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National

EMERGENCY OBSTETRIC AND NEWBORN CARE

Assessment in Cambodia



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Foreword

Cambodia has made satisfactory progress in many areas of health and social development. However, high maternal and neonatal mortality remains a major challenge for the country and is one of the top priorities of the Ministry of Health. The Royal Government of Cambodia remains committed to the achievement of the Millennium Declaration and to reduction of maternal and neonatal mortality by two thirds by 2015. One of the strategies to attain that goal is to improve the health system; including health facilities so they can respond to the maternal and child care needs; especially emergency obstetric and newborn care.

The National Assessment of Emergency Obstetric and Newborn Care is the first study of this type to be conducted in Cambodia. The study is an assessment of the level of readiness of the health facilities nationwide, to provide emergency obstetric care to mothers and newborns. The evidence generated through this report will serve as a national baseline for future monitoring and evaluation, and will assist policy makers and program managers to design effective strategies for maternal and newborn mortality reduction.

We would like to thank the National Institute of Public Health and all people involved in the study implementation, analysis of the results and report writing for this assessment.

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Professor Eng Huot
Secretary of State
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Acronyms

AOP	Annual Operational Plan
AMDD	Averting Maternal Death and Disability
ANC	Antenatal Care
AVD	Assisted Vaginal Delivery
BEmONC	Basic Emergency Obstetric and Newborn Care
CBR	Crude Birth Rate
CBT	Competency Based Training
CDHS	Cambodia Demographic and Health Survey
CMDG	Cambodia Millennium Development Goals
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CPA	Complementary Package of Activities
DOCFR	Direct Obstetric Case Fatality Rate
EmOC	Emergency Obstetric Care
EmONC	Emergency Obstetric and Newborn Care
HC	Health Center
HIS	Health Information System
HSP2	Second Health Sector Strategic Plan 2008-2015
LBW	Low Birth Weight
MCH Sub-TWG	Maternal and Child Health Sub-Technical Working Group
MoH	Ministry of Health
NMCHC	National Maternal and Child Health Center
MPA	Minimum Package of Activities
NGO	Non Government Organization
NRH	National Reproductive Health
NRHP	National Reproductive Health Program
NIPH	National Institute of Public Health
OD	Operational District
PMTCT	Prevention of Mother to Child Transmission
PPH	Postpartum Hemorrhage
QA	Quality Assurance
SBA	Skilled Birth Attendant
TFR	Total Fertility Rate
TOR	Terms of Reference
TBA	Traditional Birth Attendant
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund

Executive Summary

Background

Cambodia has made satisfactory progress in many areas of health and social development. However, high maternal mortality of 472 per 100,000 live births and neonatal mortality of 28 per 1,000 remains a major challenge for the country. These indices are unacceptably high and reflect the limited quality and availability of maternal and neonatal health services in the country.

In response to the high maternal and neonatal mortality, AusAID provided funds, through UNFPA, for the first national assessment of Emergency Obstetric and Newborn Care (EmONC). The National Institute of Public Health (NIPH) was contracted to manage and conduct the assessment between September 2008 and May 2009, for the Ministry of Health (MoH).

Objectives

The main objectives of the nationwide assessment were:

- To determine the availability, functioning, quality and utilization of EmONC services in Cambodia
- To establish a baseline from which to monitor progress towards improving EmONC
- To identify barriers to the availability, functioning and utilization of EmONC services and develop appropriate strategies to address the problems.

Methodology

The cross-sectional study was undertaken in all 24 provinces of Cambodia. In total, the maternity services of all 77 public hospitals, 230 health centers, and 40 private facilities were assessed.

Three teams of doctors and midwives collected data by reviewing facility registers and records, observation, and interviewing staff and managers of the health facilities. UN EmONC Indicators for EmONC were used to assess the availability, quality and utilization of EmONC services.

In all the hospitals and health centers surveyed, data collectors assessed the performance of signal functions (or specific life saving procedures) in the 3 month period preceding the survey. Based on the number of signal functions performed, health facilities were classified as either EmONC (Basic or Comprehensive) or non-EmONC facilities. Facilities were then assessed for the availability of supplies, equipment, staff and basic infrastructure to support EmONC services.

Data Analysis and Presentation of Data

Data has been analyzed in stages and is presented for different sub-sets of facilities: all facilities surveyed; identified EmONC facilities; private facilities. When facilities for upgrade to EmONC status were identified, they formed another sub-set of facilities for analysis and presentation.

Findings

WHO/UNICEF/UNFPA, in collaboration with the Averting Maternal Death and Disability Program (AMDD) from Columbia University and other partners have developed Emergency Obstetric Care (EMOC) indicators often referred to as “UN EmONC Indicators”. These indicators;

provided a framework for the National EmONC assessment and helped establish a baseline for the availability, utilization and functioning of EmONC throughout Cambodia. The UN EmONC Indicators helped answer the following research questions:

1. Are there enough facilities providing EmONC?

The needs assessment found that there are 1.6 EmONC and 0.9 CEmONC services per 500,000 people. This falls short of the recommended level of *at least five* EmONC facilities which includes *at least one* CEmONC facility per 500,000 people. An additional 99 non-EmONC facilities are being recommended for upgrade. This would fill the current shortfall of 12 CEmONC and 87 BEmONC facilities.

2. Are the facilities well distributed?

EmONC facilities are poorly distributed. Five provinces are without any form of EmONC service and another 8 provinces have no BEmONC coverage. EmONC facilities are clustered around towns and cities. No health centers have been classified for EmONC so there is a critical shortage of BEmONC, which is the closest facility to the community.

3. Are enough women using EmONC facilities?

In Cambodia, 11.4 % of all expected births took place in EmONC facilities. The UN recommends that at least 15% of all births should be in EmONC facilities. Only 3 out of 24 provinces in Cambodia met or exceeded the level. This suggests that in most provinces of Cambodia EmONC services are being under-utilized.

4. Are the right women using the EmONC facilities?

Only 12.7% of the 15% of all women who develop obstetric complications were treated in EmONC facilities. This is below the recommended level of 100%. This means that the needs of women with complications of pregnancy are not being met in all provinces of Cambodia. It is clear that the majority of women with obstetric complications are not receiving much needed EmONC in health facilities throughout Cambodia.

5. Are enough critical services being provided by EmONC facilities?

In EmONC facilities, 1.3% of all births were by caesarean section in Cambodia. This is well below the recommended levels between 5% -15% for all expected births in Cambodia. This means that there are women who require caesarean sections who are not receiving them. Only Phnom Penh met the required UN standard.

6. Is the quality of services adequate?

The Direct Obstetric Case Fatality Rate (DOCFR) for all identified EmONC facilities was 0.8%. This meets the UN recommended level of 1% or less. 7 out of 24 provinces were below the UN recommended level of 1%. However, maternal deaths are under-reported in most provinces, so the interpretation of this indicator has very little meaning at present, other than to provide a baseline for future reporting.

Baseline for EmONC Facilities

A summary of baseline findings for the 44 identified EmONC facilities and all 307 public facilities surveyed are presented in Table 1.1

Table 1.1 Baseline Indicators for Identified EmONC Facilities and all Public Facilities Surveyed

Indicator	Baseline (July 2007 – June 2008)	UN Standard
Current availability of EmONC services	1.6 EmONC facilities per 500,000 population	≥ 5 EmONC facilities per 500,000 population
	0.9 CEmONC facilities per 500,000 population	≥ 1 Comprehensive per 500,000 population
Geographical distribution of EmONC facilities	Sub national geographical areas do not meet the minimum acceptable level Five provinces have no EmONC facilities No health centers were classified EmONC is clustered around urban areas	100% of sub-national areas have the minimum acceptable numbers of basic and comprehensive EmONC facilities
Proportion of all births in EmONC facilities	<u>EmONC Facilities</u> 11.4% of all expected live births in Cambodia occurred in EmONC facilities <u>All Facilities Surveyed</u> 24% of all expected live births in Cambodia occurred in surveyed facilities	Minimum: 15%
Met need for EmONC services	<u>EmONC Facilities</u> 12.7% of the expected number of women who will develop complications were treated in EmONC facilities <u>All Facilities Surveyed</u> 14.8% of the expected number of women who will develop complications were treated in surveyed facilities	At least 100% of the estimated complications which is 15% of all births
Caesarean sections as a percentage of all births	<u>EmONC Facilities</u> In EmONC facilities, 1.3% of all births were by caesarean section <u>All Facilities Surveyed</u> In all surveyed facilities, 1.4% of all births were by caesarean section.	Minimum 5% Maximum 15%
Direct Obstetric Case Fatality Rate (DOCFR)	<u>EmONC Facilities</u> 0.8%** of women treated with obstetric complications in all EmONC facilities <u>All Facilities Surveyed</u> 0.75%** of women treated with obstetric complications in all EmONC facilities	Maximum 1%
Intrapartum and very early neonatal death rate	1.2% of all women giving birth in all EmONC facilities	No standard set – New indicator being tested
Proportion of maternal deaths due to indirect causes	28.9%** of total deaths from all causes in EmONC facilities.	No standard set – New indicator being tested

** In all facilities surveyed there were 57 maternal deaths from direct causes and the number of women giving birth 83,708 from July 2007-June 2008. As the Cambodia maternal mortality ratio is 472, per 100,000 births; it would seem deaths are being under reported. Therefore care must be taken when interpreting this indicator.

Barriers

The following are barriers to the availability, functioning and utilization of EmONC services.

Standards, Guidelines and Protocols

There are no EmONC standards or guidelines in place to guide service delivery. Standardized lists of EmONC equipment, supplies and essential drugs are missing. MoH equipment lists are inadequate and newly revised safe motherhood protocols need to be reviewed to ensure EmONC best practice is included.

Policy Issues

“Policy issues” were the main reasons given for non-performance of signal function. This relates to MPA and CPA guidelines which only allow health centers and referral hospital to perform certain procedures and keep specific drugs in stock. For health centers to be upgraded to BEmONC status; there needs to be policy in place to support practice and administration of life saving signal functions.

Infrastructure

No new health centers, hospitals or theatres will need to be built, but existing infrastructure needs to be improved and upgraded to support a standardized EmONC ‘package’.

Existing EmONC facilities need improving and non-EmONC facilities need to be upgraded to EmONC status. Improvement and upgrades should include running water, functioning toilets, curtains for privacy and waiting areas for visitors.

Supplies and Equipment

Many of the facilities have missing items essential to good quality EmONC. There were facilities without vacuum extractors or forceps for assisted deliveries. There is a critical shortage of supplies and equipment for specialized areas such as laboratories and neonatal emergency care.

There are inadequate supplies of drugs and other consumables for key programs of the MoH – such as prevention-of-mother-to-child- transmission (PMTCT) of HIV, intermittent preventive treatment for malaria.

Staff Coverage

Health facilities are critically understaffed and health providers are not always available in the right numbers and skills mix to provide good quality EmONC.

More anesthetists, obstetricians and midwives are required to support ‘around the clock services’. Staffing norms for EmONC need to be developed and the current workforce reviewed and redistributed to ensure an optimum skill mix to support EmONC functions. There also needs to be an upgrade of clinical skills to ensure a competent and proficient workforce.

Skilled and Proficient Providers

The needs assessment showed that a large number of health staff have extreme deficiencies in skills and knowledge regarding basic actions to deal with maternal and neonatal complications. Not all EmONC signal functions are taught to midwives in pre-service training and are not widely practiced throughout Cambodia. The provision of training for: the administration of parenteral drugs; provision of Assisted Vaginal Delivery (AVD) services (especially vacuum delivery); manual vacuum aspirator services; dealing with neonatal emergencies, will assist greatly in improving maternal health services.

Availability of Blood

For public facilities, blood is available for transfusions through facility blood banks, families and friends and the central blood bank. However adequate technical support and equipment for ensuring a safe supply of blood is missing. It is vital that blood is screened for a number of tests including HIV and Hep B. Most private facilities source blood from the Central Blood Bank, which is a safe supply; however poor women in the public system cannot afford this service.

“Around-the-Clock” Services

Availability of staff, trained to perform essential EmONC services, is the starting point for providing 24-hour services. Secondary midwives are the main providers of 24-hour “on-site care” Only 61% of hospitals and 7% of health centers have a secondary midwife “physically available” for 24-hours a day.

The delivery of a child cannot be delayed waiting for facilities to open for business. 64.6% of facilities for upgrade and 11.4% of EmONC facilities were not providing laboratory services and EmONC drugs ‘around-the-clock’. Only 52.3% of EmONC facilities and 7.1% of facilities for upgrade have access to blood bank facilities 24-hours a day and the availability of operating theatres and anesthesia needs improving.

Referral

Referrals into the hospitals are less than the number of referrals out of health centers. An explanation might be poor record keeping or the referral chain needs strengthening. Neonatal complications are referred less frequently. Only 6.5% of hospitals and 2.9% of health centers referred neonates out. Data is not being collected as to where neonates were referred. This needs further investigation.

Referral Transport

Transport is a key component of referral. The most common form of transport for referral was car, ambulance or motorcycle. More traditional modes of transport, such as three wheel moto, ox/horse cart and remork moto were used less frequently. As most poor women are unable to afford transport by car, cost of transport is likely to be a barrier to accessing EmONC.

User Fees

User fees may deter women from prompt use of health services for themselves and their newborns. It is unclear if poor women are accessing EmONC. To learn more about where women are coming from, a study should be undertaken to determine who is accessing services, where they are coming from, what help they are getting and how much they are being charged.

