

KINGDOM OF CAMBODIA
NATION -RELIGION-KING



MINISTRY OF HEALTH



EMERGENCY OBSTETRIC
&
NEWBORN CARE (EmONC)
IMPROVEMENT PLAN
2016 – 2020

June 2016

Preface

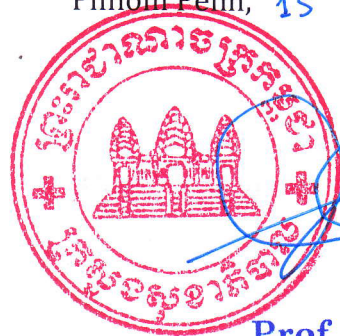
Maternal and newborn health is a top priority of the Cambodian Government. Efforts have resulted in impressive gains in expanding the reach of maternal and newborn services. However maternal and newborn mortality remain a challenge for the country.

The Ministry of Health has invested heavily in Emergency Obstetric and Newborn Care (EmONC), beginning with a National EmONC study in 2009, which was followed by an EmONC Improvement Plan for the period 2010-2015. A recent EmONC review in April 2015 assessed the impact of these efforts over the past 5 years and remaining gaps. A second EmONC Improvement Plan was developed in order to respond to the remaining needs and close the remaining gaps over the next five years (2016-2020).

This EmONC Improvement Plan (2016-2020) is a culmination of efforts involving many individuals and organizations. Sincere gratitude and appreciation is extended to NMCHC, Provincial Health Departments, EmONC facilities and all partners, including UNFPA, URC, USAID, WHO and members of the Sub-Technical Working Group for Maternal and Child Health for technical and financial support for the development of this EmONC Improvement Plan. Special thanks is given to Dr. Vincent Fauveay, who worked as a consultant to NMCHC on the development of this EmONC Improvement Plan through a cohesive and participatory the process.

Most importantly, acknowledgement is given to the dedicated service and hard work of all health personnel at all levels of service delivery: they are on the front-line of national efforts to ensure a smooth journey before, during and after pregnancy for mothers and their newborn babies. The successful implementation of this plan lies largely on your commitment and willingness. *Eng Huot*

Phnom Penh, *15* June 2016



Prof. ENG HUOT
SECRETARY OF STATE

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Acronyms

AMDD	Averting Maternal Death and Disability (Columbia University, New York)
AMTSL	Active Management of the Third Stage of Labour
ANC	Antenatal Care
BEmONC	Basic Emergency Obstetric and Newborn Care
CBR	Crude Birth Rate
CDHS	Cambodian Demographic and Health Survey
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CFR	Case Fatality Rate
CMS	Central Medical Store
CPA	Complementary Package of Activities
CPR	Contraceptive Prevalence Rate
CMA	Cambodian Midwives Association
EENC	Early Essential Newborn Care
EmONC	Emergency Obstetric and Newborn Care
FP	Family Planning
FTIRM	Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality
HEF	Health Equity Fund
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HRH	Human Resources for Health
HSDP	Health Sector Development Plan
HSSP	Health Sector Strategic Plan
LBW	Low Birth Weight
MBS	Mao Bunsoth Research
MDG	Millennium Development Goals
MNH	Maternal and Newborn Health
MoH	Ministry of Health
MPA	Minimum Package of Activities
NGO	Non-governmental organization
NMCHC	National Maternal and Child Health Centre
OD	Operational District
PHD	Provincial Health Department
RGoC	Royal Government of Cambodia
RH	Referral Hospital
RMNH	Reproductive, Maternal and Neonatal Health
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goals
SMW	Secondary Midwife
SDG	Service Delivery Grant
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WRA	Women of Reproductive Age

Executive Summary

In response to high levels of maternal and newborn morbidity and mortality, Cambodia developed and implemented an Emergency Obstetric and Newborn Care (EmONC) Improvement Plan for the period 2010-2015. The recent review of the EmONC Improvement Plan (April 2015) revealed significant progress in the availability, accessibility, quality and utilization of EmONC services in Cambodia by early 2015, as well as challenges in implementation. Between 2009 and 2015, the number of CEmONC facilities increased from 25-37 and the number of BEmONC facilities increased from 19 to 110. Progress was strongest in terms of expanding coverage of Comprehensive EmONC care (CEmoNC), and by 2015, Cambodia had exceeded international standards for CEmONC coverage. Improvements were also made in expanding the number of functional Basic EmONC (BEmONC) facilities, but progress has been slower in this area. Only 28 of the 110 upgraded BEmONC facilities were found to be fully functional (performing all 7 BEmONC signal functions in the 3 months preceding the EmONC Review). Improvements were also found in the proportion of births taking place in functional EmONC facilities, reductions in financial barriers to EmONC care, reductions in the Direct Obstetric Case Fatality Rate, and performance of specific signal functions.

However, Cambodia still has fewer than half of the recommended number of EmONC facilities for the country and EmONC facilities are still largely concentrated at the hospital level and in urban areas, with one province still lacking any EmONC facilities. The needs of newborns with complications are also being insufficiently met. In order to address these and other remaining challenges, a new EmONC Improvement Plan is being proposed for the period 2016 - 2020.

The Goal of this new EmONC Improvement Plan 2016-2020 is to reduce maternal and newborn deaths and contribute to the Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality (FTIRM) 2016-2020. **The main objectives and targets** in EmONC for the year 2020 are to:

- Improve EmONC **coverage** and **availability** so that there are at least 5 EmONC (CEmONC and BEmONC) facilities per 500,000 population, including at least 1 functional CEmONC facility and at least 4 functional BEmONC facilities per 500,000 population (UN Process Indicator #1),
- Ensure greater accessibility to EmONC through improved geographic distribution of EmONC facilities throughout the country and a more functional referral system,
- Ensure effective **utilization** of EmONC services in order to meet at least 90% of need, through improved communications, effective referrals, delivery of quality services, continued reductions in financial barriers, and community participation,
- Improve the quality of care by strengthening the competencies of staff in designated EmONC facilities to perform key signal functions. Cambodia should **reach or exceed UN standards** for EmONC process indicators on proportion of births in EmONC facilities, met need, cesarean delivery, and direct obstetric case fatality rate (UN Process Indicators 3-6). Specifically, Cesarean deliveries should be at 10 percent (10%) of expected births nationally by 2020, with no province below 3.5% and Phnom Penh not above 17%),
- Strengthen the **capacity** of PHDs and lower level administrative structures to plan, manage, monitor, and support EmONC services and ensure high quality of care,
- Reduce remaining **financial barriers** to EmONC services. Ensure that all women in reproductive age have access to full package of key reproductive maternal and newborn health services without financial hardship, when needed.

The approaches and key interventions proposed in this EmONC Improvement Plan are evidence-based, build on established interventions and programs, and are integrated into the existing health system. They rely on

clear definitions of roles and responsibilities, transparency and accountability at all levels, equitable treatment, ongoing monitoring and periodic evaluation, and partnership with civil society and international partners.

Key interventions include: upgrading facilities and staffing, GIS mapping of EmONC facilities to ensure geographic coverage, reducing gaps in basic drugs and equipment, increasing staff competencies through training and on-site coaching, enabling availability of 24/7 EmONC services, improving management coordination, monitoring and evaluation by the National Program and Provincial Health Departments, and improving the recording and reporting of obstetric and newborn complications and deaths at health facilities. These key interventions will be implemented at both national and provincial levels, according to phased annual plans.

1. Background and Context

Maternal and Newborn Health in Cambodia

Maternal and newborn health has been a priority of the health sector since the mid 1990's when the NMCHC was created. Accelerated plans for improving maternal and newborn health were agreed to in 2009 with the Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality 2010-2015 and the Emergency Obstetric and Newborn Care (EmONC) Improvement Plan 2010-2015. The implementation of these plans is coming to an end, and with continued commitment at the highest levels of the Royal Government of Cambodia (RGoC), it is time to take stock, prepare follow up plans, and to mobilize resources. This is the purpose of the new EmONC Improvement Plan 2016-2020.

The EmONC Improvement Plan 2016-2020 builds on an April 2015 Review of the EmONC Improvement Plan 2010-2015, a Consultative Workshop on EmONC organized in Phnom Penh on 19-20 October 2015, a second consultative meeting in December 2015, and on inputs from program managers, partner agencies, and experts in the field, including from a consultant visit in October 2015. A new Fast track Initiative Road Map for Reducing Maternal and Newborn Mortality 2016-2020 was developed at the same time and in close coordination with this EmONC Improvement Plan.

Select MNH indicators for Cambodia and neighboring countries

Cambodia is in the group of countries with the highest Maternal Mortality Ratios (MMR, maternal deaths per 100,000 live births) in South-East Asia. However, Cambodia performs better than several other countries in the region, including Indonesia, Myanmar, Lao PDR and Timor Leste (see Table 1).

Table 1: Maternal Mortality in South-East Asian countries

Country	Maternal Mortality Ratio (confidence interval)	Number of Maternal Deaths (Annual)
Timor Leste	270 (140-500)	110
Lao PDR	220 (130-370)	400
Myanmar	200 (120-350)	1900
Indonesia	190 (120-300)	8800
Cambodia	170 (110-280)	670
Vietnam	49 (29-84)	690
Thailand	26 (18-38)	180

In terms of neonatal mortality (NMR, newborn deaths per 1,000 live births), Table 2 (next page) shows that Cambodia is performing better than Lao PDR, Myanmar, and Timor Leste, but remains behind Indonesia, Vietnam and Thailand.

¹ Ministry of Health. Royal Government of Cambodia, Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality in Cambodia 2010-2015, 2009.

² Ministry of Health, Royal Government of Cambodia, Emergency Obstetric & Newborn Care Improvement Plan 2010-2015, 2009.

³ Ministry of Health, Royal Government of Cambodia and MBS Research, Review of the Cambodian Emergency Obstetric and Newborn Care Improvement Plan 2010-2015, April 2015.

⁴ Ministry of Health. Royal Government of Cambodia, Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality in Cambodia 2016-2020, January 2016.

⁵ Source: World Health Organization, Partnership for Maternal, Newborn and Child Health. Countdown to 2015, Geneva, 2014.

