6

CHAPTER SIX

Maternal and Newborn Health

1 Introduction

Globally, one in seven women will face a complication during pregnancy or childbirth. There are over 500 000 maternal deaths each year, 99% of which occur in the developing world. Of the 130 million babies born every year, an estimated 4 million die in the first four weeks of life (neonatal period). A similar number of babies are stillborn, dying in utero during the last three months of pregnancy. [*]

These global maternal and neonatal mortality statistics are used because there is a relative lack of data for humanitarian settings. However, it is well established that countries in conflict or experiencing other forms of instability have the highest maternal and neonatal mortality. For example, Sierra Leone has the world's highest maternal mortality ratio (MMR) at 2100 maternal deaths per 100 000 live births. Afghanistan, which has endured more than 20 years of conflict, has an MMR of 1800. The lifetime risk of maternal death in both countries is 1 in 8, when compared to 1 in 8200 in the UK or 1 in 11 000 in Canada.[**]

Most maternal and neonatal deaths occur around the time of labour, delivery and the immediate postpartum period. The primary causes of maternal and neonatal death are depicted in Figures 5 and 6.

Many of these causes are preventable, or could be managed by skilled providers with adequate resources at the facility level.

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[*] Lawn, Joy E, et. al. "4 million neonatal deaths: When? Where? Why?" *The Lancet*. March 2005. www.who.int/child_adolescent_health/documents/pdfs/lancet_neonatal_survival_paper1.pdf.

[**] *Countdown to 2015 Tracking Progress in Maternal, Newborn, and Child Survival. The 2008 Report.* www.countdown2015mnch.org/reports-publications/2008report.

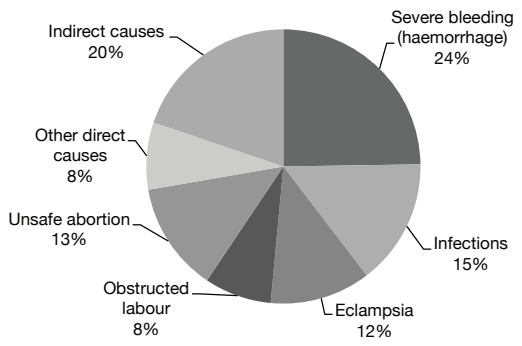
Maternal and Newborn Health

Emergency Obstetric Care (EmOC) and Emergency Obstetric and Newborn Care (EmONC)

In this manual we use the acronym EmOC (Emergency Obstetric Care). The reason for this is that the list of "signal functions" used for monitoring emergency obstetric care (life-saving emergency interventions performed by skilled providers to manage the majority of maternal complications in pregnancy, childbirth and postpartum period) includes only one signal function related to newborn care: basic neonatal resuscitation, using bag and mask, to treat asphyxia. WHO, UNFPA, UNICEF and AMDD refer to the package as EmOC.

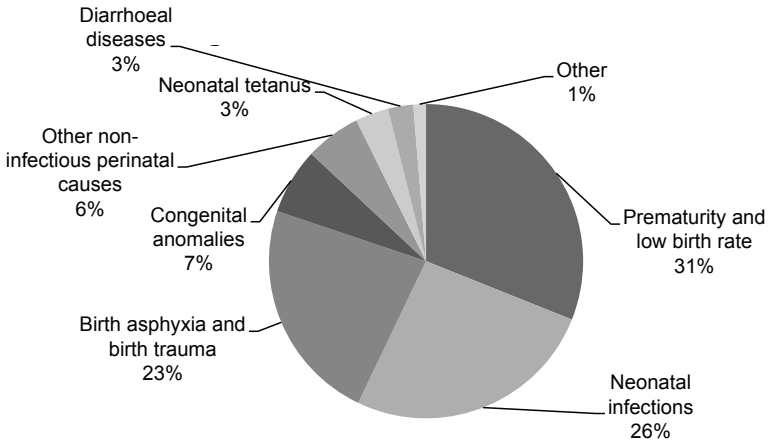
However, it is important to ensure midwives are able to perform not only "emergency obstetric functions", but also a range of essential newborn care interventions, such as resuscitation, thermal protection, promoting early and exclusive breast feeding, treatment of neonatal sepsis, and care of preterm and low birth weight babies. Therefore, some agencies use the acronym EmONC (Emergency Obstetric and Newborn Care) when advocating for the importance of linking maternal health interventions with newborn health interventions as part of the implementation of a comprehensive continuum of care for maternal and child health in humanitarian settings.

Figure 5: Causes of Maternal Death *



* World Health Report 2005. WHO. p. 62. http://www.who.int/whr/2005/en/index.html.

Figure 6: Causes of Neonatal Death *



2 Objectives

The objective of this chapter is to assist reproductive health (RH) officers, managers and service providers to

- plan for and implement comprehensive maternal and newborn health (MNH) services in humanitarian settings;
- understand key barriers that impact on maternal and newborn deaths;
- take into consideration evidence-informed interventions along the continuum of care for maternal and newborn health.

3 Programming for comprehensive MNH

Because most maternal and neonatal deaths occur around the time of labour, delivery and the immediate postpartum period, the Minimum Initial Service Package (MISP) components related to MNH (see Chapter 2) aim to reduce morbidity and mortality associated with these complications by ensuring that:

- emergency obstetric and newborn care services are available, including that:
  - nurses and midwives attending births in health centres have all the supplies they need to attend normal births and to manage obstetric and newborn complications (BEmOC);
  - skilled medical staff and supplies are available at referral hospitals to manage all obstetric and newborn complications (CEmOC);
- a referral system is in place to facilitate transport and communication from the community to the health centre and between health centre and hospital for women with obstetric complications;
- clean delivery supplies are provided to obviously pregnant women who may not be able to reach a health centre for delivery.