Best Practice

Magnesium sulphate could reduce maternal mortality in Cambodia. Despite being on the essential drug list, it is not always readily available due to procurement issues.

Summary of Short Term Recommendations – Development of Improvement Plan

Based on the study findings, the following short and medium term recommendations are made.

1. Continue with consultative meetings and disseminate needs assessment findings at all levels with stakeholders and agree on next steps.
2. Based on the findings of the needs assessment, develop a ‘fully costed’ National EmONC improvement plan with involvement of key stakeholders.
3. Agree on service standards and guidelines for EmONC facilities. Standards should include specifications for infrastructure, human resources, essential EmONC drugs, equipment etc.
4. Provide feedback on the safe motherhood protocols to ensure all signal functions, other vital services and best practice.
5. Review National Guidelines for referral hospitals and health centers: recommend changes e.g. allowing health centers providing BEmONC to provide a wider range of drugs.
6. Review the recommended level for the UN EmONC Indicators, in consultation with the MoH, and if required, adjust to suit the Cambodia context.

Longer Term Recommendations – Implementation of Improvement Plan

Management

Implementation of EmONC throughout the country will require a process which ensures local capacity is in place to support and sustain EmONC.

7. Mobilize resources to support the EmONC improvement plan on an ongoing basis.
8. Oversee and support EmONC services centrally, then gradually decentralize as local capacity is developed and EmONC strengthened. Steps for decentralization should be as follows:
 - Establish a core EMONC team in the NMCHC that will oversee and lead EmONC throughout the country.
 - Upgrade facilities; then begin to decentralize by having core team develop capacity of regional teams attached to the 5 Regional Training Centers.
 - Continue to decentralize by having regional teams develop capacity of provinces. Transfer oversight and support to provinces within two years of establishing regional teams.
9. Consider introducing a non-financial award program to strengthen the quality of services and raise the profile of EmONC in the community. A concept note is provided in appendix 7.

Renovation and maintenance of facilities

To ensure access and equitable distribution of EmONC across Cambodia:

10. Appoint an EmONC officer within the NMCHC core team, to coordinate and monitor the renovations and maintenance of EmONC facilities, according to standards, guidelines and specifications.
11. Upgrade 99 non-EmONC facilities to fill the current shortfall of 12 CEmONC and 87 BEmONC facilities. This should be under the direction of MoH and with support from the EmONC core team; for a list of facilities for upgrade see appendix 2.

Supplies and Equipment Acquisition

Many of the facilities were found to be missing items essential to good quality EmONC. There were inconsistencies between different kinds of packs, sets and equipment and between MoH essential supply, equipment and drug lists, Safe Motherhood protocols.

12. Work with MoH to streamline procurement by:
 - Preparing a list to show what each EmONC facility requires.
 - Sending a directive, with the list attached, to procurement, central medical stores (CMS) and the person in charge of the facility being upgraded.
13. To ensure important equipment and supplies are available and standardized, consider supplying selected essential equipment and supplies in EmONC kits/boxes.
14. Deploy maintenance teams to attend to the repair of existing equipment. This could also be part of the strategy employed to address infrastructure needs.

Facility Setup

As facilities are renovated, repairs completed and new equipment installed, pay attention to the readiness of each room and area of a facility, to serve its designated function.

15. In each EmONC facility, identify an existing committee within the facility to be responsible for:
 - Opening and setting up equipment and providing training in “room by room” facility setup.
 - Preparing an inventory list and recording in the inventory register.
 - Seeing that all equipment is installed and functional.
 - Posting lists in appropriate rooms of instruments, supplies and emergency drugs.

Training

Particular attention will need to be given to updating skills of staff to reflect current evidence-based practices through practical, skills-based training and not just theoretical lectures.

16. Pay particular attention to developing and upgrading skills of local EmONC specialists, i.e. anesthetists, neonatologists and obstetricians and gynecologists.
17. Adapt and establish a competency-based training (CBT) program in EmONC and neonatal care and provide national recognition for the training.

18. Consider upgrading the skills of primary midwives for obstetric first-aid.
19. Use a team approach to training in the workplace (or as close to where team members work) using real life problems and cases. This will reinforce the teamwork required to respond effectively in emergencies.
20. Ensure CBT learning is followed through with visits by trainers to the worksites, to review progress and assess workers' confidence and competence in using new skills.
21. Ensure clinical skills are maintained, implement regular skills assessment where EmONC service providers are required to practice and then demonstrate their skills on a yearly basis. To ensure there is opportunity to do this, and out of respect for the women upon whom these skills might be practiced, use models.
22. Particular attention needs to be given to training of midwives and medical officers for proficiency in the performance of signal functions and the management of complications – including assisted vaginal delivery, neonatal resuscitation, MVA, the use of magnesium sulphate for eclampsia and the routine use of partographs for the monitoring of labor and delivery.
23. Make use of existing local program to support training. It was obvious during the assessment that RACHA and NMCHC had done a good job with teaching and supporting Life Saving Skills. Such initiatives need to be scaled up.

Data Management

There is a need to improve the quality of data being recorded and reported.

24. Negotiate with Siem Reap Provincial Health Department to collect facility data from Jay Varaman Hospital for inclusion with existing baseline data.
25. Facilitate a series of workshops to promote the use of the UN EmONC indicators at a national, provincial and district level.
26. Pay special attention to the definition of different kinds of cases, such as how to define the different types of direct and indirect obstetric and neonatal complications / terms e.g. spontaneous abortion, and stillbirth.
27. Conduct a series of workshops with facility staff as well as district and provincial managers on the calculation and interpretation of UN EmONC Indicators.

Integration and Monitoring

28. Ensure EmONC improvement plan is integrated into Program and Provincial Annual Operational Plans (AOPs), 3 year rolling plans and the updated Health Strategic Plan and the Reproductive and Sexual Health Strategy.
29. Review recommended levels for each UN EmONC Indicator and decide whether the level is appropriate for Cambodia, if not then adapt to local context
30. Develop CEmONC/BEmONC monitoring checklist and reporting format, implement, then integrate it into the routine Health Information System (09-10).

31. Help Provincial Health Department and Operational Districts translate the results and recommendations into their annual operational plan (on-going).
32. Monitor and review annually as part of the Joint Annual Performance Report starting 2010.

Research

33. Maternal death audits should be instituted nationwide in all health facilities across the country.
34. There is a need to understand where women are coming from, what services they are using and the barriers they face when accessing services. A study could be undertaken to better understand this.
35. A study is required to understand if, and to where, neonates are being referred, and what happens to women who are referred onto the next level.
36. Evaluate progress made with a follow-up assessment of EmONC nationwide in 2015.

1. Introduction and Rationale

1.1 Introduction

To help address the high maternal and newborn mortality in Cambodia, UNFPA/AusAid funded the first national assessment of Emergency Obstetric and Newborn Care (EmONC). The National Institute of Public Health (NIPH) was contracted to manage and conduct the assessment between September 2008 and May 2009, for the Ministry of Health (MOH). An international consultant was also contracted to support survey design and implementation, particularly regarding use of international instruments and tools.

The assessment is timely. Maternal and neonatal mortality in Cambodia is among the highest in South East Asia. To effectively fight against this problem, access to quality EmONC is critical. The evidence generated through this report will help the MoH and partners to design effective strategies to reduce maternal and neonatal mortality.

Objectives of the Needs Assessment

The main objectives of the nationwide assessment were:

- To determine the availability, functioning, quality and utilization of EmONC services in Cambodia
- To establish a baseline from which to monitor progress towards improving EmONC
- To identify barriers to the availability, functioning and utilization of EmONC services and develop appropriate strategies to address the problems.

1.2 Rationale

Cambodia has made significant progress, since thirty years of war and internal conflict left the country impoverished and lacking trained professionals toward the end of the last century. During the last 15 years, the country has enjoyed stable economic growth, accompanied by a reduction in poverty of 10%-15%.¹

Despite these encouraging signs, the country still faces challenges. Gross domestic product is declining, economic growth is narrowly focused and inequality is increasing. Poverty rates remain high with 35% of the population living below the poverty line. An estimated 15% of people live in extreme poverty, especially in rural areas.²

Organization of Health Services

The MoH administers health services through 24 Provincial Health Departments, 77 Operational Districts (ODs), 73 referral hospitals and nearly 1000 health centers. A Health Coverage Plan specifies the location of health facilities and their catchment area. Each OD covers a population of 100,000 to 200,000 and includes a referral hospital and network of health centers, each covering

¹ ADB, DFID, UNCT and World Bank, (2004), The Challenges Facing Cambodia

² UNFPA, (2005), Population, Gender and Reproductive Health: Cambodia at a Glance

populations of about 10,000.

There are three levels of the public health system and a large private sector which is unregulated. Health centers which are closest to the community provide a Minimum Package of Activities (MPA). Maternity services are an integral part of the package.

Referral hospitals provide a Complementary Package of Activities (CPA) at three levels CPA1, CPA 2 and CPA 3. A CPA 3 referral hospital is usually located in a provincial town where they provide a full range of health services. A CPA 2 referral hospital provides caesarean sections, minor surgery, blood transfusions but may not have the blood bank. Lastly, CPA1 referral hospitals provide non-surgery services³.

The third level of the health system is comprised of national institutes, hospitals, programs and training institutions.

Health Policy Context

The country's first National Health Sector Strategy Plan 2003-2007 was launched in 2002. The Second Health Sector Strategic Plan 2008-2015 (HSP2) was launched in 2008. A priority of the HSP2 is to reduce maternal, newborn and child morbidity and mortality.

Maternal and Neonatal Health

Cambodia has one of the highest maternal mortality ratios in the region, which remained unchanged between the 2000 and 2005 (Cambodia Demographic Surveys), while neonatal mortality decreased. The maternal mortality ratio is 472 deaths per 100,000 live births and neonatal mortality is 28 deaths per 1,000 live births⁴. These indices are unacceptably high and reflect negatively on maternal and neonatal health services in the country.

Postpartum hemorrhage remains the leading cause of maternal mortality, followed by infection, complications from abortion and hypertension. Maternal death contributes 17% to mortality in women aged 15-49 years. In 2005⁵ 71.4% of pregnant mothers had at least one antenatal care (ANC) visit conducted by skilled staff and 22% of deliveries were in institutions. Over half (55%) of all births are delivered by a Traditional Birth Attendant (TBA) and the majority of births (78%) take place at home. 44% of pregnant women are delivered by a trained health professional (doctor, midwife, nurse), an increase from 32% in 2000.

Forty percent of women use a contraceptive, of which 27% use modern methods and 13% use traditional methods.⁶ One quarter of currently married women have an unmet need for family planning, which is especially high among women in the lowest quartile and uneducated women. The median interval between births is 38.6 months and the total fertility rate (TFR) is 3.4. There

³ Ministry of Health, (2006), National Guidelines on Complementary Package of Activities for Referral Hospital Development from 2006 – 2010. Kingdom of Cambodia

⁴ National Institute of Public Health and National Institute of Statistics, (2005), Cambodia Demographic and Health Survey, Cambodia

⁵ Ibid

⁶ Ibid

are low institutional delivery rates, in a demographically young population with moderate population growth. The stage is set for a high maternal and newborn mortality and morbidity.

The reported⁷ prevalence of HIV among adults (15-49 years) is low. Prevention of mother to child transmission (PMTCT) services are offered in health centers, provincial hospitals and tertiary health facilities. Suffice to say that with a 22% institutional delivery rate, the coverage of PMTCT services will be poor.

Four out of 10 newborn infants are weighed at birth and the proportion of low-birth-weight babies is 8%⁸. Socioeconomic characteristics and vulnerability risks include: an urban versus rural environment; the mothers' educational level; the mother's household wealth. These all influence infant and child survival substantially.

Barriers to Safe Delivery

A major obstacle to the provision of maternal and newborn care services is the unavailability of human resources and specialized services. These include care of neonates with complications, assisted ventilation and the management of complicated deliveries.

The Khmer Rouge period left the country impoverished. Training facilities were closed and the skilled population died or emigrated. In order to maintain services, medical assistants were allowed to undertake additional training and qualify as doctors. Similarly, nurses and midwives were allowed to undertake a year of training and qualify as midwives to fill a desperate need for skilled care in rural areas.

Secondary midwives are the most qualified of the nursing cadre in rural and remote areas. However they are poorly organized as a profession, and are not proficient enough to manage obstetric and neonatal complications without assistance. A comprehensive Midwifery Review⁹, carried out in 2006, revealed a low level of competence, particularly in life-saving skills among midwives.

There are multiple reasons for the high and unchanged maternal mortality ratio. Poor access to professional delivery and essential emergency postpartum services, as well as low facility delivery rates, are important contributing factors.

Barriers to safe delivery services include: official and unofficial fees in the public service system; poor physical access for rural populations; the sometimes unprofessional conduct of staff. There are limited emergency obstetric care services, including emergency blood transfusion; these factors impact negatively on outcomes in hospitals.

In recognition of the dire status of maternal and newborn health in Cambodia, this needs assessment has been undertaken.