Table 2: Neonatal mortality and stillbirths in South East Asian countries

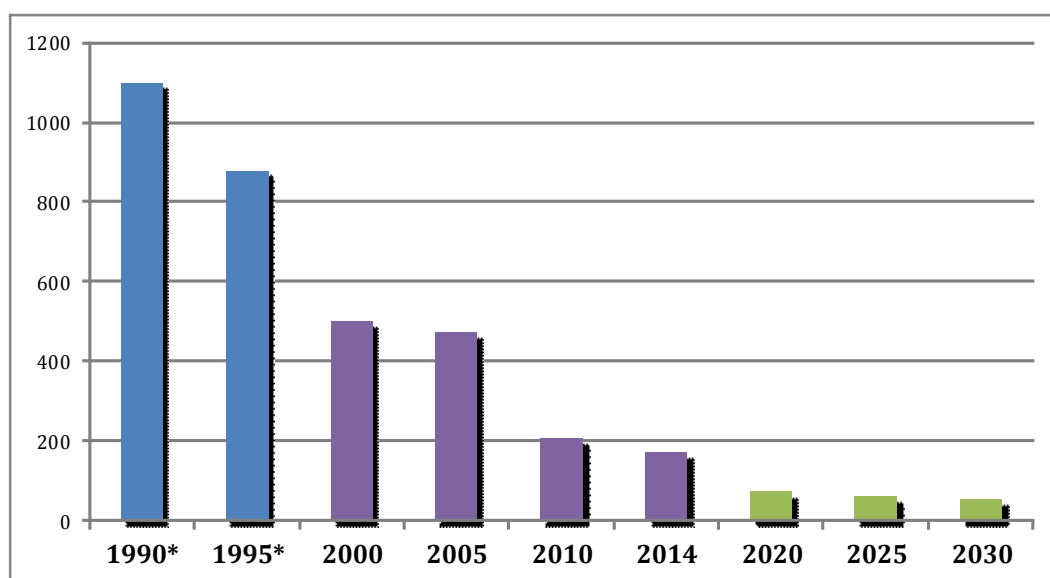
Country	Neonatal Mortality Rate 1990	Number of Newborn deaths in 1990 (thousands)	Neonatal Mortality Rate 2015	Number of Newborn deaths in 2015 (thousands)	Stillbirth Rate 2000	Number of Stillbirths in 2000 (thousands)	Stillbirth Rate 2015	Number of Stillbirths in 2015 (thousands)
Lao PDR	55	10	30	5	31.6	5	23.7	4
Myanmar	47	50	26	24	29.8	36	20	19
Timor Leste	56	2	22	1	26.3	1	17.8	0.9
Cambodia	41	14	15	5	20.8	7	11.9	4
Indonesia	30	138	14	74	17.7	78	13.2	73
Vietnam	24	46	11	18	15.0	18	10.1	16
Thailand	20	22	7	5	7.7	7	5	4

Maternal Mortality in Cambodia

The trends in maternal mortality reduction during the Millennium Development Goal (MDG) period 1990-2015 are clear and encouraging (see Figure 1). To the extent that surveys and estimates can be trusted in the absence of a comprehensive and expensive separate study of maternal death in the country, MDG Target 5A has been reached in Cambodia. This is a rare achievement worldwide, and one that has been well recognized by international health authorities.

Figure 1 below shows trends in maternal mortality in Cambodia from 1990-2014 and projected values if trends continue through 2030, when the Sustainable Development Goals (SDG) are to be achieved. All values have wide confidence intervals. The FTIRM target for MMR is 130 per 100,000 live births by 2020. Although not explicit in the SDG document, all developing countries are encouraged to reach a Maternal Mortality Ratio of less than 70 maternal deaths per 100,000 live births by 2030. Cambodia should aim at this figure.

Figure 1: Maternal Mortality in Cambodia 1990-2030



⁷Sources: Levels and Trends in Child Mortality - Report 2015 and Supplement to: Blencowe et al H, Cousens S, Jassir FB, et al, for The Lancet Stillbirth Epidemiology Investigator Group, 2016)

⁸Sources: *1990 and 1995: Trends in MMR 1990 to 2015 - WHO, UNICEF, UNFPA, the WB Group and United Nations Population Division 2015; 2000, 2005, 2010, and 2014: CDHS; 2020, 2025, and 2030: estimates based on SDG target

The values used in Figure 1 are drawn from various publications. Since most data included are built on indirect measures of maternal death, they are likely to be an underestimate, due to underreporting, incompleteness and misclassification of deaths inherent in all of the indirect methods used to collect such data. For example, the CDHS uses the Sisterhood Method, which gives an estimate of pregnancy related mortality in the previous 5-6 years, with large confidence intervals. The Annual Health Statistical Report of the MoH (DPHI) reported only 32 maternal deaths in 2013, while the Maternal Death Audit system of the MOH reported 113 maternal deaths in 2014, most of them institutional deaths. These figures are low compared to expectations, which would be more in the range of 670 maternal deaths annually, assuming a MMR of 170 (CDHS 2014).

Neonatal Mortality in Cambodia

Neonatal mortality is much easier to measure because newborn deaths are both more frequent and less sensitive than maternal deaths. Ideally, data on early newborn mortality, which is closely linked with maternal mortality, would also be available. However, early newborn deaths (in the first days and weeks) are less measured and reported than later newborn deaths (up to 28 days post delivery) in Cambodia, as in many developing countries.

Figure 2: Neonatal Mortality in Cambodia 1990-2030

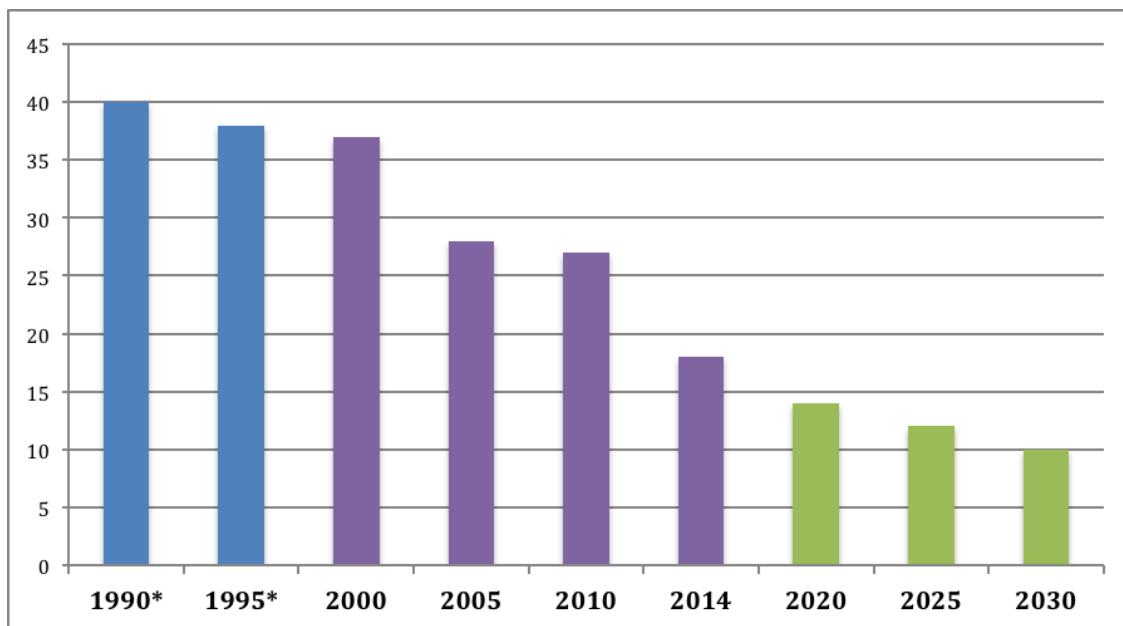


Figure 2 shows trends in neonatal mortality (newborn deaths in the first 28 days per 1,000 live births) between 1990 and 2015, and extends projected values until 2030, the end of the SDG era. Newborn deaths have not and are not expected to continue to decrease as fast as maternal deaths over time. These projected values are also approximate, probably underestimated, and subject to caution. However, they follow reasonable expectations. The main problem in the data is underreporting of Early Newborn Mortality (deaths during the first 6 days of life), Very Early Newborn Mortality (deaths during the first 24 hours), and Stillbirth Mortality, particularly late stillbirth or Intra-partum mortality, which is the most correlated with maternal mortality, sharing the same epidemiologic conditions and roughly the same case management, both of which are related to EmONC. It should be noted that very few developing countries report on Early, Very Early or Stillbirth Mortality, making the construction of UN EmONC Process Indicator N° 7 Intrapartum and Early Newborn Death Rate quite difficult.

⁹ Sources: *1990 and 1995: Trends in MMR 1990 to 2015 – WHO, UNICEF, UNFPA, the WB Group and United Nations Population Division 2015; 2000, 2005, 2010, and 2014: CDHS; 2020, 2025, and 2030: estimates based on SDG target

Policy context

In Cambodia, the policy environment concerning RMNH is very enabling. The MoH encourages institutional delivery, offers a financial incentive for each live birth in a public health facility, and proposes a reasonable midwifery staffing standard for facilities (including at least two secondary midwives per health center). Results of these policies are impressive in terms of institutional deliveries and, with continued support and attention, should continue to improve (see EmONC UN Process indicators below).

Progress since 2009

Since the publication of the EmONC Improvement Plan 2010-2015, significant progress has been observed. Progress and remaining challenges were analyzed in the EmONC Review published in April 2015, which compared the situation and data collected in 2008-2009 to that of 2014-2015.

Table 3 summarizes the changes in selected indicators between 2008 and end 2014. It also identifies gaps in data collection due to insufficient quality of recording, therefore rendering some indicators less reliable than expected.

Table 3: Summary of the main progress in EmONC between 2008 and 2014 (in pink: very reliable data; in grey and italic: less-reliable data)

Figure 2 shows trends in neonatal mortality (newborn deaths in the first 28 days per 1,000 live births) between 1990 and 2015, and extends projected values until 2030, the end of the SDG era. Newborn deaths have not and are not expected to continue to decrease as fast as maternal deaths over time. These projected values are also approximate, probably underestimated, and subject to caution. However, they follow reasonable expectations. The main problem in the data is underreporting of Early Newborn Mortality (deaths during the first 6 days of life), Very Early Newborn Mortality (deaths during the first 24 hours), and Stillbirth Mortality, particularly late stillbirth or Intra-partum mortality, which is the most correlated with maternal mortality, sharing the same epidemiologic conditions and roughly the same case management, both of which are related to EmONC. It should be noted that very few developing countries report on Early, Very Early or Stillbirth Mortality, making the construction of UN EmONC Process Indicator N° 7 Intrapartum and Early Newborn Death Rate quite difficult.