This chapter describes approaches for RH officers, managers and service providers to program for comprehensive MNH services as soon as the situation allows, building upon the MISP interventions. Comprehensive MNH programming has **three strategic priorities:**

- Understand and remove barriers to MNH services;
- Increase availability of evidence-informed

* http://www.who.int/child_adolescent_health/media/causes_death_u5_neonates_2004.pdf.

Most maternal and perinatal deaths are due to a failure to get skilled help in time to address complications of pregnancy and delivery. Even with the best antenatal and childbirth care, any birth can face complications and require emergency interventions. Therefore, skilled care during childbirth with access to emergency care for maternal and newborn complications (both basic emergency obstetric care (BEmOC) and newborn care, and comprehensive (CEmOC)) are crucial to saving women's and newborn's lives and preventing disabilities.

MNH services;
- Improve utilization and demand for MNH services.

While this chapter provides guidance on programmatic approaches and service components of MNH, it is not meant to provide detailed comprehensive clinical management guidelines. The Further Reading section provides more information.

Comprehensive maternal and newborn health programmes have three service components:

1. Antenatal or pregnancy care
2. Childbirth care (labour, delivery and immediate post-partum care)
3. Postnatal maternal and newborn care.

Quality of care underpins all components of comprehensive MNH services (See Chapter 1 Fundamental Principles). Elements of quality MNH services include:

- **Availability of EmOC and newborn care facilities:** there must be at least 5 EmOC and newborn care facilities (including at least one CEmOC facility) for every 500 000 population. They must be open 24 hours per day and 7 days per week (24/7), as childbirth and complications can occur any time.
- **Geographic accessibility:** services are reachable by roads or waterways and affordable means of transport can be found.
- **Provision of evidence-informed interventions** to improve maternal and newborn health and survival in pregnancy, childbirth and postnatal care (see Annex 1 for detailed information).
- **Acceptability:** the services need to be:
  - **affordable** — efforts must be made to offer services at reduced cost or free of charge;
  - **culturally appropriate** — consider language and culture of the target populations, such as preference for a female health provider; however, lack of a female provider should not be a barrier to services;
  - **respectful** of each woman and considerate of her concerns.

3.1 Needs assessment

After the MISP is in place, integrate MNH considerations into needs assessments for comprehensive RH planning in order to design an appropriate and comprehensive MNH programme. Using a combination of tools, RH officers need to collect or estimate the following information, in coordination with other health sector/cluster actors:

Population characteristics

- The number of affected population and their geographical distribution.
- Demographic indicators about the MNH status of the affected population prior to the crisis, for example, the maternal mortality ratio (MMR), crude birth rate (CBR), general or total fertility rate (GFR, TFR), contraceptive prevalence (CP), percentage of births with a skilled birth attendant (% SBA), etc.
- The number of women of childbearing age, pregnant women and newborns.
- The number of deliveries per month.
- Beliefs, knowledge, attitudes and practices of the population related to pregnancy and childbirth.

- Community awareness of and satisfaction with the MNH service availability.

Health services and service delivery staff characteristics

Map existing health service delivery points by geographic location and type and the agency supporting/managing them. Each facility needs to be evaluated for its capacity to provide quality MNH services, including EmOC and newborn care, the availability of skilled health providers and medical supplies, and/or the possibility to refer to higher level services. Examples of information to collect include:

- Number, location and type of health centres and hospitals.
- Which among these facilities provide MNH services, including BEmOC and CEmOC.
- Availability of functioning equipment, supplies and medicines for MNH service delivery.
- Provisions for standard precautions, including medical waste and placenta disposal facilities.
- Number and type and skills levels of health staff (see also Box 26: Skilled Birth Attendants Versus Traditional Birth Attendants).
- Availability of MNH protocols and guidelines.
- On referral mechanisms:
  - Distances from community to BEmOC facilities
  - Distances from BEmOC to CEmOC facilities
  - Feasible transport options
  - Means of communication
  - Protocols for managing and referring complications
- Availability of clean water, electricity, refrigeration and sanitation (bathing and toilet facilities) at the service delivery points.
- Availability of adequate nutrition for pregnant and lactating women.
- Information, education and communication (IEC) on the availability of services.

Box 26: Skilled Birth Attendants Versus Traditional Birth Attendants

A **"skilled (birth) attendant"** is defined 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"*

Although **traditional birth attendants (TBAs),** either trained or untrained, cannot be considered skilled providers, they often hold a special place in the community. Training of TBAs as to be skilled birth attendants is no longer recommended, but it is important to integrate them into other service delivery aspects of MNH. For example, they can play a role in promoting reproductive health, addressing barriers to care, facilitating referrals to health facilities and providing labour support to mothers. This can optimize community acceptance of MNH services and help build linkages between families, communities, local authorities and reproductive health services.

* From: *Making pregnancy safer: the critical role of the skilled attendant* : a joint statement by WHO, ICM and FIGO. WHO 2004.

National legislation and policies

RH officers, managers and service providers must also be familiar with national legislation and policies related to MNH. For example: Are there laws, regulations or policies regarding:

- reducing maternal mortality?
- access to and provision of MNH services? Pay particular attention to provisions on:
  - routine performance of maternal, perinatal and neonatal death audits and reviews;
  - licensing for skilled birth attendants;

  - traditional birth attendants;
  - use, distribution and provision of medicines essential for maternal and neonatal health.
- mandatory birth registration?
- testing pregnant women for HIV and prevention of mother-to-child transmission of HIV?
- treatment, care and support for HIV positive pregnant women?
- third-party (i.e. a husband's) authorization to seek maternal health services?
- Female Genital Mutilation (FGM) and /or other harmful practices that have damaging consequences to maternal health?
- the elimination of early marriage, forced marriage, the minimum age of marriage and/or free and full consent to marriage?

