percentage time spent on SRMNH and quality are not taken into account. In this figure, the ability to perform all midwifery tasks and the requirement to conduct

at least 25 supervised births before graduation have been taken as proxy indicators of quality. For the cadres where data for all these dimensions were available (n=23) the figure shows the increasingly accurate picture of the real availability of the workforce that is gained by moving from the simple headcount of workers (first column), to their full-time equivalent availability based on the percentage of time spent on providing SRMNH services (second column), to counting those who can perform all midwifery tasks specified by the ICM (third column), to counting those ones whose educational curriculum requires at least 25 supervised births before graduation (fourth column). There is an 81% overall reduction from the headcount of the workforce to the full-time equivalent available workforce that is able to perform all midwifery tasks and has at least 25 supervised births in

their educational curriculum. This is evidence that the constraints to coverage within the dimensions of availability and quality alone are considerable (quite apart from other issues in the dimensions of acceptability and accessibility).

This represents the gap between theoretical coverage and effective coverage. Reducing this gap requires the collection and better use of data on: the proportion of midwifery workers' time spent on SRMNH; the number of students likely to join the workforce in the future; where health workers are located; how women and their communities feel about the services they experience; and how the HRH plan furthers SRMNH strategies. To achieve this, strong leadership is needed to prioritize midwifery and to secure resources to implement this approach to workforce and service planning.

FIGURE 17   **Midwifery workforce in 13 Arab states: from availability to quality**
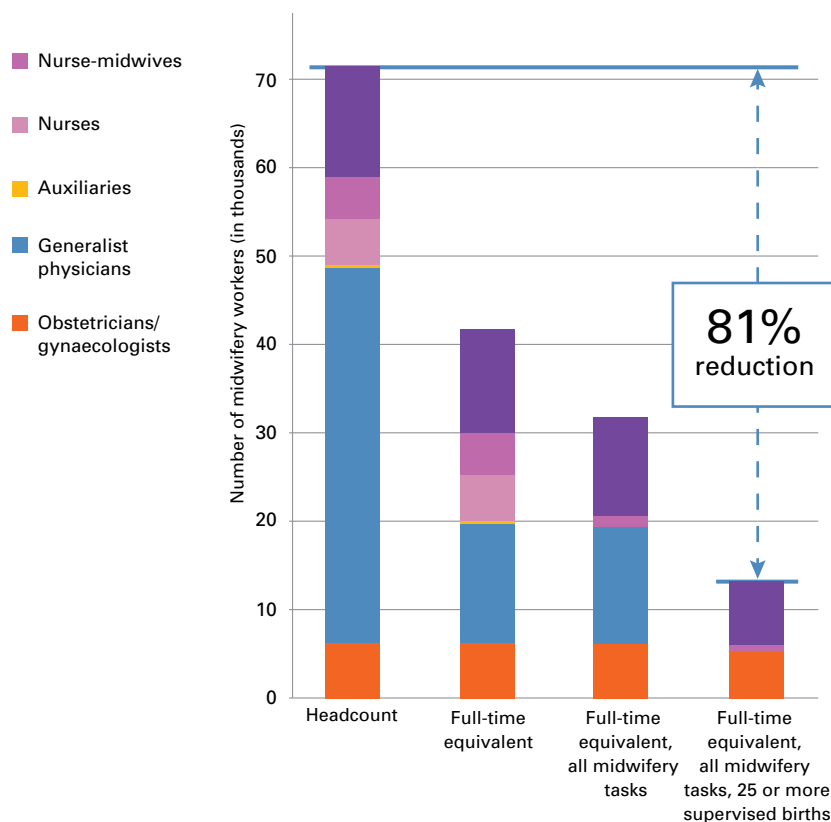
COUNTRY BRIEFS

HOW TO USE THE ARAB STATES COUNTRY BRIEFS

The country briefs have been designed to prompt and inform policy discussions on how the composition, skill-mix, deployment and enabling environment of the midwifery workforce impacts on the delivery of SRMNH services for all women and newborns who need them. This guide describes the graphics and data presented on the two-page country briefs. For more information on using the country briefs to promote advocacy for improved midwifery services in your country, see the SoWMy toolkit, *Making the Case for Midwifery: A Toolkit for Using Evidence from the State of the World's Midwifery 2014 Report to Create Policy Change at the Country Level.*[1]

First page: Where are we now?

The first page of the country brief can be used as a basis for discussing the extent to which the workforce is currently able to deliver SRMNH services for all women and newborns who need them. Proxies for availability, accessibility and quality are presented to facilitate these discussions. All data are from 2012.

WHAT DO WOMEN AND NEWBORNS NEED?

The brief starts by showing the current level of need for SRMNH services in the population. The number of pregnancies, their geographical distribution (see Annex 6 for methodology) and the volume of services (in pre-pregnancy, antenatal, birth and post-partum/postnatal care) that must be provided to meet this need are shown in this section.

WORKFORCE AVAILABILITY AND MET NEED

The brief then considers how many health workers are available to meet this need, using country data reported in the SoWMy survey, or, if unavailable, data from the WHO Global Health Observatory, or from national policy documents. The number (by headcount) of all workers reported and the percentage time each one spends on MNH services are shown. This information makes it possible to calculate the number of available health workers by their full-time equivalent. For example, if there are 100 midwives in the country, each spending 70% of their time on MNH, this equates to 70 full-time equivalent midwives. Only by considering the number of full-time equivalent workers can a true picture of availability be obtained.

In this section, health workers are grouped by broad category, with details of the country cadre names included in each category provided in footnote 1 on the opposite page.

The **estimated met need** figure provides a national aggregate estimate of the extent to which the current midwifery workforce, taking into account which health workers provide which services, has enough time to deliver the package of 46 essential interventions for SRMNH (see Annex 4) to all women and newborns who need them in the country. The estimate of met need is highly sensitive to the package of care (i.e. the 46 essential interventions), the number of health workers reported, the percentage of time they spend on SRMNH services, and the roles they perform. Full details of the methodology for calculating this estimate are found in Annex 3.

It is important to note that the **estimated met need** is an indicator of *availability*, calculated as a national average, and does not take into account, firstly, subnational variations or inequities, and secondly, whether the midwifery workforce and the SRMNH services are accessible to the population (geographically and financially), acceptable, and of high quality.

FINANCIAL ACCESSIBILITY

Even if there are sufficient health workers, the services they provide may not be affordable. This graph shows the proportion of the 46 essential SRMNH interventions that are included in the country's minimum health benefits package (and therefore should be available free at the point of delivery) as an indication of the degree of financial protection offered to women and newborns in accessing SRMNH care. The data are from the SoWMy survey.

GEOGRAPHICAL ACCESSIBILITY

Health workers, and the facilities from which they work, may not be distributed where they are most needed. This graph shows the number of births in urban and rural areas to indicate the geographical need for SRMNH services. Where data are available (from the USAID Demographic and Health Surveys programme or UNICEF delivery care database) the graph also shows the number of live births for which a skilled birth attendant was reportedly available. This provides an indicative measure of workforce accessibility.

EDUCATION, REGULATION, ASSOCIATION

These are all crucial to support health workers in delivering quality midwifery care. This section provides information on the strength of the enabling environment for quality of care within a country. The data are from the SoWMy survey.

Second page: What might 2030 look like?

The second page of the country brief aims to prompt policy discussion concerning the future evolution of the midwifery workforce compared with the future scale of population need. The last section, "Estimates and projections to 2030", compares projections of the future availability of the health workforce and future needs for SRMNH services in a variety of scenarios. Given the absence of data in some countries and the nature of projections, this analysis includes a number of assumptions, so it should be seen as a starting point for policy discussion (including around the availability and quality of national data) rather than as a statement of fact.
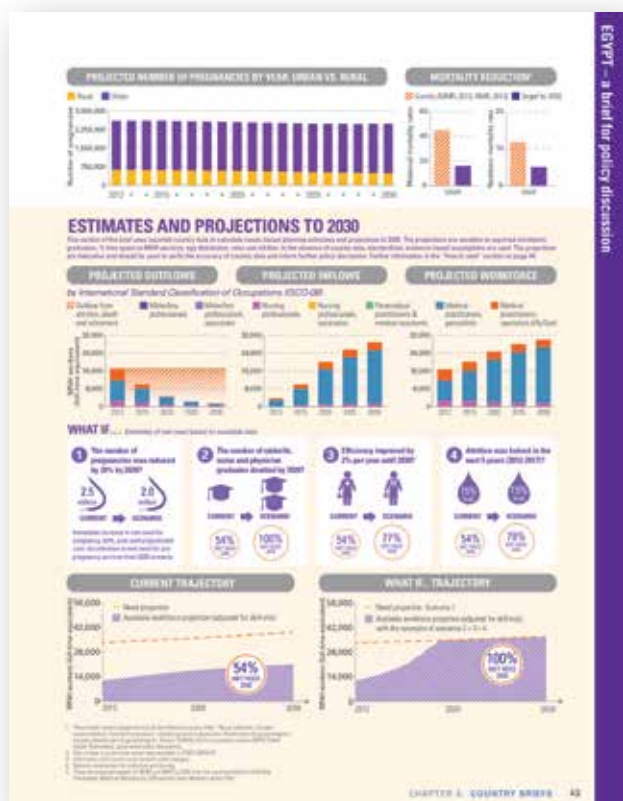
PROJECTED PREGNANCIES AND MORTALITY REDUCTION

Achieving universal coverage of SRMNH services means anticipating and responding to future needs. This section shows the evolution of need (expressed as the annual number of pregnancies in urban and rural areas) in the period 2012–2030 (see Annex 6 for methodology). Other needs for sexual and reproductive health services will be determined by changes in the number of women of reproductive age, including adolescents.

The section also provides an indication of the targets for reductions in maternal and neonatal mortality, as proposed in the Ending Preventable Maternal Mortality by 2030 initiative and the Every Newborn Action Plan. These proposed targets are subject to national policy priorities and decisions.

ESTIMATES AND PROJECTIONS TO 2030

This section illustrates the potential evolution of the midwifery workforce under "business as usual" assumptions and according to different policy scenarios.

The first row of three graphs considers the number of health workers who will enter and exit the midwifery workforce in the period 2012–2030, using data from the SoWMy survey, and a standard set of decision rules (see Annex 5). The differently coloured sections of the bars represent different cadres within the workforce. For this section of the brief, the health worker cadres reported by the countries were reclassified into categories according to the international standard of classifications (ISCO-2008 revision).[2] This reclassification is based on the roles and responsibilities that the countries reported in the SOWMY questionnaire for each cadre. In some cases this results in workers "changing category": for example, a cadre that in one country is called "midwives" may be reclassified as midwifery associate professionals, or auxiliaries, according to the ISCO code, if they do not perform all the essential roles and responsibilities of midwives. This reclassification allows an accurate estimate of met need based on the actual roles and responsibilities of each cadre.

The graph labelled "**Projected outflows**" shows how the full-time equivalent number of health workers will reduce over time, due to death, attrition and retirement, with the red shaded area representing the volume of outflows each year.

The graph labelled "**Projected inflows**" shows the number of health workers who will enter the workforce each year following graduation from national educational institutions.

The graph labelled "**Projected workforce**" shows the cumulative effect of the exits in the first graph and the entries in the second graph, and thus projects how the total size of the workforce will change over time.

The "**What If**" section presents examples of policy scenarios. These illustrate the potential impact of policy decisions and the changes in **estimated met need** (see opposite page) that could be realized through four different scenarios: 1) reducing the number of pregnancies per annum; 2) increasing the supply of midwives, nurses and physicians; 3) improving efficiency; and 4) reducing voluntary attrition.

The bottom two graphs show the difference between the country continuing on its current trajectory and applying the policy changes from the scenarios. The graph labelled "**Current trajectory**" shows the projections of workforce availability and need with no policy changes in the country, while the graph labelled "**What if… trajectory**" shows the projections of workforce availability and need if the four policy scenarios indicated above are applied. These projections and the changes in **estimated met need** are based on country data reported in the SoWMy survey, as well as demographic and epidemiological data from international published sources (see methodology in Annex 3).

1   Available from http://www.familycareintl.org/en/resources/publications/110
2   World Health Organization. Classifying health workers: Mapping occupations to the international standard classification. Geneva, 2014. Available from: http://www.who.int/hrh/statistics/Health_workers_classification.pdf

ALGERIA

In 2012, of an estimated total population of 38.5 million, 12 million (31%) were living in rural areas and 10.9 million (28%) were women of reproductive age; the total fertility rate was 2.8. By 2030, the population is projected to increase by 26% to 48.6 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 1 million pregnancies per annum by 2030, 33% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 90 million antenatal visits, 16.1 million births and 64.5 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

1,334,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

		APPROX.
PRE-PREGNANCY (all women of reproductive age)	=	**20,577,000** family planning visits
ANTENATAL (pregnancies x 4)	=	**5,335,000** routine visits
BIRTH	=	**956,000** skilled birth attendance
POST-PARTUM (births x 4) **POSTNATAL** (newborns x 4)	=	**3,822,000** routine visits

0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	9,404	100
Midwives, auxiliary	*na*	*na*
Nurse-midwives	*na*	*na*
Nurses	99,320	75
Nurses or nurse-midwives, auxiliary	20,005	–
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	30,901	–
Obstetricians & gynaecologists	612	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED =

98%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

7% (n=3)

93% (n=43)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births

600,000
400,000
200,000
0

Rural | Urban

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	5
Standardized curriculum? Year of last update	Yes, 2012
Minimum number of supervised births in curriculum	-
Number of 2012 graduates/as % of all practising midwives	880/9
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	No
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	3
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	1987, 2004, 2005
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	Yes

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural   Urban

Number of pregnancies

2012 · · 2015 · · · 2020 · · · 2025 · · 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012)   Target by 2030

Maternal mortality ratio — MMR

Newborn mortality rate — NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

- Outflow from attrition, death and retirement
- Midwifery professionals
- Midwifery professionals, associates
- Nursing professionals
- Nursing professionals, associates
- Paramedical practitioners & medical assistants
- Medical practitioners, generalists
- Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

2012 2015 2020 2025 2030

2013 2015 2020 2025 2030

2012 2015 2020 2025 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

1 million CURRENT → 0.8 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

100% MET NEED 2030   100% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

100% MET NEED 2030   100% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

5% leak CURRENT → 2% leak SCENARIO
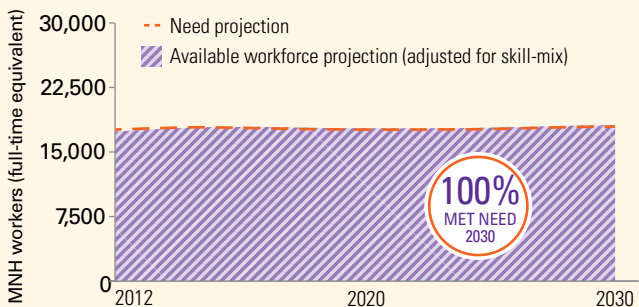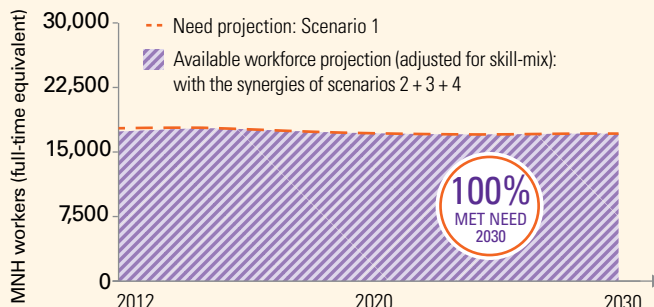
100% MET NEED 2030   100% MET NEED 2030

CURRENT TRAJECTORY

- - - Need projection
Available workforce projection (adjusted for skill-mix)

MNH workers (full-time equivalent)

100% MET NEED 2030

2012 2020 2030

WHAT IF... TRAJECTORY

- - - Need projection: Scenario 1
Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

MNH workers (full-time equivalent)

100% MET NEED 2030

2012 2020 2030

1. These health worker categories include the following country titles - Midwives: includes sage-femmes principales, sage-femmes de santé publique; Nurses: includes infirmiers diplomés d´état, infirmiers de santé publique, puericultrices; Auxiliary nurse-midwives: includes aides soignantes, auxiliares de puériculture, infirmier brevetés; Generalist physicians: includes médecins généralistes, pédiatres; Obstetricians & gynaecologists: includes médecins spécialistes (obs.gyn). Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Year of data is as per most recent data available in UNICEF delivery care database. Available at: http://data.unicef.org/maternal-health/delivery-care
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are the proposed targets for MMR and NMR by 2030 from the recommendations of the Ending Preventable Maternal Mortality by 2030 and Every Newborn Action Plan
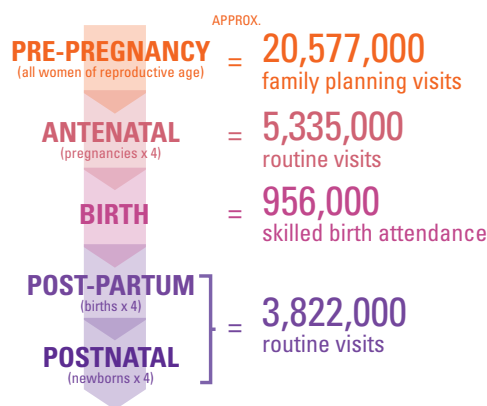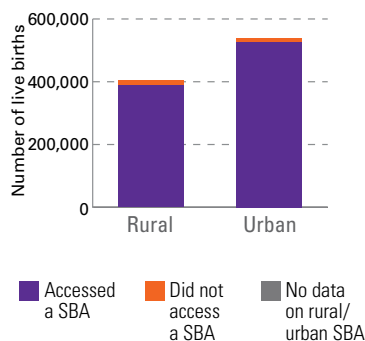
DJIBOUTI

In 2012, of an estimated total population of 0.9 million, 0.3 million (38%) were living in rural areas and 0.2 million (27%) were women of reproductive age; the total fertility rate was 3.4. By 2030, the population is projected to increase by 25% to 1.1 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.03 million pregnancies per annum by 2030. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 2.5 million antenatal visits, 0.5 million births and 1.8 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

34,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

PRE-PREGNANCY (all women of reproductive age) = APPROX. **420,000** family planning visits

ANTENATAL (pregnancies x 4) = **136,000** routine visits

BIRTH = **25,000** skilled birth attendance

POST-PARTUM (births x 4) / **POSTNATAL** (newborns x 4) = **100,000** routine visits

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	167	100
Midwives, auxiliary	*na*	*na*
Nurse-midwives	*na*	*na*
Nurses	*na*	*na*
Nurses or nurse-midwives, auxiliary	*na*	*na*
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	185	50
Obstetricians & gynaecologists	—	100
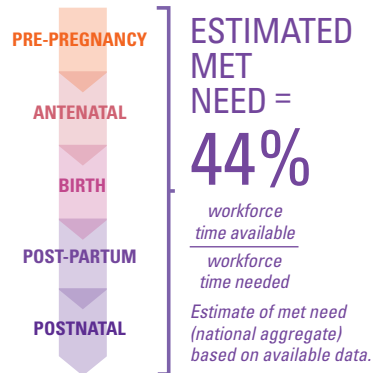
PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 44%

workforce time available

workforce time needed

Estimate of met need (national aggregate) based on available data.