Domain/Indicator	Baseline 2008	Progress 2014	Remarks
Number of functional EmONC facilities (defined as 3 months performance of all signal functions) Number of EmONC facilities recommended for upgrade	44, out of 143 recommended EF, out of a total of 347 assessed (incl 40 private) 99 recommended for upgrad	63, out of a total 178 assessed (no private) 115 recommended for upgrade	Applying the extended definition of 7 and 9 signal functions performed in the last 12 months improves the figures and shows missing signal functions
Density of functional EmONC facilities, per 500,000 population	1.64	2.35 ¹¹	Expectation: at least 5
Density of functional CEmONC facilities, per 500,000 population	0.93	1.31	Expectation: 1.0 (met in 2014)

Geographic distribution of EmONC facilities	5 provinces had none	1 province had none (Kep)	Depending on size of population. USE MAPS
Proportion of births in functional EmONC facilities	11.4%	23.5%	Should be minimum 15% but can go up to 100% (optimal)
Proportion of births in all EmONC facilities	17.8%	35.0%	same
<i>Met Need for obstetric complications in functional EmONC facilities</i>	<i>12.7%</i>	<i>23.6%</i>	<i>Indicator not built on reliable definitions of DOC (Direct Obstetric Complications)</i>
<i>Met Need for obstetric complications in all EmONC facilities</i>	<i>14.5%</i>	<i>30.0%</i>	<i>same</i>
Proportion of births by Cesarean section (in CEmONC facilities)	1.3%	3.9% (22.6% in Phnom Penh)	
<i>Direct Obstetric Case Fatality Rates in functional EmONC facilities</i>	<i>0.75%</i>	<i>0.19%</i>	<i>Indicator not built on reliable definitions of DOC (Direct Obstetric Complications)</i>
<i>Direct Obstetric Case Fatality Rates in all EmONC facilities</i>	<i>0.74%</i>	<i>0.16%</i>	<i>same</i>
<i>Intra Partum mortality rates</i>	<i>1.2%</i>	<i>1.53%</i>	<i>Indicator not built on reliable definitions of intrapartum stillbirths and very early newborn death</i>
<i>Proportion of Indirect Obstetric complications</i>	<i>29.0%</i>	<i>16.7%</i>	<i>Indicator not built on reliable definitions of Direct and Indirect OC Obstetric Complications</i>
Number of maternal complications referred OUT of EmONC facilities to higher level in one year	2545	5512	Causes: hemorrhage, obstructed labour, Pre/eclampsia, preterm, anemia, others
Number of maternal complications referred INTO EmONC facilities from lower level in one year	2135	5274	Missing the causes of referral

Number of newborn complications referred OUT of EmONC facilities to higher level	258	336	Causes: low birth weight, prematurity, respiratory problems, sepsis, jaundice, others
Number of newborn complications referred INTO EmONC facilities from lower level in one year	0	993	Missing the causes of referral
% of functional EmONC facilities with 2 or more secondary midwives	84%	98%	
% of non-functional EmONC facilities with 2 or more secondary midwives	45%	74%	
% of midwives trained in administering MgSO4 for pre/Eclampsia and performed this signal function in last 3 months	34% (12%)	86% (30%)	

¹⁰Ministry of Health, Royal Government of Cambodia and MBS Research, Review of the Cambodian Emergency Obstetric and Newborn Care Improvement Plan 2010-2015, April 2015.

¹¹Cambodia has made significant progress in the number of BEmONC designated facilities with 4,5 and 6 functioning signal functions increasing from none in 2009 to 98 in 2014 (in the last 3 months) and 120 (in the last twelve months)

2. Rationale for a new EmONC Improvement Plan 2016-2020

The Review of the EmONC Improvement Plan 2010-2015 (April, 2015) included a number of observations and initial recommendations. They focused on achievements, as well as delays in implementation, insufficient progress, or barriers to availability, accessibility, utilization and/or quality of EmONC services. Progress in EmONC to date has been strongest in terms of expanding coverage of Comprehensive EmONC care (CEmONC). By early 2015, Cambodia had exceeded international standards for CEmONC coverage. Improvements were also made by early 2015 in expanding the number of functional Basic EmONC (BEmONC) facilities, but progress has been slower in this area.

Between 2009 and 2015, the number of CEmONC facilities increased from 25-37 and the number of BEmONC facilities increased from 19 to 110. Progress was strongest in terms of expanding coverage of Comprehensive EmONC care (CEmONC), and by 2015, Cambodia had exceeded international standards for CEmONC coverage. Improvements were also made in expanding the number of functional Basic EmONC (BEmONC) facilities, but progress has been slower in this area. Only 28 of the 110 upgraded BEmONC facilities were found to be fully functional (performing all 7 BEmONC signal functions in the 3 months preceding the EmONC Review). By early 2015, 98 of the 138 designated BEmONC facilities (those upgraded and others that had been targeted for upgrade) had performed at least 4 signal functions in the 3 months preceding the EmONC Review and 120 had performed at least 4 signal functions in the 12 months preceding the EmONC Review. Improvements were also found in the proportion of births taking place in functional EmONC facilities, reductions in financial barriers to EmONC care, reductions in the Direct Obstetric Case Fatality Rate, and performance of specific signal functions.

However, Cambodia still has fewer than half of the recommended number of EmONC facilities for the country (5/500,000 population), and EmONC facilities are still largely concentrated at the hospital level and in urban areas, with one province still lacking any EmONC facilities. The needs of newborns with complications are also being insufficiently met, and deserve additional attention in the future. The key remaining challenges are:

- Not enough facilities provide all the life-saving EmONC functions. Only 63 facilities are fully functional as EmONC, with a large deficit in Basic EmONC compared to expected numbers according to the UN standards.
- Facilities providing EmONC are not equitably distributed across the country.
- Although progress has been made, EmONC services are still under-utilized and there is a strong unmet need for these services. Specific signal functions - such as manual vacuum extraction, anticonvulsants, manual vacuum aspiration, and newborn resuscitation were found to be underused compared to expected complications needing these interventions.
- The needs of newborns with complications are being insufficiently met and deserve particular attention moving forward.
- The proportion of births by Cesarean section is improving but remains below international standards (except in Phnom Penh) and availability of blood transfusion is still insufficient.

¹²Ministry of Health, Royal Government of Cambodia and MBS Research, Review of the Cambodian Emergency Obstetric and Newborn Care Improvement Plan 2010-2015, April 2015.

- The quality of EmONC services is still poor and requires more training, coaching and skills refreshing of staff, as well as significant and continued supportive supervision.
- Standards for EmONC procedures, although published and available, are not universally followed.
- The referral system has improved, primarily due to improved infrastructure, but many patients in need still suffer delays in referral and treatment.
- Although impressive progress has been made, some financial barriers remain, particularly for the “near-poor”, the recent poor and marginalized groups.

Table 4: Recommendations from the Review of the EmONC Improvement Plan 2010-2015 endorsed for the EmONC Improvement Plan 2016-2020

Category	Recommendations endorsed for EmONC 2016-2020
Policy level	<ul style="list-style-type: none"> - Build on achievements, and focus on quality improvement, low cost interventions which have been shown to work - Prioritize Health Centers to become true BEmONC facilities - Select and expand low cost low tech interventions which have an impact - Utilize the mass of collected data for further in-depth analysis particularly at provincial level
Quality of care	<ul style="list-style-type: none"> - Address lack of recognition of obstetric and newborn complications and under-diagnosis by frontline EmONC staff, to reduce missed cases - Address the least practiced signal functions: newborn resuscitation, assisted delivery, anticonvulsants, manual removal of placenta - Augment the use of criterion-based audits, particularly for near-misses - Ensure that national guidelines for the management of EmONC conditions are distributed, consulted and used in all facilities, and that wall charts are posted in every working room. - Link quality improvement with financial rewards (SDGs, other methods as appropriate) - Consider introduction of certification/accreditation processes for EmONC facilities, potentially involving civil society organizations
Enabling environment	<ul style="list-style-type: none"> - Review and improve performance of the supply management chain to avoid shortages or stockouts - Ensure that all Health Centers have an emergency trolley with essential supplies - Ensure that each labor room has ambu bag and mask for newborn resuscitation and that every staff knows how to use them properly - Exploit the improved road network for improved use of communication and referral - Ensure that formal mechanisms to reduce user-fees and out-of-pocket expenditures for the poor are effectively used in all necessary cases, and expand them as necessary

UN indicators	<ul style="list-style-type: none"> - Make efforts to include large private sector EmONC facilities in the improvement plan, in order to obtain a complete picture of needs and services in the country e.g. for Cesarean sections. - Keep the 3-month benchmark for designating functional EmONC facilities. Consider alternative benchmarking such as “BEmONC minus one, two or three SFs” for identifying progress to be made - Recalculate indicators based on the population increase and designation of new provinces - Consider putting at least one BEmONC facility in Kep
Service delivery	<ul style="list-style-type: none"> - Integrate other vital Reproductive and MNH services in the activities of midwives for improved outcome
Availability and quality of basic infrastructure	<ul style="list-style-type: none"> - Review standards of infrastructure: increase number of beds, improve water hygiene and sanitation (esp. in labour room, prepare back up power generator, procure newborn cribs, - Ensure access to a laboratory for all EmONC facilities, including contracting private laboratories if necessary
Essential drugs supplies and equipment	<ul style="list-style-type: none"> - Review lists of standard equipment, supplies and essential drugs for EmONC (including refrigerator, charts for expiry dates and replenishment, emergency stocks)
Cost of services	<ul style="list-style-type: none"> - Abolition of user fees upfront at admission in point of care for all EmONC services, including surgery and transport - Standardization of user fees for other than EmONC services - Ensure that remaining out-of-pocket expenditures are covered for the poor
Emergency communication and referral transport	<ul style="list-style-type: none"> - Emergency referred patients always accompanied by a qualified health professional with communication equipment - Develop protocols for sending, referring and receiving patients - Reinforce supervision, monitoring and misuse of ambulances
Human resources	<ul style="list-style-type: none"> - Ensure availability of adequate and trained staff at RF and HC - Verify that all EmONC staff have received adequate in-service training to perform their tasks properly, giving priority to understaffed facilities - Improve training by supervision and mentoring - Ensure that newborn care functions are given enough place in pre- and in-service training programs
Knowledge, training and experience	<ul style="list-style-type: none"> - Sharpen knowledge and skills of all EmONC related staff - Undertaking observation of clinical skills - Review core pre-service training programs to integrate evidence-based EmONC - Extend evidence-based EmONC refresher in-service training programs for all cadres at EmONC facilities, with a focus on midwives, and with inclusion of least practiced EmONC functions

3. EmONC Improvement Plan 2016-2020: Goal, objectives, targets and guiding principles

The EmONC Improvement Plan 2016-2020 responds to the recommendations above, as well as to findings of field visits, an in-depth examination of challenges, consultations with national, provincial and facility stakeholders and inputs from development partners. The goal, objectives, targets and guiding principles of the EmONC Improvement Plan 2016-2020 are outlined below. The expected outputs and related key interventions are detailed in the next section.

Goal

The overall goal of the EmONC Improvement Plan 2016-2020 is to reduce maternal and newborn deaths and contribute to the Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality (FTIRM) 2016-2020. EmONC is a key component of both the FTIRM and the Sustainable Development Goals for 2030 for Cambodia.

Objectives and targets

The main objectives of the EmONC Improvement Plan are to improve the coverage, availability, accessibility, utilization and quality of EmONC services, and strengthen the capacity of administrative structures to support EmONC services in Cambodia. The key objectives and targets for 2020 are summarized below:

- Improve EmONC **coverage** and **availability** so that there are at least 5 EmONC (CEmONC and BEmONC) facilities per 500,000 population, including at least 1 CEmONC and at least 4 BEmONC facilities per 500,000 population (UN Process Indicator #1). This translates into a target of at least 160 EmONC facilities, including at least 35 CEmONC (> 1 per 500,000 population) and at least 125 BEmONC facilities (> 4 per 500,000 population) by 2020.
To ensure that this target is reached, a total of 180 facilities have been identified for upgrading or maintenance, with the priority on expanding coverage of Basic Emergency Obstetric and Newborn Care (BEmONC, 145 facilities), while maintaining progress in the availability of Comprehensive Emergency Obstetric and Newborn Care (CEmONC, 35 facilities),
- Ensure greater accessibility to EmONC through improved geographic distribution of EmONC facilities throughout the country and a more functional referral system,
- Ensure effective **utilization** of EmONC services in order to meet at least 90% of need, through improved communications, effective referrals, delivery of quality services (the 3 delays), continued reductions in financial barriers, and community participation,
- Improve the **quality** of care by strengthening the competencies of staff in designated EmONC facilities to perform key signal functions. Cambodia should reach or exceed UN standards for EmONC process indicators on proportion of births in EmONC facilities, met need, cesarean delivery, and direct obstetric case fatality rate (UN Process Indicators 3-6). Specifically, Cesarean deliveries should be at 10 percent (10%) of expected births nationally by 2020, with no province below 3.5% and Phnom Penh not above 17%),
- Strengthen the **capacity** of PHDs and lower level administrative structures to plan, manage, monitor, and support EmONC services and ensure high quality of care,
- Reduce remaining **financial barriers** to EmONC services. Ensure that all women in reproductive age have access to full package of key reproductive maternal and newborn health services without financial hardship, when needed.