3.2 Reduce barriers to utilization of MNH services

To make sure that the services provided are appropriate, of the highest quality and fully utilized, RH officers and programme managers must ensure that:

- barriers to service utilization are reduced;
- MNH service components are provided by skilled staff who have appropriate and sufficient supplies and who receive refresher trainings and close supervision;
- service providers understand and discuss community beliefs and practices and health-seeking behaviours related to pregnancy and childbirth, such as nutrition, birthing positions, presence of relatives for support and traditional practices both positive (breastfeeding) and harmful (FGM);
- All women and their families know where to obtain assistance for antenatal care and childbirth, and how to recognize signs of complications.

Because most maternal and perinatal deaths are due to a failure to get skilled help in time for complications of childbirth (see Box 28), it is critical to have a well-coordinated system to identify obstetric complications and ensure their immediate management and/or referral to a hospital with surgical facilities. As a rule, health staff must understand that the further away the referral facility is, the earlier they must make a decision to refer women with complications of childbirth.

RH officers and programme managers can use the model of the Three Delays to identify relevant interventions to reduce barriers to service utilization in their setting (See Figure 7). This may include, for instance, ensuring an appropriate referral system and putting in place communication systems such as radios and mobile phones. A referral system requires protocols specifying when and where to refer and an adequate record of referred cases. This implies effective coordination and communication as well as trust and understanding between the community, service

Box 27: Improve Accessibility of Facilities: Maternity Waiting Homes

Maternity waiting homes are residential facilities, located near a qualified medical facility, where women defined as "high risk" can await their delivery and be transferred to a nearby medical facility shortly before delivery, or earlier should complications arise. Many consider maternity waiting homes to be a key element of a strategy to "bridge the geographical gap" in obstetric care between rural areas, with poor access to equipped facilities, and urban areas where the services are available. As one component of a comprehensive package of obstetric services, maternity waiting homes may offer a low-cost way to bring women closer to needed obstetric care.

From: *Maternity waiting homes: a review of experiences,* WHO, 1996. www.who.int/reproductivehealth/publications/maternal_perinatal_health/MSM_96_21/en/index.html

Box 28: The Three Delays Model: Identify Barriers to Service Utilization

While the availability of emergency obstetric care services is necessary to reduce maternal mortality, this is not sufficient. Each setting has features that may hinder the community from using a health facility. Even when services are functioning well, women with obstetric complications face a variety of barriers to using them. Some of these barriers are economic – e.g. lack of money to pay for transport or services, some of the barriers are cultural – e.g. the low value placed on women's lives, some are geographic – e.g. long distances and poor roads. Anything that causes delay in getting treatment may cost women their lives.

While there are many factors that can cause delay, they can be grouped using a simple model called The Three Delays. The model specifies the three types of delay that contributes to the likelihood of maternal death:

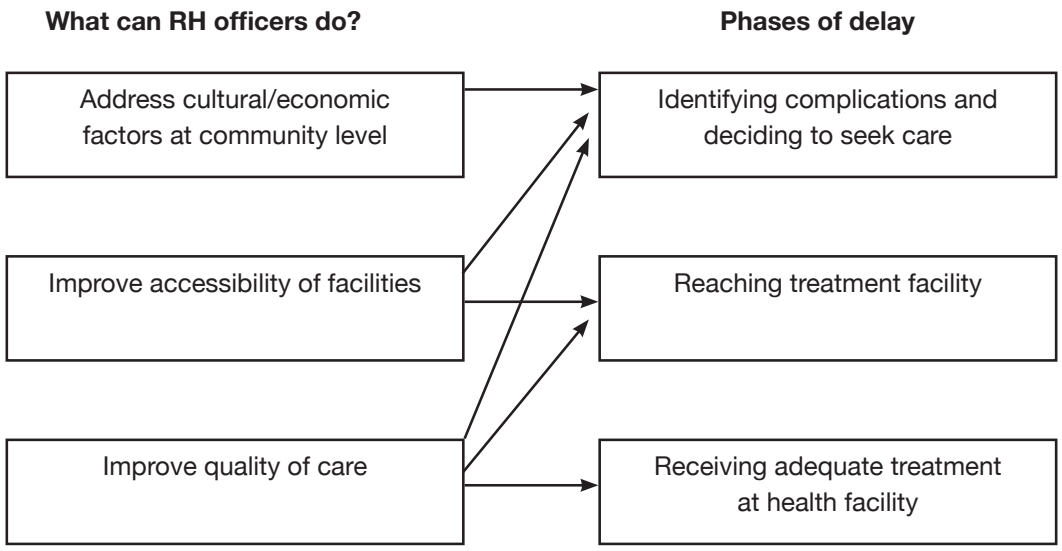
1. **Delay at the community level** in identifying complications and deciding to seek care.

2. **Delay in reaching a treatment facility** (inability to get transport, poor road conditions, insecurity, check points, curfews, etc.).

3. **Delay in receiving adequate treatment at the facility** (absence of staff, lack of drugs or other materials, high costs of treatment, need for down payment prior to receiving treatment, etc.).

Adapted from: *The Design and Evaluation of Maternal Mortality Programs,* Center for Population and Family Health, School of Public Health, Columbia University. 1997.

Figure 7: Addressing the Three Delays



Adapted from: *The Design and Evaluation of Maternal Mortality Programs,* Center for Population and Family Health, School of Public Health, Columbia University. 1997.

providers, health centre and the hospital.

3.3 Antenatal care

An ideal antenatal care package consists of four antenatal visits for uncomplicated pregnancies, with the first visit early in pregnancy, the second from 24-28 weeks, the third at 32 weeks, and the fourth around 36 weeks. This number of recommended visits may vary based on national policies.

The primary objectives of antenatal care are to:

- provide disease prevention and health promotion;
- identify and manage pre-existing health problems and complications arising during pregnancy;
- manage women who require special care during delivery, such as women who have had a previous caesarean section or female genital mutilation (refer to 3.6 Special issues).

For an overview of antenatal care interventions see the table in Annex 1.