⁷ National Institute of Public Health and National Institute of Statistics, (2005), Cambodia Demographic and Health Survey, Cambodia

⁸ Ibid

⁹ MoH, (2006), Comprehensive Midwifery Review –UNFPA Cambodia

1.3 Literature review

Maternal Care

Maternal deaths are clustered around labor, delivery and the immediate postpartum period: the most common direct cause globally is obstetric hemorrhage.¹⁰ Major causes of maternal deaths in Asia are: obstetric hemorrhage (30.8%); anemia (12.8%); sepsis/infection (11.5%); obstructed labor (9.4%); hypertensive disorders (9.1%); unsafe abortions (5.7%).¹¹

Maternal death is affected by many factors, including: the frequency and spacing of births, nutrition and access to emergency obstetric and newborn care. Underlying causes such as HIV and AIDS, malaria, tuberculosis and anemia contribute to mortality risks, but there is little evidence of the impact of these indirect causes of maternal death.¹²

Newborn Care

Neonatal deaths in the first four weeks of life make up around 40% of all under-five deaths. Half of these deaths occur in the first day of life, and three quarters in the first week.

Globally, most deaths occur at home in low-income settings with inadequate health systems and poor care-seeking.¹³ Reductions in child mortality will depend on improved neonatal survival. This is a particular challenge, given that late neonatal and post-neonatal deaths can be reduced by public health interventions, whereas individualized clinical care is generally critical to reducing both maternal and early neonatal mortality.¹⁴

Neonatal deaths are less likely to be recorded when they occur in the first hours or days of life. Data on the causes of neonatal death is inadequate; however, Lawn et al¹⁵ have used a variety of data sources to estimate the main direct causes of neonatal deaths in 2000: pre-term birth (28%), sepsis/pneumonia (26%), asphyxia complications (23%), tetanus (7%), diarrhea (3%) and other (including congenital abnormalities) (13%).

Interventions that Work

Whether women and neonates die from bleeding and other risks depends mainly on their gaining access to skilled and timely care, often within hours. Three critical delays need to be addressed:

- Delay in women and families seeking help
- Delay in accessing appropriate emergency obstetric care facilities
- Delay in receiving effective interventions from facilities¹⁶

¹⁰ Ronsmans C, Graham W, (2006) Maternal mortality: who, when, where, and why *Lancet* (368): 1189–200.

¹¹ Khan K et al. (2006) WHO analysis of causes of maternal death: a systematic review *Lancet* (367): 1066-1074.

¹² Ronsmans C, Graham W, (2006) Maternal mortality: who, when, where, and why *Lancet* (368): 1189–200.

¹³ Darmstadt G et al (2005) Evidence-based, cost-effective interventions: how many newborn babies can we save? *Lancet* (365): 977-88.

¹⁴ Lawn J et al. (2005) 4 million neonatal deaths: when, where, why? *Lancet* (365): 891-900. However as shown by some of the case studies in this paper simple approaches to improve nutrition, support mothers, increase birth attendant skills and resources and provide appropriate neonatal responses such as kangaroo care can make a significant contribution.

¹⁵ Lawn J et al. (2005) 4 million neonatal deaths: when, where, why? *Lancet* (365): 891-900

¹⁶ Maine, Deborah; Murat, Akalin Z.; Ward, Victoria M.; Kamara, Angela. (1997) *The Design and Evaluation of Maternal Mortality*

An effective and feasible model to avert maternal and neonatal deaths is recommended by The Lancet Maternal Survival Series steering group¹⁷. In this model, women would routinely choose to deliver in the health center with midwives as primary providers. Primary prevention of problems, where possible, should occur, but the model also includes early detection and management of complications. All basic emergency obstetric functions would be available at the health center, such as antibiotics and uterine contracting drugs for use by midwives.¹⁸ The exceptions are blood transfusions and surgical delivery, which would require transfer to higher-level facilities.¹⁹

In recognition of the value of such a model, the MoH undertook this needs assessment with a view of putting in place a two tiered approach, which is supported by the Lancet model. When implemented successfully, it will improve the availability, functioning and utilization of EmONC services throughout Cambodia. The use of UN EmONC Indicators as a baseline provides a firm foundation for this model.

1.4 Summary

Maternal and neonatal mortality in Cambodia is among the highest in South East Asia. There are multiple reasons for this. Poor access to professional delivery and essential emergency postpartum services, as well as low facility delivery rates, are important contributing factors. To effectively fight against this problem, access to quality EmONC is critical. The evidence generated through this report will help the MoH and partners to design effective strategies, to reduce maternal and neonatal mortality.

Programs. Centre for Population and Family Health, Joseph L. Mailman School of Public Health, Columbia University.

¹⁷ Campbell O, Graham W, (2006) Strategies for reducing maternal mortality: getting on with what works Lancet (368): 1284-99.

¹⁸ Costello, A., Kishwar, A., Barnett, S. (2006), An alternative strategy to reduce maternal mortality Lancet (368): 1477-9.

¹⁹ Campbell O, Graham W,(2006) Strategies for reducing maternal mortality: getting on with what works Lancet (368): 1284-99

2. Methodology

2.1 Study Design

The study design was a cross-sectional. The survey was nationwide. It included 77 Operational Districts²⁰ (OD) in all 24 provinces of Cambodia. The fieldwork took place between September and December 2008.

2.2 Selection of Facilities

The facilities for the study were selected from health facilities provided by the Ministry of Health at different levels of the health system. In total, 77 public hospitals, 230 health centers, and 40 private facilities were included in the study (see Table 2.1). See Appendix 1 for a full list of facilities visited.

All 4 national hospitals and 73 referral hospitals from the health coverage plan (2005) of MoH were included in the assessment.

From the MoH Health Information System (HIS) 677 health centers, which had at least 3 or more deliveries a month between January and June 2008, were identified. According to AMDD guidelines, at least 30% of all health facilities should be included in the study to ensure the number of facilities were statistically significant; so 3 health centers, which provided most deliveries, were purposively selected by the director of each operational district for inclusion in the study. In total 230 (34%) of 677 health centers were included.

There were 40 private facilities which included polyclinics, maternity clinics, and clinics providing maternity services registered with the MoH. These were all included in the study.

Table 2.1 Number of Selected Facilities by Category of Hospital

Health Facilities**	Study Total	All Possible
Total National Hospitals	4	4
Total Referral Hospitals	73	73
Private Facilities	40	40
Total Health Centers	230	677
Total Facilities	347	794

** Facilities capable of providing maternity services

2.3 Data Collection

Three teams of doctors and midwives collected data by reviewing facility registers and records, observation, and interviewing health staff and managers. UN EmONC Indicators and performance of signal functions for emergency obstetric care were used to assess the availability, utilization, performance of signal functions.

²⁰ An OD is a health district with the coverage of 100,000 to 200,000 population.

Assessment tools / Instrument

Tools developed by the Averting Maternal Death and Disability (AMDD) program (see Box 2.1) were adapted for use over a 4 stage process: customization to local context, integration of neonatal care issues, refinement based on feedback, translation into the local language (Khmer).

Box 2.1

AMDD Program and Tools

The AMDD and its partners (including WHO, UNICEF, UNFPA, Care and Save the Children) have conducted facility-based needs assessments on the availability, utilization and quality of EmOC in over 48 countries. Based on these experiences and the tools developed, AMDD has compiled tools to be used by countries and agencies interested in conducting EmOC needs assessments.

The instrument was made up of the following 9 sections. Each section represented a separate tool. Table 2.2 provides an overview of tools and methods used in the collection of information and data.

Table 2.2 Summary EmONC Assessment Tools and Methods

	Information Collected	How Data was Collected
Section 1	General Identifying Information on the facility	Filled in by interviewer or supervisor on arrival.
Section 2	Information about the facility as a whole (size infrastructure and services)	Questions to Facility Officer in Charge
Section 3	Transportation, communication and referral at each facility (general questions)	Questions to Facility Officer in Charge
Section 4	Payment for Services	Questions to Facility Officer in Charge and the person in charge of the maternity ward
Section 5	Staffing situation, 24-hour coverage, skill of staff to provide EmONC functions, training	Questions to Facility Officer in Charge and the person in charge of the maternity ward
Section 6	Provider knowledge and competency for maternal and newborn care	Questions to the provider who attended the largest number of deliveries last month who is present at the time of the visit
Section 7	Data necessary to calculate the UN EmONC Indicators and other important indicators e.g. stillbirth rate, caesarian sections, maternal deaths	All possible registries and logbook, reports or charts (as needed) in obstetric, gynecology and neonatal care for a 12 month period
Section 8	Equipment, supplies, maternity ward and essential drugs	Observation and question to person in charge
Section 9	To determine how facilities actually function. The clinical signal functions should have been performed in the last 3 months.	Reviewing facility register, observation and questioning.

2.4 Fieldwork Organization

NIPH hired 6 cars to support the teams collecting the data. One car was allocated to each of the 3 data collection teams recruited to collect data at the facilities. Almost all data collectors were practicing midwives. Supervisors were medical doctors. All team members had some experience and interest in research, data collection and/or monitoring and evaluation.

Each team was responsible for a specific region of Cambodia. Teams worked under the guidance of a senior supervisor who was only a member of the coordination team. Team composition included: 1 supervisor, 4 data collectors (2 per health facility) and 1 driver. If an additional car was needed then a car allocated to the coordination team was made available.

Each team had a supervisor, who was responsible for closely monitoring data collection, to ensure that the data collection tools were completed correctly and consistently. Supervisors were also required to conduct regular meetings with data collectors, to identify and solve problems that arose.

Data Collector Training

A five day training oriented supervisors and interviewers to the tools.

- Interviewers and supervisors were trained in the specifics of the tools to ensure a common understanding and interpretation.
- As part of the training, each question in each section of the tool was reviewed to ensure that all NIPH teams, data collectors and supervisors understood the tools.
- During training, data collectors were able to practice interviewing in a training situation.
- Final refinements to the tools were made on the 10th-11th October 2008.
- Before the training was completed, teams were briefed on the logistics of data collection (transportation, lodging, allowance, schedule, contact numbers, calling supervisors, etc.)

Field Work

Fieldwork for the EmONC Assessment was conducted between September and December 2008. The survey was nationwide. There were 4 national hospitals (all located in Phnom Penh), 73 referral hospitals, 230 health centers and 40 private health facilities. Phnom Penh accounted for the largest share of health facilities surveyed, while Kampong Cham had more public hospitals and health centers than any other province.

In total, 347 health facilities in all 24 provinces of Cambodia were visited (table 2.3). Apart from the 40 private clinics offering maternity services, all facilities were owned and managed by the Ministry of Health (MoH).

Table 2.3 Distribution of Hospitals and Health Centers Visited by Province

Provinces	Hospitals	Health Centers	Private Facilities	Total
Banteay Meanchey	4	12	0	16
Battambang	4	15	2	21
Kampong Cham	10	30	1	41
Kampong Chhnang	2	9	0	11
Kampong Speu	3	9	0	12
Kampong Thom	3	9	0	12
Kampot	4	12	0	16
Kandal	5	24	3	32
Koh Kong	2	6	0	8
Kratie	2	6	0	8
Mondul Kiri	1	3	0	4
Phnom Penh	9	11	27	47
Preah Vihear	1	3	0	4
Prey Veng	7	21	0	28
Pursat	2	6	0	8
Rattank Kiri	1	3	0	4
Siem Reap	4	12	4	20
Sihanouk Ville	1	3	1	5
Stung Treng	1	3	0	4
Svay Rieng	3	9	2	14
Takeo	5	15	0	20
Oddar Mean Chey	1	3	0	4
Kep	1	3	0	4
Paillin	1	3	0	4
Total	77	230	40	347

2.5 Quality Control

Several approaches were used to assure the quality of data collection, compilation and analysis.

- During training, all fieldworkers and supervisors reached a common understanding and interpretation of the survey tools. Quality control was ensured during the fieldwork, through effective supervision of the field staff. Team supervisors monitored the work of team members, making sure that all selected health facilities were visited and all eligible interviewees were contacted.
- To ensure the quality of the data across modules periodic cross and spot checks were undertaken by supervisors, coordination team and a consultant hired by UNFPA. As a result of these checks facility data needed to be collected a second time from many of the facilities.

- The data was checked prior to entering it in the computer. Computer checks were used to validate data. The frequencies of each variable were generated to check the completeness of data entry and validity.
- A consultant contracted by UNFPA regularly visited Cambodia to check on the performance of each field team. Review sessions and visits to the field were held to correct errors detected in the field work, and to reinforce good practices identified. Close communication was maintained at all times with the consultant.

2.6 Data Processing

Epi-Data software version 3.02 was used for data entry and data validation. Epi Info 6.04d and Stata 9 software were used for data cleaning and analysis. Excel 2000 Workbook was used for some data processing and for the production of charts and figures. ArcView GIS version 3.3 was also used for mapping the health facilities.

Data Analysis

Data has been analyzed in stages for different sub-sets of facilities:

- First for all hospitals
- All health centres
- All facilities surveyed
- The identified EmONC facilities
- Private facilities
- When facilities for upgrade to EmONC status were identified, these were another sub-set analyzed.