Guiding Principles

Evidence based: All components should be based on proven interventions that have worked in other countries and are the subject of international consensus.

Health system integration: The Improvement Plan should be fully consistent with and integrated into the National Reproductive Health Strategy, the Fast Track Initiative Road Map for Reducing Maternal and Newborn Mortality 2016-2020 and other key MOH strategies and guidelines.

Build on existing programs: The EmONC Improvement Plan builds on the achievements, challenges and lessons learned from the earlier EmONC Improvement Plan (2010-2015) and the Review conducted in 2014-2015. It also builds on and is integrated into existing national and provincial entities such as Human Resources, Central Medical Store, Laboratory, Blood Bank, etc.

Partnership: The EmONC Improvement Plan includes strong support from longstanding development partners of the Ministry of Health, but also seeks to engage new partners, from international donor agencies, non-governmental organizations, the private sector and civil society.

Clear definition of roles and responsibilities: National and provincial level five year (2026-2020) and annual plans should clarify roles and responsibilities of staff, supervisors, managers and leaders. Responsibility and accountability for successes (and challenges) should be clear.

Transparency and accountability: Following on the previous principle, all staff should act in full transparency, noting down and recording all decisions and interventions, so that they can be accountable for the consequences of decisions and interventions. EmONC is truly a question of life and death.

Equity: At all steps of the chain of case management, attention should be paid to equity in treatment and access, without discrimination or stigmatization of the poor or most vulnerable.

Ongoing monitoring and periodic evaluation: Managers and department heads should put ongoing monitoring procedures in place and follow up on them, so that they can keep an eye on activities, progress and challenges under their responsibility. Periodic evaluation, ideally annually, is also important and should be integrated into the plan at each level, so that it does not require a new search for resources each time.

4. EmONC Improvement Plan 2016-2020: Outputs and key interventions

Outputs that can be expected from full implementation of this EmONC Improvement Plan 2016-2020 are included below. The key interventions related to each of these outputs are also included in this section of the Improvement Plan. Annex 1 includes a logical framework with a proposed monitoring and evaluation framework arranged under each of these seven proposed outputs.

Key interventions of the EmONC Improvement Plan 2016-2020 include: upgrading facilities and staffing, GIS mapping of EmONC facilities to ensure geographic coverage, reducing gaps in basic drugs and equipment, increasing staff competencies through training and on-site coaching, enabling availability of 24/7 EmONC services, improving management coordination, monitoring and evaluation by the National Program and Provincial Health Departments, and improving the recording and reporting of obstetric and newborn

complications and deaths at health facilities. These key interventions will be implemented at both national and provincial levels, according to phased annual plans. The key interventions will be implemented synergistically at national and provincial levels, and regularly monitored through national meetings and provincial visits to assess progress and determine next steps and longer term plans, as needed.

The three-delay model (delay in making a decision to seek care, delay in access to services, and delay in providing appropriate services) was also used to inform the choice of outputs and key interventions below. The emphasis in the EmONC Improvement Plan 2016-2020 is on the third delay once the patient has arrived at a facility. Additional emphasis on the newborn is also included in this plan moving forward, as this aspect has been relatively neglected to date.

Output 1 – Policies and strategies in place for a supportive and enabling environment

Output 1 and corresponding interventions aim at creating an enabling environment to facilitate the delivery of EmONC services. A strong enabling environment includes support and action from the national government, national Ministry of Health, and decentralized levels, including facilities themselves. Potential interventions are included in Table 5.

Level	Proposed Interventions
National level –Royal Government of Cambodia	High level commitment and show of interest e.g. National Days, media coverage
	Review of legislation supportive of incentives for retention of professional staff in remote posts
National Level - Ministry of Health	High level commitment and show of interest with International visibility
	Resource mobilization – Budget - Donors
	Financial safety nets extended and improved to track and cover the “uncovered”
	Partnerships with other ministries and administrations, with international agencies, NGOs and private sector
	EmONC Coordination and Steering Committee in place and meeting once a year to review achievements and constraints
	Strategic guidance and regulation for new procedures, new drugs and new equipment
	Production/revision of Standards and Protocols for case management – MPA, CPA, Safe Motherhood Protocol for RHs and HCs, etc (as needed)
	Production/revision of standards for staffing and training different levels of health facilities
	Overall monitoring and evaluation at national level, annual review
	Central medical stores – procurement and distribution of equipment, drugs and supplies with warning systems for stock outs
	Pharmacy and laboratories – Standards and control
	National Blood Bank: expansion of network of provincial structures and blood depots in each designated CEmONC facility

Provincial Level - PHD	Provincial leadership for EmONC at MCH department – provincial steering committee. Annual planning and reporting
	Certification of EmONC facilities, and decisions for upgrading according to criteria of population covered, resources, staffing, communication for referral
	Relations with local administrations and provincial civil society
	Resource mobilization and management of resources at provincial level
	Posting of staff, rotating, and monitoring vacant posts
	Regular monitoring of EmONC services: annual report with indicators
	Organization of the communication and referral system
	Partnership with private sector and NGOs
	Protection of staff if and when necessary

Table 5: Suggested enabling actions at various levels for optimal delivery of EmONC services

Output 2 – Adequate coverage of EmONC facilities (availability and accessibility, Including financial accessibility), assured throughout the country

Facilities and infrastructure – EmONC facilities

The application of UN Standard #1 for the density of functional EmONC facilities leads to a recommendation of a total of at least 160 EmONC facilities (at least 35 CEmONC and at least 125 BEmONC) by 2020. The total number of functional EmONC facilities in Cambodia in late 2014/early 2015 was 63 (35 CEmONC and 28 BEmONC). While Cambodia had already achieved the UN Standard for availability and functioning of CEmONC facilities (at least 1 per 500,000 population), there remained a large gap (of 97) functional BEmONC facilities. Table 6 shows the status of EmONC, BEmONC and CEmONC coverage in 2009, at the time of the EmONC Review in late 2014/early 2015 and targets for 2020. To ensure that the target of 160 EmONC facilities is met by 2020, 180 facilities will be upgraded to EmONC status.

Table 6: EmONC coverage and targets for EmONC Improvement Plan 2016-2020

	2009	By late 2014/early 2015	2020
# EmONC facilities per 500,000 population	1.64	4.84 (upgraded) 2.35 (functional)	At least 5 (>160)
# of BEmONC facilities per 500,000 population	0.71	3.62 (upgraded) 1.04 (functional)	At least 4 (> 125)
# of CEmONC facilities per 500,000 populat	0.93	1.22 (upgraded) 1.31 (functional)	At least 1 (>35)

Designated CEmONC and BEmONC facilities will be upgraded or maintained at their previous level, so that by the end of 2020, between 160 and 180 facilities will be able to provide the 9 or 7 signal function for CEmONC and BEmONC respectively. A phased plan will focus for the first 3 years (2016-2018) on maintenance of EmONC status in 63 existing EmONC facilities (35 CEmONC and 28 BEmONC) and upgrade another 78 BEmONC facilities to BEmONC status. In the final two years (2019-2020), progress will be maintained and another 39 BEmONC facilities will be upgraded to BEmONC status. Among these facilities, three provincial hospitals and one national hospital will be maintained as EmONC clinical training sites. Provinces that have achieved their targets early will be eligible to make plans to upgrade additional facilities to BEmONC or CEmONC before the end of 2020. An additional 29 facilities were identified by provinces in December 2015 as priority facilities to consider for further upgrading before the end of 2020.

The identification of specific facilities to be maintained or upgraded to CEmONC or BEmONC status is the responsibility of PHDs, following nationally defined criteria. GIS mapping of EmONC facilities will be used to ensure geographic coverage. Facility by facility plans should be revisited and adjusted annually, taking into account any contextual changes. Some flexibility in applying the strict criteria (3-month performance of all signal functions) may be allowed by the national MOH, based on local conditions (geography and communications). However, flexibility can only be applied for Basic EmONC facilities and not for Comprehensive EmONC facilities. CEmONC facilities must always meet the 9 signal functions in the last 3 months benchmarks.

Annex 5 includes minimal requirements for EmONC facilities in terms of hours of operation, infrastructure, services, personnel, infection control, referral, and record keeping.

Equipment, Drugs and Supplies

A key intervention under this output is ensuring that gaps in basic drugs and equipment are filled on an ongoing basis. Essential equipment, drugs and supplies necessary for effective delivery of EmONC services in Cambodia will be determined at the early implementation stage of the Improvement Plan. Suggested lists of equipment, drugs and supplies to consider are included in Annex 3. Appropriate medical equipment and supplies based on agreed upon five year (2016-2020) and annual provincial action plans will be provided and installed. A regular supply of life-saving drugs for mothers and newborns will be ensured. PHDs and hospital management should ensure that all equipment provided is installed, used and well maintained and that supplies are managed effectively.

Financial Access to EmONC services

Fees for service is now routine in Cambodia. The RGoC requires all public facilities to post all fees, clearly detailed, at every health facility. In addition, there are now social health protection schemes throughout the country that provide free access and free services for the poor. Coverage of Health Equity Funds (HEFs), the RGoC's most extensive social health protection scheme that covers service fees, transport for hospitalizations and for deliveries at all facilities, and other costs for the poor, has expanded greatly in the past 5 years. By late 2014, HEFs were available in all but 2 (98.6%) of functional EmONC facilities and 91.3% of the remaining designated EmONC facilities surveyed as part of the most recent EmONC Review (April 2015). By mid 2015, HEFs were available in 82% of all health facilities, including hospitals and health centers, throughout the country. The EmONC Improvement Plan recommends that the GoC ensure that all women in reproductive age have access to full package of key reproductive maternal and newborn health services without financial hardship, when needed.

¹³Ministry of Health and MBS Research, Review of the Cambodian Emergency Obstetric and Newborn Care Improvement Plan 2010-2015, April 2015.

Output 3 - Technical and managerial capacity strengthened to ensure high quality of care

The overall strategy of the Cambodian MoH that all births should be attended by a skilled birth attendant remains a priority of the EmONC Improvement Plan 2016-2020. A skilled birth attendant in the Cambodian context means the more modern concept of a **competent and qualified midwife**, which entails a fully trained professional with a state-recognized diploma and appropriate in-service training. Competency is the sum of knowledge, skills and attitudes, and not merely the capacity to deliver services and care. The EmONC Improvement Plan 2016-2020 specifies a team of competent midwives (and at some levels, physicians and other midwifery staff), so that they can help each other and cover services 24/7. Investing in midwives is a “best bet” in modern EmONC strategic planning.