Prevention and treatment of malaria

Malaria is the cause of 2-15% of anaemia in pregnant women in Africa, resulting in an increased risk of maternal mortality and morbidity. Malaria also increases the risk of spontaneous abortion, stillbirth, preterm birth, and low birth weight. An estimated 3-8% of all infant deaths can be traced back to malaria infection in the mother.* To prevent malaria in pregnancy:

- Encourage all pregnant women to sleep under an insecticide-treated bed nets (ITN) from as early in pregnancy as possible and to continue using an ITN during the postpartum period, together with their babies. Nets must be used all night every night and cover the entire bed.
- Provide intermittent preventive therapy (IPT) in areas of stable falciparum malaria transmission. Give all pregnant women at least two doses of sulfadoxine-pyrimethamine as soon as possible after the first foetal movement. Give the doses at an interval of at least one month apart.
- Advise women to cover doors and windows to prevent mosquitoes from entering the living space, avoid going out after dark or before dawn and use mosquito coils to either kill or drive mosquitoes away.

Assess any pregnant woman with anaemia and/or fever who has been exposed to malaria and treat her for malaria according to country guidelines.

Screening for syphilis

All pregnant women have to be screened for syphilis at the first antenatal visit. Syphilis contributes to maternal morbidity and negative pregnancy outcome. Every year, maternal syphilis causes half million stillbirths and miscarriages and is responsible for at least half a million

Box 29: Syphilis Testing

In most countries, the rapid plasma reagin (RPR) test is used to screen for syphilis. RPR is difficult to use in many humanitarian settings, because it requires refrigeration, electricity and skilled laboratory staff. Rapid diagnostic tests (RDT) for syphilis have become commercially available in the last few years. In view of the importance of early treatment in the prevention of neonatal syphilis, RDTs present an excellent opportunity for the implementation of routine screening for syphilis in antenatal care services in humanitarian settings, where the RPR test is not available or cannot be done. For more information on RDTs, see Chapter 9: Sexually Transmitted Infections.

* Malaria prevention and treatment, Integrated management of pregnancy and childbirth (IMPAC). Standards for Maternal and Neonatal Care 1.7. WHO 2006. www.who.int/making_pregnancy_safer/publications/Standards1.7N.pdf.

infants born with congenital syphilis. Previously, the standard tests for syphilis were difficult to perform and not appropriate for primary care settings. Simple and effective screening tests for syphilis are now available with results immediately available so that women testing positive can be treated without delay at the point of care.

Screening for HIV and prevention of maternal-to-child transmission (PMTCT) *

An estimated 430 000 children were newly infected with HIV in 2008, over 90% of them through mother-to-child transmission (MTCT). Without treatment, about half of these infected children will die before their second birthday. Without intervention, the risk of mother to child transmission ranges from 20% to 45%. With specific interventions, the risk of MTCT can be reduced to less than 2% in non-breastfeeding populations, and to 5% or less in breastfeeding populations.

Key recommendations and principles of PMTCT:

1. Offer all pregnant women voluntary HIV counselling and testing.
2. Start lifelong antiretroviral therapy (ART) for all pregnant HIV positive women with severe or advanced clinical disease, or with a CD4 count at or below 350 cells/mm3, regardless of symptoms
   - Pregnant women in need of ART for their own health should receive ART.
   - CD4 testing is critical for determining ART eligibility and should be widely available.
3. For women not eligible for ART, provide combination ARV prophylaxis (with either AZT or triple ARV prophylaxis) beginning in 2nd trimester and linked with postpartum prophylaxis.
4. In settings where breastfeeding is the preferred infant feeding option, provide prophylaxis to either the mother or infant during breastfeeding (see 3.4).

For more information on PMTCT, see Chapter 10 HIV.

Disease prevention and health promotion

In addition to the above, preventive measures also include tetanus immunization and presumptive treatment of hookworm.

Health education and promotion aim to:

- increase healthy self-care including adequate nutrition, avoidance of potentially harmful substances, hygiene to prevent infection, adequate rest and activity, prevention of STIs/HIV, malaria, and anemia;
- promote breastfeeding and preparation for breastfeeding;
- support care-seeking behavior, including recognition of danger signs and where to go for help;
- promote postpartum family planning or birth spacing, and newborn care (including nutrition, cord care, and immunization).

Nutrition needs of pregnant and lactating women

During pregnancy and lactation, women's nutritional needs for energy, protein and micronutrients increase significantly. Pregnant women require an additional 285 kcal/day and lactating women require an additional 500 kcal/day. Adequate intake of iron, folate, vitamin A and iodine are particularly important for the health of women and their infants. The increased micronutrient needs of pregnant and lactating women are usually not met through the provision of a basic food ration. Pregnant and lactating women should therefore receive an appropriate fortified food supplement providing 500 to 700 kcal for on-site feeding and 1000 to 1200 kcal if provided as a take-home ration. Pregnant women must receive daily supplements of iron (60 mg/day) and folic acid (400 µg/day). Lactating women must receive vitamin A supplements

* From: *PMTCT strategic vision 2010–2015: preventing mother-to-child transmission of HIV to reach the UNGASS and Millennium Development Goals.* WHO 2010. www.who.int/hiv/pub/mtct/strategic_vision.pdf.

(400 000 IU in 2 doses of 200 000 IU with an interval of at least 24 hours within six weeks after delivery). Promote exclusive breastfeeding during the first 6 months and continued breastfeeding up to two years and beyond (see 3.4).

Birth preparedness

Antenatal care gives the opportunity to the woman and her health-care provider to establish a **birth and emergency plan** based on her unique needs, resources and circumstances. The birth and emergency plan identifies her intentions about where and with whom she intends to give birth and actions to be taken in the event of complications (transport, place of referral, emergency funds). As most complications during labour and childbirth are unpredictable, delivery under the care of a skilled birth attendant in a well-equipped health facility that can address potential complications is recommended and must be encouraged.

Recording of clinical data

All clinical findings and treatments provided during antenatal care must be recorded, preferably on a record that stays with the woman. Good record-keeping is essential to facilitate appropriate decision-making and interventions.