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2012
Minimum number of supervised births in curriculum	100
Number of 2012 graduates/as % of all practising midwives	45/27
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	No
A recognized definition of a professional midwife exists	No
A government body regulates midwifery practice	No
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	7
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	2012
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	No
Negotiating work or salary issues with the Government	No

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

9% (n=4)
91% (n=42)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births (Rural / Urban)

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

■ Rural ■ Urban

MORTALITY REDUCTION[5]

▨ Country (MMR, 2013; NMR, 2012) ■ Target by 2030
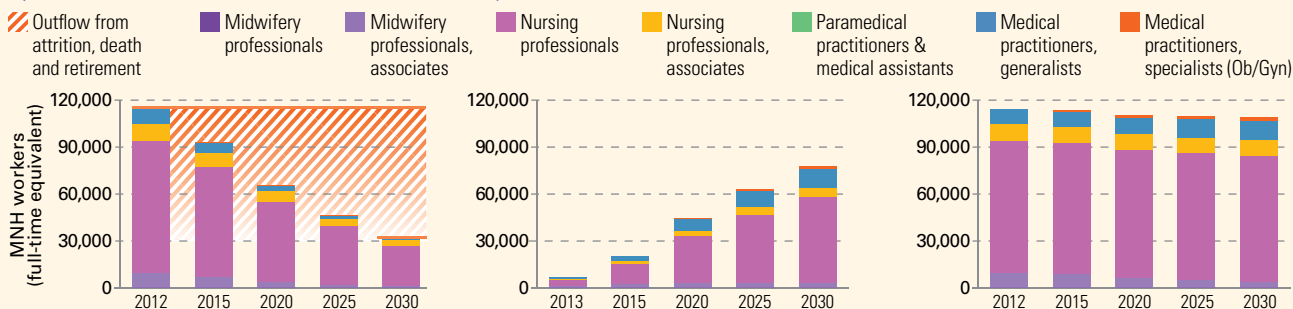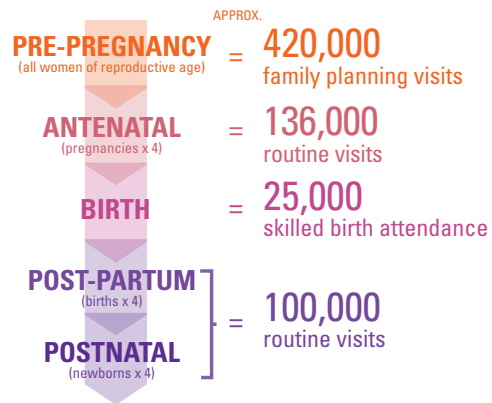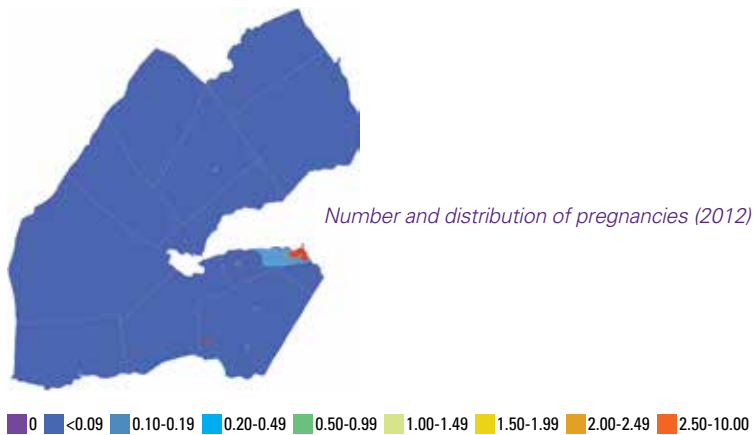

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

▨ Outflow from attrition, death and retirement
■ Midwifery professionals
■ Midwifery professionals, associates
■ Nursing professionals
■ Nursing professionals, associates
■ Paramedical practitioners & medical assistants
■ Medical practitioners, generalists
■ Medical practitioners, specialists (Ob/Gyn)

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.03 million CURRENT → 0.02 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

96% MET NEED 2030 → 96% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

96% MET NEED 2030 → 96% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

4% leak CURRENT → 2% leak SCENARIO

96% MET NEED 2030 → 96% MET NEED 2030

CURRENT TRAJECTORY

-- Need projection
▨ Available workforce projection (adjusted for skill-mix)

96% MET NEED 2030

WHAT IF... TRAJECTORY

-- Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

96% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes sages femmes; Generalist physicians: includes médecins généralistes; Obstetricians & gynaecologists: includes obstétriciens/gynécologues. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.

EGYPT

In 2012, of an estimated total population of 80.7 million, 19.2 million (24%) were living in rural areas and 20.7 million (26%) were women of reproductive age; the total fertility rate was 2.8. By 2030, the population is projected to increase by 27% to 102.6 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 2.5 million pregnancies per annum by 2030, 20% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 191.7 million antenatal visits, 35.3 million births and 141.2 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

2,588,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

er and distribution of pregnancies (2012)

		APPROX.
PRE-PREGNANCY (all women of reproductive age)	=	**38,393,000** family planning visits
ANTENATAL (pregnancies x 4)	=	**10,351,000** routine visits
BIRTH	=	**1,907,000** skilled birth attendance
POST-PARTUM (births x 4) **POSTNATAL** (newborns x 4)	=	**7,628,000** routine visits

Legend: 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	na	na
Midwives, auxiliary	na	na
Nurse-midwives	2,800	100
Nurses	na	na
Nurses or nurse-midwives, auxiliary	na	na
Clinical officers & medical assistants	na	na
Physicians, generalists	30,000	30
Obstetricians & gynaecologists	5,042	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED =
35%
workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

57% (n=26) Covered
43% (n=20) Not covered

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births (y-axis: 0, 500,000, 1,000,000, 1,500,000)
Rural | Urban

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2000
Minimum number of supervised births in curriculum	20
Number of 2012 graduates/as % of all practising midwives	125/4
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	Yes
A live registry of licensed midwives exists	Yes
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	1
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/No
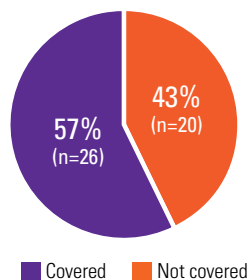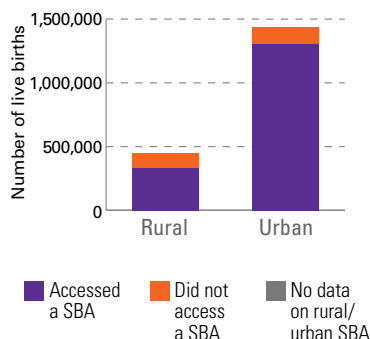
PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	1990
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	No

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

■ Rural ■ Urban

Number of pregnancies

3,000,000 — 2,250,000 — 1,500,000 — 750,000

2012   2015   2020   2025   2030

MORTALITY REDUCTION[5]

▨ Country (MMR, 2013; NMR, 2012) ■ Target by 2030

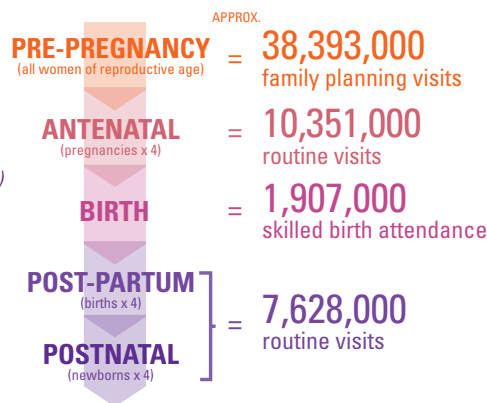Maternal mortality ratio: 60 — 40 — 20 — 0
MMR

Newborn mortality rate: 20 — 10 — 0
NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

▨ Outflow from attrition, death and retirement
■ Midwifery professionals
■ Midwifery professionals, associates
■ Nursing professionals
■ Nursing professionals, associates
■ Paramedical practitioners & medical assistants
■ Medical practitioners, generalists
■ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

32,000 — 24,000 — 16,000 — 8,000 — 0

2012 2015 2020 2025 2030

32,000 — 24,000 — 16,000 — 8,000 — 0

2013 2015 2020 2025 2030

32,000 — 24,000 — 16,000 — 8,000 — 0

2012 2015 2020 2025 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

2.5 million CURRENT → 2.0 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

54% MET NEED 2030 → 100% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

54% MET NEED 2030 → 77% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

15% leak CURRENT → 7.5% leak SCENARIO

54% MET NEED 2030 → 79% MET NEED 2030

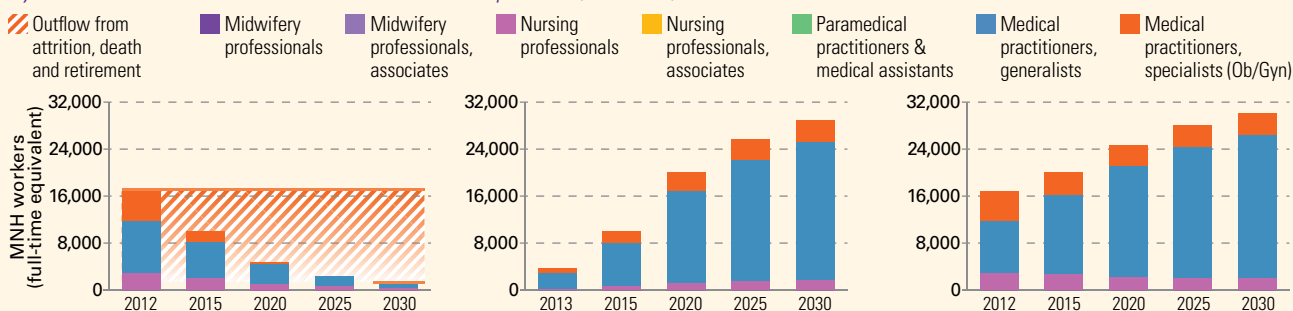## CURRENT TRAJECTORY
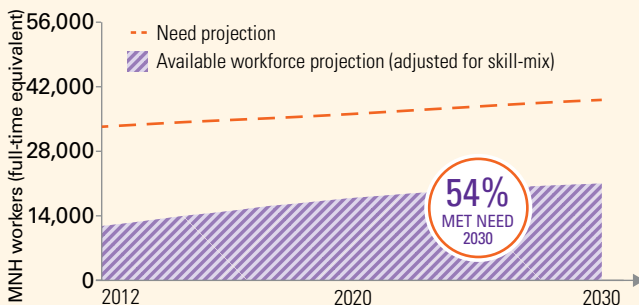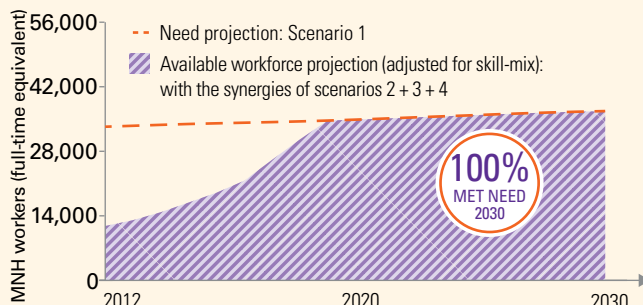
-- Need projection
▨ Available workforce projection (adjusted for skill-mix)

MNH workers (full-time equivalent)

56,000 — 42,000 — 28,000 — 14,000 — 0

2012   2020   2030

54% MET NEED 2030

WHAT IF... TRAJECTORY

-- Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

MNH workers (full-time equivalent)

56,000 — 42,000 — 28,000 — 14,000 — 0

2012   2020   2030

100% MET NEED 2030

1. These health worker categories include the following country titles - Nurse midwives: includes nurse-midwives; Generalist physicians: includes generalist physicians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Year of data is as per most recent data available in STATCOMPILER.
3. Information refers to the nurse-midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.

IRAQ

In 2012, of an estimated total population of 32.8 million, 23 million (70%) were living in rural areas and 8 million (25%) were women of reproductive age; the total fertility rate was 4.1. By 2030, the population is projected to increase by 55% to 51 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 1.9 million pregnancies per annum by 2030. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 131.7 million antenatal visits, 22.4 million births and 89.7 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

1,541,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

APPROX.

PRE-PREGNANCY (all women of reproductive age)	=	**13,143,000** family planning visits
ANTENATAL (pregnancies x 4)	=	**6,164,000** routine visits
BIRTH	=	**1,049,000** skilled birth attendance
POST-PARTUM (births x 4)		
POSTNATAL (newborns x 4)	=	**4,198,000** routine visits

0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

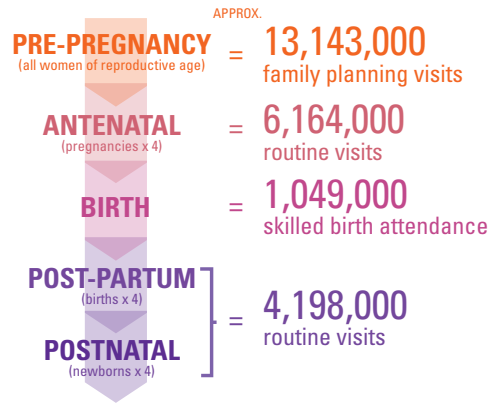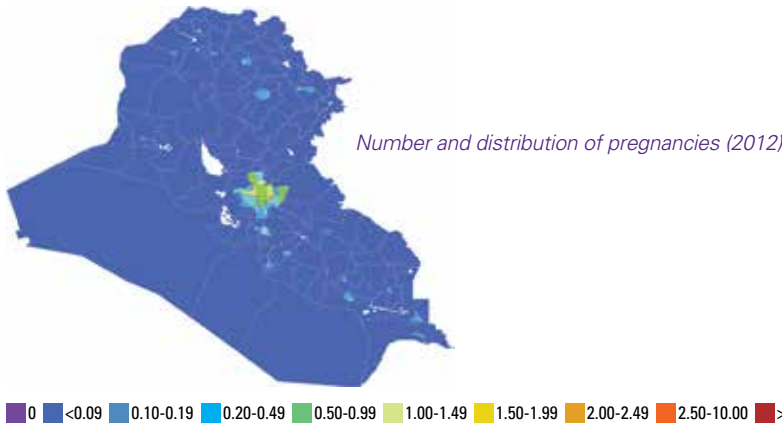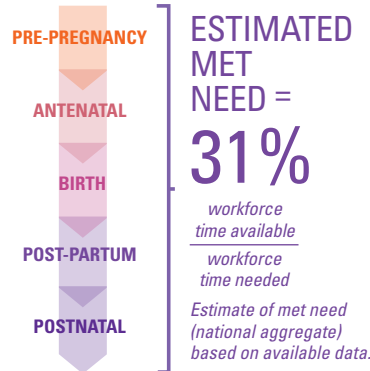|	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	1,269	100
Midwives, auxiliary	*na*	*na*
Nurse-midwives	–	100
Nurses	*na*	*na*
Nurses or nurse-midwives, auxiliary	*na*	*na*
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	6,934	60
Obstetricians & gynaecologists	1,020	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 31%

workforce time available

workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

13% (n=6)

87% (n=40)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births

900,000
300,000
0

Rural | Urban

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 10+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	No, *na*
Minimum number of supervised births in curriculum	*na*
Number of 2012 graduates/as % of all practising midwives	584/46
% of graduates employed in MNH within one year	–

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	Yes
A live registry of licensed midwives exists	Yes
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	4
Midwives allowed to provide injectable contraceptives/intrauterine devices	No/No

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	1959, 1971, 2012
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	No

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural ■ Urban

Number of pregnancies: 2012, 2015, 2020, 2025, 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012) ■ Target by 2030

Maternal mortality ratio — MMR

Newborn mortality rate — NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS
PROJECTED INFLOWS
PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

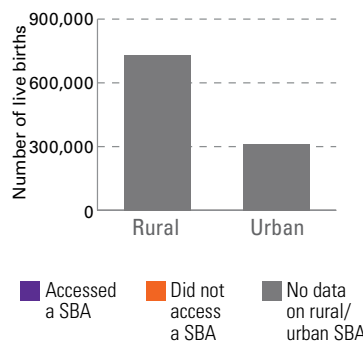Outflow from attrition, death and retirement ■ Midwifery professionals ■ Midwifery professionals, associates ■ Nursing professionals ■ Nursing professionals, associates ■ Paramedical practitioners & medical assistants ■ Medical practitioners, generalists ■ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent): 2012, 2015, 2020, 2025, 2030 / 2013, 2015, 2020, 2025, 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?
1.9 million CURRENT → 1.5 million SCENARIO
Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?
CURRENT → SCENARIO
32% MET NEED 2030 → 39% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?
CURRENT → SCENARIO
32% MET NEED 2030 → 37% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?
4% leak CURRENT → 2% leak SCENARIO
32% MET NEED 2030 → 35% MET NEED 2030

CURRENT TRAJECTORY
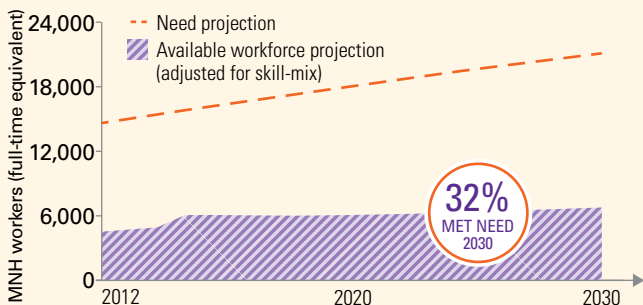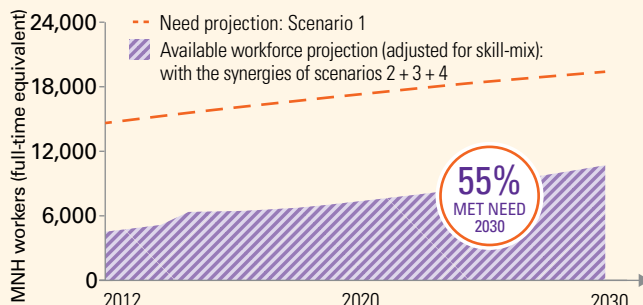
- - Need projection
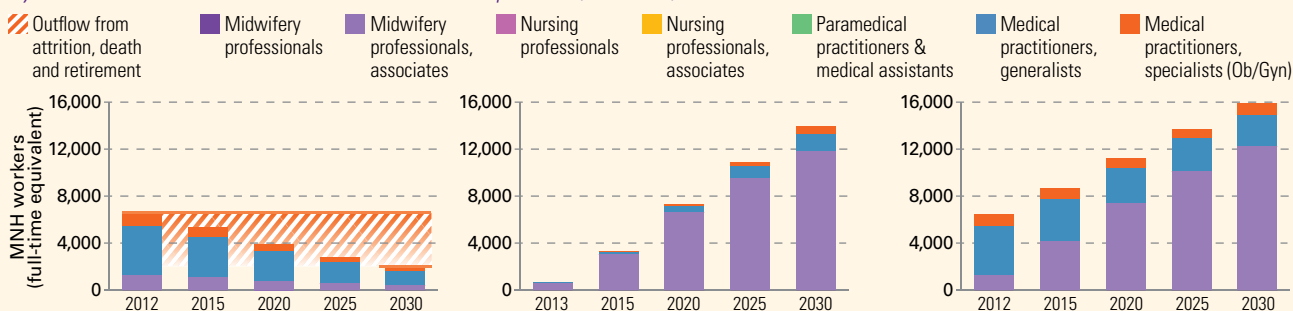■ Available workforce projection (adjusted for skill-mix)
32% MET NEED 2030

WHAT IF... TRAJECTORY

- - Need projection: Scenario 1
■ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4
55% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes midwives; Nurse-midwives: includes nurse-midwives; Generalist physicians: includes generalist physicians, family physicians and paediatricians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.