Team building and teamwork are crucial components of EmONC service delivery. Regular staff meetings are recommended for team building and constructive review of complicated cases. Staffing standards will be revised to ensure availability of staff 24/7 for full delivery of quality services. For example, a suggested minimal staffing level for BEmONC facilities that perform fewer than 400 deliveries per year might be for up to six secondary midwives on staff, working in shifts, so that at least two competent midwives are working at any one time. BEmONC facilities that perform more than 400 deliveries per year would need more midwives, at least 6 secondary midwives. CEmONC facilities would need additional staff as they tend to have more than 600 deliveries per year and many referred complications. A minimum for CEmONC facilities might include at least 10 secondary midwives working in shifts, in multiple teams (with an extra team brought in during peak times or if higher workload), one surgical team per shift (according to CPA guidelines). CEmONC facilities at sub national and national level with even higher numbers of deliveries per year would need to additional staffing adjusted to their workload. A general recommendation would be to add another midwifery team for every additional 300 deliveries per year and add surgical teams as needed. Lab, infection control, pharmacy, cleaners, security and coaching staff should also be included in staffing plans.

In-service training and on-site coaching will be used to increase competencies of staff in designated EmONC facilities to perform the core signal functions and Improve quality of care provided at EmONC facilities. Medical staff, mainly midwives, surgeons and anaesthetists, should be trained to enable 24 hour/7 day availability of quality EmONC services, including Caesarean section, other emergency surgical procedures, and safe blood transfusion in CEmONC facilities.

In-service training needs for EmONC should be regularly reviewed by managers at each facility so that staff can be appropriately identified for training sessions. Each large facility (provincial hospitals and CEmONC facilities) should have mannequins and models for the practical training of students and on duty staff, in parallel to the daily service. Coaching and on site approaches should be used to ensure that the benefits of training are used in practice, using existing PHD, OD, and senior RH staff, as well as national program staff and retired senior professionals with high levels of competency. On-site approaches and skills practice are especially important for students (medical and midwifery students) as well as for mid-level professionals who just finished a specialized training session and need coaching and for less practiced signal functions such as manual vacuum extraction, manual removal of placenta, management of pre-eclampsia, and newborn resuscitation.

Sound monitoring and evaluation rest on improved and reliable data recording. In particular recording of maternal and newborn deaths (including stillbirths) and recording of obstetric and newborn complications and their outcome need to be improved at all health facilities. Facility managers should be encouraged and coached by provincial and national managers to improve recording and reporting of obstetric and newborn complications. The participation of all concerned EmONC staff at Maternal Death Audits and Audits of Near-Missed cases is strongly encouraged and should be formalized, in view of the powerful training benefits of these procedures.

EmONC should become an essential part of pre-service education for midwifery and medicine, so that freshly certified midwives and physicians have been exposed to the concept before starting their duties. EmONC orientation, training and on-site support should also be encouraged for staff other than midwives and obstetricians who participate in service delivery, such as nurses, operating theatre staff, lab technicians, managers, and ambulance personnel.

Output 4 - Increased utilization of EmONC services to reduce unmet needs

All EmONC signal functions are life saving. Table 7 summarizes the seven Basic and the additional two Comprehensive EmONC signal functions. EmONC guidelines specify that in order to qualify for Basic or Comprehensive EmONC status, all the corresponding signal functions must have been performed during 3 months prior to the survey. Some countries have facilitated access to BEmONC status by indicating BEmONC minus 1 signal function or BEmONC minus 2 signal functions if a facility has full technical potential and has properly demonstrated skills necessary to perform missing signal functions, but a lack of patients to have encountered enough cases in the last 3 months to have employed that signal functions. The lifting of the strict rule cannot apply to CEmONC facilities – these facilities must have performed ALL 9 signal functions in the last 3 months. One comprehensive signal function that may be added in facilities where there is a newborn intensive care unit is “advanced newborn resuscitation.”

Table 7: EmONC Signal Functions

Signal Functions to qualify as BEmONC	Signal Functions to qualify as CEmONC
Antibiotics IM and IV	ALL 7 BEmONC signal functions (left column), plus the following 2 additional signal functions:
Oxytocics IM and IV	Cesarean section
Anticonvulsants IM and IV (MgSO ₄)	Blood Transfusion
Manual removal of Placenta	
Manual Vacuum Aspiration, for Post Abortion Care	
Assisted vaginal delivery by Vacuum extraction (ventouse)	
Basic Newborn Resuscitation with Ambu bag and mask	

If there are not enough patients presenting with each obstetric complication during the reference period of 3 months, supervisors should organize small refresher sessions to remind staff of the necessary protocols and practice with instruments. All signal functions must be available without delay 24 hours per day and 7 days per week (24/7). The calendar of duties for the staff should be available to all staff and frequently supervised. Measures to replace invalid or sick staff are essential.

The MoH has issued and distributed protocols and standards to manage all possible cases: these protocols are taught in clinical training sessions, but they must be available in all units at all times for consultation. A number of additional midwifery procedures are essential complements to the EmONC signal functions and should be performed according to standards in all EmONC facilities – these include partograph, repair of tears, foetal monitoring during labor, dexamethasone for prematurity, antibiotics for premature rupture of membranes, Kangaroo Mother Care, Newborn Corners, PMTCT, etc.

Surgery

Expansion of EmONC and particularly CEmONC facilities will lead to an increase in the proportion of births needing Cesarean section. To meet this need will require:

1. An increase in the number of trained surgeons, trained anesthetists, and trained instrumentalists.
2. Improvement or clarification of the appropriate indications for Cesarean section
3. Improvement in the capacity and authority of midwives to decide when to refer and to actually refer
4. Improvement in communications and referral systems
5. Increased attention to quality of procedures, infection control, and prevention and care of adverse events

The increase in the number of Cesarean sections must not induce an increase of the number of complications of Cesarean section. The more interventions done, the greater the risk, and the higher the need for supervision, quality control, and prevention of adverse consequences (sepsis, rupture of arteries, hemorrhage, rupture of scars, etc.)

Another area for consideration is the possibility for surgeons (properly trained) to perform other emergency surgical acts such as hysterectomy for severe PPH, exploration of hemoperitone, uterine rupture, rupture of ovarian cysts, repair of large perineal tears, and ectopic pregnancy.

¹⁴ Ministry of Health. Royal Government of Cambodia, Five Year Action Plan for Newborn Care in Cambodia 2016-2020, December 2015.

Blood transfusion

As a principle and when indicated, blood should be transfused within one hour of a request at CEmONC facilities and 2 hours of a request at BEmONC facility. The National Blood Bank is responsible for policies and procedures for collecting blood, testing, grouping, cross matching and transfusing. Blood should be available at provincial hospitals (provincial blood banks) and in all CEmONC facilities in Blood Depots, e.g fridges that can safely keep a small provision of bags of each blood group for immediate use. Monitoring and replenishment of Blood Depots and inter-facility mobility of supplies also need to be ensured.

Where is the “N” in EmONC?

Newborn care is often a neglected element of EmONC. The EmONC signal function of newborn resuscitation is an essential part of EmONC as well as a key part of essential life saving interventions called Immediate Newborn Care (INC) and more recently, Early Essential Newborn Care (EENC). EENC is a package of interventions delivered to the mother and the newborn between delivery and the first 3 days after birth (see Table 8). These interventions are also part of the Five Year Action Plan for Newborn Care in Cambodia 2016-2020. Newborn death audits as well as reviews of “near misses” should be routinely conducted, following the strategy used for maternal death audits.

Table 8: Early Essential Newborn Care (EENC)

Intrapartum and Immediate Newborn Care (INC)	Care for all mothers and newborns
	<u>The First Embrace.</u> Interventions include immediate and thorough drying; immediate skin-to-skin contact; appropriately timed cord clamping; non-separation of mother and newborn; and early & exclusive breastfeeding.
	Care for high risk mothers and newborns
	<u>Management of newborn infants who are not breathing despite thorough drying.</u> Interventions include management of asphyxia using bag and mask ventilation. Carefully check the rhythm and intensity of blowing via observation of the thorax and abdomen. Check for air leakage around face.
Expanded INC	<u>Prevention and management of prematurity</u> – for preterm and low birth weight babies (7-8% of all newborns in Cambodia). Interventions include preventing unnecessary inductions and caesarian sections; antibiotics for premature pre-labor rupture of membranes; antenatal steroids; tocolytics when indicated; and the Kangaroo Mother Care approach.
	<u>Care for Sick Newborns</u> – for babies with birth asphyxia, neonatal sepsis and complications of delivery (10-15% of all newborns in Cambodia). Interventions include management of asphyxia using bag and mask ventilation; identification of babies at high risk, management of sepsis through antibiotics, and management of other common problems i.e check for malformations, neurological examination.

Output 5 - Referral systems in place and operational throughout the country

Effective referrals are facilitated by three major factors: good communications, good roads and available and appropriate means of transportation. In the last 5-10 years, mobile phone networks has improved considerably, now covering almost all villages and nearly all Health Centres. The Cambodian road network has been significantly improved; major roads are now paved and can be used during all seasons. Ambulances are far more available than in the past, with a combination of public and private vehicles, as well as local smaller vehicles in villages and small towns (three-wheelers). The minimum travel time of 2 hours from any point in the country to a health facility has been assured in the great majority of villages. Efforts should be made to expand this to all parts of the county.

The referral system, however, needs improvement. Important gaps remain in identification of complications necessitating referral, respect of referral procedures, competency of accompanying personnel, availability of emergency kits in ambulances, patient comfort, first aid or stabilization training of ambulance staff, and reception and rapid access to appropriate care at the end point. The 2014 MDA figures suggest that 22% of maternal deaths took place “on the way to a facility”, without specifying whether the death took place on the way between the home and the first level of care (facility), between the first and second point of care (a referral from a health center or district hospital to a higher level facility), or between the first and second referral facility (in cases where the first receiving facility was unable to adequately care for the patient). This lends further evidence to support the need for comprehensive referral systems improvements.

Output 6 – Provincial EmONC plans developed, operational and monitored

Provincial Health Departments have an important role to play in planning, developing partnerships, mobilizing resources, managing, monitoring, supporting and evaluating the EmONC Improvement Plan. Annual activity plans with corresponding budgets and annual reports are essential tools of a good manager. Monitoring should be ongoing, evaluation periodic. Both activities should be integrated into annual plans and budgeted. The key interventions of the EmONC Improvement Plan should be implemented at both national and provincial levels, according to five year and phased annual plans.

Annex 6 includes a list of existing and proposed EmONC facilities for expansion for each province, developed through a consultative process with PHDs in October –December 2015. Priority needs by province for specific signal functions requiring special attention and improvement are also included in Annex 6.

Output 7 - Community participation strengthened to increase utilization

Communities are likely to be strongly interested in the performance of EmONC facilities. Local entities (such as Health Centre Management Committees) should be encouraged to participate in meeting the planning, construction, rehabilitation, equipment and referral needs of EmONC facilities. They may also be encouraged to participate in quality assessment and monitoring.