3.4 Childbirth care

The first few minutes after birth are critical for both the mother and newborn.

Childbirth includes labour, delivery and the immediate postpartum period. Childbirth should take place in a health facility that ensures privacy, secure, safe and equipped with the necessary supplies, drugs, personnel, and which has access to transport to and communication with referral hospitals for obstetric and newborn emergencies. RH officers must ensure that all health-care facilities have clinical protocols in place as well as protocols for standard precaution measures, including medical waste management for amniotic fluid, blood and placentas. Hand washing and other standard precautions must be maintained.

Partograph

The partograph must be used for each birth for close monitoring of labor progress, maternal and fetal conditions, and as decision-making tool for further intervention of referral (see Annex 2).

Prevention of postpartum haemorrhage

One of the leading causes of maternal mortality is postpartum hemorrhage. Active management of the third stage of labor (AMTSL) reduces the risk of retained placenta and postpartum hemorrhage. Skilled attendants must offer AMTSL to all women. It consists of:

1. administration of a uterotonic drug, preferably oxytocin to the woman within one minute of the birth of the baby;
2. controlled traction of the umbilical cord;
3. external massage of the uterus following delivery of the placenta.

Oxytocin is the recommended uterotonic for the prevention and treatment of atonic postpartum haemorrhage. However, in some settings it may not be possible to offer the full package of interventions for AMTSL because of absence of skilled staff, difficulties in ensuring safe injection practices and/or lack of refrigeration, all of which prevent the use of oxytocin. In these settings, the use of misoprostol is recommended. Health workers who administer misoprostol must be trained in avoiding administration before birth, correct use (misoprostol 600 micrograms orally immediately after the birth of the baby), and identifying and managing side-effects. In such cases no active intervention to deliver the placenta should be carried out. [*]

[*] WHO Statement regarding the use of misoprostol for postpartum haemorrhage prevention and treatment. WHO. 2009. www.who.int/reproductivehealth/publications/maternal_perinatal_health/misoprostol/en/.

Table 17: Signal Functions for EmOC and Newborn Care	
Basic Emergency Obstetric and Newborn Care (BEmOC)	**Comprehensive Emergency Obstetric and Newborn Care (CEmOC)**
1. Administer parenteral antibiotics	Perform signal functions 1–7, plus:
2. Administer uterotonic drugs (i.e., parenteral oxytocin)	8. Perform surgery (e.g. caesarean section)
3. Administer parenteral anticonvulsants for preeclampsia and eclampsia (i.e., magnesium sulfate).	9. Perform blood transfusion
4. Manually remove the placenta	
5. Remove retained products (e.g. manual vacuum extraction, dilation and curettage)	
6. Perform assisted vaginal delivery (e.g. vacuum extraction, forceps delivery)	
7. Perform basic neonatal resuscitation (e.g., with bag and mask)	
A BEmOC facility is one in which all functions 1–7 are performed. A CEmOC facility is one in which all functions 1–9 are preformed.	

From: *Monitoring emergency obstetric care, a handbook.* WHO/UNFPA/UNICEF/AMDD. WHO. 2009.

Emergency obstetrics and newborn care

In addition to essential care during childbirth care for normal childbirth, basic emergency obstetric care (BEmOC) and newborn care must be provided at the health centre level to address the main complications of childbirth, including newborn problems, or stabilize the woman before referral to a hospital. Ensure health providers are trained in emergency obstetric and newborn care procedures. Publicly display protocols and make relevant medicines, equipment and supplies available in all health centers. As with maternal emergencies, neonatal emergencies cannot always be predicted. For example, it is possible that the baby will not breathe and therefore staff must be prepared for neonatal resuscitation at every birth. Furthermore, maternal complications can cause significant neonatal compromise so that staff should prepare accordingly prior to the birth.

"Signal functions" are key medical interventions that are used to treat the direct obstetric complications that cause the vast majority of maternal deaths around the globe. Table 17 describes the signal functions in relation to BEmOC and CEmOC services. Some critical services are not mentioned but included within these signal functions. For example, carrying out caesarean sections implies that anesthesia is provided.

Initial newborn care

Neonatal deaths are up to seven times more frequent than maternal deaths. The three main causes of neonatal mortality are birth asphyxia, infections and complications of prematurity and low birth weight (LBW). These conditions are preventable and can be managed if women have access to EmOC and newborn care. Staff must be trained to recognize neonatal emergencies and refer to higher levels of care if needed.

Initial care of normal babies includes:

- Keep the baby dry and warm, and ensure skin-to-skin contact with mother.
- Encourage breastfeeding, within one hour of birth if baby and mother are ready.
- Monitor closely for umbilical bleeding, breathing difficulty, pallor and cyanosis.
- Provide eye care to prevent ophthalmia neonatorum.
- Provide immunization (Hepatitis B and/or BCG according to national protocol).

Prevention and management of the main causes of neonatal mortality include:

- **Birth asphyxia:** 5-10% of all newborns need some type of resuscitation at birth. Newborn resuscitation consists of a range of interventions: from simple, such as keeping the baby dry and warm, stimulation, positioning and clearing airway (suction), to more complex such as ventilation (bag-and-mask resuscitation). All newborns must be closely monitored following resuscitation.
- **Infections:** mainly sepsis, pneumonia, tetanus, and diarrhea. Preventive measures include implementing infection prevention practices during childbirth, tetanus toxoid immunization during pregnancy, proper cord care, keeping the baby warm and early and exclusive breastfeeding.
- **LBW/preterm birth:** complications associated with LBW/preterm birth are hypoglycemia, hypothermia, feeding difficulty, jaundice, and increased risk of infection. Care of the LBW/preterm baby include kangaroo mother care or skin-to-skin care, keeping babies warm, immediate and exclusive breastfeeding, feeding assistance, prevention of infection and early identification and appropriate treatment of infections and complications.