JORDAN

In 2012, of an estimated total population of 7 million, 1.2 million (17%) were living in rural areas and 1.9 million (27%) were women of reproductive age; the total fertility rate was 3.3. By 2030, the population is projected to increase by 33% to 9.4 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.2 million pregnancies per annum by 2030, 38% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 19.7 million antenatal visits, 3.5 million births and 13.9 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

274,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

| | 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00 |

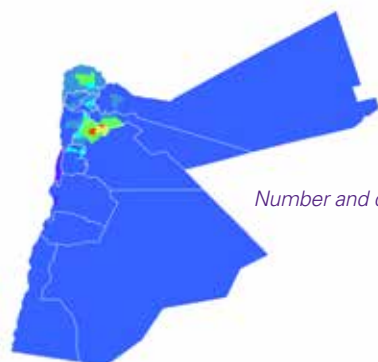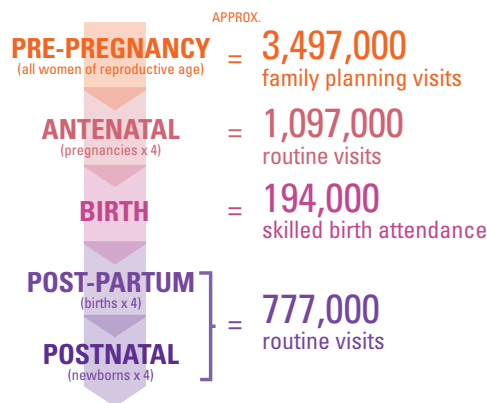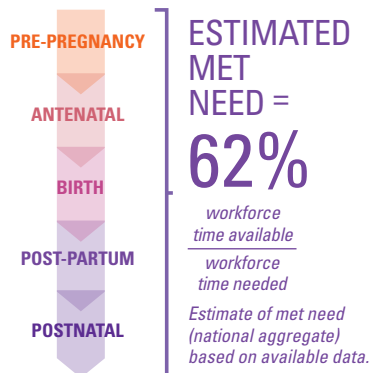**PRE-PREGNANCY** (all women of reproductive age) = APPROX. **3,497,000** family planning visits

ANTENATAL (pregnancies x 4) = **1,097,000** routine visits

BIRTH = **194,000** skilled birth attendance

POST-PARTUM (births x 4) / **POSTNATAL** (newborns x 4) = **777,000** routine visits

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	696	63
Midwives, auxiliary	*na*	*na*
Nurse-midwives	*na*	*na*
Nurses	4,252	50
Nurses or nurse-midwives, auxiliary	*na*	*na*
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	1,217	–
Obstetricians & gynaecologists	–	–

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 62%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

11% (n=5)
89% (n=41)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births (y-axis: 0 to 120,000)

Rural, Urban

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2011
Minimum number of supervised births in curriculum	12
Number of 2012 graduates/as % of all practising midwives	124/18
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	No
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	Yes
A live registry of licensed midwives exists	Yes
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	6
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	1972, 2002
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	Yes

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural Urban

Number of pregnancies

300,000
225,000
150,000
75,000
0

2012 2015 2020 2025 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012) Target by 2030

Maternal mortality ratio

60
40
20
0

MMR

Newborn mortality rate

18
12
6
0

NMR

ESTIMATES AND PROJECTIONS TO 2030
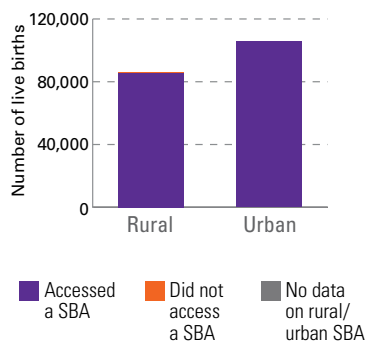
This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

Outflow from attrition, death and retirement | Midwifery professionals | Midwifery professionals, associates | Nursing professionals | Nursing professionals, associates | Paramedical practitioners & medical assistants | Medical practitioners, generalists | Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

80,000
60,000
40,000
20,000
0

2012 2015 2020 2025 2030

80,000
60,000
40,000
20,000
0

2013 2015 2020 2025 2030

80,000
60,000
40,000
20,000
0

2012 2015 2020 2025 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.25 million
CURRENT
0.2 million
SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?
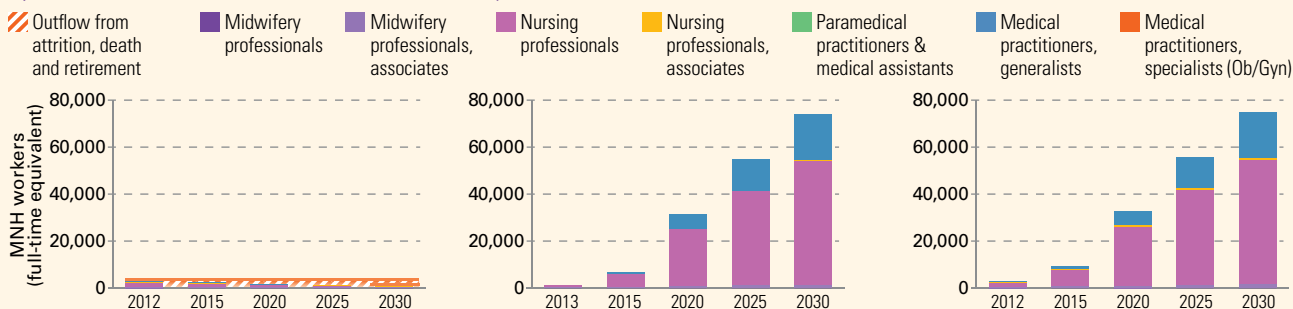
CURRENT → SCENARIO

96% MET NEED 2030   96% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

96% MET NEED 2030   96% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

4% leak
CURRENT
2% leak
SCENARIO

96% MET NEED 2030   96% MET NEED 2030

CURRENT TRAJECTORY

MNH workers (full-time equivalent)

6,000
4,500
3,000
1,500
0

- - Need projection
Available workforce projection (adjusted for skill-mix)

2012 2020 2030

96% MET NEED 2030

WHAT IF... TRAJECTORY

MNH workers (full-time equivalent)

6,000
4,500
3,000
1,500
0

- - Need projection: Scenario 1
Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

2012 2020 2030

96% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes midwives; Nurses: includes association nurses, practical nurses, registered (staff) nurses; Generalist physicians: includes generalist physicians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Year of data is as per most recent data available in UNICEF delivery care database. Available at: http://data.unicef.org/maternal-health/delivery-care
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are the proposed targets for MMR and NMR by 2030 from the recommendations of the Ending Preventable Maternal Mortality by 2030 and Every Newborn Action Plan

LEBANON

In 2012, of an estimated total population of 4.6 million, 0.6 million (13%) were living in rural areas and 1.3 million (28%) were women of reproductive age; the total fertility rate was 1.5. By 2030, the population is projected to increase by 11% to 5.2 million. To achi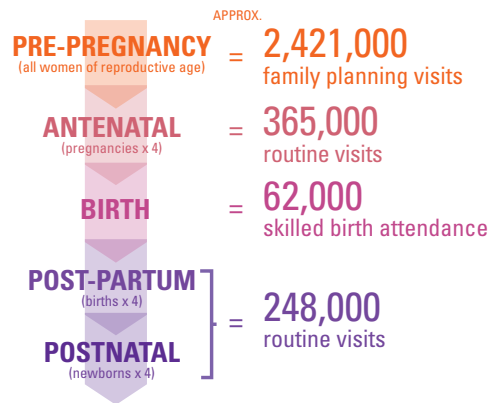eve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.08 million pregnancies per annum by 2030, 28% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 7 million antenatal visits, 1.2 million births and 4.8 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

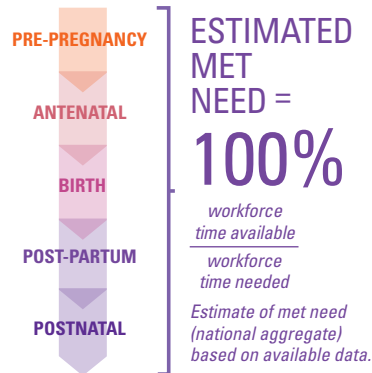### 91,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

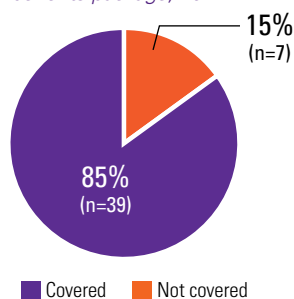*Number and distribution of pregnancies (2012)*

PRE-PREGNANCY (all women of reproductive age)	= APPROX. **2,421,000**	family planning visits
ANTENATAL (pregnancies x 4)	= **365,000**	routine visits
BIRTH	= **62,000**	skilled birth attendance
POST-PARTUM (births x 4) **POSTNATAL** (newborns x 4)	= **248,000**	routine visits

Map legend: 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	1800	70
Midwives, auxiliary	*na*	*na*
Nurse-midwives	*na*	*na*
Nurses	12807	–
Nurses or nurse-midwives, auxiliary	*na*	*na*
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	3000	10
Obstetricians & gynaecologists	950	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 100%

workforce time available
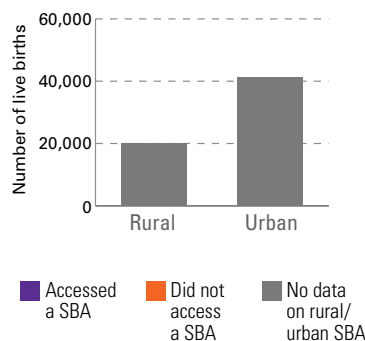workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

15% (n=7)
85% (n=39)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births

Rural	Urban
20,000	41,000

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2014
Minimum number of supervised births in curriculum	60
Number of 2012 graduates/as % of all practising midwives	45/3
% of graduates employed in MNH within one year	-%

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	Yes
A live registry of licensed midwives exists	Yes
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	6
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	2002, 2014
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	Yes

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural
Urban

Number of pregnancies: 100,000 / 75,000 / 50,000 / 25,000 / 0
Years: 2012 · · 2015 · · · 2020 · · · 2025 · · 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012)
Target by 2030

Maternal mortality ratio: 20 / 10 / 0 — MMR
Newborn mortality rate: 20 / 10 / 0 — NMR

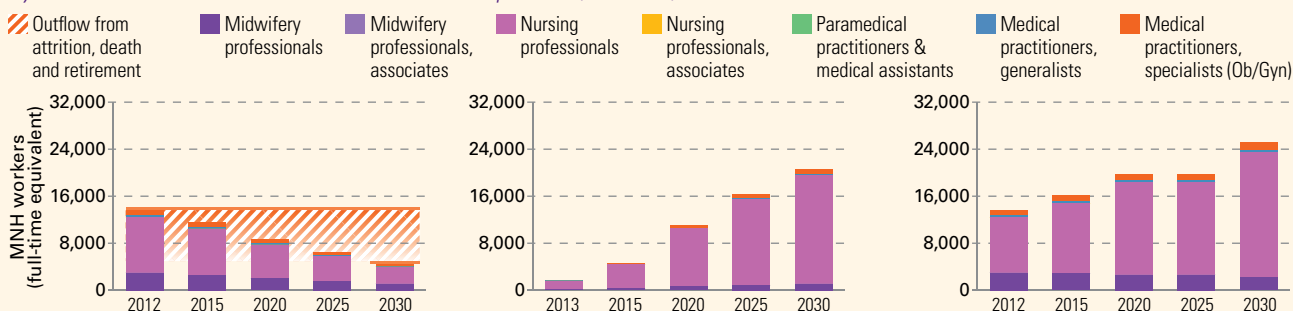# ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

Outflow from attrition, death and retirement
Midwifery professionals
Midwifery professionals, associates
Nursing professionals
Nursing professionals, associates
Paramedical practitioners & medical assistants
Medical practitioners, generalists
Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent): 32,000 / 24,000 / 16,000 / 8,000 / 0
Years: 2012 · 2015 · 2020 · 2025 · 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.08 million CURRENT → 0.07 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO
100% MET NEED 2030 / 100% MET NEED 2030

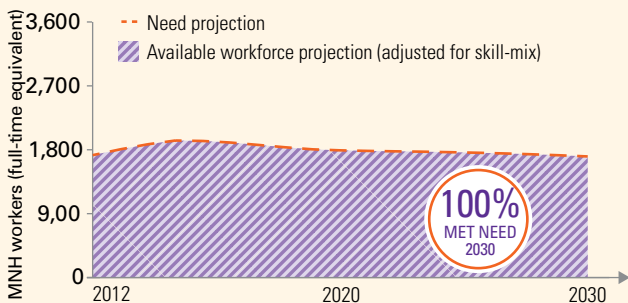**3** Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO
100% MET NEED 2030 / 100% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

4% leak CURRENT → 2% leak SCENARIO
100% MET NEED 2030 / 100% MET NEED 2030

CURRENT TRAJECTORY

- - Need projection
Available workforce projection (adjusted for skill-mix)

MNH workers (full-time equivalent): 3,600 / 2,700 / 1,800 / 9,00 / 0
Years: 2012 / 2020 / 2030

100% MET NEED 2030

WHAT IF... TRAJECTORY

- - Need projection: Scenario 1
Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

MNH workers (full-time equivalent): 3,600 / 2,700 / 1,800 / 900 / 0
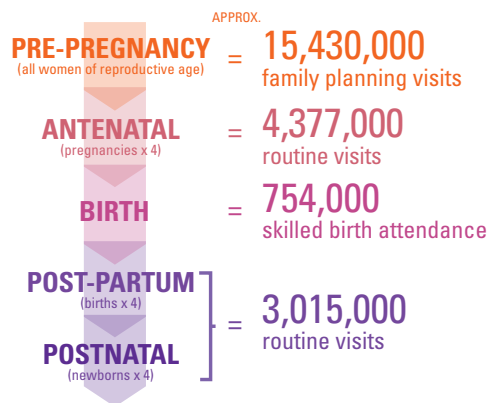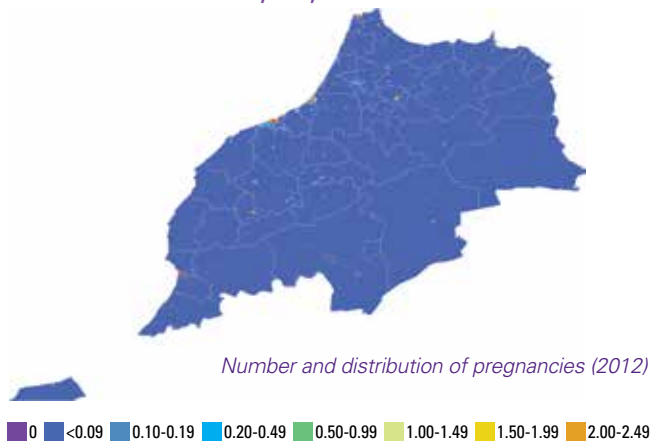Years: 2012 / 2020 / 2030

100% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes midwives; Nurses: includes nurses, registered nurses, nurses working in maternal and child position; Generalist physicians: includes generalist physicians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are the proposed targets for MMR and NMR by 2030 from the recommendations of the Ending Preventable Maternal Mortality by 2030 and Every Newborn Action Plan

MOROCCO

In 2012, of an estimated total population of 32.5 million, 13.2 million (41%) were living in rural areas and 9.2 million (28%) were women of reproductive age; the total fertility rate was 2.8. By 2030, the population is projected to increase by 21% to 39.2 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.9 million pregnancies per annum by 2030, 44% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 76 million antenatal visits, 13.1 million births and 52.4 million post-partum/postnatal visits between 2012 and 2030.
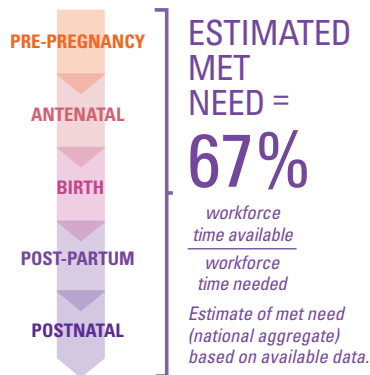
WHAT WOMEN AND NEWBORNS NEED (2012)

1,094,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

| 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00 |

PRE-PREGNANCY (all women of reproductive age) = APPROX. **15,430,000** family planning visits

ANTENATAL (pregnancies x 4) = **4,377,000** routine visits

BIRTH = **754,000** skilled birth attendance

POST-PARTUM (births x 4)
POSTNATAL (newborns x 4) = **3,015,000** routine visits

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	2,684	100
Midwives, auxiliary	na	na
Nurse-midwives	375	100
Nurses	5,200	100
Nurses or nurse-midwives, auxiliary	na	na
Clinical officers & medical assistants	na	na
Physicians, generalists	10,288	40
Obstetricians & gynaecologists	1,006	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 67%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

11% (n=5)
89% (n=41)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births — Rural, Urban

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2012
Minimum number of supervised births in curriculum	80
Number of 2012 graduates/as % of all practising midwives	454/17
% of graduates employed in MNH within one year	75%

MIDWIFERY REGULATION

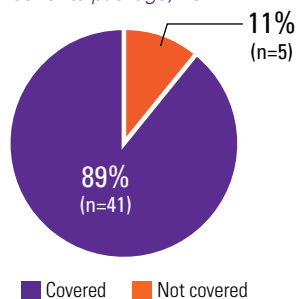|	
Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	No
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	Yes
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	7
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

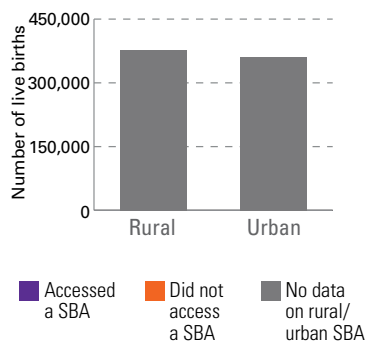|	
Year of creation of professional associations	1990, 2011
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	Yes

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural Urban

Number of pregnancies

1,200,000 / 900,000 / 600,000 / 300,000 / 0

2012 2015 2020 2025 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012) Target by 2030

Maternal mortality ratio: 120 / 80 / 40 / 0 — MMR

Newborn mortality rate: 20 / 10 / 0 — NMR
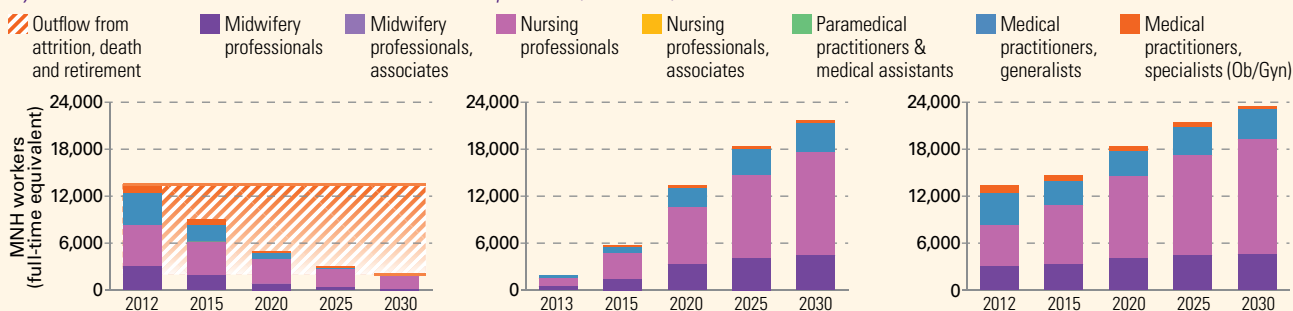
ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

Outflow from attrition, death and retirement Midwifery professionals Midwifery professionals, associates Nursing professionals Nursing professionals, associates Paramedical practitioners & medical assistants Medical practitioners, generalists Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

24,000 / 18,000 / 12,000 / 6,000 / 0

2012 2015 2020 2025 2030

2013 2015 2020 2025 2030

2012 2015 2020 2025 2030

WHAT IF… *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.89 million CURRENT → 0.71 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

98% MET NEED 2030 → 100% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?
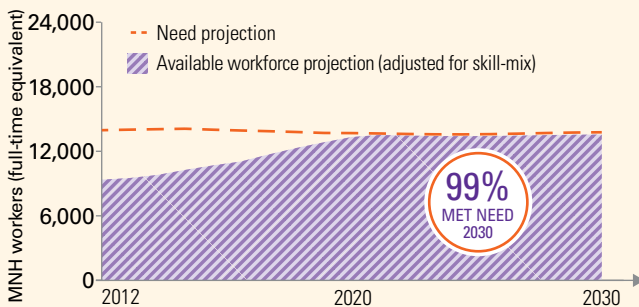
CURRENT → SCENARIO

98% MET NEED 2030 → 100% MET NEED 2030

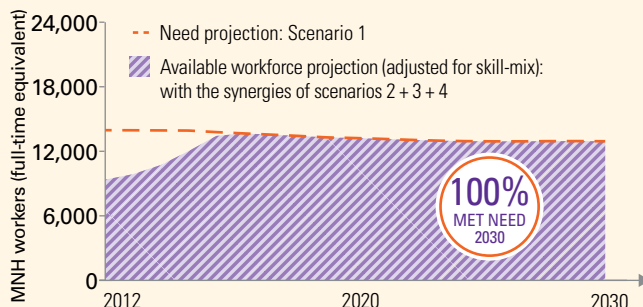**4** Attrition was halved in the next 5 years (2012-2017)?