2.7 UN EmONC Indicators

The indicators used to assess the utilization of EmONC services, were calculated by using the guidelines developed by UNICEF/WHO/UNFPA, termed as UN EmONC Indicators. They were:

- Number of EmONC services available
- Geographical distribution of EmONC facilities
- Proportion of all births in EmONC and all facilities
- Met need for EmONC and all facilities
- Caesarean sections as a percentage of all births in the population in EmONC and all facilities.
- Direct Obstetric Case Fatality Rate in EmONC and all facilities
- Intrapartum and very early neonatal death rate in EmONC and all facilities.
- Proportion of maternal deaths due to indirect causes in EmONC and all facilities

To determine the population size in a given area (province), the most recent census (2008) was used. The projection of expected births was estimated, province by province, using the province-specific Crude Birth Rate (CBR) multiplied by the province population. The definitions and formula used in calculating UN EmONC Indicators are given in table 2.4.

Facility Data

Facility data was collected for a 12 month period (July 2007 – June 2008). A summary of this data can be found in appendix 2. The main sources of data collection were registers for maternity, delivery, miscarriage and abortion. Most of the data was of poor quality; many registers were not up to date or were incomplete. The under reporting of deaths, and how cases were defined, are areas which need improvement

Health Center Data

As already discussed 230 out of a possible 677 health centers were surveyed. To adjust the data into estimates for all facilities in the area a worksheet was developed to convert data from the 230 health centres surveyed into estimates for health centers country wide.

Table 2.4

A Summary of the UN EmONC Indicators and Method of Calculation

	Indicator	Description	Numerator	Denominator	Acceptable Level
1&2*	Availability of EmONC (national or sub-national)	Ratio of facilities providing EmONC to population and geographical distribution of EmONC facilities	No. of facilities in Cambodia providing Basic or Comprehensive EmONC	Population of area divided by 500,000	≥ 5 EmONC facilities per 500 000 population
			No. of facilities in Cambodia providing Comprehensive EmONC	Population of area divided by 500,000	≥ 1 Comprehensive per 500 000 population
3	Proportion of all births in EmONC facilities	Proportion of all births in population in EmONC and all facilities.	No. of women giving birth in EmONC facilities in specified time period	Expected no. of births in Cambodia in same time period	15%
4	Met Need for EmONC	Proportion of women with major direct obstetric complications treated at EmONC facilities and all facilities.	No. of women with major direct obstetric complications treated in EmONC facilities in specified time period	Expected no. of women with severe direct obstetric complications in area in same time period**	100%
5	Caesarean sections as a proportion of all births	Proportion of all births by caesarean section taking place in EmONC and all facilities in the population.	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 and all facilities.	No. of maternal deaths due to direct obstetric causes in EmONC facilities in specified time period	No. of women 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 and all facilities.	No. of intrapartum deaths (fresh stillbirths; > 2.5 kg) and very early neonatal deaths (≤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 (new indicator being tested)
8	Proportion of maternal deaths due to indirect causes	Out of all maternal deaths in EmONC facilities, what % are due to indirect causes in EmONC and all facilities	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 (new indicator being tested)

2.8 Limitations of the Study

Selection of Facilities:

The selection of health centers for this assessment was a purposive selection of 3 health centers in each OD. Technically speaking health centers included in the survey are not representative of all health centers in an OD.

Quality of data:

The sources of data for generating UN EmONC Indicators were based on various registers maintained in the health facilities. However, significant gaps were present in the availability and the quality of the information, which has been a challenge and constraint of the study. The under reporting of maternal deaths is a particular concern.

Selection of private facilities:

The survey included the majority of maternity clinics registered with the MoH. According to CDHS²¹ 16.8% of all deliveries take place in public health facilities while 3.9% are in private facilities. This division of maternity care is not reflected in the study sample or findings. This needs to be taken into consideration when interpreting the findings.

2.9 Presentation of Data in this Report

Data has been analyzed for different subsets of facilities including:

- All hospitals surveyed
- All health centers surveyed
- All facilities surveyed
- All identified EmONC facilities and the recommended facilities for upgrade.

The presentation of data for the UN EmONC Indicators covers all identified EmONC facilities and all facilities surveyed. Assessment of equipment and infrastructure is presented for identified EmONC facilities, that require strengthening, and for facilities recommended for upgrade. Human resources data is presented for a range of sub-sets, depending on what the researchers believe will be more helpful for future planning.

2.10 Summary

The cross-sectional study was undertaken in all 24 provinces of Cambodia. In total, the maternity services of all 77 public hospitals, 230 health centers, and 40 private clinics were assessed. The AMDD methodology and tools used for the assessment have been tested in at least 48 countries.

Three teams of doctors and midwives collected data by reviewing facility registers and records, observation, and interviewing health staff and managers. UN EmONC Indicators for EmONC were used to assess the availability and utilization of EmONC services.

²¹ National Institute of Public Health and National Institute of Statistics, (2005), Cambodia Demographic and Health Survey, Cambodia

3. Findings: UN EmONC Indicators

3.1 UN EmONC Indicators

This section of the report summarizes the baseline findings against each of the UN EmONC Indicators for all identified EmONC facilities and all facilities surveyed. Facility data used to calculate indicators can be found in appendix 2.

Indicator 1: Availability of Emergency Obstetric and Neonatal Care Services

Recommended Level: For every 500,000 of population there should be at least five EmONC facilities (including *at least* one Comprehensive EmONC facility).

This indicator utilizes the performance of signal functions in the last three months prior to the needs assessment, to classify health facilities into Basic and Comprehensive EmONC facilities or non-EmONC facilities. See section 4 of this report for more information on signal functions.

Health facilities that performed the entire first seven signal functions in the 3 months prior to the study were classified Basic EmONC (BEmONC) facilities, while those that performed all the nine signal functions were classified Comprehensive EmONC (CEmONC) facilities. If a facility failed to perform all the first seven signal functions it was considered a Non-EmONC facility.

Out of 347 health facilities surveyed, 4 national hospitals, 21 referral hospitals and 2 private clinics qualified to be considered CEmONC facilities and only 19 referral hospitals and 1 private clinic that qualified as BEmONC facilities (table 3.1).

Table 3.1 Distribution of Health Facilities by EmONC Classification

Type of Health Facility	National Hospitals		Referral Hospitals		Health Centers		Private Clinic	
	No.	%	No.	%	No.	%	No.	%
CEmONC	4	100%	21	29%	0	0%	2	5%
BEmONC	0	0%	19	26%	0	0%	1	2.5%
Non-EmONC	0	0%	33	45%	230	100%	37	92.5%
Total	4	100.0%	73	100.0%	230	100.0%	40	100.0%

The identified EmONC facilities provide Cambodia with coverage of 1.6 EmONC and 0.9 CEmONC facilities per 500,000 people. This falls short of the recommended level of at least five EmONC facilities (including at least *one* CEmONC facility) per 500,000 people. The minimum standard for CEmONC is almost met, but there is a real gap is BEmONC, which is the nearest health facility to the community.

Table 3.2 shows that to ensure availability of EmONC to the whole country, an additional 99 non-EmONC facilities will need to be upgraded. There is a shortfall of 12 CEmONC and 87 BEmONC. A list of these facilities is in appendix 3.

Table 3.2 Availability (per 500,000 Population) of EmONC Services by Province

Province	Population Size ²²	Current Availability		Recommended Number		For Upgrade	
		CEmONC	BEmONC	CEmONC	BEmONC	CEmONC	BEmONC
Banteay Meanchey	678,033	1	2	2	5	1	4
Battambang	1024663	2	1	2	8	0	7
Kampong Cham	1,680,694	1	6	3	14	2	10
Kampong Chhnang	471,616	1	1	1	4	0	3
Kampong Speu	716,517	0	0	2	5	2	5
Kampong Thom	630,803	2	1	1	5	0	3
Kampot	585,110	0	1	1	5	1	4
Kandal	1,265,085	0	0	2	11	2	11
Koh Kong	139,722	1	0	1	1	0	1
Kratie	318,523	1	0	1	2	0	2
Mondul Kiri	60,811	0	0	1	0	1	0
Phnom Penh	1,325,681	5	1	3	11	0	8
Preah Vihear	170,852	1	0	1	1	0	1
Prey Veng	947,357	2	3	2	8	0	5
Pursat	397,107	1	0	1	3	0	3
Ratanak Kiri	149,997	1	0	1	1	0	1
Siem Reap*	896,309	0	2	2	7	2	6
Sihanouk ville	199,902	1	0	1	1	0	1
Steung Treng	111,734	1	0	1	1	0	1
Svay Rieng	482,785	1	1	1	4	0	3
Takeo	843,931	2	0	2	6	0	6
Oddor Meanchey	185,443	0	0	1	1	1	1
Kep	35,753	0	0	0	1	0	1
Pailin	70,482	1	0	1	0	0	0
Total	13,388,910	25**	19**	34	105	12	87

* In Siem Reap there is a large private hospital (Jay Varaman Hospital) which is partly funding by government and donors. That was not included in the study. When upgrading facilities this needs to be taken account of. It does not make sense to upgrade the provincial hospital to CEMONC when Jay Varaman is there and providing good quality services.

** This does not include Private Clinics 1 CEmONC and 1 BEmONC in Phnom Penh and 1 CEmONC in Battambang

²² National Institute of Public Health and National Institute of Statistics, (2008) General Population Census of Cambodia

Table 3.3 summarizes the number of MoH EmONC facilities available across the country, the recommended number required based on the UN EmONC Indicator of availability and the recommended number for upgrade. The number recommended for upgrade is greater than the recommended number because consideration has been given to accessibility of services in some areas.

Table 3.3 Availability of Public EmONC Services

EmONC Classification	Current Status	Minimum Recommended*	Recommended for Upgrade**
Comprehensive EmONC	25	34	12
Basic EmONC	19	105	87

* For every 500,000 people there should be *at least* 5 EmONC facilities including; *at least* 1 CEmONC facility.

** Number does not reconcile; additional facilities where assessed where access is a problem.

Indicator 2: Geographic Distribution of EmONC Services

Recommended Level: All sub-national areas have *at least* 5 EmONC facilities (including *at least* one Comprehensive EmONC facility) for every 500,000 of population

EmONC services ought to be close to where women live so that when emergencies inevitably occur, they are able to access the services that they need locally. This indicator highlights the spatial inequalities in the distribution of EmONC services.

EmONC distribution varied from province to province. There were 5 provinces without any form of EmONC services. A further 2 provinces lacked CEmONC facilities, and another 8 had no BEmONC coverage.

The minimum UN requirement for equitable distribution at a sub-national level is not being met. In cities and large provincial towns; all national hospitals and 76% of CPA 3 referral hospitals are providing EmONC services. At the lower levels of the health system it is a different picture. No health center has been classified as an EmONC facility (refer to table 3.4) so there is a critical shortage of BEmONC. Women with life threatening complications need to travel to a larger town or city for the care they require.

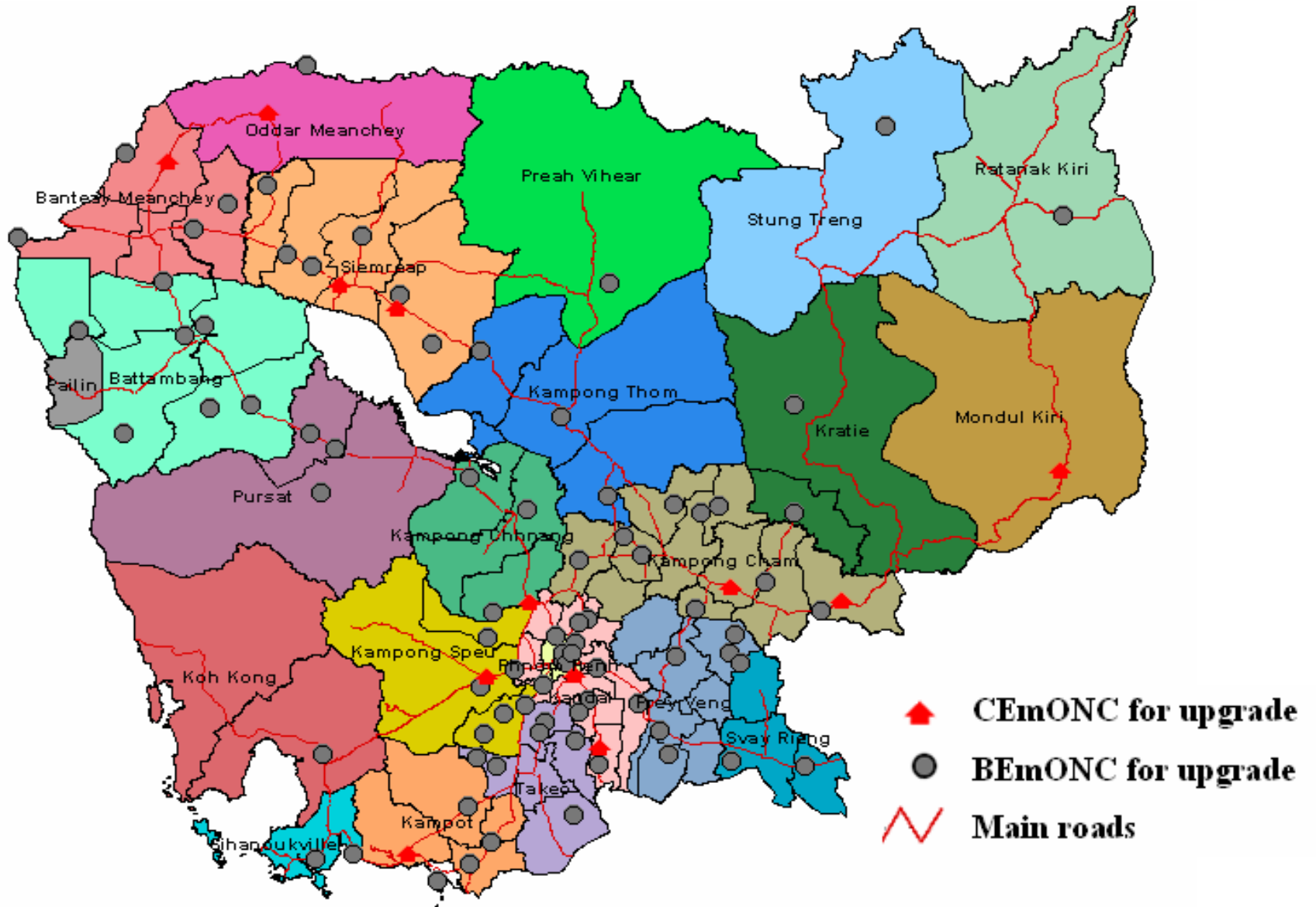
Table 3.4 EmONC Facilities by Level of Health System Functioning

Type of Health Facility	No. Surveyed	% EmONC Facilities	% Non-EmONC Facilities
National Hospital	4	4 (100)	0 (0%)
Referral Hospital CPA 3	17	13 (76%)	4 (24%)
Referral Hospital CPA 2	28	19 (68%)	9 (32%)
Referral Hospital CPA 1	28	8 (29%)	20 (71%)
Health Centers	230	0 (0%)	230 (100%)
Total	307	44 (14%)	263 (86%)

Maps of the geographical distribution of identified EmONC facilities across Cambodia and facilities for upgrade are presented in Figures 3-1 and 3-2.