3.5 Postnatal maternal and newborn care

The postnatal period is a time of rapidly occurring physiological changes for the mother and baby, with the first 24 - 48 hours being the most critical. Sixty percent of maternal deaths and 40% of neonatal deaths occur in the first 24 hours following childbirth. Following the non-complicated delivery of a healthy term baby, it is recommended to keep mother and baby in the health facility for observation. If discharged prior to 48 hours following delivery, a qualified provider must assess mother and baby within 24-48 hours after discharge. Ensure health workers are trained in recognizing postpartum complications and referring mothers and newborns who may need further observation or treatment. Inform families to know the danger signs for postpartum mothers and newborns in order to seek care early if needed.

The postpartum visit provides an occasion to assess and discuss hygiene, breastfeeding and appropriate methods and timing of family planning (see Chapter 4: Adolescent Reproductive Health). Ensure health providers support early and exclusive breastfeeding, and discuss appropriate nutrition with the mother. Iron and folate tablets must be continued and Vitamin A and iodised oil or salt provided when necessary. The postpartum visit also provides an opportunity to weigh the newborn and discuss his or her care. Newborns must be referred to the under-five clinic for immunisations, growth monitoring and other well-child services.

Breastfeeding is particularly important in humanitarian settings. The risks associated with bottle feeding and breast-milk substitutes are dramatically increased when there is poor hygiene, crowding and limited access to water and fuel. In these situations breast milk may be the only safe and sustainable source of food for infants. The warmth and care provided during breastfeeding is crucial to both mothers and children. Since breastfeeding is also an important traditional activity for women, it can help uprooted women preserve a sense of their self-worth. Therefore, it is important to initiate breastfeeding within one hour of birth, promote exclusive breastfeeding, encourage frequent, on-demand feeding (including night feeds) with no

restrictions on the length or frequency of feeds. On-demand breastfeeding during the first six months also provides contraceptive protection, provided menses has not returned and no other food is given to the baby (see Chapter 5: Family Planning).

Support women who are HIV-positive to make an informed decision about infant feeding. Ensure women testing positive are counselled and have access to AIDS care or ART prophylaxis (PMTCT) and the baby is treated after birth (see 3.4). In settings where replacement feeding (with breast milk substitutes) carries very significant risks of illness, malnutrition and death, infant health outcomes will be better if a mother living with HIV breastfeeds her infant.

Mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first six months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life. Breastfeeding should then only stop once a nutritionally adequate and safe diet without breast-milk can be provided[*] (see Chapter 10: HIV for more information).

3.6 Special issues

Safe abortion and post-abortion care

For information on safe abortion and post-abortion care, please refer to Chapter 7: Comprehensive Abortion Care.

Obstetric fistula

It is estimated that more than 2 million women suffer from untreated obstetric fistula and at least 50 000 – 100 000 new women are affected each year.[**] The vast majority of fistula cases are caused by prolonged or obstructed labour (one of the leading direct causes of maternal mortality and morbidity).

RH officers must ensure that national fistula programmes reach refugee and IDP communities. Fistula eradication strategies include primary prevention, secondary prevention, treatment and reintegration. Primary and secondary prevention include delaying early marriage and childbirth, improving nutrition for girls and adolescents, educating against harmful traditional practices, increasing education for women and girls and improving access to emergency obstetric care — especially caesarean section. All components must be incorporated into fistula campaigns and programmes.

Female Genital Mutilation (FGM)

FGM-associated complications during pregnancy can be identified through history taking and pelvic examination during antenatal care (ANC). Where Type III FGM[***] is common, the vulval area should be routinely inspected at the first ANC visit. Opening up of the infibulation is performed during the second trimester, after careful counselling of the woman and her partner. Once the infibulation has been opened up, episiotomy should only be performed if necessary during labour.

When a woman with an unopened Type III FGM gives birth, the formation of rigid scar tissue around the vaginal opening is likely to lead to delay in the second stage of labour, which may endanger both the woman and the baby. An anterior episiotomy, cutting the scarred infibulations, possibly extended into lateral episiotomies, may be needed to allow for safe delivery. Alternatively the baby may need to be delivered by caesar-

[*] *Infant feeding in the context of HIV. Key Messages.* WHO. 2009. www.who.int/hiv/pub/paediatric/advice/en/.

[**] *Obstetric Fistula: Guiding principles for clinical management and programme development.* WHO, 2005. www.who.int/reproductivehealth/publications/maternal_perinatal_health/9241593679/en/.

[***] Type III FGM: Excision of part or all of the external genitalia and stitching/narrowing of the vaginal opening (infibulation). Approximately 15% of women and girls who are subjected to FGM undergo this type.

ean section. Providers need to be trained to not resuture the labia together after delivery, but to suture the edges separately on each side to avoid recreating an infibulation. Both partners need sensitive counselling to understand and accept the changes after deinfibulation. For more information on FGM, see Chapter 8 on Gender-based Violence.

4 Human rights and legal considerations

The rights to safe pregnancy and to survive pregnancy are included in the international human rights *to life, to health and to be free from discrimination,* and their importance is recognized in the Millennium Development Goals (MDGs).

The fulfilment of other human rights, such as the right to adequate food, shelter, clean water, privacy, information and education, are also key to ensuring the survival and health of mother and child.

The protection and fulfilment of human rights related to maternal health include:

- taking all necessary measures to reduce maternal mortality among all mothers, including adolescents;
- ensuring access to antenatal, delivery and postpartum care, including emergency obstetric and newborn care for all women, including adolescents, poor women, women living in rural areas;
- reducing mother-to-child transmission of HIV through the provision of appropriate antenatal and perinatal care, including access to ARV medication;
- registering newborns immediately after birth;
- eliminating traditional practices harmful to women and newborns, such as FGM, dietary restrictions of pregnant women, preferential feeding and/or care of male children and early and forced marriage and pregnancy. Early marriage can have a negative impact on maternal mortality and morbidity, including an increased risk of obstetric fistula. Prevention of early marriage includes ensuring primary school enrolment for girls and ensuring that married and pregnant girls are not forced to leave school;
- eliminating discriminatory employment practices relating to pregnancy. For example, requiring a pregnancy test before employment is a violation of the right to privacy. Special protection relating to employment should be accorded to mothers for a reasonable period before and after childbirth and working mothers should be accorded leave with appropriate pay and/or social security benefits.