5. Execution, Calendar, and Implementation Responsibilities

The EmONC improvement Plan covers a five year period from 2016-2020. Not everything can be implemented at once or in the first year, thus a phased plan has been proposed. The national program and PHDs should re-adjust current plans on an annual basis so that they are informed by progress and challenges, and are responsive to contextual changes that occur over the course of implementation. An assessment should be undertaken at the end of the early implementation phase 2016-2018, before adjusting targets related to the second phase 2019-2020.

The NMCHC and its Director, also acting as EmONC Coordinator, remain the focal point for implementation, monitoring and evaluation of the EmONC Improvement Plan. They will receive continuous support and technical assistance from international donor agencies. An EmONC Steering Committee comprised of members of the MCH Sub-Technical Working Group, will assist in monitoring and responding to challenges that occur during implementation of the EmONC Improvement Plan.

6. Monitoring and Evaluation

Monitoring is an on-going, permanent, activity, while evaluation is a periodic and intermittent. Both must be integrated in the annual plans, and funds must be set apart for these activities. An annual assessment of EmONC facilities should be undertaken in order to determine whether they meet BEmONC or CEmONC functional criteria. This assessment could be carried out by PHDs or as part of an accreditation process for example by integrating it into the Level 2 Quality Assessment. The 3-month benchmark must be kept with explanations of failures or insufficient information (for example BEmONC minus one signal function), so that gaps and needs for improvement, or additional training, or additional equipment are clearly identified.

A proposed monitoring & evaluation framework for the EmONC Improvement Plan 2016-2020 is included in Annex 1. The UN EmONC Process Indicators and their mode of construction are included as Annex 4 (Source: Handbook for EmONC, 2009, WHO, UNFPA, UNICEF, AMDD).

Annex 1 - Monitoring & Evaluation framework

Hierarchy of aims	Objectively Verifiable Indicators	Means of verification	Target 2020	Key interventions	Responsible
Goal					
Reduce maternal and neonatal deaths and contribute to the Fast Track Initiative Road Map for Reducing Maternal and newborn Mortality (FTIRM) 2016-2020	Maternal Mortality Ratio	CDHS	130	All below	All below
	Neonatal Mortality Rate	CDHS	14	All below	All below

Output 1					
<i>Policies and strategies in place for a supportive and enabling environment</i>	EmONC Improvement Plan 2016 - 2020 finalized and disseminated	Document signed by MoH	Complete	<ul style="list-style-type: none"> - Advocacy for increased financial allocation to EmONC activities - Dissemination of EmONC Improvement Plan to all stakeholders 	MoH, NMCHC, PHDs
	Coordination mechanisms operational	Minutes of meetings	Complete	<ul style="list-style-type: none"> - Regular meetings of MCH Sub- TWG - Annual EmONC meeting 	NMCH-CPHDs
	Provincial leadership for EmONC IP	Minutes of meetings	90%	<ul style="list-style-type: none"> - Annual workplans, annual reports, supervisory visits, supportive activities - Pro- TWGH 	PHDs
	% of EmONC facilities with guidance on EmONC standards and procedures	Provincial reports	90%	<ul style="list-style-type: none"> - Standards & protocols for staffing, equipment & case management distributed to all EmONC facilities - Standards, guidelines & protocols updated as needed 	NMCHC, PHDs
	Stockouts of essential medicine and supplies	MOH reports and databases	<5%	<ul style="list-style-type: none"> - Ensure regular supply of basic equipment, supplies & drugs - Logistic systems that include essential EmONC medicines & supplies in place and functional 	Central & Provincial Medical Stores
	Blood availability 24/7 in CE-mONC facilities	Records of blood transfusion	90%	Expand operational blood depots/banks in all CE-mONC facilities	National & Provincial

Hierarchy of aims	Objectively Verifiable Indicators	Means of verification	Target 2020	Key interventions	Responsible
Output 2					
Adequate coverage of EmONC facilities (availability and accessibility, including financial accessibility) assured throughout the country	# EmONC facilities per 500,000 population (UN EmONC PI N° 1)	Provincial records	At least 5 (>160)	- Upgrade facilities & provide equipment according to phased EmONC IP 2016-2020 - Review status & revise plans for second phase (2019-2020) as needed at end of first phase	MOH, NMCHC, PHDs
	# of BEmONC facilities per 500,000 population (UN EmONC PI N° 1, sub-indicator)	Provincial records	At least 4 (> 125)	- Same as above - GIS mapping of EmONC facilities	MOH, NMCHC, PHDs
	# of CEmONC facilities per 500,000 population (UN EmONC PI N° 1, sub-indicator)	Provincial records	At least 1 (>35)	- Same as above - GIS mapping of EmONC facilities	MOH, NMCHC, PHDs
	The full package of reproductive, maternal & newborn health services are included in benefit packages of Health Equity Funds and national health insurance	MoH reports, Special surveys	TBD	- HEF expansion, other mechanisms as needed to cover hard to reach or marginalized populations	MOH, PHDs
Output 3					
Technical and managerial capacity strengthened to ensure high quality of care	% of health centers with at least 2 secondary midwives	PHD records	50%	- Pre-service training - Ensure needed staffing at all health centers - PHDs to review & propose adjustments	MOH, PHDs

	% of BEmONC facilities with at least 6 SMWs	PHD records	50% of BEmONC facilities with >400 deliveries per year	<ul style="list-style-type: none"> - Ensure needed staffing at BEmONC facilities - Pre-service training - PHDs to review & propose adjustments (baseline 2014 – 27% of BEmONC and 50% of EmONC facilities with > 400 deliveries per year) 	MOH, PHDs
	% BEmONC facilities with all SMWs trained on EmONC	PHD records	80%	<ul style="list-style-type: none"> - Improve quality of care/competencies to perform core signal functions through training & on-site skills coaching - Annual plans for in-service training - Pre-service training 	MOH, PHDs
	% of maternal [and newborn] deaths reviewed through audits	PHD records	80%	<ul style="list-style-type: none"> - Improve recording & reporting of obstetric & newborn deaths (including stillbirths), complications & their outcomes - Audit maternal & newborn deaths & near misses on a routine basis 	MOH, PHDs, Facility managers
	Direct Obstetric Case Fatality Rate (DOCFR) (UN EmONC PI N° 6)	Facility records, PHD records	< 1%	<ul style="list-style-type: none"> - Improve identification & recording of DOCFR at EmONC facilities - Improve referral system 	Facility managers, Ob Ward

Output 4					
Increased utilization of EmONC services to reduce unmet needs	% of births in EmONC facilities (UN EmONC PI N° 3) (UN EmONC PI N° 3)	CDHS, Facility records	60%	<ul style="list-style-type: none"> - Improve identification of obstetric & newborn complications - Improve referral system - Ensure 24/7 availability of quality EmONC services at facilities 	PHDs, Facility managers
	% of deliveries by Cesarean section (UN EmONC PI N°5)	CDHS, Facility records	10%	<ul style="list-style-type: none"> - Improve identification of obstetric & newborn complications - Improve quality of care/competencies to perform core signal functions through training & on-site skills coaching - Improve referral system 	PHDs, Facility managers
	% of targeted facilities implementing Expanded INC	PHD records, Facility records	90%	- Improve quality of newborn care through training and on-site skills coaching	NMCHC, PHDs, Facility managers
	% of newborns receiving early PNC (within 2 days of delivery)	PHD, Facility records	95%	- Improve quality of newborn care through training & on-site skills coaching	NMCHC, PHDs, Facility managers
	Met need for Direct Obstetric Complications (UN EmONC PI N° 4)	PHDs records Facility records, EmONC Survey	90%	<ul style="list-style-type: none"> - Improve identification of obstetric & newborn complications - Improve quality of care/competencies to perform core signal functions through training & on-site skills coaching - Improve referral system 	PHDs, Facility managers

Output 5					
Referral systems in place and operational throughout the country	% of EmONC facilities with ambulance ready 24/7 with trained personnel	PHD records Facility records	80%	- Ensure availability and maintenance of ambulances and availability of trained personnel to accompany patients around the clock - Improve referral system	PHDs, Facility managers
Output 6					
Provincial EmONC plans developed, operational and monitored	% of PHDs with annual EmONC Improvement Plan and annual report	PHD records and reports	90%	-Training and technical assistance to PHDs & ODs to improve EmONC management, coordination, monitoring, analysis of challenges, evaluation & reporting - Support facilities to improve recording & reporting of obstetric & newborn complications & deaths	PHDs, MOH, Development Partners
Output 7					
Community participation strengthened to increase utilization	% EmONC facilities having annual meeting with community representatives	PHD records and reports	50%	-Encourage communes, HCMC & Commune Councils to meet & participate in meeting needs of EmONC	PHDs

Annex 2 – Major obstetric and newborn complications and signal functions for their management

Major complications	Associated EmONC Signal Functions
Haemorrhage	<p>If Antepartum: Cesarean section for placenta praevia Blood transfusion</p> <p>If Postpartum: Uterotonics</p> <p>Products Manual removal of placenta Removal of retained</p> <p>Blood transfusion Emergency surgery (Hysterectomy)</p>
Prolonged or obstructed labor	<p>Assisted vaginal delivery Cesarean section Uterotonics Newborn resuscitation</p>
Postpartum sepsis	<p>Parenteral antibiotics Removal of retained products Surgery for pelvic collection drainage</p>
Complication of abortion	<p>Removal of retained products Blood transfusion if hemorrhage Parenteral Antibiotics</p>
Pre-eclampsia and Eclampsia	<p>Parenteral anticonvulsants (MgSO₄) Cesarean section Newborn resuscitation</p>
Ectopic pregnancy	<p>Emergency surgery (laparotomy) Blood transfusion Parenteral antibiotics</p>
Ruptured uterus	<p>Emergency surgery (laparotomy) Blood transfusion Parenteral antibiotics</p>
Newborn distress at birth	<p>Newborn resuscitation (basic and advanced) Cesarean section Parenteral antibiotics on newborn</p>
Intrapartum stillbirth	<p>Induction of labor (if not spontaneous)</p>

Annex 3 – Recommended infrastructure, equipment, supplies & drugs for EmONC

Physical Infrastructure	Miscellaneous
<ul style="list-style-type: none"> Electricity and back up generator Water supply Staff quarters Telephone/radio call/mobile phone Ambulance 	<ul style="list-style-type: none"> Wall clock Torch and extra batteries Refrigerator Log books Records Registers
Warm and Clean Room	Waste
<ul style="list-style-type: none"> Delivery bed(s) Clean bed linen Curtains if more than one bed Clean surface (for alternative delivery position) Work surface for resuscitation of newborn near delivery bed(s) or newborn corner Light source Heat source Room thermometer) 	<ul style="list-style-type: none"> Puncture resistant container for sharps disposal Receptacle for soiled linen Bucket for soiled pads and swabs Bowl and plastic bag for placenta
Hand Washing	Sterilization
<ul style="list-style-type: none"> Clean water supply Soap Nail brush or stick Clean towels 	<ul style="list-style-type: none"> Instrument sterilizer Jar for forceps
Equipment	Test Kits
<ul style="list-style-type: none"> Blood pressure machine and stethoscope Fetal stethoscope Fetal doppler Thermometer Baby scale Self inflating bag and masks (adult) Self inflating bag and masks (newborn sizes 0 and 1) Mucous extractor with suction tubes Vacuum extractor MVA syringe and cannulae 	<ul style="list-style-type: none"> Syphilis (rapid test) HIV (rapid test) Haemoglobin Oxymeter
	Delivery Instruments (Sterile)
	<ul style="list-style-type: none"> Scissors Needle holder Artery forceps or clamp Dissecting forceps Sponge forceps Vaginal speculum
Supplies	
<ul style="list-style-type: none"> Gloves: <ul style="list-style-type: none"> - Utility - Sterile or high-level disinfected - Long sterile for manual removal of placenta 	<ul style="list-style-type: none"> Antiseptic solution (iodophors or chlorhexidine) Spirit (70% alcohol)