Figure 3-2

CEmONC and BEmONC Facilities for Upgrade



Indicator 3: Proportion of all Births in EmONC facilities

Recommended Level: At least 15% of all births are in EmONC facilities. (Although this is the international standard, many countries raise this level).

The proportion of all births that occur in EmONC facilities is an indication of the utilization of services by expectant women. It is recommended that at least 15% of all births should be in EmONC facilities.²³

Between July 2007 and June 2008, 11.4 % of all births in Cambodia took place in EmONC facilities and 24% of all births took place in all facilities surveyed. 11.4% of births in EmONC facilities is just below the recommended UN minimum level of 15% (Table 3.5).

Table 3.5 Proportion of Births in all EmONC and All Facilities Surveyed

Facility Type	Total No. Women Giving Birth	No. of Expected births	Proportion of Births	Recommended Level %
EmONC Facilities	38,981	342,756	11.4%*	15%
All facilities Surveyed	83,708	342,756	24 %**	

This does not include private facilities * 0.6% of births were in 3 private EmONC clinics ** 3% in private clinics surveyed

When the number of births occurring in all facilities surveyed is weighted to represent all health centers providing 3 or more deliveries a month, the proportion of births increased to 30.71%. Had all private facilities in the country been included in the study then the number of institutional births would have been higher. Nonetheless the proportion of births in all facilities is higher than the institutional delivery rate of 22%²⁴ for the country.

²³ WHO/UNFPA/UNICEF/AMDD, (2009), Monitoring Emergency Obstetric Care – A Handbook

²⁴ Ibid

Proportion of Births in all Identified EmONC Facilities by Province

At the province level, the situation varied. Only 3 out of 24 provinces met or exceeded the UN recommended level of 15% of all births in EmONC facilities. 21 provinces fell short of the recommended level. Phnom Penh had the highest proportion (73%) of births in all identified EmONC facilities; refer to table 3.6.

Table 3.6 Proportion of Births in all Identified EmONC Facilities by Province

Provinces	Total No. Women Giving Birth	No. of Expected Births	Proportion of Births in all EmONC Facilities	Recommended Level %
Phnom Penh	19,351	26,514	73.0%	15%
Paillin	449	1,973	22.8%	
Sihanouk Ville	1,078	5,797	18.6%	
Stung Treng	495	3,464	14.3%	
Koh Kong	513	4,052	12.7%	
Kampong Chhnang	1,687	16,035	10.5%	
Svay Rieng	1,201	12,070	10.0%	
Battambang	2,649	30,740	8.6%	
Rattank Kiri	529	6,150	8.6%	
Takeo	1,672	23,630	7.1%	
Kratie	709	10,193	7.0%	
Preah Vihear	368	5,296	7.0%	
Kampong Cham	3,449	50,421	6.8%	
Pursat	801	12,707	6.3%	
Kampong Thom	1,162	18,924	6.1%	
Banteay Meanchey	1,003	20,341	4.9%	
Prey Veng	1,231	25,579	4.8%	
Kampot	261	16,383	1.6%	
Siem Reap	373	28,682	1.3%	
Kampong Speu	0	22,212	0.0%	
Kandal	0	32,892	0.0%	
Mondul Kiri	0	2,432	0.0%	
Oddar Mean Chey	0	5,378	0.0%	
Kep	0	965	0.0%	
Cambodia**	38,981	382,830		

** Variations in province totals are the result of differences in the CBR between provinces

Proportion of Births in all Facilities Surveyed by Province

Table 3.7 shows the proportion of births, in all facilities, surveyed in the 24 Provinces of Cambodia. It is difficult to understand why provinces like Kampong Thom and Kampong Speu, with a large urban population, have such a low proportion of births in facilities. It could be related to the quality of service; or women may be bypassing local facilities, because of a higher level of referral to another province; or simply because the number of deliveries are not being recorded.

Table 3.7 Proportion of Births in all Facilities Surveyed by Province

Provinces	Total No. Women Giving Birth	No. of Expected Births	Proportion of Births in all Facilities Surveyed	Recommended Level %
Phnom Penh	25,453	26,514	96.0%	15%
Paillin	857	1,973	43.4%	
Koh Kong	1,078	4,052	26.0%	
Sihanouk Ville	1,494	5,797	25.8%	
Takeo	5,802	23,630	24.6%	
Kandal	7,374	32,892	22.4%	
Svay Rieng	2,703	12,070	22.4%	
Kampong Chhnang	4,357	16,035	21.2%	
Stung Treng	716	3,464	20.7%	
Preah Vihear	860	5,296	16.2%	
Pursat	1,949	12,707	15.3%	
Battambang	4,600	30,740	15.0%	
Mondul Kiri	365	2,432	15.0%	
Rattank Kiri	917	6,150	14.9%	
Banteay Meanchey	2,882	20,341	14.2%	
Kampong Cham	7,078	50,421	14.0%	
Kampot	2,290	16,383	14.0%	
Prey Veng	3,528	25,579	13.8%	
Kep	132	965	13.7%	
Oddar Mean Chey	702	5,378	13.1%	
Siem Reap	3,608	28,682	12.6%	
Kratie	1,247	10,193	12.2%	
Kampong Speu	2,033	22,212	9.2%	
Kampong Thom	1,683	18,924	8.9%	
Cambodia	83,708	382,830		

** Countries are being encouraged to develop their own standard for this level

Indicator 4: Met Need for EmONC Services

Recommended Level: 100% of women with complicated pregnancies being attended to in EmONC facilities

This is an indicator of the utilization of health services by expectant mothers, who develop complications during pregnancy, labor and delivery. It is estimated that 15% of pregnancies have complications.²⁵ To meet the UN standard, 100% of all women with complications should be treated in EmONC facilities

Table 3.8 shows that the met need was estimated to be 12.7% of all women expected to develop complications within identified EmONC facilities. The met need in all facilities surveyed was slightly higher, 14.8%. Both figures are well under the UN recommended level of 100%.

Table 3.8 Met Needs for EmONC in all EmONC and All Facilities Surveyed

Facility Type	No. of Women Treated with Complications	No. of Expected births	Percent of Met Need	Recommended Level %
EmONC Facilities	6517	342,756	12.7%	100%
All Facilities Surveyed	7622	342,756	14.8%	

This does not include private facilities * 0.5% of met need in private EmONC clinics ** 1.8% in all private clinics surveyed

At present health centers contribute very little to meeting the needs of women with complications. When health centers surveyed were weighted, to represent all health centers in Cambodia, providing more than 3 deliveries a month, only 0.4% of the expected complications were being treated. Regardless of the figure, it is clear that the majority of women with obstetric complications are not receiving much needed EmONC in health facilities throughout Cambodia.

²⁵ WHO/UNICEF/UNFPA (2008) The Indicators for Monitoring the Availability and Use of Obstetric Services: (Draft document)

Met Need for EmONC in all Identified EmONC Facilities by Province

All provinces were below the UN recommended level of 100% for met need (table 3.9). As expected, Phnom Penh treated the most complications with a met need of 66.1%. Met need in Kampong Speu, Kandal, Mondul Kiri, Oddar Mean Chey and Kep was 0% because there were no EmONC facilities. Table 3.2; availability of EmONC by province confirms this

Table 3.9 Met Need for EmONC in all Identified EmONC Facilities by Province

Provinces	No. of Women Treated with Complications	No. of Expected Births	No. of Expected Complications	% Met Need in EmONC Facilities	Recommended Level %
Phnom Penh	2,629	26,514	3,977	66.1%	100%
Stung Treng	145	3,464	520	27.9%	
Svay Rieng	487	12,070	1,810	26.9%	
Paillin	54	1,973	296	18.2%	
Kampong Cham	991	50,421	7,563	13.1%	
Pursat	240	12,707	1,906	12.6%	
Prey Veng	450	25,579	3,837	11.7%	
Kratie	174	10,193	1,529	11.4%	
Rattank Kiri	95	6,150	922	10.3%	
Kampong Chhnang	245	16,035	2,405	10.2%	
Kampong Thom	233	18,924	2,839	8.2%	
Battambang	327	30,740	4,611	7.1%	
Banteay Meanchey	176	20,341	3,051	5.8%	
Preah Vihear	45	5,296	794	5.7%	
Sihanouk Ville	38	5,797	870	4.4%	
Koh Kong	20	4,052	608	3.3%	
Siem Reap	91	28,682	4,302	2.1%	
Takeo	51	23,630	3,545	1.4%	
Kampot	26	16,383	2,457	1.1%	
Kampong Speu	0	22,212	3,332	0.0%	
Kandal	0	32,892	4,934	0.0%	
Mondul Kiri	0	2,432	365	0.0%	
Oddar Mean Chey	0	5,378	807	0.0%	
Kep	0	965	145	0.0%	
Cambodia**	6,517	382,830	57,425	12.7%	

** Variations in province totals are the result of differences in the CBR between provinces

Met Need for EmONC in all Facilities Surveyed by Province

Table 3.10 shows the met need for EmONC ranked from highest to lowest for all provinces in Cambodia. It is interesting to note that Kandal and Kampong Speu, a neighboring province of Phnom Penh, has the lowest met need for EmONC of any area while Phnom Penh has the highest. Possibly women in Kandal and Kampong Speu prefer to by-pass hospitals in favor of the more advanced services in Phnom Penh, or they are simply not happy with the service provided in Kandal and Kampong Speu.

Table 3.10 Met Need for EmONC in all Facilities Surveyed by Province

Provinces	No. of women Treated with Complications	No. of Expected Births	No. of Expected Complications	% Met Need in Facilities Surveyed	Recommended Level %
Phnom Penh	2,629	26,514	3,977	66.1%	100%
Stung Treng	173	3,464	520	33.0%	
Svay Rieng	536	12,070	1,810	29.6%	
Kep	35	965	145	24.2%	
Paillin	54	1,973	296	18.2%	
Kratie	261	10,193	1,529	17.1%	
Pursat	286	12,707	1,906	15.0%	
Kampong Cham	1,100	50,421	7,563	14.5%	
Prey Veng	501	25,579	3,837	13.1%	
Rattank Kiri	100	6,150	922	10.8%	
Kampong Chhnang	254	16,035	2,405	10.6%	
Battambang	398	30,740	4,611	8.6%	
Kampot	210	16,383	2,457	8.6%	
Kampong Thom	233	18,924	2,839	8.2%	
Oddar Mean Chey	58	5,378	807	7.2%	
Banteay Meanchey	197	20,341	3,051	6.5%	
Preah Vihear	45	5,296	794	5.7%	
Koh Kong	34	4,052	608	5.6%	
Sihanouk Ville	40	5,797	870	4.6%	
Siem Reap	190	28,682	4,302	4.4%	
Mondul Kiri	13	2,432	365	3.6%	
Takeo	104	23,630	3,545	2.9%	
Kampong Speu	86	22,212	3,332	2.6%	
Kandal	85	32,892	4,934	1.7%	
Cambodia**	7,622	382,830	57,425	14.8%	

** Variations in province totals are the result of differences in the CBR between provinces

Indicator 5: Caesarean Sections as a Percentage of all Births

Recommended Level: The proportion of estimated births **in the population** that are by caesarean section is not less than 5% or more than 15%

To save women's lives it is crucial that they have access to critical live-saving procedures such as caesarean sections. This indicator computes caesarean section deliveries as a fraction of all expected births in the country or province. This is a proxy indicator for the provision of sufficient quantities of critical services²⁶.

In the 12 months preceding the study, 1.3% of all births in CEmONC facilities were by caesarean section, compared with 1.4% in all facilities surveyed (table 3.11). This is well below the recommended minimum level of 5% and means that many women and their newborns could be suffering unnecessarily, or are at risk of continued morbidity and mortality.