12% leak CURRENT → 6% leak SCENARIO

98% MET NEED 2030 → 100% MET NEED 2030

CURRENT TRAJECTORY

Need projection

Available workforce projection (adjusted for skill-mix)

MNH workers (full-time equivalent)

24,000 / 18,000 / 12,000 / 6,000 / 0

2012 2020 2030

99% MET NEED 2030

WHAT IF… TRAJECTORY

Need projection: Scenario 1

Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

MNH workers (full-time equivalent)

24,000 / 18,000 / 12,000 / 6,000 / 0

2012 2020 2030

100% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes sages femmes; Nurse-midwives: includes infirmières accoucheuses; Nurses: includes infirmières polyvalentes de santé maternelle et infantile; Generalist physicians: includes médecins généralistes; Obstetricians & gynaecologists: includes gynéco obstétriciens. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.
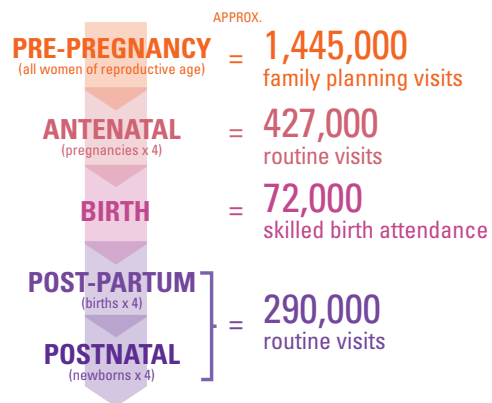
OMAN

In 2012, of an estimated total population of 3.3 million, 0.8 million (24%) were living in rural areas and 0.7 million (22%) were women of reproductive age; the total fertility rate was 2.9. By 2030, the population is projected to increase by 48% to 4.9 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.08 million pregnancies per annum by 2030, 62% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 7.5 million antenatal visits, 1.3 million births and 5.1 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

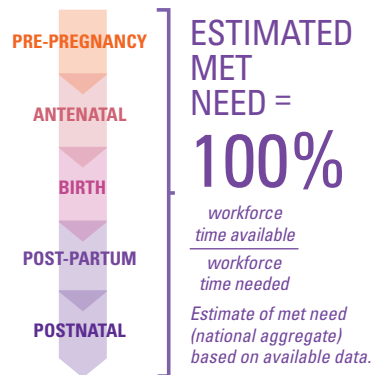### 107,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

PRE-PREGNANCY (all women of reproductive age) = APPROX. **1,445,000** family planning visits

ANTENATAL (pregnancies x 4) = **427,000** routine visits

BIRTH = **72,000** skilled birth attendance

POST-PARTUM (births x 4) = **290,000** routine visits
POSTNATAL (newborns x 4)

0	<0.09	0.10-0.19	0.20-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.50-10.00	>10.00

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	na	na
Midwives, auxiliary	na	na
Nurse-midwives	706	100
Nurses	16,930	–
Nurses or nurse-midwives, auxiliary	na	na
Clinical officers & medical assistants	na	na
Physicians, generalists	4,349	71
Obstetricians & gynaecologists	192	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 100%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

DATA NOT AVAILABLE

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	1.5
Standardized curriculum? Year of last update	Yes, 2010
Minimum number of supervised births in curriculum	40
Number of 2012 graduates/as % of all practising midwives	47/7
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

Legislation exists recognizing midwifery as an autonomous profession	No
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	5
Midwives allowed to provide injectable contraceptives/intrauterine devices	No/No

PROFESSIONAL ASSOCIATIONS[4]

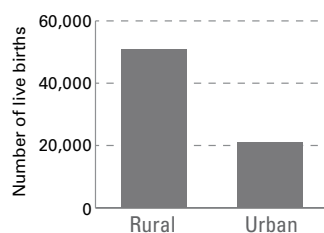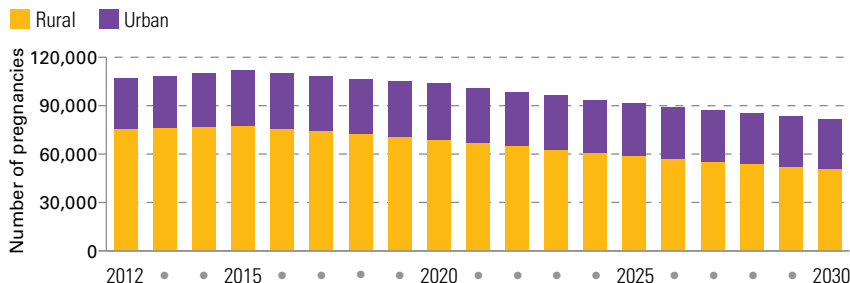|	
Year of creation of professional associations	na
Roles performed by professional associations:	
Continuing professional development	na
Advising or representing members accused of misconduct	na
Advising members on quality standards for MNH care	na
Advising the Government on policy documents related to MNH	na
Negotiating work or salary issues with the Government	na

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural ▮ Urban

Number of pregnancies / years 2012–2030

MORTALITY REDUCTION[5]

▨ Country (MMR, 2013; NMR, 2012) ▮ Target by 2030

Maternal mortality ratio — MMR
Newborn mortality rate — NMR

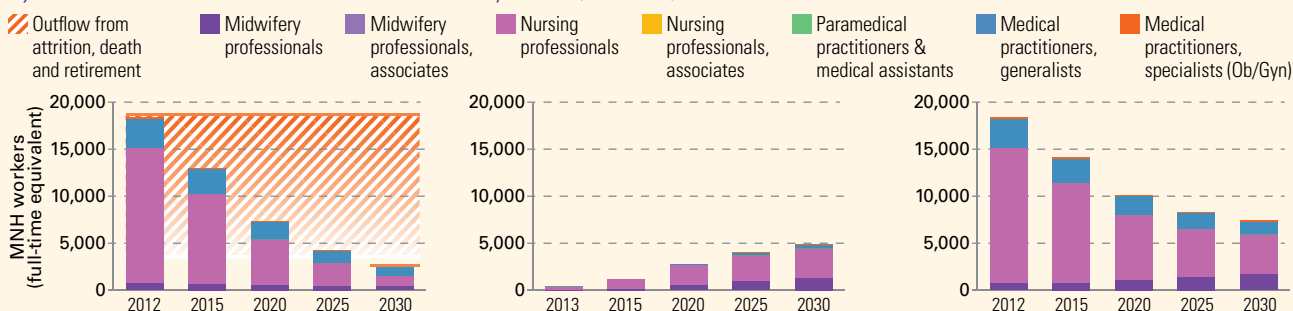# ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

▨ Outflow from attrition, death and retirement
▮ Midwifery professionals
▮ Midwifery professionals, associates
▮ Nursing professionals
▮ Nursing professionals, associates
▮ Paramedical practitioners & medical assistants
▮ Medical practitioners, generalists
▮ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent) / 2012, 2015, 2020, 2025, 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.08 million — CURRENT ➔ 0.07 million — SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT ➔ SCENARIO
100% MET NEED 2030 — 100% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?
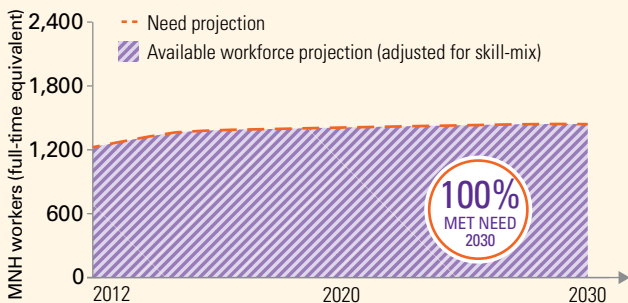
CURRENT ➔ SCENARIO
100% MET NEED 2030 — 100% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

9% leak — CURRENT ➔ 5% leak — SCENARIO
100% MET NEED 2030 — 100% MET NEED 2030
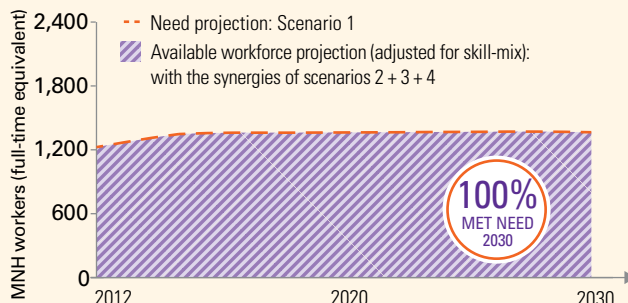
CURRENT TRAJECTORY

- - - Need projection
▨ Available workforce projection (adjusted for skill-mix)

100% MET NEED 2030

WHAT IF... TRAJECTORY

- - - Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

100% MET NEED 2030

1. These health worker categories include the following country titles - Nurse-midwives: includes nurse-midwives; Nurses: includes nurses; Generalist physicians: includes generalist physicians, paediatricians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the nurse-midwife cadre category.
4. National associations for midwifery and nursing.
5. These are the proposed targets for MMR and NMR by 2030 from the recommendations of the Ending Preventable Maternal Mortality by 2030 and Every Newborn Action Plan
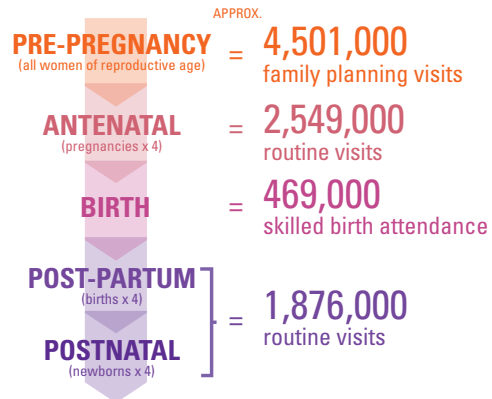
SOMALIA

In 2012, of an estimated total population of 10.2 million, 7.7 million (76%) were living in rural areas and 2.2 million (22%) were women of reproductive age; the total fertility rate was 6.6. By 2030, the population is projected to increase by 66% to 16.9 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.9 million pregnancies per annum by 2030. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 57.8 million antenatal visits, 10.6 million births and 42.5 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

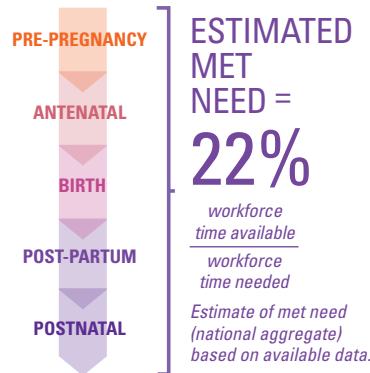### 637,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

	APPROX.	
PRE-PREGNANCY (all women of reproductive age)	=	**4,501,000** family planning visits
ANTENATAL (pregnancies x 4)	=	**2,549,000** routine visits
BIRTH	=	**469,000** skilled birth attendance
POST-PARTUM (births x 4) **POSTNATAL** (newborns x 4)	=	**1,876,000** routine visits

0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	65	100
Midwives, auxiliary	612	100
Nurse-midwives	218	70
Nurses	na	na
Nurses or nurse-midwives, auxiliary	1,838	50
Clinical officers & medical assistants	na	na
Physicians, generalists	339	27
Obstetricians & gynaecologists	21	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED =

22%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	No, *na*
Minimum number of supervised births in curriculum	*na*
Number of 2012 graduates/as % of all practising midwives	–/*na*
% of graduates employed in MNH within one year	*na*

MIDWIFERY REGULATION

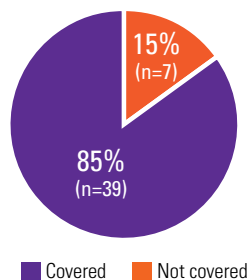|	
Legislation exists recognizing midwifery as an autonomous profession	No
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	7
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/No

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

- 15% (n=7)
- 85% (n=39)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births

Rural | Urban

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA

PROFESSIONAL ASSOCIATIONS[4]

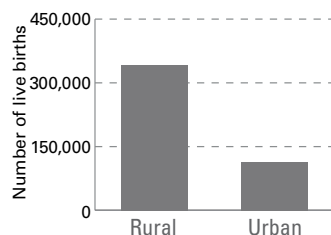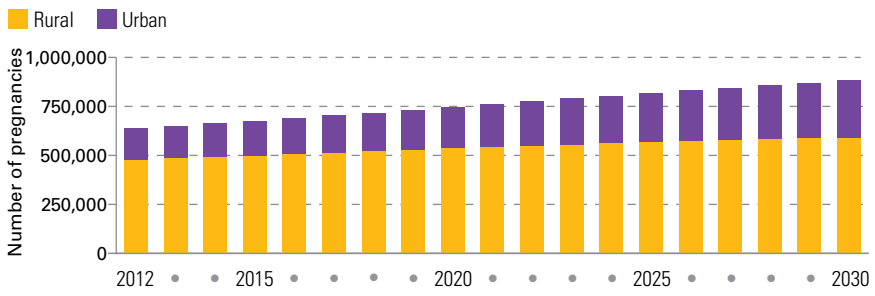|	
Year of creation of professional associations	2013
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	No
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	No

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural ■ Urban

Number of pregnancies

2012 • 2015 • 2020 • 2025 • 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012) ■ Target by 2030

Maternal mortality ratio — MMR

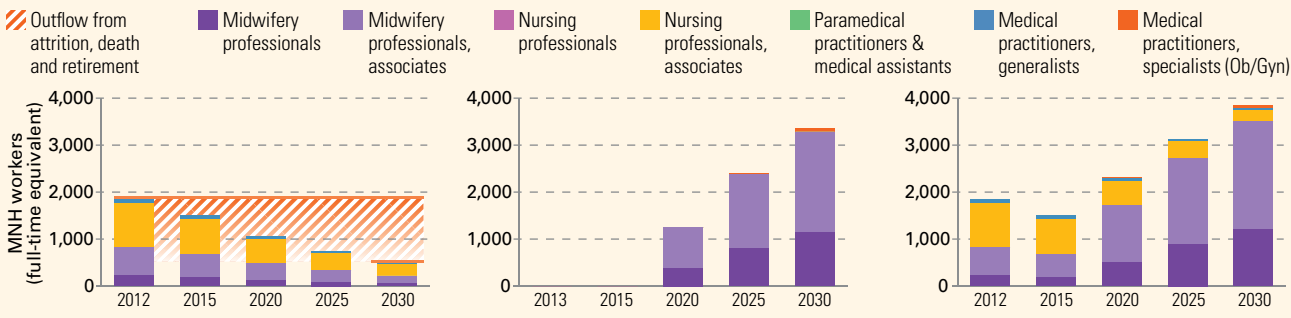Newborn mortality rate — NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

Outflow from attrition, death and retirement ■ Midwifery professionals ■ Midwifery professionals, associates ■ Nursing professionals ■ Nursing professionals, associates ■ Paramedical practitioners & medical assistants ■ Medical practitioners, generalists ■ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

2012 2015 2020 2025 2030 | 2013 2015 2020 2025 2030 | 2012 2015 2020 2025 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.88 million CURRENT → 0.71 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

31% MET NEED 2030 → 40% MET NEED 2030

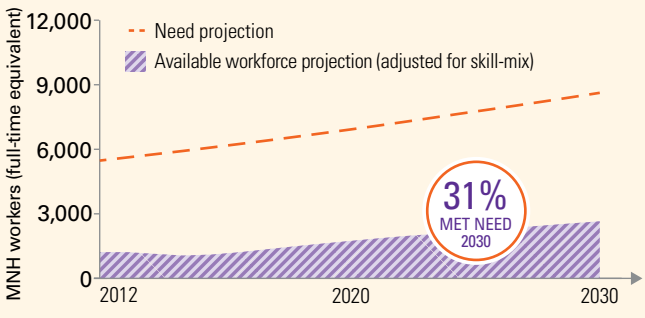**3** Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

31% MET NEED 2030 → 35% MET NEED 2030

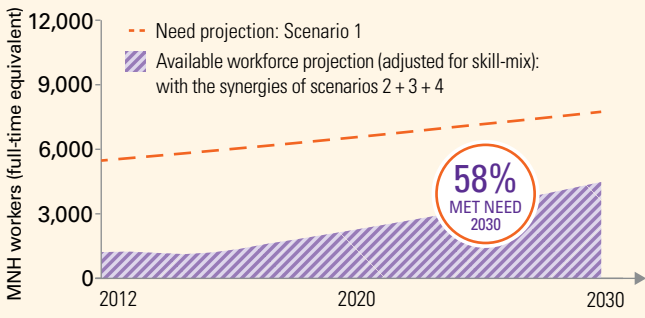**4** Attrition was halved in the next 5 years (2012-2017)?

4% leak CURRENT → 2% leak SCENARIO

31% MET NEED 2030 → 32% MET NEED 2030

CURRENT TRAJECTORY

MNH workers (full-time equivalent)

-- Need projection
■ Available workforce projection (adjusted for skill-mix)

31% MET NEED 2030

2012 2020 2030

WHAT IF... TRAJECTORY

MNH workers (full-time equivalent)

-- Need projection: Scenario 1
■ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

58% MET NEED 2030

2012 2020 2030

1. These health worker categories include the following country titles - Midwives: includes midwives; Auxiliary midwives: includes auxiliary midwives; Nurse-midwives: includes nurse-midwives; Auxiliary nurse-midwives: includes auxiliary nurse-midwives; Generalist physicians: includes generalist physicians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.
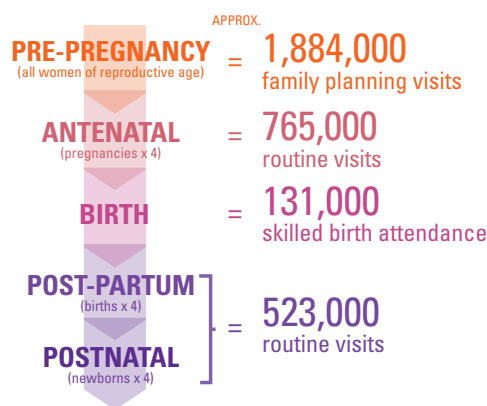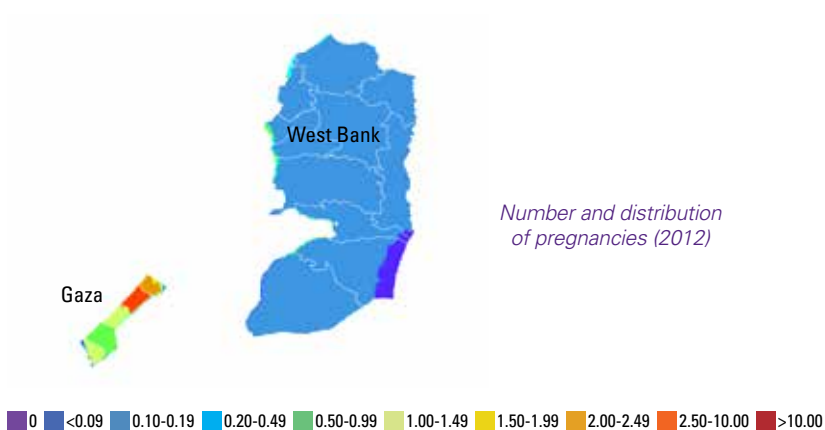
STATE OF PALESTINE

In 2012, of an estimated total population of 4.2 million, 1.1 million (25%) were living in rural areas and 1 million (25%) were women of reproductive age; the total fertility rate was 4.1. By 2030, the population is projected to increase by 52% to 6.4 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.2 million pregnancies per annum by 2030, 39% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 16.3 million antenatal visits, 2.8 million births and 11.2 million post-partum/postnatal visits between 2012 and 2030.
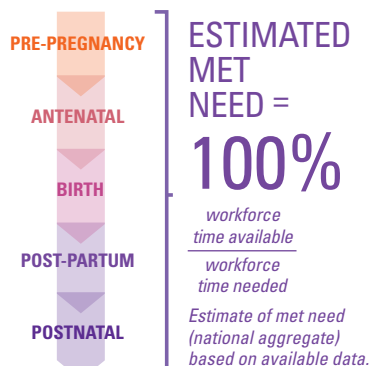
WHAT WOMEN AND NEWBORNS NEED (2012)

191,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

West Bank

Gaza

	PRE-PREGNANCY (all women of reproductive age)	=	APPROX. 1,884,000 family planning visits
	ANTENATAL (pregnancies x 4)	=	765,000 routine visits
	BIRTH	=	131,000 skilled birth attendance
	POST-PARTUM (births x 4) POSTNATAL (newborns x 4)	=	523,000 routine visits

| 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00 |

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	900	100
Midwives, auxiliary	200	100
Nurse-midwives	50	100
Nurses	na	na
Nurses or nurse-midwives, auxiliary	na	na
Clinical officers & medical assistants	na	na
Physicians, generalists	5,000	50
Obstetricians & gynaecologists	140	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 100%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	4
Standardized curriculum? Year of last update	Yes, 2005
Minimum number of supervised births in curriculum	45
Number of 2012 graduates/as % of all practising midwives	45/5
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

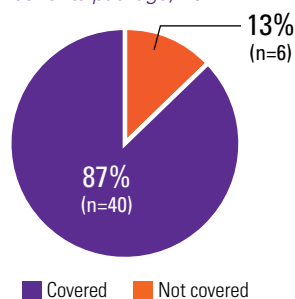|	
Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	Yes
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	4
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/No

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	1974
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	Yes

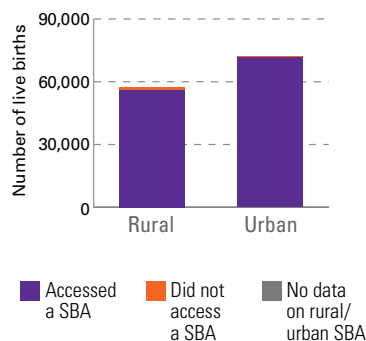## FINANCIAL ACCESSIBILITY

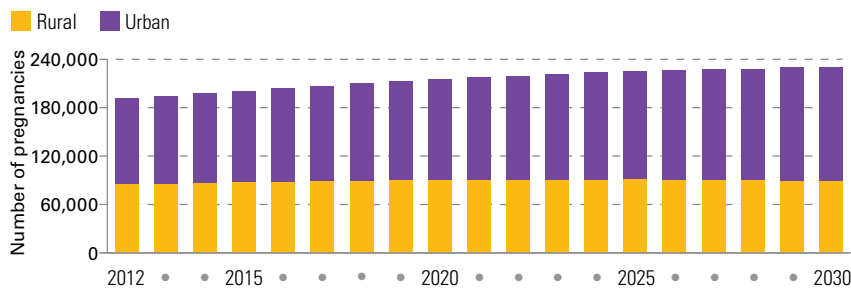Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

13% (n=6)
87% (n=40)

- Covered
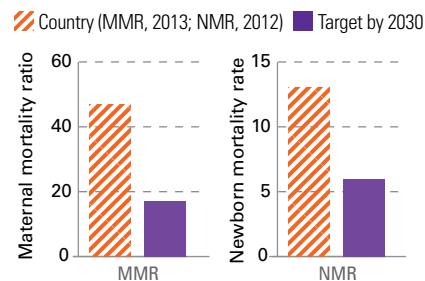- Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births

Rural / Urban

- Accessed a SBA
- Did not access a SBA
- No data on rural/ urban SBA

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

🟨 Rural   🟪 Urban

Number of pregnancies: 240,000 / 180,000 / 120,000 / 60,000 / 0
2012 • • • 2015 • • • • 2020 • • • • 2025 • • • • 2030

MORTALITY REDUCTION[5]

▨ Country (MMR, 2013; NMR, 2012)   🟪 Target by 2030

Maternal mortality ratio: 60 / 40 / 20 / 0 — MMR
Newborn mortality rate: 15 / 10 / 5 / 0 — NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

▨ Outflow from attrition, death and retirement   🟪 Midwifery professionals   🟪 Midwifery professionals, associates   🟪 Nursing professionals   🟨 Nursing professionals, associates   🟩 Paramedical practitioners & medical assistants   🟦 Medical practitioners, generalists   🟧 Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent): 4,000 / 3,000 / 2,000 / 1,000 / 0
Outflows: 2012 2015 2020 2025 2030
Inflows: 2013 2015 2020 2025 2030
Workforce: 2012 2015 2020 2025 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.23 million CURRENT → 0.18 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

86% MET NEED 2030 → 100% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?
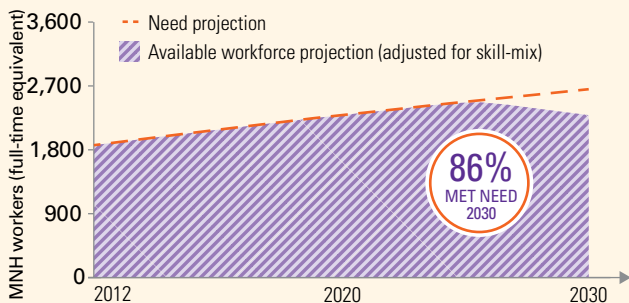
CURRENT → SCENARIO

86% MET NEED 2030 → 100% MET NEED 2030

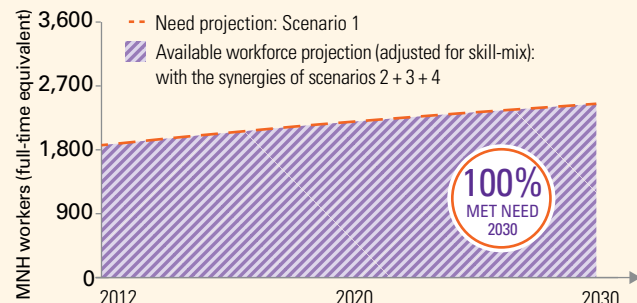**4** Attrition was halved in the next 5 years (2012-2017)?