4.1 Challenges and opportunities

At times, service providers may face difficult decisions or dilemmas when providing MNH information and services. Providing appropriate care may be restricted by national legislation, social or cultural norms or medical misconceptions. For example:

- Social norms may prevent women from leaving their homes to go to a health facility for MNH services, including safe delivery.
- Laws on age of marriage may be different for boys and girls and girls may therefore not be adequately protected from early and/or forced marriage.
- Certain groups of people in a humanitarian setting (e.g. refugees and IDPs) may not be able to access EmOC and newborn care services through government-sponsored programmes.

Such norms, laws and practices can be in conflict with internationally accepted human rights principles. As a RH manager or service provider you may find yourself facing such dilemmas. You must be aware of your agency's/organization's position on these RH issues and include it as part of your analysis of the situation and possible next steps. When faced with a difficult situation

you should first and foremost give priority to the client's safety and health, and your own safety and that of colleagues. Then, you may wish to:

- talk to your supervisor;
- discuss options with your client;
- find out whether your agency is engaged in advocacy on the issue and how you can contribute;
- explore linkages with and referrals to local organizations that might be able to help your client further;
- while respecting the confidentiality of the client, identify with colleagues and other RH providers how to avoid such situations/ handle them in the future;
- raise these concerns in health coordination meetings.

5 Monitoring

Investigate every maternal and perinatal death.

Death reviews and near-miss reviews are critical components of a maternal health programme for reflective learning; to promote and monitor change in practice; and to advocate for measures to prevent adverse complications and deaths. There are several approaches recommended to conduct maternal death review and near-miss review, such as verbal autopsies and surveys of severe morbidity. Starting with a no-name/no-blame assessment of preventable factors associated with maternal deaths, stillbirths and neonatal deaths in facilities will provide information on how to improve programmes. (For an example of a Maternal Death Review Form, see Annex 4 in Chapter 3: Assessment, Monitoring and Evaluation).

The following indicators can be used to monitor MNH programmes:

1. Percentage of pregnant women who had at least four antenatal visits during pregnancy.

2. Availability of emergency obstetric care: basic and comprehensive care facilities:

3. Proportion of all births in emergency obstetric care facilities.

4. Meeting the need for emergency obstetric care: proportion of women with major direct obstetric complications who are treated in such facilities.

5. Caesarean sections as a proportion of all births.

6. Direct obstetric case fatality rate.

For more information on monitoring see Chapter 3: Assessment, Monitoring and Evaluation.

6 Further reading

• Integrated Management of Pregnancy and Childbirth (IMPAC)*: Pregnancy, Childbirth, Post partum and Newborn Care: A guide for essential practice.* WHO. 2006. www.who.int/making_pregnancy_safer/documents/924159084x/en/index.html.

• *Integrated Management of Pregnancy and Childbirth (IMPAC): Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors.* WHO. 2005. www.who.int/making_pregnancy_safer/documents/9241545879/en/index.html.

• *Integrated Management of Pregnancy and Childbirth (IMPAC): Managing Newborn Problems: A guide for doctors, nurses and midwives.* WHO. 2003. www.who.int/making_pregnancy_safer/documents/9241546220/en/index.html.

• *Monitoring emergency obstetric care, a handbook.* WHO/UNFPA/UNICEF/AMDD. WHO. 2009. www.who.int/reproductivehealth/publications/monitoring/9789241547734/en/index.html.

• *Cochrane reviews*. www.cochrane.org/reviews.

Annexes

Annex 1: WHO Recommended Interventions for Improving Maternal and Newborn Health

Table 18: Care in Pregnancy, Childbirth and Postpartum Period for Mother and Newborn Infant

	Routine care (offered to all women and babies)	Additional care (for women and babies with moderately severe diseases and complications)	Specialized obstetrical and neonatal care (for women and babies with severe diseases and complications)
Pregnancy care, 4 visits *Essential*	• Confirmation of pregnancy • Monitoring of progress of pregnancy and assessment of maternal and foetal well-being • Detection of problems complicating pregnancy (e.g. anaemia, hypertensive disorders, bleeding, malpresentations, multiple pregnancy) • Respond to other reported complaints • Tetanus immunization, anaemia prevention and control (iron and folic acid supplementation) • Information and counselling on self-care at home, nutrition, safe sex, breastfeeding, family planning, healthy lifestyle • Birth and emergency planning, advice on danger signs and emergency preparedness • Recording and reporting • Syphilis testing	• Treatment of mild to moderate pregnancy complications ▸ mild to moderate anaemia ▸ urinary tract infection ▸ vaginal infection • Postabortion care and family planning • Pre-referral treatment of severe complications ▸ pre-eclampsia/eclampsia ▸ bleeding ▸ infection ▸ complicated abortion • Support for women with special needs (e.g. adolescents, women living with violence) • Treatment of syphilis (woman and her partner)	• Treatment of severe pregnancy complications ▸ anaemia ▸ severe pre-eclampsia/eclampsia ▸ bleeding ▸ infection ▸ other medical complications • Treatment of abortion complications
Situational	• HIV testing and counselling • Antimalarial intermittent preventive treatment (IPT) and promotion of insecticide-treated nets (ITN) • Deworming • Assessment of female genital mutilation (FGM)	• Prevention of mother to child transmission of HIV (PMTCT): ▸ antiretroviral treatment (ART) ▸ infant feeding counselling ▸ mode of delivery advice • Treatment of mild to moderate opportunistic infections • Treatment of uncomplicated malaria	• Treatment of severe HIV infection • Treatment of complicated malaria