Table 3.11 Caesarean Sections as a Proportion of all Expected Births

Facility Type	No. of Caesarean Sections	No. of Expected Births	Proportion of C/S Performed	Recommended Level %
EmONC Facilities	4,496	342,756	1.3%*	5%-15%
All Facilities Surveyed	4,881	342,756	1.4%**	

Does not include private facilities * 0.1% of C/S were in private EmONC clinics ** 0.4% in all private clinics surveyed

Private Facilities

About 16.8%²⁷ of all deliveries take place in public health facilities while 3.9% are in private facilities. This division of maternity care is not reflected in the study sample or findings. The proportion of caesarean sections, by the private clinics registered with the MoH, is very small; 0.1% for private EmONC facilities and 0.4% for all private facilities surveyed. Caesarean births would have been higher, had all private hospitals providing maternity services in Cambodia participated in the assessment.

²⁶ Olsen E, Ndeki S, Norheim O, (2004), Complicated deliveries, critical care and quality in Emergency Obstetric Care in Northern Tanzania - AMDD/International Journal of Gynecology and Obstetrics 87, 98—108

²⁷ National Institute of Public Health and National Institute of Statistics, (2005), Cambodia Demographic and Health Survey, Cambodia

Caesarean Sections in all CEmONC Facilities by Province

The only area to meet the UN recommended level for caesarean sections was Phnom Penh, where 9.3% of expected births for the area were by caesarean section (refer to table 3.12). Six provinces recorded no complications because the facilities in those provinces were not classified CEmONC.

Table 3.12 Caesarean Sections as a Proportion of all Births in EmONC Facilities by Province

Provinces	No. of Caesarean Sections	No. of Expected Births	Proportion of C/S Performed	Recommended Level %
Phnom Penh	2,461	26,514	9.3%	5-15%
Sihanouk Ville	102	5,797	1.8%	
Kampong Chhnang	210	16,035	1.3%	
Pursat	155	12,707	1.2%	
Battambang	297	30,740	1.0%	
Kratie	102	10,193	1.0%	
Kampong Cham	454	50,421	0.9%	
Paillin	17	1,973	0.9%	
Stung Treng	26	3,464	0.8%	
Prey Veng	184	25,579	0.7%	
Svay Rieng	88	12,070	0.7%	
Takeo	166	23,630	0.7%	
Rattank Kiri	38	6,150	0.6%	
Kampong Thom	91	18,924	0.5%	
Preah Vihear	21	5,296	0.4%	
Banteay Meanchey	66	20,341	0.3%	
Koh Kong	8	4,052	0.2%	
Kampong Speu	0	22,212	0.0%	
Kampot	0	16,383	0.0%	
Kandal	0	32,892	0.0%	
Mondul Kiri	0	2,432	0.0%	
Siem Reap	10	28,682	0.0%	
Oddar Mean Chey	0	5,378	0.0%	
Kep	0	965	0.0%	
Cambodia**	4,496	382,830	1.3%	

** Variations in province totals are the result of differences in the CBR between provinces

Caesarean Sections in all Facilities Surveyed in all Provinces

Table 3.13 presents caesarean sections as a proportion of all expected births in all facilities surveyed in each province of Cambodia. The low caesarean rate in Seam Reap could be because the Jay Varaman Hospital, a large private hospital with partly funding from the Royal Government of Cambodia and donors absorbs almost all maternity services in that province, but did not participate in the study. There are also some provinces which have no CEmONC facilities e.g. Kep has a CPA 1 facility only; therefore the province is unable to provide caesarean sections and blood transfusions. However, women are still able to access these services in a neighboring province, within two hours of travel.

Table 3.13 Caesarean Sections as a Proportion of all Births in all Facilities Surveyed by Province

Provinces	No. of Caesarean Sections	No. of Expected Births	Proportion of C/S Performed	Recommended Level %
Phnom Penh	2,461	26,514	9.3%	5-15%
Sihanouk Ville	102	5,797	1.8%	
Kampong Chhnang	210	16,035	1.3%	
Pursat	155	12,707	1.2%	
Battambang	336	30,740	1.1%	
Kratie	109	10,193	1.1%	
Kampong Cham	454	50,421	0.9%	
Paillin	17	1,973	0.9%	
Stung Treng	26	3,464	0.8%	
Prey Veng	184	25,579	0.7%	
Svay Rieng	88	12,070	0.7%	
Takeo	166	23,630	0.7%	
Kampong Speu	132	22,212	0.6%	
Kampot	99	16,383	0.6%	
Mondul Kiri	15	2,432	0.6%	
Rattank Kiri	38	6,150	0.6%	
Kampong Thom	91	18,924	0.5%	
Preah Vihear	21	5,296	0.4%	
Oddar Mean Chey	23	5,378	0.4%	
Banteay Meanchey	66	20,341	0.3%	
Koh Kong	8	4,052	0.2%	
Siem Reap	49	28,682	0.2%	
Kandal	31	32,892	0.0%	
Kep	0	965	0.0%	
Cambodia	4,881	382,830	1.4%	

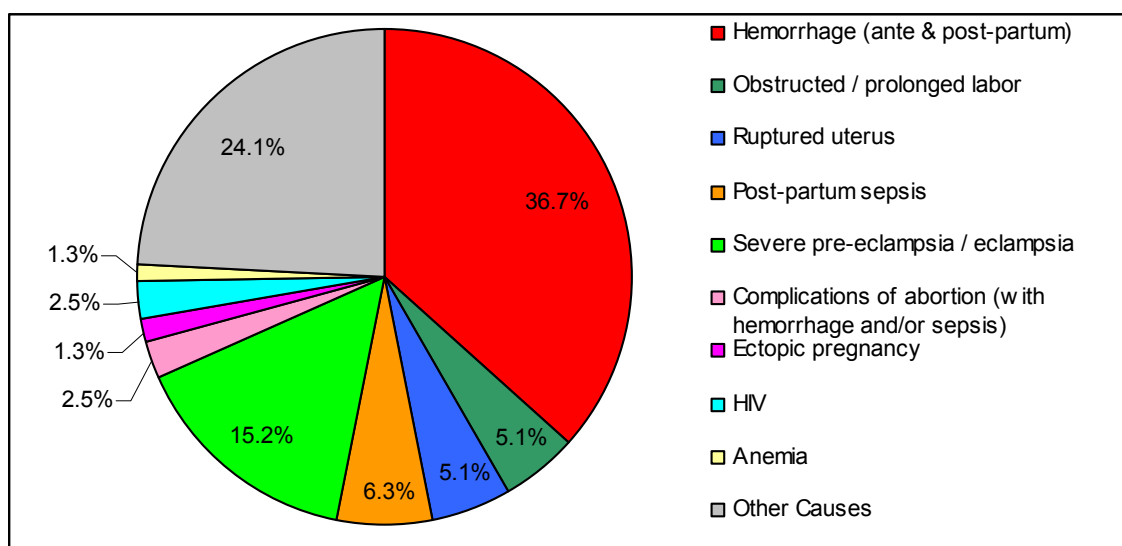
Indicator 6: Direct Obstetric Case Fatality Rate (DOCFR)

Recommended Level: The maximum acceptable level is 1%

This is a proxy indicator for the quality of services provided to women with complications of pregnancy and childbirth in EmONC facilities. It is defined as the total number of direct obstetric deaths on record in EmONC facilities, as a proportion of total number of direct obstetric complications on record.

Only 57 maternal deaths from direct causes were recorded in all facilities surveyed from July 2007-June 2008. The indirect causes of maternal death were lower (22). Refer to figure 3-3.

Figure 3-3 Causes of Maternal Deaths



When consideration is given to the official²⁸ Cambodian maternal mortality ratio of 472, per 100,000 births, and that in all facilities studied the number of women giving birth was 83,708, it would seem deaths are being under reported. Therefore care must be taken when interpreting this indicator.

The National DOCFR for all identified EmONC facilities was 0.8% and for all facilities surveyed was 0.75%. This meets the UN recommended level of 1% or less (table 13.14). However, because of the under reporting of deaths, this needs to be interpreted in the context of the previous indicators, which show that women are not utilizing EmONC services and their need for EmONC is not being met.

²⁸ National Institute of Public Health and National Institute of Statistics, (2005), Cambodia Demographic and Health Survey, Cambodia

Table 3.14 Direct Obstetric Case Fatality Rate in all EmONC Facilities and all Facilities Surveyed

Facility Type	No. of Obstetric Deaths due to Direct causes	No. of complicated cases	DOCFR	Recommended Level %
EmONC Facilities	49	6517*	0.8%*	≤ 1
All Facilities Surveyed	57	7622**	0.75%**	

*244 complications and 0.0% were in the identified private EmONC clinics **924 and 0.0% were in private clinics

DOCFR in all EmONC Facilities by Province

Seventeen provinces met the UN recommended level of 1% or less; while 7 provinces were above the level (refer to table 3.15). The highest DOCFR was reported by Takeo (7.8%) followed by Kratie (4.0%). This could indicate quality of care is inadequate. However, there could be another explanation. For example, long delays in reaching EmONC facilities can result in women suffering poor condition on arrival. Also the facility might be the end point of referral, where women with the most serious complications are referred.

Five provinces recorded no obstetric complications and 12 have reported no maternal deaths. Having no maternal deaths or complications might indicate that women with serious complications are not being brought to the facility, or cases are not reported.

Table 3.15 Direct Obstetric Case Fatality Rate in all EmONC Facilities by Province

Provinces	No. of Obstetric Deaths due to Direct causes	No. of Complicated Cases	DOCFR	Recommended Level %
Takeo	4	51	7.8%	≤ 1
Kratie	7	174	4.0%	
Preah Vihear	1	45	2.2%	
Banteay Meanchey	3	176	1.7%	
Pursat	4	240	1.7%	
Svay Rieng	6	487	1.2%	
Siem Reap	1	91	1.1%	
Battambang	3	327	0.9%	
Kampong Thom	2	233	0.9%	
All Cambodia	49	6,517	0.8%	
Phnom Penh	14	2,629	0.5%	
Kampong Chhnang	1	245	0.4%	
Prey Veng	2	450	0.4%	
Kampong Cham	1	991	0.1%	
Kampong Speu	0	0	0.0%	
Kampot	0	26	0.0%	
Kandal	0	0	0.0%	
Koh Kong	0	20	0.0%	
Mondul Kiri	0	0	0.0%	
Rattank Kiri	0	95	0.0%	
Sihanouk Ville	0	38	0.0%	
Stung Treng	0	145	0.0%	
Oddar Mean Chey	0	0	0.0%	
Kep	0	0	0.0%	
Paillin	0	54	0.0%	
Cambodia	49	6,517	0.8%	

** Variations in province totals are the result of differences in the CBR between provinces

DOCFR in all Facilities Surveyed by Province

The DOCFR in all facilities surveyed is presented in table 3.16. Similar to the baseline for the EmONC facilities, the under reporting of deaths is possibly the reason why the DOCFR meets the recommended level. Because of the large unmet need for EmONC in these provinces, this is possibly more a reflection of quality of the reporting and data that is not being recorded.

Table 3.16 Direct Obstetric Case Fatality Rate in all Facilities Surveyed by Province

Provinces	No. of Obstetric Deaths due to Direct causes	No. of Complicated Cases	DOCFR	Recommended Level %
Kampong Speu	4	86	4.7%	≤ 1
Takeo	4	104	3.9%	
Kratie	7	261	2.7%	
Preah Vihear	1	45	2.2%	
Banteay Meanchey	3	197	1.5%	
Pursat	4	286	1.4%	
Kampong Thom	3	233	1.3%	
Kandal	1	85	1.2%	
Svay Rieng	6	536	1.1%	
Battambang	4	398	1.0%	
Rattank Kiri	1	100	1.0%	
Phnom Penh	14	2,629	0.5%	
Siem Reap	1	190	0.5%	
Kampong Chhnang	1	254	0.4%	
Prey Veng	2	501	0.4%	
Kampong Cham	1	1,100	0.1%	
Kampot	0	210	0.0%	
Koh Kong	0	34	0.0%	
Mondul Kiri	0	13	0.0%	
Sihanouk Ville	0	40	0.0%	
Stung Treng	0	173	0.0%	
Oddar Mean Chey	0	58	0.0%	
Kep	0	35	0.0%	
Paillin	0	54	0.0%	
All Cambodia	57	7,622	0.75%	

Indicator 7: Intrapartum and very Early Neonatal Death Rate

No standard has been set; a maximum level will be determined after it has been tested in various circumstances.

Stillbirths and early neonatal deaths are linked to the quality of antenatal and obstetric care. The numerator is the sum of intrapartum deaths and very early neonatal deaths that occur in the first 24-hours of life taking place in the facility, during a specific time-frame. The denominator is all women giving birth in the facility during the same time period.

The quality of data recorded on stillbirths varied from facility to facility. Figure 3.4 shows stillbirths in all public health facilities surveyed. Because the objective of this indicator is to measure the quality of newborn and intrapartum care births, less than 2.5kg are excluded and stillbirth and neonatal deaths without birth weight were excluded.