4% leak CURRENT → 2% leak SCENARIO

86% MET NEED 2030 → 100% MET NEED 2030

CURRENT TRAJECTORY

- - Need projection
▨ Available workforce projection (adjusted for skill-mix)

MNH workers (full-time equivalent): 3,600 / 2,700 / 1,800 / 900 / 0
2012 2020 2030

86% MET NEED 2030

WHAT IF... TRAJECTORY

- - Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

MNH workers (full-time equivalent): 3,600 / 2,700 / 1,800 / 900 / 0
2012 2020 2030

100% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes midwives; Auxiliary midwives: includes auxiliary midwives; Nurse-midwives: includes nurse-midwives; Generalist physicians: includes generalist physicians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Year of data is as per most recent data available in UNICEF delivery care database. Available at: http://data.unicef.org/maternal-health/delivery-care.
3. Information refers to the midwife cadre category.
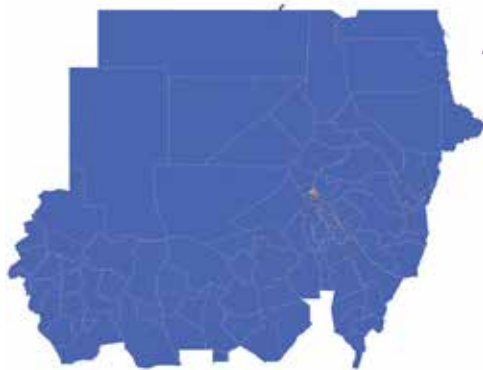4. National associations for midwifery and nursing.
5. These are the proposed targets for MMR and NMR by 2030 from the recommendations of the Ending Preventable Maternal Mortality by 2030 and Every Newborn Action Plan
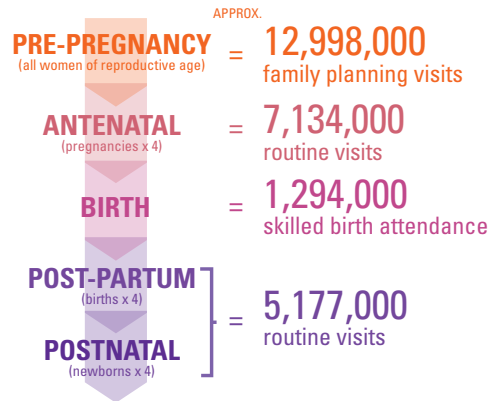
SUDAN

In 2012, of an estimated total population of 37.2 million, 24 million (64%) were living in rural areas and 9 million (24%) were women of reproductive age; the total fertility rate was 4.5. By 2030, the population is projected to increase by 48% to 55.1 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 2.1 million pregnancies per annum by 2030. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 149.3 million antenatal visits, 27.1 million births and 108.3 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

1,784,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

	APPROX.	
PRE-PREGNANCY (all women of reproductive age)	=	**12,998,000** family planning visits
ANTENATAL (pregnancies x 4)	=	**7,134,000** routine visits
BIRTH	=	**1,294,000** skilled birth attendance
POST-PARTUM (births x 4)		**5,177,000** routine visits
POSTNATAL (newborns x 4)	=	

Legend: 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	478	100
Midwives, auxiliary	67	100
Nurse-midwives	689	100
Nurses	na	na
Nurses or nurse-midwives, auxiliary	na	na
Clinical officers & medical assistants	13,455	–
Physicians, generalists	7,226	50
Obstetricians & gynaecologists	316	80
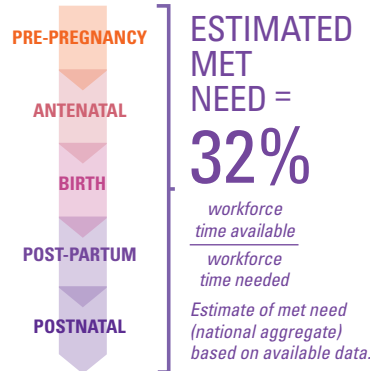
PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED =
32%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

- 20% (n=9) Not covered
- 80% (n=37) Covered

Covered | Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births (y-axis: 0 to 900,000)

Rural | Urban

Accessed a SBA | Did not access a SBA | No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	4
Standardized curriculum? Year of last update	Yes, 2010
Minimum number of supervised births in curriculum	50
Number of 2012 graduates/as % of all practising midwives	0/*na*
% of graduates employed in MNH within one year	33%

MIDWIFERY REGULATION

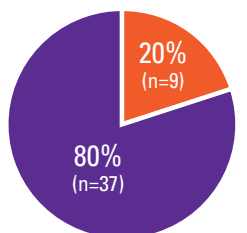|	
Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	No
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	Yes
A live registry of licensed midwives exists	Yes
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	5
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/No

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	2008
Roles performed by professional associations:	
Continuing professional development	No
Advising or representing members accused of misconduct	No
Advising members on quality standards for MNH care	No
Advising the Government on policy documents related to MNH	No
Negotiating work or salary issues with the Government	No

na = not applicable; — = missing data

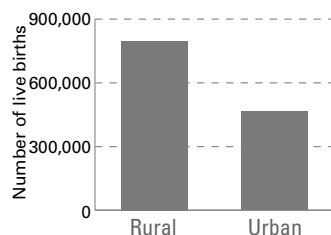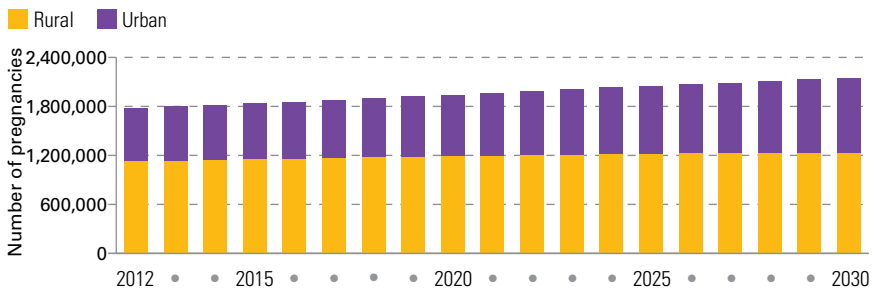## PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

■ Rural ■ Urban

Number of pregnancies
2,400,000
1,800,000
1,200,000
600,000
0

2012　2015　2020　2025　2030

MORTALITY REDUCTION[5]

▨ Country (MMR, 2013; NMR, 2012)　■ Target by 2030

Maternal mortality ratio
450
300
150
0
MMR

Newborn mortality rate
40
20
0
NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

▨ Outflow from attrition, death and retirement
■ Midwifery professionals
■ Midwifery professionals, associates
■ Nursing professionals
■ Nursing professionals, associates
■ Paramedical practitioners & medical assistants
■ Medical practitioners, generalists
■ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)
56,000
42,000
28,000
14,000
0
2012　2015　2020　2025　2030

MNH workers (full-time equivalent)
56,000
42,000
28,000
14,000
0
2013　2015　2020　2025　2030

MNH workers (full-time equivalent)
56,000
42,000
28,000
14,000
0
2012　2015　2020　2025　2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

2.1 million
CURRENT
→
1.7 million
SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

38% MET NEED 2030　46% MET NEED 2030

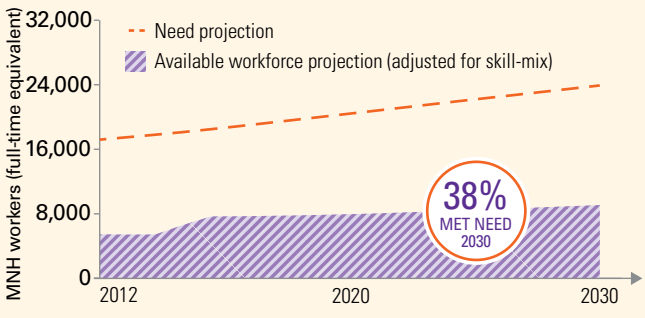**3** Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

38% MET NEED 2030　43% MET NEED 2030

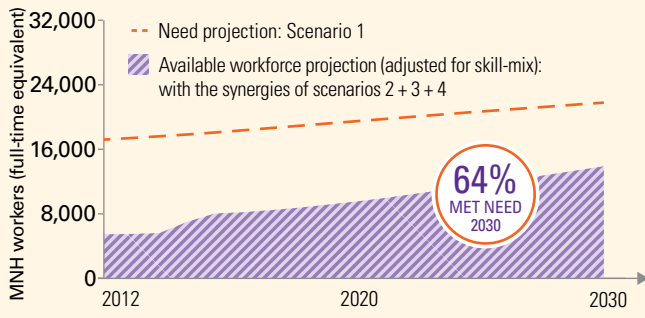**4** Attrition was halved in the next 5 years (2012-2017)?

4% leak
CURRENT
→
2% leak
SCENARIO

38% MET NEED 2030　40% MET NEED 2030

CURRENT TRAJECTORY

-- Need projection
▨ Available workforce projection (adjusted for skill-mix)

MNH workers (full-time equivalent)
32,000
24,000
16,000
8,000
0
2012　2020　2030

38% MET NEED 2030

WHAT IF... TRAJECTORY

-- Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

MNH workers (full-time equivalent)
32,000
24,000
16,000
8,000
0
2012　2020　2030

64% MET NEED 2030

1. These health worker categories include the following country titles - Midwives: includes midwives, health visitors; Auxiliary midwives: includes technical/community midwives; Nurse-midwives: includes nurse-midwives; Generalist physicians: includes generalist physicians; Obstetricians & gynaecologists: includes obstetricians & gynaecologists; Clinical officers & medical assistants: includes medical assistants. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.
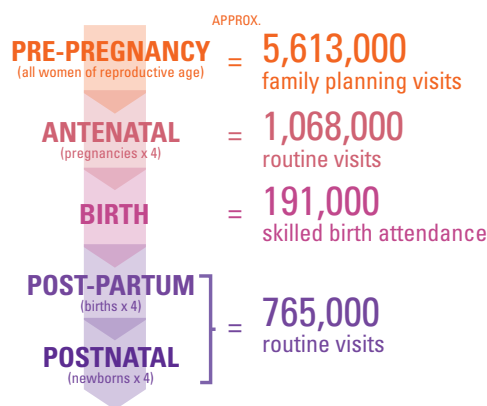
TUNISIA

In 2012, of an estimated total population of 10.9 million, 3.7 million (34%) were living in rural areas and 3.1 million (28%) were women of reproductive age; the total fertility rate was 2. By 2030, the population is projected to increase by 16% to 12.6 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 0.2 million pregnancies per annum by 2030, 31% of these in rural settings. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 18.4 million antenatal visits, 3.3 million births and 13.1 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

267,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

APPROX.

PRE-PREGNANCY (all women of reproductive age) = **5,613,000** family planning visits

ANTENATAL (pregnancies x 4) = **1,068,000** routine visits

BIRTH = **191,000** skilled birth attendance

POST-PARTUM (births x 4) / **POSTNATAL** (newborns x 4) = **765,000** routine visits

Legend: 0 | <0.09 | 0.10-0.19 | 0.20-0.49 | 0.50-0.99 | 1.00-1.49 | 1.50-1.99 | 2.00-2.49 | 2.50-10.00 | >10.00

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	2,132	100
Midwives, auxiliary	*na*	*na*
Nurse-midwives	*na*	*na*
Nurses	*na*	*na*
Nurses or nurse-midwives, auxiliary	*na*	*na*
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	1,929	20
Obstetricians & gynaecologists	960	100
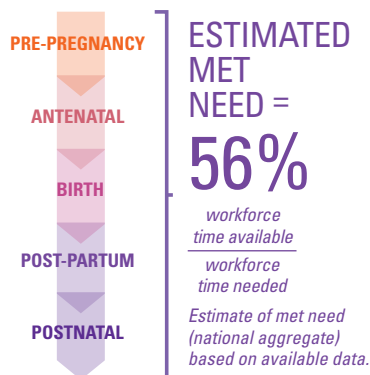
PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 56%

workforce time available
workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

9% (n=4)
91% (n=42)

■ Covered   ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

Number of live births (y-axis: 0 – 150,000)
Rural | Urban

■ Accessed a SBA   ■ Did not access a SBA   ■ No data on rural/urban SBA

MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 12+
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2014
Minimum number of supervised births in curriculum	50
Number of 2012 graduates/as % of all practising midwives	172/8
% of graduates employed in MNH within one year	100%

MIDWIFERY REGULATION

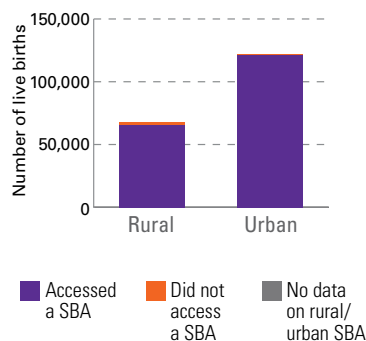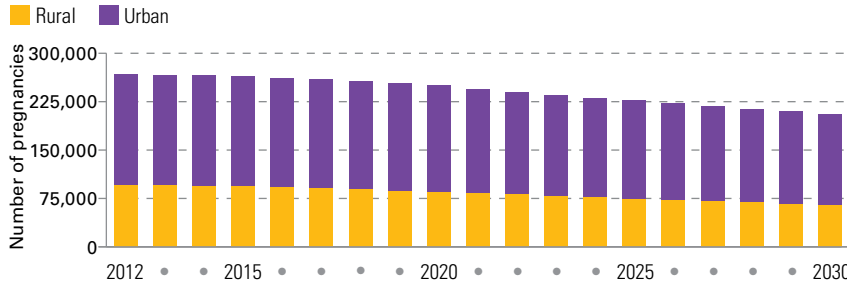|	
Legislation exists recognizing midwifery as an autonomous profession	Yes
A recognized definition of a professional midwife exists	No
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	7
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

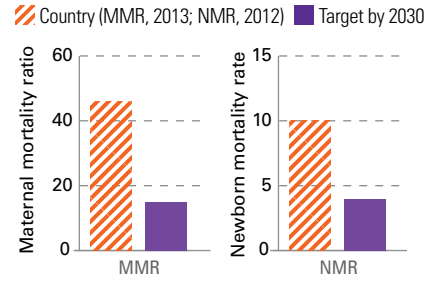|	
Year of creation of professional associations	1989, 2012, 2014
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	Yes
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	Yes

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural ■ Urban

Number of pregnancies

300,000 / 225,000 / 150,000 / 75,000 / 0

2012 ● ● ● 2015 ● ● ● ● 2020 ● ● ● ● 2025 ● ● ● ● 2030

MORTALITY REDUCTION[5]

▨ Country (MMR, 2013; NMR, 2012) ■ Target by 2030

Maternal mortality ratio: 60 / 40 / 20 / 0 — MMR

Newborn mortality rate: 15 / 10 / 5 / 0 — NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

▨ Outflow from attrition, death and retirement
■ Midwifery professionals
■ Midwifery professionals, associates
■ Nursing professionals
■ Nursing professionals, associates
■ Paramedical practitioners & medical assistants
■ Medical practitioners, generalists
■ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

Outflows: 10,000 / 7,500 / 5,000 / 2,500 / 0 — 2012 2015 2020 2025 2030

Inflows: 10,000 / 7,500 / 5,000 / 2,500 / 0 — 2013 2015 2020 2025 2030

Workforce: 10,000 / 7,500 / 5,000 / 2,500 / 0 — 2012 2015 2020 2025 2030

WHAT IF… *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

0.21 million CURRENT → 0.16 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

100% MET NEED 2030 — 100% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

100% MET NEED 2030 — 100% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

0.8% leak CURRENT → 0.4% leak SCENARIO

100% MET NEED 2030 — 100% MET NEED 2030
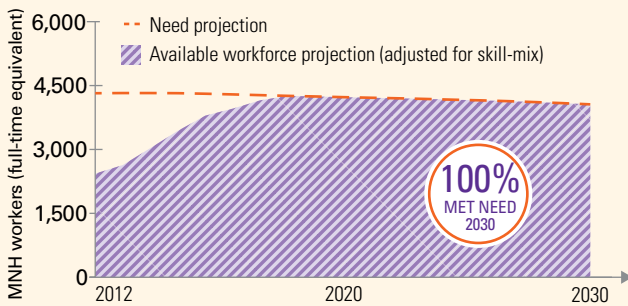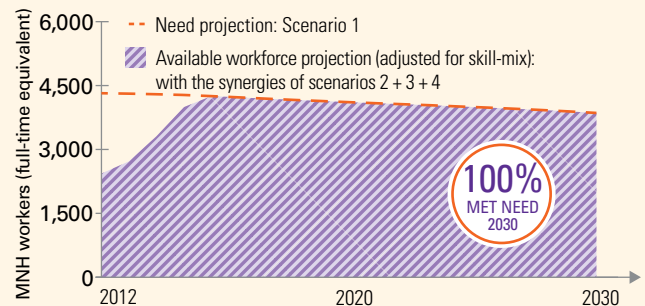
CURRENT TRAJECTORY

MNH workers (full-time equivalent)

6,000 / 4,500 / 3,000 / 1,500 / 0

- - Need projection
▨ Available workforce projection (adjusted for skill-mix)

100% MET NEED 2030

2012 2020 2030

WHAT IF… TRAJECTORY

MNH workers (full-time equivalent)

6,000 / 4,500 / 3,000 / 1,500 / 0

- - Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

100% MET NEED 2030

2012 2020 2030

1. These health worker categories include the following country titles - Midwives: includes sage-femmes; Generalist physicians: includes médecins de santé publique, médecins généralistes; Obstetricians & gynaecologists: includes gynécologues obstétriciens. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Year of data is as per most recent data available in UNICEF delivery care database. Available at: http://data.unicef.org/maternal-health/delivery-care
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are the proposed targets for MMR and NMR by 2030 from the recommendations of the Ending Preventable Maternal Mortality by 2030 and Every Newborn Action Plan
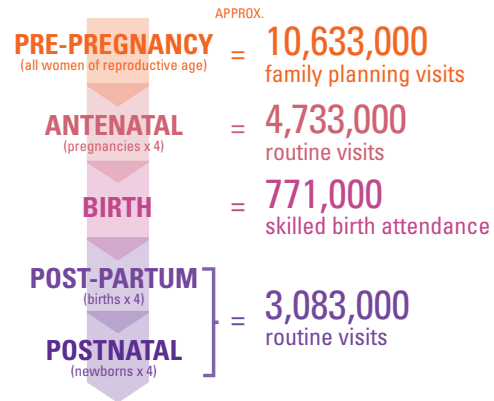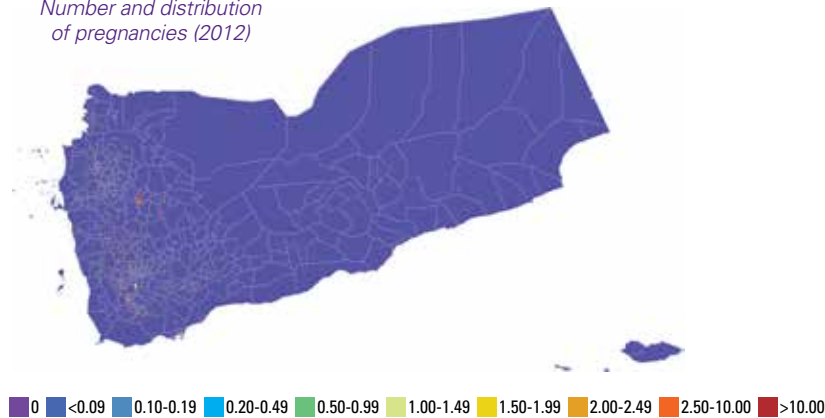
YEMEN

In 2012, of an estimated total population of 23.9 million, 10.5 million (44%) were living in rural areas and 5.9 million (25%) were women of reproductive age; the total fertility rate was 4.1. By 2030, the population is projected to increase by 43% to 34 million. To achieve universal access to sexual, reproductive, maternal and newborn care, midwifery services must respond to 1.2 million pregnancies per annum by 2030. The health system implications include how best to configure and equitably deploy the SRMNH workforce to cover at least 93.1 million antenatal visits, 15.2 million births and 60.6 million post-partum/postnatal visits between 2012 and 2030.