<ul style="list-style-type: none"> • Long plastic apron • Waterproof foot ware • Plastic eye shield • Urinary catheters • Syringes and needles • IV tubing • IV solutions (Ringers lactate, normal saline) • Suture material for repair of tears or episiotomy 	<ul style="list-style-type: none"> • Swabs • Bleach (chlorine-based compound) • Clean plastic sheet to place under mother • Sanitary pads • Clean towels/cloths for drying and wrapping the baby • Cord ties/clamp • Impregnated bednets • Urine dipstix
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Drugs for pregnancy, childbirth, postpartum & newborn care

Drugs
<ul style="list-style-type: none"> • Amoxicillin • Ampicillin • Artemeter • Benzathine penicillin • Calcium gluconate • Ceftriaxone • Chloriquine tablets • Ciprofloxacin • Clotrimazole vaginal pessaries • Cloxicillin • Adrenaline • Diazepam • Dexamethazone • Erythromycin • Gentian violetw • Gentamycin • Hydralazine • Iron/folic acid tablets • Lamivudine (3TC) • Lignocaine • Magnesium sulphate • Mebendazole • Metoclopramide • Metronidazole • Nevirapine (adult, infant) • Oxytocin • Paracetamol • Quinine • Sulphadoxine-pyrimethamine • Tetracycline or doxycycline • Tetracycline 1% eye ointment • Trimethoprim + sulphamethoxazole • Zidovudine (AZT) (adult, infant) • Water for injection • Vitamine K1

Vaccines
<ul style="list-style-type: none"> • Tetanus toxoid • BCG • OPV • Hepatitis B
Contraceptives
<ul style="list-style-type: none"> • Condoms • Progesterone-only oral contraceptives • Progesterone-only injectables • Implants • IUDs • Combined oral contraceptives • Combined injectables

Additional equipment & supplies for CEmONC

Basic Equipment
<ul style="list-style-type: none"> • Sphygmomanometer (aneroid) and stethoscope (binaural) • Self-inflating bag and face masks (adult size) • Self-inflating bag and face masks (newborn sizes 0 and 1) • Adult and infant laryngoscope with spare bulb and batteries • Adult and infant laryngoscope tubes • Absorbable, nonreactive sutures (e.g., polyglycolic, chromic catgut) and suture needles • Urinary catheters and closed bag or container for catheter drainage • Tourniquet • 16- to 18-gauge IV cannulas • Dextrose solution (5%) • Ringer's lactate or normal saline • IV administration sets • Adhesive tape • Oxygen tubing, nasal cannulae, and face masks • Suction tubing and catheters • Surgical scrub brushes
Obstetric Laparotomy and/or Caesarean Section
<ul style="list-style-type: none"> • Stainless steel instrument tray with cover • Towel clips (5) • Sponge forceps, 22.5 cm (6) • Straight artery forceps, 16 cm (4) • Uterine hemostasis forceps, 20 cm (8) • Hysterectomy forceps, straight, 22.5 cm (4) • Mosquito forceps, 12.5 cm (6) • Tissue forceps, 19 cm (6) • Needle holder, straight, 17.5 cm (1) • Surgical knife handle, No. 3 (1), No. 4 (1) • Surgical knife blades (4) • Triangular point suture needles, 7.3 cm, size 6 (2) • Round-bodied needles No. 12, size 6 (2) • Abdominal retractors, double-ended (Richardson) (2) • Curved operating scissors, blunt pointed (Mayo), 17 cm (1) • Straight operating scissors, blunt pointed (Mayo), 17 cm (1)

Blood Transfusion	Anaesthesia
<ul style="list-style-type: none"> • 8.5 g/l sodium chloride solution • 20% Bovine albumin • Centrifuge • 37°C waster bath (or incubator) • Pipettes Volumetric (1 ml, 2 ml, 3 ml, 5 ml, 10 ml, 20 ml) • Test tubes (small and medium size) • Sphygmomanometer cuff • Airway needle for collecting blood • Artery forceps and scissors • Pilot bottles (containing 1 ml ACD solution) • Compound microscope and slides • Microscope illuminator • Blood giving sets 	<ul style="list-style-type: none"> • Anaesthetic face masks • Oropharyngeal airways • Endotracheal tubes with cuffs (8 mm and 10 mm) • Intubating forceps (Magill) • Endotracheal tube connectors, 15mm plastic (3 for each tube size) • Spinal needles (range of sizes, 18-gauge to 25-gauge)

Annex 4 – EmONC Process Indicators

Indicator	Description	Numerator	Denominator	Acceptable Levels
1 & 2. Availability of EmONC facilities and geographic distribution (national or provincial)	Ratio of facilities providing EmONC to population and geographical distribution of EmONC facilities	No. of facilities providing Basic or Comprehensive EmONC	Population of area divided by 500,000	≥ 5 EmONC facilities per 500 000 population
		No. of facilities providing Comprehensive EmONC	Population of area divided by 500,000	≥ 1 Comprehensive EmONC facility per 500 000 population
3. Proportion of all births in EmONC facilities	Proportion of all expected births in EmONC facilities in catchment area	No. of women giving birth in EmONC facilities in specified time period (1 year)	Expected no. of births in the same catchment area in same time period	15% to 100% (if ALL births should take place in EmONC facilities)
4. Met Need for EmONC.....	Proportion of women with direct obstetric complications treated at EmONC facilities	No. of women with major direct obstetric complications treated in EmONC facilities in specified time period	Expected no. of women with major direct obstetric complications in area in same time period (expected)	100%

5. Caesarean sections as a proportion of all births	Proportion of all births by Caesarean section taking place in EmONC facilities	No. of Caesarean sections in EmONC facilities in specified time period	Expected no. of births in area in same time period	5% – 15%
6. Direct obstetric case fatality rate (DOCFR)	Proportion of women with major direct obstetric complications who die in an EmONC facility	No. of maternal deaths due to direct obstetric causes admitted in EmONC facilities in specified time period	No. of women admitted and treated for direct obstetric complications in EmONC facilities in same time period	< 1%
7. Intrapartum and very early neonatal death rate	Proportion of births that result in an intrapartum death or a very early neonatal death occurring within the first 24 hours in EmONC facilities	No. of intrapartum deaths (fresh stillbirths; > 2.5 kg) and very early neonatal deaths (\leq 24 hours; > 2.5 kg) in EmONC facilities in specified time period	No. of women giving birth in EmONC facilities in same time period	To be decided but normally < 1%
8. Proportion of maternal deaths due to indirect causes	Out of all maternal deaths in EmONC facilities, what % are due to indirect causes	No. of maternal deaths due to indirect causes in EmONC facilities in specified time period	All maternal deaths (from direct and indirect causes) in EmONC facilities in same time period	None set (depends on the local epidemiology)

Annex 5 – Minimum requirements for EmONC facilities

Minimum Re-requirement	Basic EmONC	Comprehensive EmONC
Clinical hours	SBA with EmONC skills present or on call 24 hours	Emergency team present or on call 24 hours
Infrastructure	<ul style="list-style-type: none"> • Rooms for essential services • Running water • Electricity (alternative backup) • Sewage system • Waste disposal (placenta pit) • Secure staff quarters • Latrines for patients • Shower for patients 	
Functional Department and services (including equipment and supplies)	<ul style="list-style-type: none"> • Outpatient area • Ante- and post-natal ward/area • Delivery room with visual and audio privacy • Basic laboratory and pharmacy 	<ul style="list-style-type: none"> • Outpatient area • Ante- and post-natal ward • Delivery room and operating theater with visual and audio privacy • Essential neonatal care • Laboratory, including blood screening and cross-matching • Blood bank • Pharmacy

Minimum Requirement	Basic EmONC	Comprehensive EmONC
Personnel	<ul style="list-style-type: none"> • Midwife, nurse and supporting staff Lab and pharmacy staff • Administrative staff • Security staff 	<ul style="list-style-type: none"> • OB/GYN • Anesthetists • Midwife, nurse and supporting staff • Lab and pharmacy staff • Administrative staff • Security staff
Infection control	<ul style="list-style-type: none"> • Safe water, soap • Disinfectants • Boiler/autoclave • Universal precautions to prevent the spread of HIV and other infections • Laundry facilities • Staff's attitudes 	
Referral	<ul style="list-style-type: none"> • Reliable referral system 24 hours a day, 7 days a week • If vacuum-assisted vaginal delivery is carried out, Cesarean section backup within 30 minutes is recommended, in case of failure • Communication facilities: radio call or telephone 	
Registers and records	<ul style="list-style-type: none"> • ANC register • Delivery/maternity (including information on major obstetric complications) • OT register (for comprehensive EmONC facility) • Blood bank register (for comprehensive EmONC facility) • Referral register • Monthly summary • ANC card • Individual patient record • Partograph • Others 	

Annex 6 - Existing & proposed EmONC facilities by Province

Province	Priority Signal Functions for Improvement	Existing EmONC facilities targeted in 2010-2015		Proposed EmONC facilities 2016-2020		Additional facilities to upgrade if 2020 plans in the province are achieved early	
		BEmONC	CEmONC	BEmONC	CEmONC	BEmONC	CEmONC
Banteay Meanchey	ACT, NNR, AVD, RRP, BLT	3 RHs: Srey Sophorn, Preah Net Preah, Phnom Srok (Srah Chik) 3 HCs: Malai, Svay Chek, Boeng Trakuon	3 RHs: Mongkul Borey-PH, O Chrov, Thmor Puok	3 RHs: Srey Sophorn, Preah Net Preah, Phnom Srok (Srah Chik) 3 HCs: Malai, Svay Chek, Boeng Trakuon	3 RHs: Mongkul Borey-PH, O Chrov, Thmor Puok	2 HCs: Kob, Poipet 1	None
Battambang	ABC, ACT, NNR, MRP, AVD	1 RH: Thmar Koul 11 HCs: Chrey, Ta Sanh, Sdao, Kan Toeu, Prek Norin, Bavel 1, Kaos Kralor, Preaek Chik, Ta Krey, Trang, Boeung Pring	3 RHs: Battambang-PH, Mong Russey, Sampov Luon	1 RH: Thmar Kol 11 HCs: Chrey, Ta Sanh, Sdao, Kan Toeu, Prek Norin, Bavel 1, Kaos Kralor, Preaek Chik, Ta Krey, Trang, Boeung Pring	3 RHs: Battambang-PH, Mong Russey, Sampov Luon	None	None
Kampong Cham	ACT, NNR, MRP, RRP	6 RHs: Srey Santhor, Batheay, Steung Trang, Prey Chhor, Cheung Prey, Chamkar Leu 4 HCs: Krouch, Ph'Av, Mesar Chrey, Prek Romdeng	1 RH: Kampong Cham-PH,	4 RHs: Steung Trang, Prey Chhor, Cheung Prey, Chamkar Leu 4 HCs: Krouch, Ph'Av, Mesar Chrey, Prek Romdeng	3 RHs: Kampong Cham-PH, Srey Santhor, Batheay,	None	None

¹⁵ ABC=Antibiotics; OXY= Oxytocics; ACT= Anticonvulsants; MRP=Manual removal of placenta; RRP= Removal of retained products; AVD= Assisted vaginal delivery; NNR= Neonatal resuscitation; BLT=Blood transfusion; C/S= Cesarean section. See pages 137-144 of the EmONC review (April 2015) for details on missing signal functions by facility.