Figure 3-4 Stillbirths in All Public Health Facilities Surveyed

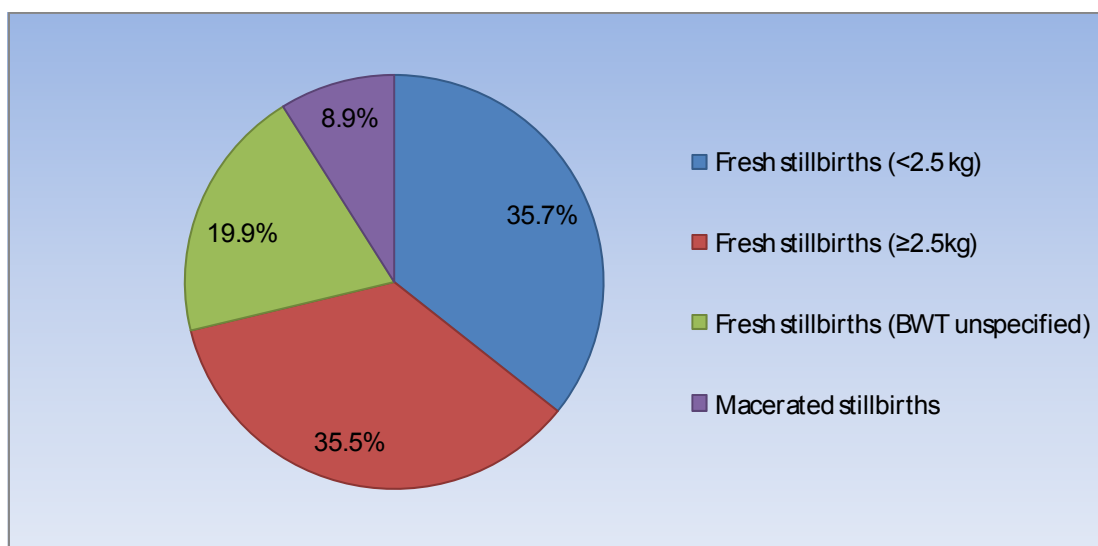


Table 3.17 shows the calculated intrapartum and very early neonatal death rate was 1.24% for EmONC facilities and 0.75% for all surveyed.

Table 3.17 Intrapartum and Early Neonatal Death Rate in all EmONC and All Facilities Surveyed

Facility	Fresh Stillbirths ≥ 2.5kg + Early Neonatal Deaths in the First 24-hours ≥ 2.5kg **	No of Women Giving Birth	Intrapartum and very early neonatal Death Rate
EmONC Facilities	483	38981	1.2%
All Facilities Surveyed	625	83708	0.75%

** 283 Fresh stillbirths with an unspecified birth weight were excluded from the sample

As this indicator is being tested, it was decided to calculate it using different numerators. However, the use of fresh stillbirths $\geq 2.5\text{kg}$ + early neonatal deaths in the first 24-hours $\geq 2.5\text{kg}$ had the most meaning which has been interpreted as: for every 1000 women giving birth in EmONC facilities there are 12 intraparutm or early neonatal deaths and for all facilities surveyed there are 8 intraparutm or early neonatal deaths.

Indicator 8: Proportion of Maternal Deaths from Indirect Causes in EmONC Facilities

This indicator does not lend itself to a recommended level; instead it highlights the larger social and medical context of a country or region. It has implications for intervention strategies, especially intervention in addition to EmONC, where indirect causes kill many women of reproductive age.²⁹

The numerator for the indicator is maternal deaths due to indirect maternal causes taking place in EmONC facilities during a specific time period. Table 3.18 shows that when the proportion of maternal deaths from indirect causes in EmONC facilities is computed, it was 29.0% and for all facilities surveyed 27.8%.

Table 3.18 Proportion of Maternal Deaths from Indirect Causes

Facility	No of Deaths Due of Indirect Causes	All Maternal Deaths	Proportion of Maternal Deaths from Indirect Causes
EmONC Facilities	20	69	29.0%
All Facilities Surveyed	22	79	27.8%

²⁹ Direct quote from AMDD Guidelines, p. 49

3.2 Summary

Cambodia

The baseline assessment found that 12 additional CEmONC facilities are required and there is a critical shortage of 87 BEmONC facilities, which are poorly distributed. Five provinces are without any form of EmONC services. There is an under-utilization of EmONC. Between July 2007 and June 2008, 11.4 % of all births in Cambodia took place in EmONC facilities. This is just below and above the recommended UN minimum level of 15%.

The met need in the 44 identified EmONC facilities was 12.7 %³⁰ whereas it should be 100%, if all women with complications were treated. It is clear that the majority of women with obstetric complications are not receiving much needed EmONC in health facilities throughout Cambodia.

There are women requiring critical services, such as caesarean sections, who are not receiving them. Only 1.3% of all births in the identified EmONC facilities were by caesarean section. This is well below the recommended minimum level of 5% and means that many women and their newborns could be suffering unnecessarily or are at risk of continued morbidity and mortality.

The National DOCFR for all identified EmONC facilities was 0.8% and for all facilities surveyed was 0.75%. This meets the UN recommended level of 1% or less. However, because of the under reporting of deaths, this needs to be interpreted in the context of the previous indicators, which show that women are not utilizing EmONC services and their need for EmONC is not being met.

Provinces

The provinces have been ranked according to met need, from highest to lowest (see table 3.19). As expected, Phnom Penh treated the most complications with a met need of 66.1%. Kampong Speu, Kandal, Mondul Kiri, Oddar Mean Chey and Kep recorded no complications. These were also the provinces that had no EmONC facilities.

Some of the largest provinces were also toward the bottom of the list. This could be because all private facilities providing maternity services were not captured in the study. For example, in Seam Reap, Jay Varaman Hospital provides maternity services but was not included as it is not registered with the MoH even though it is partly funding from the Royal Government of Cambodia and donors.

³⁰ 12.7% in identified EmONC facilities

Table 3.19

Summary of Baseline for all EmONC Facilities Sorted by Met Need

	Current availability of EmONC Services		Geographic Distribution*	Proportion of births in EmONC facilities	Met Need	Caesarean deliveries as a proportion of all births	Direct Obstetric Case Fatality rate (DOCFR)
	Minimum 1 CEmONC and 4 BEmONC per 500,000 population		Minimum level is met at sub-national level	Minimum 15%	At least 100% of the estimated 15% of expected births	Minimum 5% Maximum 15%	Minimum 1%
	<u>CEmONC</u>	<u>BEmONC</u>					
Phnom Penh	5	1	No	73.0%	66.1%	9.3%	0.5%
Stung Treng	1	0	No	14.3%	27.9%	0.8%	0.0%
Svay Rieng	1	1	No	10.0%	26.9%	0.7%	1.2%
Paillin	1	0	No	22.8%	18.2%	0.9%	0.0%
Kampong Cham	1	6	No	6.8%	13.1%	0.9%	0.1%
Pursat	1	0	No	6.3%	12.6%	1.2%	1.7%
Prey Veng	2	3	No	4.8%	11.7%	0.7%	0.4%
Kratie	1	0	No	7.0%	11.4%	1.0%	4.0%
Rattank Kiri	1	0	No	8.6%	10.3%	0.6%	0.0%
Kampong Chhnang	1	1	No	10.5%	10.2%	1.3%	0.4%
Kampong Thom	2	1	No	6.1%	8.2%	0.5%	0.9%
Battambang	2	1	No	8.6%	7.1%	1.0%	0.9%
Banteay Meanchey	1	2	No	4.9%	5.8%	0.3%	1.7%
Preah Vihear	1	0	No	7.0%	5.7%	0.4%	2.2%
Sihanouk Ville	1	0	No	18.6%	4.4%	1.8%	0.0%
Koh Kong	1	0	No	12.7%	3.3%	0.2%	0.0%
Siem Reap	0	2	No	1.3%	2.1%	0.0%	1.1%
Takeo	2	0	No	7.1%	1.4%	0.7%	7.8%
Kampot	0	1	No	1.6%	1.1%	0.0%	0.0%
Kampong Speu	0	0	No	0.0%	0.0%	0.0%	0.0%
Kandal	0	0	No	0.0%	0.0%	0.0%	0.0%
Mondul Kiri	0	0	No	0.0%	0.0%	0.0%	0.0%
Oddar Mean Chey	0	0	No	0.0%	0.0%	0.0%	0.0%
Kep	0	0	No	0.0%	0.0%	0.0%	0.0%
Cambodia all Provinces	25**	19**	No	11.4%	12.7%	1.3%	0.8%

* Minimum level not met. There is a shortage of EmONC at health center level nationwide. ** This does not include private facilities 1 CEmONC and 1 BEmONC

4. Findings: Signal Functions and Other Vital Services

In all facilities surveyed, fieldworkers asked about the performance of signal functions and other services considered vital to the outcome of the mother and newborn, in the 3 and 12 month period preceding the survey. This section looks more closely at the performance and non performance of these signal functions and vital services.

4.1 Signal Functions Used to Identify EmONC Facilities

As discussed in section 3 of this report, health facilities that performed the first seven signal functions (see table 4.1) were classified BEmONC facilities, while those that performed all nine signal functions were classified CEmONC.

Table 4.1 Signal Functions Used to Identify Basic and Comprehensive EmONC Facilities³¹

Basic EmONC services	Comprehensive EmONC services
1. Administer parenteral** antibiotics	Perform signal functions 1-7, plus:
2. Administer uterotonic drugs (parenteral oxytocin, parenteral ergometrine, misoprostol) ³²	8 Perform surgery (caesarean section)
3. Administer parenteral anticonvulsants for pre-eclampsia and eclampsia (magnesium sulphate, diazepam)	9. Perform blood transfusion
4. Perform manual removal of placenta	
5. Perform removal of retained products (MVA, misoprostol, dilatation and curettage)	
6. Perform assisted vaginal delivery (vacuum extractor, forceps)	
7. Perform neonatal resuscitation (with bag and mask)	

A Basic EmONC facility is one that performs all functions 1-7.

A Comprehensive EmONC facility is one that performs all functions 1-9.

** Parenteral administration of drugs means by injection or intravenous infusion.

A list of signal functions performed between November 2007 and December 2008, by each health facility surveyed, can be found in appendix 4.

³¹ Adapted from The Indicators for Monitoring the Availability and Use of Obstetric Services: A Handbook UNICEF, UNFPA, WHO, 1997 p 26 [5]

³² Hofmeyr, G.J., et al., Misoprostol to treat postpartum hemorrhage: a systematic review. BJOG: An Internal Journal of Obs Gyn, (200)5. 112(5): p. 547-553.

4.2 Performance of EmONC Signal Functions

Basic Signal Functions

Of the 307 health facilities assessed, 25 hospitals were able to demonstrate performance of all 7 basic EmONC functions and the additional 2 functions required for the classification of a CEmONC facility. Another 19 had performed all 7 basic signal functions in the 3 months prior to the survey. They were classified as BEmONC facilities.

There were 4 referral hospitals that would have qualified as either a BEmONC or CEmONC facilities. However 3 did not perform manual removal of a placenta and the other had not administered anticonvulsants in the three months before the survey. Section 4 of this report provides more information on the performance of signal functions.

Table 4.2 shows that the administration of oxytocics (100%) was the most frequently performed signal function for both hospitals and health centers. Performed less frequently were administration of parenteral anticonvulsants (24.4%), assisted vaginal delivery (25.7%), neonatal resuscitation (50.8%), administration of parenteral antibiotics (58.3%), removal of retained products (58.6%) and manual removal of placenta (61.9%).

The percentage of facilities performing signal functions in the last 3 months and the last 12 months were slightly different. From table 4.2 it can be seen that there was a small increase in the performance of manual removal of placenta (61.9% to 81.7%), removal of retained products (58.6% to 70.7%) and neonatal resuscitation (50.8% to 73.9%) over the 12 months period. However; for assisted vaginal delivery and administration of anticonvulsants there was little difference. This indicates that if a facility had not performed the function in the 3 months prior to the study they had possibly not performed it at all.

Table 4.2 Basic EmONC Functions Performed in Hospitals and Health Centers

Signal Functions	% of Facilities Performing Signal Function in Last 3 Months		% of Facilities Performing Signal Function in Last 12 Months	
	No	%	No	%
Parenteral antibiotics	179	58.3	185	60.3
Parenteral oxytocics	307	100	-	-
Parenteral anticonvulsants	75	24.4	96	31.3
Manual removal of placenta	190	61.9	251	81.7
Removal of retained products	180	58.6	217	70.7
Assisted vaginal delivery	79	25.7	89	29.0
Neonatal resuscitation	156	50.8	227	73.9

Comprehensive Signal Functions

From table 4.3 it can be seen that there was little variation in the percentage of facilities performing comprehensive signal functions in the last 3 and 12 months. This may be due to a lack of equipment / supplies or human resources in a few facilities. However; a more feasible explanation is that according to MoH CPA Guidelines, up to now, only 49 hospitals can perform

caesarean sections. About 83.7% of this number performed a caesarean section in the three months prior to the assessment leaving less 16.3% who might have performed the function in the 12 months prior to the study.