Table 18: Care in Pregnancy, Childbirth and Postpartum Period for Mother and Newborn Infant			
Childbirth care (labour, delivery, and immediate postpartum) *Essential*	• Care during labour and delivery ▸ Diagnosis of labour ▸ Monitoring progress of labour, maternal and foetal well-being with partograph ▸ Providing supportive care and pain relief ▸ Detection of problems and complications (e.g. malpresentations, prolonged and/or obstructed labour, hypertension, bleeding, and infection) ▸ Delivery and immediate care of the newborn baby, initiation of breastfeeding ▸ Newborn resuscitation ▸ Active management of third stage of labour • Immediate postpartum care of mother ▸ Monitoring and assessment of maternal well being, prevention and detection of complications (e.g. hypertension, infections, bleeding, anaemia) ▸ Treatment of moderate posthaemorrhagic anaemia ▸ Information and counselling on home self care, nutrition, safe sex, breast care and family planning ▸ Advice on danger signs, emergency preparedness and follow-up • Recording and reporting	Treatment of abnormalities and complications (e.g. prolonged labour, vacuum extraction; breech presentation, episiotomy, repair of genital tears, manual removal of placenta) • Pre-referral management of serious complications (e.g. obstructed labour, foetal distress, preterm labour, severe peri- and postpartum haemorrhage) • Emergency management of complications if birth imminent • Support for the family if maternal death	• Treatment of severe complications in childbirth and in the immediate postpartum period, including caesarean section, blood transfusion and hysterectomy: ▸ obstructed labour ▸ malpresentations ▸ eclampsia ▸ severe infection ▸ bleeding • Induction and augmentation of labour
Situational	• Vitamin A administration	• PMTCT by mode of delivery, guidance and support for chosen infant feeding option	• Management of complications related to FGM
Postpartum maternal care (up to 6 weeks) *Essential*	• Assessment of maternal well-being • Prevention and detection of complications (e.g. infections, bleeding, anaemia)	• Treatment of some problems (e.g. mild to moderate anaemia, mild puerperal depression)	• Treatment of all complications ▸ severe anaemia ▸ severe postpartum bleeding

Table 18: Care in Pregnancy, Childbirth and Postpartum Period for Mother and Newborn Infant			
	• Anaemia prevention and control (iron and folic acid supplementation) • Information and counselling on nutrition, safe sex, family planning and provision of some contraceptive methods • Advice on danger signs, emergency preparedness and follow-up • Provision of contraceptive methods • Promotion of ITN use	• Pre-referral treatment of some problems (e.g. severe postpartum bleeding, puerperal sepsis)	▸ severe postpartum infections ▸ severe postpartum depression • Female sterilization
Situational	• Promotion of ITN use	• Treatment of uncomplicated malaria	• Treatment of complicated malaria
Newborn care (birth and immediate postnatal) *Essential*	• Promotion, protection and support for breastfeeding • Monitoring and assessment of well-being, detection of complications (breathing, infections, prematurity, low birthweight, injury, malformation) • Infection prevention and control, rooming-in • Eye care • Information and counselling on home care, breastfeeding, hygiene • Advice on danger signs, emergency preparedness and follow-up • Immunization according to the national guidelines (BCG, HepB, OPV-0)	• Care if moderately preterm, low birth weight or twin: support for breastfeeding, warmth, frequent assessment of well-being and detection of complications e.g. feeding difficulty, jaundice, other perinatal problems • Kangaroo Mother Care (KMC) follow-up • Treatment of mild to moderate: ▸ local infections (cord, skin, eye, thrush) ▸ birth injuries • Pre-referral management of infants with severe problems: ▸ very preterm babies and/or birth weight very low ▸ severe complications ▸ malformations • Supporting mother if perinatal death	• Management of severe newborn problems - general care for the sick newborn and management of specific problems: ▸ preterm birth ▸ breathing difficulty ▸ sepsis ▸ severe birth trauma and asphyxia ▸ severe jaundice ▸ KMC • Management of correctable malformations
Situational	• Promotion of sleeping under ITN	• Presumptive treatment of congenital syphilis • Prevention of mother-to-child transmission of HIV by ART • Support for infant feeding of maternal choice	• Treatment of: ▸ congenital syphilis ▸ neonatal tetanus

Table 18: Care in Pregnancy, Childbirth and Postpartum Period for Mother and Newborn Infant			
Postnatal newborn care (visit from/at home) *Essential*	• Assessment of infant's well-being and breastfeeding • Detection of complications and responding to maternal concerns • Information and counselling on home care • Additional follow-up visits for high risk babies (e.g. preterm, after severe problems, on replacement feeding)	• Management of: ▸ minor to moderate problems ▸ feeding difficulties • Pre-referral management of severe problems: ▸ convulsions ▸ inability to feed • Supporting the family if perinatal death	• Management of severe newborn problems: ▸ sepsis ▸ other infections ▸ jaundice ▸ failure to thrive

Annex 2: Partograph

PARTOGRAPH

USE THIS FORM FOR MONITORING ACTIVE LABOUR

CERVICAL DILATATION

10 cm
9 cm
8 cm
7 cm
6 cm
5 cm
4 cm

FINDINGS	TIME	1	2	3	4	5	6	7	8	9	10	11	12
Hours in active labour													
Hours since ruptured membranes													
Rapid assessment B3-B7													
Vaginal bleeding (0 + ++)													
Amniotic fluid (meconium stained)													
Contractions in 10 minutes													
Fetal heart rate (beats/minute)													
Urine voided													
T (axillary)													
Pulse (beats/minute)													
Blood pressure (systolic/diastolic)													
Cervical dilatation (cm)													
Delivery of placenta (time)													
Oxytocin (time/given)													
Problem-note onset/describe below													

Sample form to be adapted. Revised on 13 June 2003.