WHAT WOMEN AND NEWBORNS NEED (2012)

1,183,000 PREGNANCIES A YEAR = HOW MANY EPISODES OF CARE?

Number and distribution of pregnancies (2012)

0	<0.09	0.10-0.19	0.20-0.49	0.50-0.99	1.00-1.49	1.50-1.99	2.00-2.49	2.50-10.00	>10.00

APPROX.

PRE-PREGNANCY (all women of reproductive age) = **10,633,000** family planning visits

ANTENATAL (pregnancies x 4) = **4,733,000** routine visits

BIRTH = **771,000** skilled birth attendance

POST-PARTUM (births x 4)
POSTNATAL (newborns x 4) = **3,083,000** routine visits

WORKFORCE AVAILABILITY (2012)

	Country classification of staff working in MNH[1]	Time spent on MNH %
Midwives	5,500	100
Midwives, auxiliary	*na*	*na*
Nurse-midwives	500	90
Nurses	*na*	*na*
Nurses or nurse-midwives, auxiliary	100	60
Clinical officers & medical assistants	*na*	*na*
Physicians, generalists	5,412	30
Obstetricians & gynaecologists	1,543	100

PRE-PREGNANCY
ANTENATAL
BIRTH
POST-PARTUM
POSTNATAL

ESTIMATED MET NEED = 57%

workforce time available / workforce time needed

Estimate of met need (national aggregate) based on available data.

FINANCIAL ACCESSIBILITY

Percentage of 46 RMNH Essential Interventions included in minimum health benefits package, 2012

- 67% (n=31)
- 33% (n=15)

■ Covered ■ Not covered

GEOGRAPHICAL ACCESSIBILITY

Number of births with a skilled birth attendant (SBA)[2]

■ Accessed a SBA ■ Did not access a SBA ■ No data on rural/urban SBA
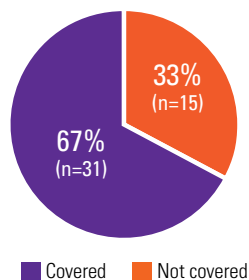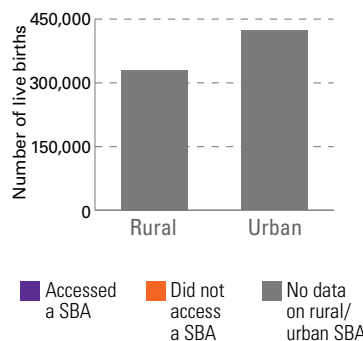
MIDWIFERY EDUCATION[3]

Minimum high-school requirement to start training	Grade 10-
Years of study required to qualify (rounded)	3
Standardized curriculum? Year of last update	Yes, 2012
Minimum number of supervised births in curriculum	20
Number of 2012 graduates/as % of all practising midwives	290/5
% of graduates employed in MNH within one year	0%

MIDWIFERY REGULATION

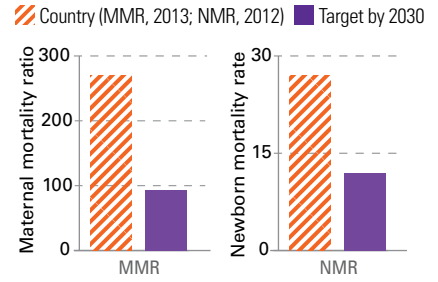|	
Legislation exists recognizing midwifery as an autonomous profession	No
A recognized definition of a professional midwife exists	Yes
A government body regulates midwifery practice	Yes
A licence is required to practise midwifery	No
A live registry of licensed midwives exists	No
Number of EmONC basic signal functions that midwives are allowed to practise (out of a possible 7)	6
Midwives allowed to provide injectable contraceptives/intrauterine devices	Yes/Yes

PROFESSIONAL ASSOCIATIONS[4]

Year of creation of professional associations	2004
Roles performed by professional associations:	
Continuing professional development	Yes
Advising or representing members accused of misconduct	No
Advising members on quality standards for MNH care	Yes
Advising the Government on policy documents related to MNH	Yes
Negotiating work or salary issues with the Government	No

na = not applicable; — = missing data

PROJECTED NUMBER OF PREGNANCIES BY YEAR: URBAN VS. RURAL

Rural ■ Urban

Number of pregnancies

1,300,000 — 975,000 — 650,000 — 325,000 — 0

2012 • • 2015 • • 2020 • • 2025 • • 2030

MORTALITY REDUCTION[5]

Country (MMR, 2013; NMR, 2012) ■ Target by 2030

Maternal mortality ratio: 300 — 200 — 100 — 0
MMR

Newborn mortality rate: 30 — 15 — 0
NMR

ESTIMATES AND PROJECTIONS TO 2030

This section of the brief uses reported country data to calculate needs-based planning estimates and projections to 2030. The projections are sensitive to reported enrolment, graduation, % time spent on MNH services, age distribution, roles and attrition. In the absence of country data, standardized, evidence-based assumptions are used. The projections are indicative and should be used to verify the accuracy of country data and inform further policy discussion. Further information in the "How to read" section on page 44.

PROJECTED OUTFLOWS

PROJECTED INFLOWS

PROJECTED WORKFORCE

by International Standard Classification of Occupations (ISCO-08)

Outflow from attrition, death and retirement ■ Midwifery professionals ■ Midwifery professionals, associates ■ Nursing professionals ■ Nursing professionals, associates ■ Paramedical practitioners & medical assistants ■ Medical practitioners, generalists ■ Medical practitioners, specialists (Ob/Gyn)

MNH workers (full-time equivalent)

10,000 — 7,500 — 5,000 — 2,500 — 0
2012 2015 2020 2025 2030

10,000 — 7,500 — 5,000 — 2,500 — 0
2013 2015 2020 2025 2030

10,000 — 7,500 — 5,000 — 2,500 — 0
2012 2015 2020 2025 2030

WHAT IF... *Estimates of met need based on available data.*

1 The number of pregnancies was reduced by 20% by 2030?

1.2 million CURRENT → 0.97 million SCENARIO

Immediate increase in met need for pregnancy, birth, post-partum/postnatal care. Acceleration in met need for pre-pregnancy services from 2028 onwards.

2 The number of midwife, nurse and physician graduates doubled by 2020?

CURRENT → SCENARIO

25% MET NEED 2030 → 37% MET NEED 2030

3 Efficiency improved by 2% per year until 2030?

CURRENT → SCENARIO

25% MET NEED 2030 → 36% MET NEED 2030

4 Attrition was halved in the next 5 years (2012-2017)?

13% leak CURRENT → 6.5% leak SCENARIO

25% MET NEED 2030 → 34% MET NEED 2030

CURRENT TRAJECTORY
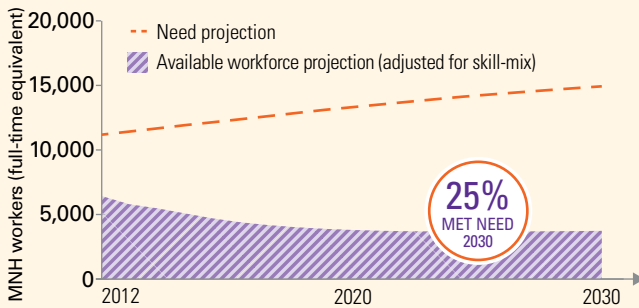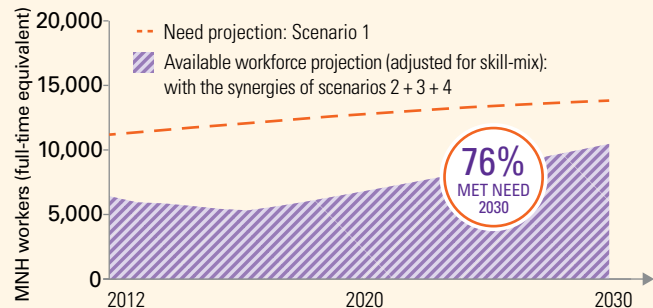
MNH workers (full-time equivalent)

20,000 — 15,000 — 10,000 — 5,000 — 0

-- Need projection
▨ Available workforce projection (adjusted for skill-mix)

25% MET NEED 2030

2012 2020 2030

WHAT IF... TRAJECTORY

MNH workers (full-time equivalent)

20,000 — 15,000 — 10,000 — 5,000 — 0

-- Need projection: Scenario 1
▨ Available workforce projection (adjusted for skill-mix): with the synergies of scenarios 2 + 3 + 4

76% MET NEED 2030

2012 2020 2030

1. These health worker categories include the following country titles - Midwives: includes community midwives, technical midwives; Nurse-midwives: includes nurse midwives; Auxiliary nurse-midwives: includes female primary health care workers (Morshidate); Generalist physicians: includes physicians (general practitioners); Obstetricians & gynaecologists: includes obs/gyn specialists. Source: SoWMy 2014 or secondary sources (WHO Global Health Observatory; government policy documents).
2. Rural/urban SBA coverage is not available. Figure refers to rural/urban births only.
3. Information refers to the midwife cadre category.
4. National associations for midwifery and nursing.
5. These are proposed targets for MMR and NMR by 2030 from the recommendations of *Ending Preventable Maternal Mortality by 2030* and the *Every Newborn Action Plan*.

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Acceptability (of health services): Dimension of the right to health, which requires that all health facilities, goods and services must be respectful of medical ethics and culturally appropriate, as well as sensitive to gender and life-cycle requirements [1].

Acceptability (of the health workforce): The characteristics and ability of the workforce to treat everyone with dignity, create trust and enable or promote demand for services [2].

Accessibility (of health services): Dimension of the right to health, which requires that health facilities, goods and services are accessible to everyone within the jurisdiction of the country. Accessibility has four overlapping dimensions: non-discrimination; physical accessibility; economic accessibility (affordability) and information accessibility [1].

Accessibility (of the health workforce): The equitable access to health workers, including in terms of travel time and transport, opening hours and corresponding workforce attendance, disability-friendly infrastructure, referral mechanisms and the direct and indirect cost of services, both formal and informal [2].

Accreditation: A process designed to confirm the educational quality of new, developing and established education and training programmes. It is usually carried out by peer/third-party review by reference to established standards/outcomes [3].

Association (or College): An organized body of persons engaged in a common professional practice, sharing information, career-advancement objectives, in-service training, advocacy and other activities. It usually defends the interests of the profession and the professionals, but is not a union.

Auxiliary midwife: A health worker assisting in the provision of maternal and newborn health care, particularly during childbirth, who possesses some of the competencies in midwifery but is not a fully qualified/licensed midwife. In the latest International Standard Classification of Occupations (ISCO-2008 revision) these are also referred to as midwifery associate professionals [4].

Auxiliary nurse-midwife: A health worker assisting in the provision of maternal and newborn health care, particularly during childbirth but also in the prenatal and post-partum periods, who possesses some of the competencies in midwifery but is not a fully qualified/licensed nurse-midwife.

Availability (of health services): Dimension of the right to health that requires functioning public health and health-care facilities, goods and services, as well as programmes in sufficient quantity [1].

Availability (of the health workforce): The sufficient supply and stock of health workers, with the relevant competencies and skill mix that correspond with the health needs of the population [2].

Council or Board: A regulatory institution responsible for the registration and licensing of professionals, thus enabling them to practise, while overseeing their professional conduct and ensuring the ethics of the profession. Usually accredits educational institutions and programmes, sometimes in collaboration with the government or other bodies. It may be government-led, professional-led or mixed. It normally defends patients' interests.

Effective coverage of SMRNH services: The situation in which the proportion of a population which needs SRMNH services receives them and benefits from them [5]. Effective coverage is often measured against the four dimensions of availability, accessibility, acceptability and quality of services.

Efficiency: The capacity to produce the maximum output for a given input [6].

Emergency obstetric and neonatal care (EmONC): The treatment of emergency obstetric and neonatal complications. EmONC is usually measured using "signal functions". A health facility can be classed as providing basic EmONC (B-EmONC) if, in the past three months, it has performed seven basic signal functions: parenteral administration of antibiotics, anticonvulsants, oxytocics, manual removal of placenta, manual vacuum aspiration for retained products, assisted instrumental delivery by vacuum extractor, and newborn resuscitation with mask. The performance of an additional two signal functions means a facility can be classed as providing comprehensive EmONC (C-EmONC): emergency surgery (caesarean section) and safe blood transfusion (can also include advanced newborn resuscitation) [7].

Equity (in health): The absence of systematic or potentially remediable differences in health status, access to health care and health-enhancing environments, and treatment for one or more aspects of health across populations or population groups defined socially, economically, demographically or geographically within and across countries [6].

External Cephalic Version: A procedure during which pressure is applied to the abdomen of a pregnant woman in an attempt to manoeuvre the foetus into a head-down (cephalic) position [8].

Full-time equivalent (FTE) on maternal and newborn health: FTE is the number of hours worked by one person in a full-time job. It is usually used when converting the hours worked by several part-time employees into the equivalent number of full-time workers, which can be useful when making comparisons between different countries, workplaces etc. By contrast, in this report, FTE is the amount of time that a country's health workers spend on SRMNH care, expressed as the equivalent number of full-time health workers. It is calculated by multiplying the number of workers by the proportion of their working time that is spent on providing SRMNH care. It is important because generalist

cadres of health worker (e.g. nurse-midwives and generalist physicians) spend some of their time on other aspects of health care, so to assume that they spent all their time on SRMNH would be to over-estimate the availability of SRMNH workers.

Health management information system (HMIS): An information system designed to assist in the management and planning of health-care systems, rather than the delivery of care [9].

Human resources for health (HRH): All people engaged in actions whose primary intent is to enhance health [10].

Internally displaced person (IDP): Someone who is forced to flee his or her home but who remains within his or her country [11].

Kangaroo mother and baby care: A method of caring for preterm and low-birth weight babies, keeping them warm through continuous skin-to-skin contact on the mother's chest. It has been shown to prevent infections, promote breastfeeding, regulate the baby's temperature, breathing, and brain activity, and encourages mother and baby bonding [12].

Licensing: Generally involves conferring upon an individual a licence to practise their particular health-care profession. Many countries do not distinguish between licensing and registration (see below) and both may be partial/temporary/conditional in some circumstances (for instance, newly qualified professionals in some countries) [3].

Malpresentation: An unborn baby is said to be in the vertex position if the crown of its head will be the first part of its body to enter the mother's pelvis during labour. Any unborn baby not in the vertex position (e.g. breech or transverse lie) is said to be malpresented.

Maternal and newborn health (MNH): The health of women during pregnancy, labour, childbirth and the post-partum period, as well as the health and survival of the foetus during labour and the newborn within the first few hours and days, a period during which the newborn is mostly taken care of by a professional birth attendant (and in privileged circumstances by a neonatologist). This operational definition differentiates newborn health from neonatal health, which spans the period from birth to the end of the fourth week after birth, and is in accordance with the H4+ (UNAIDS, UN Women, WHO, UNFPA, UNICEF and the World Bank) consensus.

Maternal mortality ratio: The number of maternal deaths per 100,000 live births. A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes [13].

Midwife: The report uses the term "midwife" to include those health professionals who are educated to undertake the roles and responsibilities of a midwife regardless of their educational pathway to midwifery, whether direct-entry or after basic nursing. This definition is aligned with the recommendations and position statements of the International Confederation of Midwives (ICM) and the International Council of Nurses. ICM defines a midwife as a person who, having been regularly admitted to a midwifery educational programme, duly recognized in the country in which it is located, has: successfully completed the prescribed course of studies in midwifery based on the ICM Essential Competencies for Basic Midwifery Practice and the framework of the ICM Global Standards for Midwifery Education; acquired the requisite qualifications to be registered and/or legally licensed to practise midwifery and use the title "midwife"; and demonstrates competency in the practice of midwifery [14].

Midwifery: The profession encompassing the health services and health workforce needed to support and care for women and newborns during pre-pregnancy, pregnancy, labour and the post-partum/postnatal period. It involves: preventing health problems in pregnancy, detecting abnormal conditions, procuring medical assistance when necessary, and executing emergency measures in the absence of medical help [15].

Midwifery workforce: The health professionals whose primary function includes providing health services to women during pregnancy, labour and birth, as well as post-partum care for mothers and newborns. The definition includes midwives and others competent in the practice of midwifery, such as nurse-midwives and doctors with relevant competence (and, in some countries, auxiliary nurse-midwives). These professionals are also referred to as skilled birth attendants [16].

Midwifery-led unit: Birth centres that are staffed and managed by midwives [17].

Millennium Development Goal (MDG): Eight MDGs were adopted by world leaders at the Millennium Summit at the United Nations in 2000, with the global aim of reaching equitable development by 2015. MDG 4 is to reduce the under-5 mortality rate by two thirds of its 1990 value by 2015. MDG 5 is to improve maternal health by reducing the maternal mortality ratio by three quarters of its 1990 value by 2015 (Target 5A). The proportion of births attended by skilled health personnel is used as an official indicator of this target. In 2005 a second target was added to MDG 5 (Target 5B): to achieve universal access to reproductive health by 2015 [18].

Minimum guaranteed benefits package: In the context of this report, this refers to a set of health services that the government has committed itself to making available to all, free at the point of access. It is also known as an essential health package, which, in a low-income country, consists of a limited list of public health and clinical services which will be provided at primary and/or secondary care levels [19].

Neonatal mortality rate: The number of neonatal deaths (within 28 days) per 1,000 live births.

Nurse-midwife: A person who is legally licensed/registered to practise the full scope of nursing and midwifery in his/her country [20].

Pre-eclampsia: A hypertensive disorder of pregnancy characterized by high blood pressure and proteinuria. Hypertensive disorders are among the leading causes of maternal mortality and morbidity [21].

Preterm: Occurring before 37 complete weeks of pregnancy.

Refugee: Someone who, owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his or her nationality, and is unable, or owing to such fear is unwilling, to avail himself or herself of the protection of that country [22].

Respiratory distress syndrome: A condition in which the lungs are not able to provide sufficient oxygen.

Quality (of health services): Dimension of the right to health, which requires that health facilities, goods and services must be scientifically and medically appropriate and of good quality [1].

Quality (of the health workforce): The competencies, skills, knowledge and behaviour of the health worker assessed according to professional norms and as perceived by users [2].

Registration: Generally refers to the process of enrolling with a professional regulatory body following graduation from an accredited programme. Many countries do not distinguish between registration and licensing, but some do, and a licence to practise may be issued by a separate authority, particularly in countries where the processes are managed at a subnational level. Both licensing and registration may be partial/temporary/conditional under certain circumstances (for instance, newly qualified professionals in some countries) [3].

Regulation: Act of controlling professional practice in accordance with laws, policies and standards, and ethics. It can apply to education, practice, management of the profession, career advancement, etc.

Sexual, reproductive, maternal and newborn health (SRMNH): Health services provided in the continuum of care, from information, education and counselling on human sexuality to prenatal, delivery and postnatal care [23].

Skilled birth attendant: Defined by WHO as an accredited health professional—such as a midwife, doctor or nurse—who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns [24].

Skills: Abilities learned through training or acquired by experience to perform specific actions or tasks, usually associated with individual tasks or techniques, particularly those requiring the use of the hands or body.

Sustainable Development Goals (SDGs): A set of global goals with the aim of eradicating poverty through sustainable development. These will succeed the Millennium Development Goals. SDG 3 aims to "ensure healthy lives and promote well-being for all at all ages", and includes specific targets to reduce the maternal mortality ratio, end preventable deaths of newborns, ensure universal access to sexual and reproductive health services, and achieve universal health coverage, including financial risk protection [25].

Union: A form of professional association that can include more than one type of health worker, generally independent of government, whose purpose is to defend the interests of the workers. In some countries the professional association is called a union.