Kampong Chhnang	ACT, NNR, RRP, AVD, ABC, MRP	2 RHs: Kampong Tralach, Boribo 4 HC: Kampong Hav, Cheap, Sway Chuk, Kraing Lvea	1 RH: Kampong Chhnang-PH	2 RHs: Kampong Tralach, Boribo 4 HC: Kampong Hav, Cheap, Sway Chuk, Kraing Lvea	1 RH: Kampong Chhnang-PH	1 HC: Prey Kri	None
Kampong Speu	AVD, RRP, BLT, CS, ACT, NNR	2 RHs: Kong Pisey, Traapaing Kraleung 4 HC: Choeng Ros Samaki, Veal Ang Popel, Kak Preah Khe, Baset Pomreal	2 RHs: Kampong Speu-PH, Oudong	2 RHs: Kong Pisey, Traapaing Kraleung 4 HC: Choeng Ros Samaki, Veal Ang Popel, Kak Preah Khe, Baset Pomreal	2 RHs: Kampong PH, Oudong	2 HCs: Prey Chum-po Mean Ang, Por Angkrang	None
Kampong Thom	ABC, ACT, RRP, AVD, NNR, BLT	1 RH: Baray-Santuk 4 HC: Meanchey, Pralay, Treal, Taing Kraisaing	2 RHs: Kampong Thom-PH, Stong	5 HCs: Meanchey, Pralay, Treal, Taing Kraisaing, Sambo	3 RHs: Kampong Thom PH, Stong, Baray-Santuk	None	None
Kampot	ABC, ACT, MRP, AVD, NNR	4 RHs: Chhouk, Bun Rany-Hun Sen Koh Sla, Kampong Trach, Angkor Chey 2 HCs: Traapaing Ropov, Touk Meas	1 RH: Kampot-PH	4 RHs: Chhouk, Bun Rany-Hun Sen Koh Sla, Kampong Trach, Angkor Chey 2 HCs: Traapaing Ropov, Touk Meas	1 RH: Kampot-PH	2 HCs: Traapaing Raing, Dangtong	None
Kandal	ACT, RRP, MRP, AVD, NNR, BLT	3 RHs: Saang, Kean Sway, Ksach Kandal 9 HCs: Anlong Romeat, Kraing Yov, Talun, Koki Thom, Dey Eith, Prek Tonlorb, Prek Luong,	3 RHs: Chey Chum Neah-PH, Koh Thom, Rokar Korng	5 RHs: Saang, Kean Sway, Ksach Kandal, Rokar Kong, Slvea Em (Teuk Klaing) 8 HCs: Anlong Romeat, Kraing Yov, Talun, Koki Thom, Dey Eith,	2 RHs: Chey Chum Neah-PH, Koh Thom,	None	None

		Prek Anhchanh, Teuk Klaing			Prek Tonlorb, Prek Luong, Prek Anhchanh,			
Kep	ABC, ACT, AVD, RRP, NNR	1 RH: Kep 1 HC: Pong Teuk	1 RH: Kep 1 HC: Pong Teuk		1 RH: Kep 1 HC: Pong Teuk		None	None
Koh Kong	Maintain	RH : Sre Ambel	1 RH : Koh Kong-PH	1 RH: Koh Kong-PH	1 RH: Sre Ambel	1 RH: Koh Kong-PH	1 HC : Kiri Sakor	None
Kratie	ABC, ACT, MRP, AVD	1 RH: Snuol 2 HCs: Sambour, Chambak	2 RHs: Kratie-PH, Chhlong	2 RH: Chhlong, Snuol 2 HCs: Sambour, Chambak	2 RH: Chhlong, Snuol 2 HCs: Sambour, Chambak	1 RH: Kratie-PH,	2 HCs: Roluos, Prek Prasop	None
Mondulkiri	ACT	2 HCs : Koh Nhek, Keo Seima	1 RH: Mondulkiri-PH	3 HCs : Koh Nhek, Keo Seima, OAm	3 HCs : Koh Nhek, Keo Seima, OAm	1 RH: Mondulkiri-PH	None	None
Oddar Meanchey	ABC, ACT, RRP, BLT, C/S	2 HCs: Kok Morn, Traapaing Prasath	2 RHs: Samrong-PH, Anlong Veng	2 HCs: Kok Morn, Traapaing Prasath	2 HCs: Kok Morn, Traapaing Prasath	2 RHs: Samrong-PH, Anlong Veng	1 HC: Chong Kal	None
Pailin	Maintain		1 RH: Pailin-PH	1 RH: Pailin-PH		1 RH: Pailin-PH	1 HC: Phnom Preal	None
Phnom Penh	ABC, ACT, NNR, MRP, RRP, AVD	8 RHs: Samdach Ov, Don Penh, Chamkar Mon, Sen Sok (Anlong Kgnan), Prek Pnov, Pochen Tong, Meanchey, Dangkor(Chamkar Dong) 7 HCs: Teuk Thla, Pong Toeuk, Tuol Kork, Chak Angrae, Steng Meanchey, Psar Doem Thkov, Chroy Changva	5 NHs: Calmette-NH, MCH-NH, Preah Kosamak-NH, Khmero-Soviet-NH, Municipal Hospital	7 RHs: Samdach Ov, Don Penh, Sen Sok (Anlong Kgnan), Prek Pnov, Pochen Tong, Meanchey, Dangkor(Chamkar Dong) 6 HCs: Teuk Thla, Pong Toeuk, Tuol Kork, Chak Angrae, Steng Meanchey, Psar Doem Thkov	5 NHs: Calmette-NH, MCH-NH, Preah Kosamak-NH, Khmero-Soviet-NH, Municipal Hospital	1 HC : Samrong Krom		None

Preah Sihanouk	ACT, NNR, RRP	2 HCs: Veal Rin, Steung Hav	1 RH: Sihanouk Ville-PH	2 HCs: Veal Rin, Steung Hav	1 RH: Sihanouk Ville-PH	None	None
Preah Vihear	ACT, NNR, MRP, AVD	3 HCs: Ro Vieng, Sra Em, Choam Khsan	1 RH: Preah Vihear-PH	3 HCs: Ro Vieng, Sra Em, Choam Khsan	1 RH: Preah Vihear-PH	2 HCs: Kolen, Chheb	None
Pursat	ACT, NNR, MRP, AVD	3 RHs: Bakan, Phnom Kra- vanh, Kra Kor 2 HCs: Pramoy, Talo	1 RH: Sampov Meas-PH	3 RHs: Bakan, Phnom Kra- vanh, Kra Kor 2 HCs: Pramoy, Talo	1 RH: Sampov Meas-PH	3 HCs: Metoek, Cheur Tom, Siya	None
Prey Veng	ACT, NNR, MRP, AVD, BLT, ACT, NNR, MRP, AVD, BLT	5 RHs: Peareang, Preah Sdach, Kamchay Mear, Mesang, Svay Anthor 3 HCs: Choeung Phnom, Kanchreach, Prey Pon	3 RHs: Prey Veng-PH, Neak Loeung, Kampong Trabek	5 RHs: Preah Sdach, Kamchay Mear, Mesang, Svay Anthor, Sithor Kandal 2 HCs: Choeung Phnom, Kanchreach,	4 RHs: Prey Veng-PH, Neak Loeung, Kampong Trabek, Pear-eang,	None	None
Ratanakiri	Maintain	1 RH: Bor Keo	1 RH: Rattanakiri-PH	1 RH: Bor Keo 1 HC: O Yadav	1 RH: Rattanakiri-PH	4 HCs: Lumphat, Vensai, Ta Veng, Andong Meas	None
Siem Reap	ACT, NNR, MRP, AVD	3 RHs: Kralanh, Angkor Chum, Puok 4 HCs: Samrong, An-long Samnar, Srey Snam, Banteay Srey,	2 RHs: Siem Reap-PH, Soth Nikum	3 RHs: Kralanh, Angkor Chum, Puok 4 HCs: Samrong, Anlong Samnar, Srey Snam, Bakong	2 RHs: Siem Reap-PH, Soth Nikum	2 HCs: Sre Noy, Kok Dong	None
Stung Treng	ACT, MRP, RRP, AVD	2 HCs: Siem Pang, Sre Kror Saing	1 RH: Steung Treng-PH	2 HCs: Siem Pang, Sre Kror Saing	1 RH: Steung Treng-PH	1 HC: Chamkaleu	None

Svay Rieng	ABC, ACT, RRP, MRP, AVD, NNR, BLT	1 RH: Chi Phu 6 HCs : Kruos, Krasaing, Chrey Thom, Mesa Tngork, Nhor, Chantrey	2 RH : Svay Rieng-PH, Romeas Hek	3 RH: Chi Phu, Svay Chrom, Svay Teap 3 HCs : Chork, Mesa Tngork, Nhor	2 RH : Svay Rieng-PH, Romeas Hek	None	None
Takeo	ABC, ACT, RRP, MRP, AVD, NNR	3 RHs: Ang Rokar, Prey Kabass, Bati 4 HCs: Rominh, Rovieng, Trapaing Andoeuk, Angkor Borey	2 RHs: Takeo-PH, Kirivong	3 RHs: Ang Rokar, Prey Kabass, Bati 4 HCs: Rominh, Rovieng, Trapaing Andoeuk, Angkor Borey	2 RHs: Takeo-PH, Kirivong	1 HC: Tram Kna	None
Tbong Khmum	ABC, ACT, NNR, MRP, AVD, RRP, BLT	3 RHs: Ponhea Krek, Kroch Chhmar, O Reang Ov 3 HCs: Rokar Por pram 2, Chong Cheach, Dar	2 RHs: Tbong Khmum RH, Memot	2 RHs: Kroch Chhmar, O Reang Ov 3 HCs: Rokar Por pram 2, Chong Cheach, Dambe	3 RHs: Tbong Khmum RH, Memot, Ponhea Krek	3 HC: Sla, Toek Chrov, Krek I	None
TOTAL		52 RHs 84 HCs	44 RHs	52 RHs 81 HCs	47 RHs	29 HCs	None

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