Vulnerable: Vulnerable groups, usually women, children and elderly people, are associated with poverty, but vulnerability can also arise when people are isolated, insecure and defenceless in the face of risk, shock or stress [26].

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ANNEX 2: GENERAL METHODOLOGY

The research and analysis for this report was conducted using the data from the SoWMy 2014 report and survey, with additional data collected using the same methodology for the 6 countries that were not a part of the original report.

Methods

SoWMy questionnaire

A self-completion questionnaire was distributed to the 13 participating countries to collect quantitative data on selected indicators. Data collection for the 7 original SoWMy countries (Djibouti, Egypt, Iraq, Morocco, Somalia, Sudan, Yemen) took place between December 2013 and March 2014, and for the 6 additional countries (Algeria, Jordan, Lebanon, Oman, Palestine, Tunisia) between September 2014 and May 2015.

The aim of the questionnaire was to elicit quantitative data on key indicators relating to the midwifery workforce and SRMNH services. The questionnaire was based on that used for the 2011 SoWMy report, amended to address lessons learned during the 2011 study, and to include a stronger focus on the size and structure of the midwifery workforce, as well as the key related issues of education, regulation and association (ERA) and health service infrastructure.

The questionnaire was developed through an iterative feedback process involving the core research team and representatives of WHO, UNFPA, ICM, ICN, FIGO and Jhpiego. Reference was made to international policy documents and agreed research and analysis frameworks. Information needs were balanced against the need to make the process manageable for respondents.

A French translation of the original English language questionnaire was also produced.

Data collection: self-completion questionnaire

For the 7 original SoWMy countries, UNFPA and WHO distributed the self-completion questionnaire and the workshop guidance to their country representatives in each country, and nominated a lead technical midwifery/SRMNH advisor in each country as the focal point. The focal points worked with personnel from Ministries of Health, Ministries of Education, professional associations, H4+ agencies and other relevant stakeholders to complete and validate the self-completion questionnaire. Each contributor was named in the completed questionnaire, with the option of requesting anonymity in the final report.

The paper questionnaire was also converted into an online tool, available in English, French and Spanish, which allowed respondents to enter their answers online and upload them directly to the analysis team. Once a user had submitted their responses, the system generated a PDF document which displayed their answers, allowing contributors to check and validate the submitted data. A multi-lingual helpdesk was available to assist users throughout the process.

For the 6 new countries featured in this report, the questionnaire in the form of a Word document was shared with UNFPA focal points, who sought the support of national stakeholders from Ministries, professional associations and others to complete and return the document. Their responses were inputted into an Excel database by the research team and a PDF copy was sent to the focal points for review and approval before analysis commenced.

Data collection: secondary data

Secondary data from published sources were collected on population, demographics, epidemiology and health service delivery to inform the modelling of met need (see Annexes 3 and 4) and the mapping of subnational distributions of populations, women of reproductive age, pregnancies and live births (see Annex 6).

Data analysis & reporting

Members of the research team analysed the complete dataset. Key subject areas analysed included: alignment between country cadre titles and ISCO classification; current policy environment; education; designation of health facilities as EmONC facilities; workforce availability and projections towards achieving UHC; strength of regulation and professional associations; policy actions since 2011; salaries.

Ethical approval

Ethical approval for the SoWMy 2014 study was obtained from the research ethics committee at the University of Southampton, UK. Those contributing to the self-completion questionnaire were asked to state whether or not they wanted their participation to be acknowledged in the final report.

ANNEX 3: METHODOLOGY FOR MODELLING MET NEED FOR THE ESSENTIAL INTERVENTIONS FOR SEXUAL, REPRODUCTIVE, MATERNAL AND NEWBORN HEALTH CARE

"Health interventions cannot be carried out without health workers" [1]

Health workforce projections are a policymaking necessity [2]. Their purpose in this report, aligned with the WHO framework on health policy and systems research, is to provide "directional" and "correctional" scenarios [3] that can inform policy dialogue and decisions within countries on "what actions need to be taken in the near future to ensure movement towards achieving longer-term objectives" [2]. A key element of these actions is the requirement for further detailed analysis and investigation of the health workforce and health labour market to account for changing demographic, economic and health service contexts [4].

The methodology for modelling met need for the 46 essential interventions for SRMNH care [5] builds upon published papers, tools and guidelines from the World Bank, WHO and others to inform needs-based workforce planning [4,6–15]. The result is a snapshot of "met need", comparable across countries.

"Met need" is defined as: the percentage of a universal SRMNH benefits package that could potentially be obtained by women and newborns given the composition, competencies and available working time of the midwifery workforce* The universal benefits package in this instance is, at minimum, the 46 essential interventions. The indicator is calculated as:

$$\frac{\text{Volume of essential SRMNH services that can be provided by the midwifery workforce (expressed in hours of work)}}{\text{Volume of essential SRMNH services required by women and newborns (expressed in hours of work)}} \times 100$$

The model — Effective Coverage Modelling (ECoMod) – is a tool to test scenarios and encourage multi-criteria decision-making [16,17] in workforce planning for Universal Health Coverage. For each of the 73 countries that contributed to this report, ECoMod was used to create baselines and projections, for each year between 2012 and 2030, of met need for the 46 essential interventions. The model uses self-reported data from countries (collected through the SoWMy 2014 survey), published secondary sources for population, demographics, epidemiology and health service delivery data, as described in Annex 4, and evidence-informed assumptions when countries reported missing data or "don't know" (Annex 5). A full description is available in a separate Working Paper [18].

The model calculates:

1. The annual SRMNH workforce required to deliver universal coverage (100%) of the 46 essential interventions for SRMNH in relation to the needs of women and newborns;

2. The annual SRMNH workforce available and competent to deliver these interventions;

3. The annual SRMNH workforce deficit in relation to the requirement to meet women's and newborns' need for SRMNH services;

4. The impact of alternative scenarios and policy options to increase "met need".

1. Estimating workforce requirements (2012-2030)

The mathematical model follows an *adjusted service targets-based* approach. The model is implemented using the following steps:

a. Determining the package of SRMNH services that women and newborns need. This package is the set of 46 essential interventions which together cover the continuum of SRMNH care (pre-pregnancy, antenatal, childbirth and postnatal health care). These 46 interventions are recommended by the Partnership for Maternal Newborn and Child Health (PMNCH): they have an impact on reducing maternal, neonatal and child mortality; are suitable for delivery in low- and middle-income countries, and/or settings where minimal essential care is generally available; and are delivered through the health sector [5].

b. Quantifying the annual volume of each health-care service required. The model estimates the total number of contacts, per year, to deliver each essential intervention to women and/or newborns based the assumption of universal coverage (100% of need). Universal coverage is estimated based on key demographic variables (e.g. number of women of reproductive age, number of pregnancies, number of live births, each with urban/rural and sub-national disaggregation, projected over time) and on available country-specific data on the incidence/prevalence of conditions associated with the essential interventions.

c. Converting the annual volume of need into time and workload indicators of staffing requirements. Evidence-based estimates of the average time needed by a SRMNH worker to provide each essential intervention are available from the OneHealth tool [19]. When average time is multiplied by the total number of contacts and aggregated across the SRMNH continuum of care, it provides the total available working time (i.e. workforce requirement) needed to achieve universal coverage.

2. Estimating workforce availability (2012-2030)

Next, the model calculates, for the years 2012-2030, projections on the availability of the SRMNH workforce for comparison with the workforce requirements calculated in section 1. The model uses self-reported data from the SoWMy 2014 survey. In instances where a country responded "don't know", data were either identified from the WHO's Global Health Observatory or defaulted to evidence-informed modelling assumptions. This is implemented in three steps:

a. Determining the initial stock and age-distribution of each SRMNH cadre in the baseline year (2012). The SoWMy 2014 survey requested specific information on the composition, roles and age of the SRMNH workforce. These data were inputted into the model.

b. Estimating the changes over time (2013-2030). The model adopts the standard workforce logic of "stock-and-flow" [4,20,21]. It includes an advanced mathematical simulation procedure to calculate, per year, the net number of workers (full-time equivalents, FTEs) who are actively engaged in

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* As defined in the glossary, and including associate midwifery/nursing personnel, midwifery/nursing personnel, clinical officers and medical assistants, physicians (generalists), and obstetricians/gynaecologists.

providing SRMNH care. The simulation accounts for the annual outflows (from voluntary attrition, mortality and retirement) and the annual inflows (from new graduates entering the workforce). Total FTEs available per cadre are then converted into total hours of available working time.

c. Assigning the total hours of available working time to the provision of essential interventions. WHO guidelines (OneHealth and Optimize for MNH [22]) provide evidence-informed analysis of the competencies and roles of the SRMNH workforce in relation to the essential interventions. These evidence-based guidelines do not reflect the diversity of task allocation across and within countries, but are appropriate for global projections. Roles for each cadre were allocated using a sequential marginal time allocation procedure:

1. The SRMNH cadres are categorized according to the essential interventions (1–46) based on the WHO guidelines for their role and competencies in an integrated health workforce (from community to primary and specialized cadres).

2. The annual working time available from each cadre category (starting at 1 and rising to 46) is allocated on a marginal basis to match the time requirements for the essential interventions that this cadre is authorized and competent to perform. This is done in blocks of 48 hours,* starting with the first family planning intervention and finishing with the last postnatal intervention. This allocation procedure is iterative. Once the first round of time blocks is allocated, the time allocation starts again from the first intervention until either the working time requirements are met or the available working time from the cadre has been allocated.

3. The available working time from each of the other cadres is then allocated to match the remaining time requirements not met by the previous category. Crucially, each cadre's available working time is allocated in increasing order of their roles and competencies. In practice, this means that although a GP could deliver family planning advice, the GP cadre's time will only be allocated to this intervention if the available working time from other cadres in previous categories (e.g. the midwife cadre) has already been "spent".

The procedure outlined above for allocating available working time is based on the economic principle of "productive efficiency" [23]. This economic principle is adopted within the Optimize 4 MNH guidelines, and encourages the distribution of tasks (interventions) across the integrated health workforce in relation to the cadre's education, licensing and competencies. Secondly the procedure assumes that no essential SRMNH intervention is prioritized for delivery: each intervention is afforded equal weighting.

3. Estimating the workforce surplus/deficit (2012-2030)
The third stage is a straightforward calculation. For each year between 2012 and 2030, the likely SRMNH workforce deficit in meeting women's and newborns' needs for SRMNH services is the difference between workforce requirements and the available working time.

4. Alternative scenarios and policy options
Finally, the model is designed to test scenarios and encourage multi-criteria decision-making in workforce planning for Universal Health Coverage. Four scenarios were developed to explore the impact of alternative policy options: 1) improved family planning to reduce the annual number of pregnancies and births; 2) the scale-up of graduate numbers to 2020; 3) efficiency gains in the existing workforce; and 4) a 50% reduction in voluntary attrition from the existing workforce. The impact of each scenario on the available working time and the resulting increase in met need is then calculated.

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* Ideally, the marginal time allocation to the essential interventions should be done in blocks of 1 hour, but for computational efficiency a larger unit of time allocation (48 hours) was used (except for Brazil, China, India and Nigeria, where due to population size blocks of 480 hours were used).

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ANNEX 4: ESTIMATING WOMEN'S AND NEWBORNS' NEED FOR THE 46 ESSENTIAL INTERVENTIONS

Essential intervention (SRMNH)	Need (defined as number of contacts with a health care worker by the population in need)	Data requirements and sources
PRE-PREGNANCY		
1. **Family planning advice**	All WRA (i.e. women aged 15-49), one contact per year.	**Indicator:** Number of WRA (2012-2030). **Source(s):** United Nations population database, medium fertility, 2012 revision (available from: http://esa.un.org/wpp/unpp/panel_indicators.htm).
2. **Family planning methods – delivery**	All WRA who use one of the following contraception methods: condoms/ pills/ injectables/ IUD/ female sterilization. For each year y, need is defined for each method as follows: 1. Need for condoms (y) = WRA (y) x (CPR + unmet need) x condom method mix x 3. 2. Need for pills and injectables (y) = WRA (y) x (CPR + unmet need) x method mix (pills + injectables) x 3. 3. Need for IUD = [WRA (y) x (CPR + unmet need) x IUD method mix] / 5. 4. Need for female sterilization (y) = [WRA (y) – WRA (y-1)] x (CPR + unmet need) x sterilization method mix.	**Indicator:** CPR (latest available figure) **Source(s):** WHO Global Health Observatory (available from: http://apps.who.int/gho/data/node.main.531?lang=en). United Nations, Department of Economic and Social Affairs, Population Division. 2014 Update for the MDG Database: Contraceptive Prevalence **Indicator:** Unmet need for family planning. **Source(s):** United Nations Statistics Division, Millennium Development Goals Indicators (latest year available); WHO Global Health Observatory (latest year available) (available from http://unstats.un.org/UNSD/MDG/Data.aspx); DHS StatCompiler (available from: http://www.statcompiler.com/); Partnership in Action 2012-2013 Report (available from: http://www.familyplanning2020.org/images/content/documents/FP2020_Partnership_in_Action_2012-2013.pdf); Algeria, Lebanon: Alkema L, Kantorova V, Menozzi C, Biddlecom A. National, regional, and global rates and trends in contraceptive prevalence and unmet need for family planning between 1990 and 2015: a systematic and comprehensive analysis. *Lancet* 2013; 381:1642–52. **Indicator:** Prevalence of contraceptive method mix. **Source(s):** Seiber E, Bertrand J, Sullivan T. Changes in contraceptive method mix in developing countries. *International Family Planning Perspectives 2007;* 33(3). (available from: http://www.guttmacher.org/pubs/journals/3311707.pdf). **Note:** Information in this source for our purposes is only available for the following methods: IUD/ pill/ injectable/ condom/ female sterilization. Implants are apparently excluded from method mix because they account, across countries, for less than 1% of all contraception methods.
3a. **Prevention and management of STIs and HIV in all WRA: prevention of STIs and HIV**	All WRA, one contact per year.	**Indicator:** Number of WRA (2012-2030). **Source(s):** United Nations population database, 2012 revision (available from: http://esa.un.org/wpp/unpp/panel_indicators.htm).
3b. **Prevention and management of STIs and HIV in all WRA: management of STIs**	All WRA with syphilis, gonorrhoea, chlamydia or trichomoniasis. For each year y, calculated as follows: 1. Need for management of syphilis (y) = WRA (y) x incidence of syphilis. 2. Need for management of gonorrhoea (y) = WRA (y) x incidence of gonorrhoea. 3. Need for management of chlamydia (y) = WRA (y) x incidence of chlamydia. 4. Need for management of trichomoniasis (y) = WRA (y) x incidence of trichomoniasis.	**Indicator:** Incidence of STIs in WRA. **Source(s):** WHO. Global incidence of selected curable sexually transmitted infections by region. Geneva: WHO, 2008 (available from: http://apps.who.int/iris/bitstream/10665/75181/1/9789241503839_eng.pdf?ua=1).
3c. **Prevention and management of STIs and HIV in all WRA: management of HIV**	All WRA needing ART, calculated as follows: Number of WRA needing ART in 2012 / WRA in 2012 x WRA (y).	**Indicator:** % of WRA needing ART (number of adults needing ART x % of HIV positive adults who are women). **Source(s):** Number of adults needing ART (available from: http://www.unaids.org/en/data-analysis/datatools/aidsinfo/); some countries' individual sources; % of HIV positive adults who are women (number of female adults who are HIV positive / number of all adults who are HIV positive) from UNAIDS AIDSinfo database (available from: http://www.unaids.org/en/dataanalysis/datatools/aidsinfo/); some countries' individual sources.
4. **Folic acid fortification/ supplementation**	All WRA, one contact per year.	
PREGNANCY		
5. **Iron and folic acid supplementation**	All PW, one contact per year.	
6. **Tetanus vaccination**	All PW, one contact per year.	
7a. **Prevention and management of malaria with insecticide-treated nets and antimalarials: prevention**	All PW living in areas of high malaria transmission, calculated as follows: Need for prevention of malaria (y) = PW (y) x % population in the country living in areas of high malaria transmission.	**Indicator:** % population living in high malaria transmission areas (number of people living in high risk areas (or if not available, used living in active foci)/total population). **Source(s):** WHO. Annex 6A of the World Malaria Report 2013. Geneva: WHO, 2013 (available from: http://www.who.int/malaria/publications/world_malaria_report_2013/en/); some countries' individual sources.

ANC=antenatal care; ART=antiretroviral therapy; CPR=contraceptive prevalence rate; IUD=intrauterine device; PMTCT=preventing mother to child transmission; pPROM=pre-term premature rupture of membranes; PW=pregnant women; STIs= sexually transmitted infections; WRA=women of reproductive age.

Essential intervention (SRMNH)	Need (defined as number of contacts with a health care worker by the population in need)	Data requirements and sources
PREGNANCY (continued)		
7b. Prevention and management of malaria with insecticide-treated nets and antimalarials: management	All PW with presumed and confirmed malaria, calculated as follows: Need for malaria management (y) = PW (y) x incidence of presumed and confirmed malaria cases.	**Indicator:** Incidence of resumed and confirmed malaria cases in PW, (Number of presumed and confirmed malaria cases/Total United Nations population estimates). **Source(s):** WHO. Annex 6A of the World Malaria Report 2013. Geneva: WHO, 2013 (available from: http://www.who.int/malaria/publications/world_malaria_report_2013/en/); some countries' individual sources.
8a. Prevention and management of STIs (as part of ANC): prevention of STIs and HIV	All PW, one contact per year.	
8b. Prevention and management of STIs (as part of ANC): management of STIs	All PW with gonorrhoea, chlamydia or trichomoniasis (note syphilis is addressed separately below). For each year y, calculated as follows: 1. Need for management of gonorrhoea (y) = PW (y) x incidence of gonorrhoea. 2. Need for management of chlamydia (y) = PW (y) x incidence of chlamydia. 3. Need for management of trichomoniasis (y) = PW(y) x incidence of trichomoniasis.	**Indicator:** Incidence of STIs in PW. **Sources(s):** WHO. Global incidence of selected curable sexually transmitted infections by region. Geneva: WHO, 2008. (available from: http://apps.who.int/iris/bitstream/10665/75181/1/9789241503839_eng.pdf?ua=1).
8c. Prevention and management of STIs (as part of ANC): management of HIV	All PW needing ART to avoid mother-to-child transmission, calculated as follows: Need for management of HIV (y) = % (number of pregnant women needing ART for PMTCT in 2012/ PW in 2012) x PW (y).	**Indicator:** % of HIV positive PW needing effective ART for PMTCT. **Source(s):** For Africa: USAID AIDSinfo (available from: http://www.unaids.org/en/data-analysis/datatools/aidsinfo/); For other regions: UNAIDS. Global Report: UNAIDS report on the global AIDS epidemic 2013. (available from: http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/UNAIDS_Global_Report_2013_en.pdf); Some countries' individual sources. **Note:** Where value is <500 or <1000, 500 and 1000 values were assumed, respectively; where value is not available for country, the following data were used: HIV positive PW needing ART for PMTCT {region} x (HIV infected females {country}/ HIV infected females {region}).
9. Calcium supplementation to prevent hypertension	All PW, one contact per year.	
10. Interventions for cessation of smoking	All PW who smoke, calculated as follows: Need for smoking cessation interventions (y) = PW x prevalence of smoking in women aged over 15 years.	**Indicators**: Current smoking of any tobacco product (age-standardized rate), all females **Source(s):** WHO Global Health Observatory (available from: http://apps.who.int/gho/data/node.main.1250?lang=en) ; World Bank World Development Indicators (available from: http://data.worldbank.org/indicator/SH.PRV.SMOK.FE); some countries' individual sources. **Note:** If no data were found for a particular country, used WHO regional average for the countries in the dataset.
11a. Screening for and treatment of syphilis: screening	All PW, one contact per year.	
11b. Screening for and treatment of syphilis: treatment	All PW with syphilis. For each year y, calculated as follows: 1. Need for management of syphilis (y) = PW (y) x incidence of syphilis.	**Indicator:** Incidence of syphilis in PW. **Sources(s):** WHO. Global incidence of selected curable sexually transmitted infections by region. Geneva: WHO, 2008 (available from: http://apps.who.int/iris/bitstream/10665/75181/1/9789241503839_eng.pdf?ua=1).
12+13: Antihypertensive drugs to treat high blood pressure (including low-dose aspirin to prevent pre-eclampsia)	All PW with raised blood pressure and all PW with pre-eclampsia, calculated as follows: Need for antihypertensive drugs (y) = [WRA x (incidence of pre-eclampsia)] + [live births x (incidence of pre-eclampsia)].	**Indicator:** Incidence of high blood pressure and pre-eclampsia in PW. **Source(s):** Dolea C, AbouZahr C. Global burden of hypertensive disorders of pregnancy in the year 2000. Evidence and Information for Policy. Geneva: WHO, 2003 (available from: http://www.who.int/healthinfo/statistics/bod_hypertensivedisordersofpregnancy.pdf). **Note:** Only half of all hypertensive disorders presented in Table 6.1 in the reference paper were considered for the analysis.
14. Magnesium sulphate for eclampsia	All PW with eclampsia and pre-eclampsia, calculated as follows: Need for magnesium sulphate (y) = live births x (incidence of eclampsia + incidence of pre-eclampsia).	**Indicator:** Incidence of pre-eclampsia and eclampsia in PW. **Source(s):** Dolea C, AbouZahr C. Global burden of hypertensive disorders of pregnancy in the year 2000. Evidence and Information for Policy. Geneva: WHO, 2003 (available from: http://www.who.int/healthinfo/statistics/bod_hypertensivedisordersofpregnancy.pdf); Regional rates used according to WHO regions. **Note:** Total eclampsia incidence rates calculated as percentage of pre-eclampsia. Regional rates by WHO regions.

(continued)

Essential intervention (SRMNH)	Need (defined as number of contacts with a health care worker by the population in need)	Data requirements and sources
PREGNANCY (continued)		
15. Antibiotics for pre-term premature rupture of membranes (pPROM)	All cases of pPROM, calculated as follows: Need for antibiotics for pPROM (y) = all births including stillbirths (y) x incidence of pPROM.	**Indicator:** Incidence of pPROM **Source(s):** WHO global survey on maternal and perinatal health, 2005 (available from: http://www.who.int/reproductivehealth/topics/best_practices/GS_Tabulation.pdf?ua=1). **Note:** Where country rate not available used regional rate; where regional rate not available used world total rate.
16. Corticosteroids to prevent respiratory distress	All preterm births (including stillbirths), calculated as: Need for corticosteroids (y) = all births, including stillbirths (y) x preterm birth rate.	**Indicators:** Prevalence of preterm births. **Source(s):** Healthy Newborn Network. Global and national newborn health data and indicators (available from: http://www.healthynewbornnetwork.org/resource/database-global-and-national-newborn-health-data-and-indicators); some countries' individual sources.
17. Safe abortion	All safe abortions, calculated as follows: Need for safe abortions (y) = WRA (y) x rate of safe abortions.	**Indicator:** Rate of safe abortions. **Source(s):** Sedgh G, Singh S, Shah IH, et al. Induced abortion: incidence and trends worldwide from 1995 to 2008. *Lancet* 2012; 379:625 32 (available from: http://www.thelancet.com/journals/lancet/article/PIIS0140673611617868/table?tableid=tbl2&tableidtype=table_id&sectionType=red). **Note:** Where the value was <0.5 used 0.5.
18. Post-abortion care	All unsafe abortions, calculated as follows: Need for post-abortion care (y) = WRA(y) x rate of unsafe abortions.	**Indicator:** Rate of unsafe abortions. **Source(s):** Sedgh G, Singh S, Shah IH, et al. Induced abortion: incidence and trends worldwide from 1995 to 2008. *Lancet* 2012; 379:625–32 (available from: http://www.thelancet.com/journals/lancet/article/PIIS0140673611617868/table?tableid=tbl2&tableidtype=table_id&sectionType=red). **Note:** Where the value was <0.5 used 0.5.
19. Reduce malpresentation at birth with external cephalic version	All breech births (including stillbirths), calculated as follows: Need for external cephalic version (y) = all births, including stillbirths (y) x incidence of breech births (including stillbirths).	**Indicator:** Incidence of breech presentations. **Source(s):** WHO. Global survey on maternal and perinatal health. Statistics on breech presentations, 2005 (available from: http://www.who.int/reproductivehealth/topics/best_practices/GS_Tabulation.pdf?ua=1). **Note:** Where country rate not available used regional rate; where regional rate not available used world total rate.
20. Induction of labour to manage pre-labour rupture of membranes at term	All cases of pPROM, calculated as follows: Need for antibiotics for pPROM (y) = all births, including stillbirths (y) x incidence of pPROM.	**Indicator:** Incidence of pPROM. **Source(s):** WHO. Global survey on maternal and perinatal health. Statistics on breech presentations, 2005 (available from: http://www.who.int/reproductivehealth/topics/best_practices/GS_Tabulation.pdf?ua=1).
CHILDBIRTH		
23. Normal labour and delivery management and social support during childbirth	All births (including stillbirths), one contact.	
21+22+24. Active management of third stage of labour (to deliver placenta) to prevent post-partum haemorrhage (including uterine massage, uterotonics and cord traction)	All births (including stillbirths), one contact.	
26a. Screen and manage HIV during childbirth – screen if not already tested	All births (including stillbirths) except in those cases when there have been 4 ANC visits, calculated as follows: Need for screening for HIV during childbirth (y) = all births including stillbirths (y) x (1 - % of cases with 4 ANC visits).	**Indicator:** % of antenatal care coverage (4 visits). **Source(s):** United Nations Statistics Division. The official United Nations site for the MDG indicators (available from: http://mdgs.un.org/unsd/mdg/Default.aspx); UNICEF Data. Antenatal care (available from: http://www.data.unicef.org/maternal-health/antenatal-care) **Note**: Where country data not available, used regional average.
26b. Screen and manage HIV during childbirth – treat	All births (including stillbirths) of HIV positive women who have not had 4 ANC visits, calculated as follows: Need for screening for HIV during childbirth (y) = all births, including stillbirths (y) x (% of cases without 4 ANC visits) x % HIV prevalence in all adults.	**Indicator:** % of antenatal care coverage (4 visits) of HIV positive women. **Source(s):** United Nations Statistics Division. The official United Nations site for the MDG indicators (available from: http://mdgs.un.org/unsd/mdg/Default.aspx); UNAIDS AIDSinfo (available from: http://www.unaids.org/en/dataanalysis/datatools/aidsinfo/); some countries from individual sources; UNICEF Data. Antenatal care (available from: http://www.data.unicef.org/maternal-health/antenatal-care) **Note:** Where country data not available, used regional average.
27+28. C-section for maternal/foetal indication (including prophylactic antibiotics for c-section)	All births, including stillbirths, which require c-section, calculated as follows: Need for c-section (y) = all births, including stillbirths (y) x fixed assumption on need for a c-section.	**Note:** Assumption = 0.05 x all births (including stillbirths).

Essential intervention (SRMNH)	Need (defined as number of contacts with a health care worker by the population in need)	Data requirements and sources
CHILDBIRTH (continued)		
29. **Induction of labour for prolonged pregnancy (midwife or nurse)**	All births including stillbirths that occur after 41 weeks, calculated as follows: Need for induction of labour (y) = pregnancies (y) x % of pregnancies which go beyond 41 weeks.	**Indicator:** % pregnancies terminated after 42 weeks. **Source(s):** OneHealth Model: Interventions treatment assumptions, 2013 (available from: http://futuresinstitute.org/Download/Spectrum/Manuals/Intervention%20Assumptions%20 2013%209%2028.pdf). **Note:** Assumption = 0.05 x pregnancies.
30+25. **Management of post-partum haemorrhage (manual removal of placenta and/or surgical procedures and/or oxytocics)**	All births, including stillbirths, where there is post-partum haemorrhage, calculated as follows: Need for management of post-partum haemorrhage (y) = WRA (y) x incidence of post-partum haemorrhage (per 1000 women aged 15-49).	**Indicator:** Incidence of post-partum haemorrhage cases. **Source(s):** Dolea C, AbouZahr C, Stein C. Global burden of maternal haemorrhage in the year 2000. Evidence and information for policy. Geneva: WHO, 2003 (available from: http://www.who.int/healthinfo/statistics/bod_maternalhaemorrhage.pdf).
POSTNATAL CARE		
31-34 and 36-38. **Postnatal preventive care**	All births (including stillbirths), 4 contacts.	
35. **Detect and treat post-partum sepsis (PPS)**	All cases of post-partum sepsis, calculated as follows: Need for detecting and treating post-partum sepsis (y) = WRA (y) x incidence of post-partum sepsis per 1000 WRA.	**Indicator:** Incidence of post-partum sepsis. **Source(s):** Dolea C, AbouZahr C, Stein C. Global burden of maternal sepsis in the year 2000. Evidence and information for policy. Geneva: WHO, 2003 (available from: http://www.who.int/healthinfo/statistics/bod_maternalsepsis.pdf).
39. **Neonatal resuscitation with bag and mask**	All newborns requiring resuscitation, calculated as follows: Need for neonatal resuscitation (y) = live births (y) x 0.01.	**Indicator:** % of newborns requiring resuscitation. **Source(s):** OneHealth Model: Interventions treatment assumptions, 2013 (available from: http://futuresinstitute.org/Download/Spectrum/Manuals/Intervention%20 Assumptions%202013%209%2028.pdf). **Note:** around 1% of newborns require resuscitation
40. **Kangaroo mother care**	All newborns with low birth weight, calculated as follows: Need for kangaroo mother care (y) = live births (y) x % of newborns with low birth weight.	**Indicator:** % of newborns with low birth weight. **Source(s):** UNICEF and WHO. Low birth weight: country, regional and global estimates. New York: UNICEF, 2004 (available from: http://www.unicef.org/publications/files/low_birth-weight_from_EY.pdf). **Note:** Where country rate not available used regional rate.
41. **Extra support for feeding small and preterm babies**	All preterm births (including stillbirths), calculated as follows: Need for extra feeding support (y) = all births including stillbirths (y) x preterm birth rate.	**Indicators:** % of preterm birth. **Source(s):** Healthy Newborn Network. Global and national newborn health data and indicators. (available from: http://www.healthynewbornnetwork.org/resource/database-global-and-national-newborn-health-data-and-indicators); some countries' individual sources.
42. **Management of newborns with jaundice**	All newborns with jaundice, calculated as follows: Need for management of jaundice (y) = live births (y) x % of newborns with jaundice requiring phototherapy.	**Indicator:** % of newborns with jaundice. **Source(s):** Teune MJ, Bakhuizen S, Gyamfi Bannerman C, et al. A systematic review of severe morbidity in infants born late preterm. *Am J Obstet Gynecol* 2011; 205:374.e1-9. **Note:** Uniform assumption. Sum of incidence in late preterm infants (1245/26,252) and in full-term infants (2033/150,700).
43. **Initiate prophylactic ART for babies exposed to HIV**	All births, including stillbirths (except when there have been 4 ANC visits) in women who are HIV positive, calculated as follows: Need for prophylactic ART (y) = all births including stillbirths (y) x (1 - % of cases with 4 ANC visits) x % HIV positive adults.	**Indicator:** % of newborns, born from a HIV positive woman, who received prophylactic ART. **Source(s):** United Nations Statistics Division. The official United Nations site for the MDG indicators (available from: http://mdgs.un.org/unsd/mdg/Default.aspx); UNAIDS AIDSinfo (available from: http://www.unaids.org/en/dataanalysis/datatools/aidsinfo/).
44. **Presumptive antibiotic therapy for newborns at risk of bacterial infections**	All newborns at risk of bacterial infection, calculated as follows: Need for presumptive antibiotic therapy (y) = live births (y) x incidence of bacterial infection in newborns.	**Indicator:** Incidence of bacterial infection in newborns. **Source(s):** Singh S, Darroch JE, Ashford LS. Adding it up: the need for and cost of maternal and newborn care – estimates for 2012. Guttmacher Institute, 2013 (available from: http://www.guttmacher.org/pubs/AIU-MNH-2012-estimates.pdf). **Note:** Uniform assumption of 20%.
45. **Surfactant to prevent respiratory distress syndrome in preterm babies**	All preterm births (including stillbirths), calculated as follows: Need for surfactant (y) = live births (y) x preterm birth rate.	**Indicator:** % of preterm births. **Source(s):** Healthy Newborn Network. Global and national newborn health data and indicators. (available from: http://www.healthynewbornnetwork.org/resource/databaseglobal-and-national-newborn-health-data-and-indicators); some countries' individual sources.
46. **Continuous positive airway pressure (CPAP) to manage babies with respiratory distress syndrome (RDS)**	All newborns with respiratory distress syndrome, calculated as follows: Need for surfactant(y) = live births (y) x incidence of respiratory distress syndrome in newborns.	**Indicator:** Incidence of respiratory distress syndrome in newborns. **Source(s):** Rodriguez RJ, Martin RJ, Fanaroff AA. Respiratory distress syndrome and its management – Chapter 19. In Fanaroff AA, Martin RJ. Neonatal-perinatal medicine: diseases of the fetus and infant. St Louis: Mosby, 2010. (available from http://www.thoracic.org/education/breathing-in-america/resources/chapter-19-respiratory-distress-syndr.pdf). **Note:** Uniform assumption of 1%

The countries included in this report provided new information on the midwifery workforce by: cadre, ISCO classification, number, age distribution, % time spent on MNH services, annual attrition (voluntary), retirement age, graduates and enrolments, years of education, and student attrition from education.

The values for each of these indicators informed the modelled projections of workforce availability in relation to women's and newborn infants' need for the 46 essential SRMNH interventions (see methodology in Annex 3).

In the case of missing or inconsistent data, the model applied a fixed set of decision rules, listed below. These decision rules were developed for the SoWMy 2014 report and have been maintained in this analysis, for consistency.

Indicator used in the modelled projections	Example value	Decision rule (for missing or inconsistent data)
Name of cadre	Midwife	Apply the name of the category under which the country cadre was listed.
International Standard Classification of Occupation (ISCO) code	Code 2222	Assigned based on the roles and responsibilities specified, in the context of the cadre category selected.
Number of workers	1,515	Default to WHO Global Health Observatory (2014 version). If not in WHO Global Health Observatory, secondary source from government policy document. If neither, zero.
Age distribution	Aged under 30: 300 workers Aged 30-39: 510 workers Aged 40-49: 424 workers Aged over 50: 281 workers	Apply an equal distribution of the total number of workers across age groups, taking into account the duration of education (and therefore the minimum age at which a member of this cadre can join the workforce) and statutory retirement age in that country.
% time spent on MNH	100%	Apply the sample median, across all 73 countries of the SoWMy 2014 survey, for that ISCO code: –2222 (midwifery professionals): 100% –2221 (nursing professionals): 85% –3222 (midwifery professionals, associates): 100% –3221 (nursing professionals, associates): 55% –2211 (medical practitioners, generalists): 30% –2212 (medical practitioners, specialists Ob/Gyn): 100% –2240 or 3256 (paramedical practitioners and medical assistants): 75%
Annual workforce attrition (voluntary)	10%	Apply 4% for all cadres.
Retirement age	62 years	Apply the retirement age of any cadre in the same country with the same ISCO code. If the former not available, retirement age of any other cadre in the same country, regardless of ISCO code. If retirement age not available for any cadre, default to 65.
Graduates in 2012	43 graduates	Default to the last available figure from previous years. If not available, apply 5% of the total number of workers in 2012, equivalent to a stable replacement rate of workforce turnover.
Enrolments each year from 2010 to 2015	2010: 52 students 2011: 50 students 2012: 54 students 2013: 48 students 2014: 55 students 2015: 60 students	Default to the last available enrolment figure from previous years. If not available, assume enrolment is equal to graduates from 2012.
Years of education	3 years	Apply the given years of education of any cadre with the same ISCO code in the same country. If former not available, assign the sample median, across all 73 countries of the SoWMy 2014 survey, for that ISCO code: –2222 (midwifery professionals): 3 years –2221 (nursing professionals): 3 years –3222 (midwifery professionals, associates): 2 years –3221 (nursing professionals, associates): 2 years –2211 (medical practitioners, generalists): 7 years –2212 (medical practitioners, specialists Ob/Gyn): 10 years –2240 or 3256 (paramedical practitioners and medical assistants): 3 years
Student attrition from education	20%	Apply student attrition from education for any cadre with the same ISCO code in the same country. If the former not available, assign the sample median, across 73 countries of the SoWMy 2014 survey, for that ISCO code.

The mapping methodology used in this report was developed and published by a group of partners (University of Southampton, ICS Integrare, USAID, Norad, UNFPA, WHO) working on the State of the Art in Mapping for MNH [1]. It includes new, innovative approaches to make the geography of MNH informative for policy and planning at country level. In particular, this report utilizes the increasing capacity of geographic information systems (GIS) to map women of reproductive age (WRA), pregnancies and live births [2]. The methodology follows a simple four-step process to disaggregate and estimate distributions of populations, WRA, pregnancies and live births by subnational boundaries. Each of the four steps is described below.

1. Construction of detailed and contemporary population distribution datasets

Construction of estimates of population distribution for Africa and Asia at approximately 100 metre spatial resolution has recently been completed (full details are available at www.worldpop.org.uk) [3-8]. Briefly, a GIS-linked database of census and official population estimate data was constructed, targeting the most recent and spatially detailed datasets available, given their importance in producing accurate mapping. Detailed 30 metre spatial resolution maps of settlement extents were derived from Landsat satellite imagery through either semi-automated classification approaches [6-8] or expert opinion-based analyses. These settlement maps were then used to refine land cover data. Local census data mapped at fine resolution by enumeration area level from sample countries across Africa and Asia were exploited to identify typical regional per-land cover class population densities. These were then applied to redistribute census counts by regional ecozones to map human population distributions at approximately 100 metre spatial resolution continent-wide. Where available, additional country-specific datasets providing valuable data on population distributions, not captured by censuses, such as internally displaced people or detailed national surveys, were incorporated into the mapping process. Population datasets for the Americas were being constructed at the time of analysis, and therefore population datasets from the Global Rural Urban Mapping Project (GRUMP) [9] were used for countries in the Americas.

2. Construction of future projection population distribution datasets

United Nations estimates of urban- and rural-specific growth rates [10] were compiled for all 73 countries participating in this report. These were applied to the datasets described above. For populations mapped as living within urban areas, as defined by Columbia University's Global Rural Urban Mapping Project urban extent map [9] the urban growth rates were applied. For all other populations the rural growth rates were applied. This approach was used to construct 2010, 2012, 2015, 2020, 2025 and 2030 population distribution datasets, which were adjusted to ensure that national population totals matched those estimated by the United Nations.

3. Construction of WRA distribution datasets

Following previously published methods [11], data on subnational population compositions were obtained from a variety of sources for as many countries as possible, principally from contemporary census-based counts broken down at a fine resolution administrative unit level. These were matched to corresponding GIS datasets showing the boundaries of each unit, and used to adjust the existing spatial population datasets described above to produce estimates of the distributions of populations by sex and 5-year age group. The datasets were then adjusted to ensure that national population totals by age group, specific city totals and urban/rural totals matched those reported by the United Nations [12]. A summation of the datasets representing females in the 15-49 year age groups was undertaken to produce WRA datasets.

4. Mapping pregnancies and live births

Following the previously published approach [2], in 73 countries, age-specific fertility rates by 5-year age groupings, disaggregated by subnational regions and urban versus rural, were derived from the most recent national household surveys conducted as part of the Demographic and Household Survey (DHS) programme (www.measuredhs.com). GIS datasets representing the boundaries of the subregions (http://spatialdata.dhsprogram.com/) and the urban extents within them were assembled [9], and the age-specific fertility rates were matched to these boundaries. These rates were then used to adjust each 5-year age grouped female population distribution dataset described above to produce gridded estimates of the distributions of live births across each country. At the national level, these totals were then adjusted linearly to ensure that their totals matched those estimated by the United Nations for the 2010-2030 period [12] to create the different year datasets. For countries where no recent DHS data existed (n= 25) the population datasets described above were simply adjusted to ensure that their totals matched those of the United Nations estimates. To convert the gridded datasets of numbers of live births to numbers of pregnancies, national level estimates of numbers of pregnancies in 2012 were obtained from the Guttmacher Institute (www.guttmacher.org) and the 2012 birth dataset totals were adjusted nationally to match these totals. For the other years, it was assumed that the national-level ratios between numbers of births and pregnancies in 2012 remained constant, and these country-specific ratios were used to convert each live birth dataset to a pregnancy dataset.

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ANNEX 7. TASKS WITHIN THE SCOPE OF MIDWIFERY PROFESSIONALS ACCORDING TO THE INTERNATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS

The tasks for midwifery professionals are divided into eight categories as follows:

1. planning, providing and evaluating care and support services for women and babies before, during and after pregnancy and childbirth according to the practice and standards of modern midwifery care;

2. providing advice to women and families and conducting community education on health, nutrition, hygiene, exercise, birth and emergency plans, breastfeeding, newborn care, family planning and contraception, lifestyle and other topics related to pregnancy and childbirth;

3. assessing progress during pregnancy and childbirth, managing complications and recognizing warning signs requiring referral to a medical doctor with specialized skills in obstetrics;

4. monitoring the health status of newborns managing complications and recognizing warning signs requiring referral to a medical doctor with specialized skills in neonatology;

5. monitoring pain and discomfort experienced by women during labour and delivery and alleviating pain using a variety of therapies, including pain-killing drugs;

6. reporting births to government authorities to meet legal and professional requirements;

7. conducting research on midwifery practices and procedures and disseminating findings e.g. through scientific papers and reports;

8. planning and conducting midwifery education activities in clinical and community settings.

Source: ILO. ISCO-08 group definitions. Final draft. International Labour Organization. Available from: http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm (accessed April 24, 2014).

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