Table 4.3 Comprehensive EmONC Signal Functions Performed in Hospitals

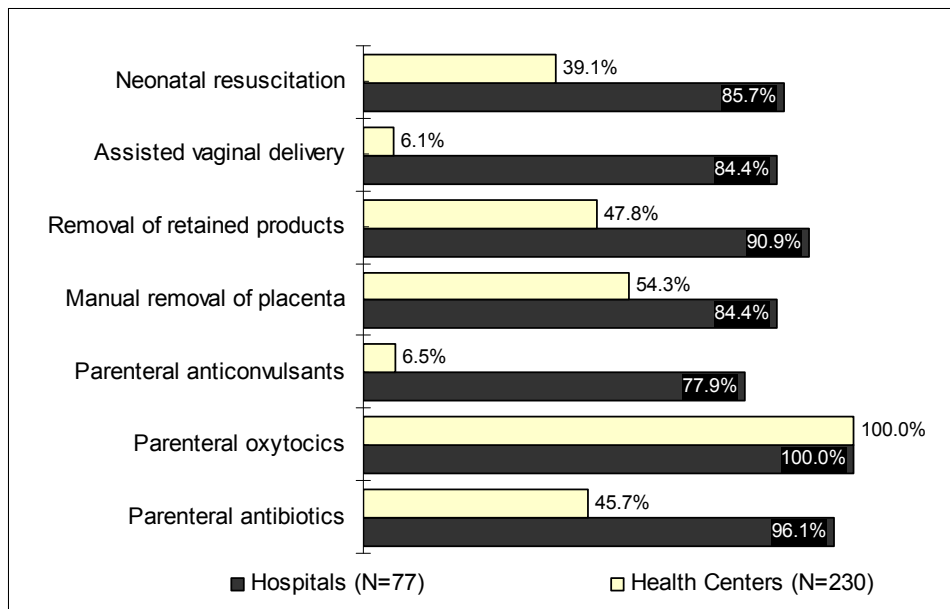
Signal Functions	% of Facilities Performing Signal Function in Last 3 Months		% of Facilities Performing Signal Function in Last 12 Months	
	No	%	No	%
Blood Transfusion	31	40.3	35	45.4
Caesarean Section	41**	53.2**	43	55.8**

** MoH Guidelines, up to now, only 49 hospitals can perform caesarean sections. 83.7% of this number performed a caesarean section in the three months prior to the assessment

4.3 Signal Functions: Comparison between Hospitals and Health Centers

Figure 4-1 compares basic signal functions performed by hospitals with health centers. Except for parenteral oxytocics, all signal functions are performed less frequently by health centers. Low performing signal functions such as assisted vaginal delivery and administration of parenteral anticonvulsants are performed by more than 77% of hospitals, when health centers are excluded. However, there is no reason why a well equipped health center, with proficient staff, can't perform these basic functions and provide BEmONC.

Figure 4-1 Basic Signal Functions Performed by Health Centers and Hospitals



4.4 Reasons for Non-Performance of Basic Signal Functions

Basic Signal Functions

When a particular signal function was not performed, the staff at a facility was asked the reason why. From the table 4.4 it can be seen that ‘policy issues’ or ‘no indication’ were popular responses. Supplies, equipment and drugs were obstacles to performing assisted vaginal delivery and administering parenteral antibiotics. Management and training issues were hardly mentioned.

Table 4.4 Reasons for Not Performing Selected Signal Functions in all Facilities Surveyed

Signal Function Not Performed	No.	%	Main Reason for Not Performing a Signal Function	No.	%
Parenteral antibiotics	148	41.7	Training issues	2	1.6
			Supplies / equipment /drug issues	41	32
			Management issues	4	3.1
			Policy issues	69	53.9
			No indication	12	9.4
Parenteral anticonvulsants	232	75.6	Training issues	10	4.3
			Supplies / equipment /drug issues	8	3.4
			Policy issues	20	8.6
			No indication	194	83.6
Manual removal of placenta	117	38.1	Training issues	3	2.6
			Supplies / equipment /drug issues	1	0.9
			Policy issues	7	6
			No indication	106	90.6
Removal of retained products	127	41.4	Training issues	14	11
			Supplies / equipment /drug issues	11	8.7
			Policy issues	22	17.3
			No indication	80	63
Assisted vaginal delivery	228	74.3	Training issues	10	4.4
			Supplies / equipment /drug issues	36	15.8
			Management issues	1	0.4
			Policy issues	118	51.8
			No indication	63	27.6
Neonatal resuscitation	151	49.2	Training issues	2	1.3
			Supplies / equipment /drug issues	3	2
			No indication	146	97

Policy issues relate to MPA guidelines, which only allow health centers to keep a limited number of parenteral drugs in stock. Midwives, who are the main providers of care at the health center, have no authority to perform most signal functions. While ‘no indication’ might be true in some cases, the UN EmONC Indicators demonstrate that there are women and newborns that need EmONC, but are not receiving it. Supplies were only an issue for the administration of parenteral antibiotics (41.9%) and this is linked to policy as discussed.

Comprehensive EmONC Signal Functions

Blood Transfusions

Where blood transfusions had not been performed in the 3 months before the survey, hospitals were asked the main reason for not providing the service. Reasons given were: policy issues (65.2%), no indication (23.9%), and inadequacy of supplies and equipment (8.7%). Refer to table 4.5. As already discussed, MoH guidelines do not allow CPA 1 hospitals to perform surgery even though they may perform a blood transfusion with blood supplied by a blood bank or CPA 2 or 3 facilities. This is not clearly understood by some referral hospitals or they are not willing to perform blood transfusion and directly refer to CPA 2 or CPA 3 hospitals.

Table 4.5 Missing Signal Functions for CEmONC in Hospitals

Signal Function Not Performed	No.	%	Main Reason for Not Performing a Signal Function	No.	%
Blood Transfusion	46	59.7%	Training issues	1	2.2
			Supplies / equipment /drug issues	4	8.7
			Policy issues	30	65.2
			No indication	11	23.9
Caesarean Section	36	46.8%	Training issues	1	2.8
			Supplies / equipment /drug issues	1	2.8
			Policy issues	32	88.9
			No indication	2	5.6

Caesarean Sections

Table 4.5 shows, policy issues (88.9%) were the main reason for not performing caesareans. This again relates to the official classification of referral hospitals. 28 of the 77 hospitals surveyed were classified as CPA 1. A CPA 1 referral hospital has no “grand surgery” (without anesthesia) but at least it should provide an obstetric service, where women with complications are treated or stabilized and, if appropriate, referred to a higher level facility which has an operating theatre,³³ (CPA 2, CP3 or national hospital).

³³ Ministry of Health, (2006), National Guidelines on Complementary Package of Activities for Referral Hospital Development from 2006 – 2010. Kingdom of Cambodia

4.5 Other Services Vital to Mother and Newborns

Table 4.6 shows other services or functions considered vital to the outcome of both mothers and their unborn babies. Health staff were asked if they had performed these services 3 months prior to the survey. Where a service was not performed health staff were asked if it had been performed within the last 12 months. Except for breech delivery there was very little difference between performance of functions when the two time periods. This indicates that with the exception of breech delivery facilities that had not performed the function in the 3 months prior to the assessment more than likely, did not perform it at all.

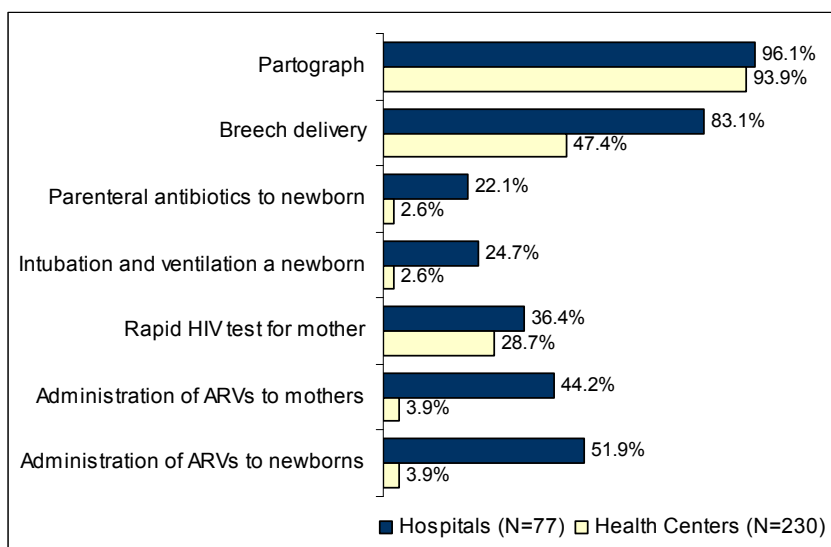
Table 4.6 Other Services Vital to Mothers and Newborns Performed in all Health Facilities

Signal Functions	% of Facilities Performing Signal Function in Last 3 Months		% of Facilities Performing Signal Function in Last 12 Months	
	No	%	No	%
Partograph	290	94.5	294	95.8
Breech Delivery	173	56.4	262	85.3
Parenteral antibiotics to newborn	23	7.5	37	12.0
Newborn intubation & ventilation	25	8.1	29	9.4
Rapid HIV test for mother	94	30.6	97	31.6
ARV to mothers	43	14.0	54	17.6
ARV to newborns	49	16.0	64	20.8

4.6 Other Vital Services: Comparison between Hospitals and Health Centers

Figure 4-2 compares the selected services considered vital to the outcome of the mother and newborn, provided by hospitals with health centers. An exception is the use of a partograph by 96.1% and 93.9% of hospitals and health centers respectively. The high usage of partographs could be explained by an incentive payment for deliveries linked to a completed partograph.

Figure 4-2 Hospitals and Health Centers Performing Selected Vital Services



Only 22.1% of hospitals and 2.6% of health centers gave parenteral antibiotics to newborns. Breech deliveries were performed by 83.1% of hospitals and 47.4% of health centers. Rapid testing for HIV was performed by only 36.4% of hospitals and 28.7% of health centers. 51.9% of hospitals provided antiretroviral to newborns and 44.2% to mothers while only 3.9% of health centers provided the same services.

Non-Performance of Services Vital to Mothers and Newborns

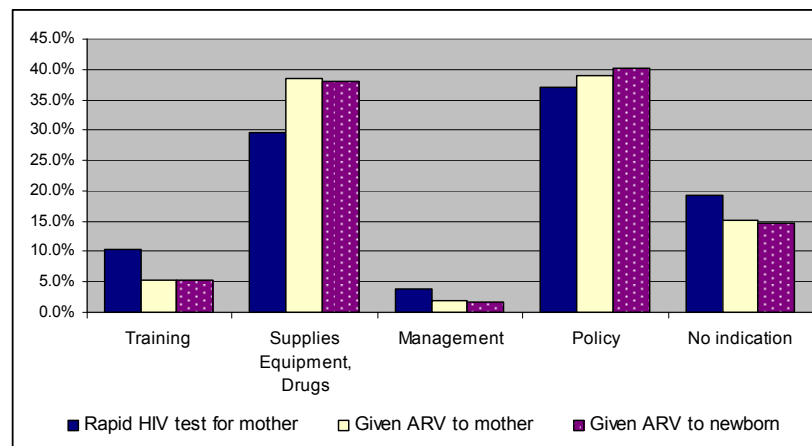
Table 4.7 shows that policy issues (23.7-39.0%) and no indication (45.7%-62.9%) were the main reasons for not administering parenteral antibiotics and performing intubation and ventilation on the newborn.

Table 4.7 Reasons for Non-Performance of Services for Mothers and Newborns

Vital Service Not Performed	No.	%	Main Reason for Not Performing Vital Service	No.	%
Partograph	17	5.5	Training issues	8	47.1
			Supplies / equipment /drug issues	4	23.5
			Management issue	5	29.4
Breech Delivery	134	43.6	Training issues	1	0.7
			Policy issues	3	2.2
			No indication	130	97.0
Parenteral antibiotics to newborn	284	92.5	Training issues	17	6.0
			Supplies / equipment /drug issues	15	5.3
			Management issue	6	2.1
			Policy issues	67	23.7
			No indication	178	62.9
Newborn intubation & ventilation	282	91.9	Training issues	24	8.5
			Supplies / equipment /drug issues	13	4.6
			Management issue	6	2.1
			Policy issues	110	39.0
			No indication	129	45.7

Figure 4-3 shows that between 30 to 40% of health facilities gave policy issues and supplies, equipment and drugs as the main reason for non performance of Rapid HIV testing of HIV for mothers and ARV to mothers and newborns. Training was an issue for less than 10% of facilities.

Figure 4-3 Reasons for Non-Performance of Rapid HIV Test and ARV to Mothers and Newborns



4.7 Summary

Performance of Signal Functions and Services Vital to Mothers and Newborns

All facilities were asked about the performance of signal functions and services vital to mother and newborns in the 3 months prior to the survey.

Signal Functions

The administration of oxytocics (100%) was the most frequently performed signal function for all facilities surveyed. Performed less frequently were administration of parenteral anticonvulsants (24.4%), assisted vaginal delivery (25.7%), neonatal resuscitation (50.8%), blood transfusion (40.3%), administration of parenteral antibiotics (58.3%), removal of retained products (58.6%) and manual removal of placenta (61.9%).

Other Services Vital to Mothers and Newborns

Only 22.1% of hospitals and 2.6% of health centers gave parenteral antibiotics to newborns. Breech deliveries were performed by 83.1% of hospitals and 47.4% of health centers. Rapid testing for HIV was undertaken by less than 36.4% facilities surveyed. Only 51.9% of hospitals and 3.9% of health centers provided antiretroviral to mothers and newborns.

Reasons for Non-Performance

The main reasons for non-performance were ‘policy issues’ or ‘no indication’. Policy issues relate to MPA and CPA guidelines which only allow health centers and referral hospital to perform certain procedures and keep specific drugs in stock. While ‘no indication’ might be true, the UN EmONC Indicators show that women and newborns are not receiving EmONC. Training was an issue for less than 24% of the facilities.

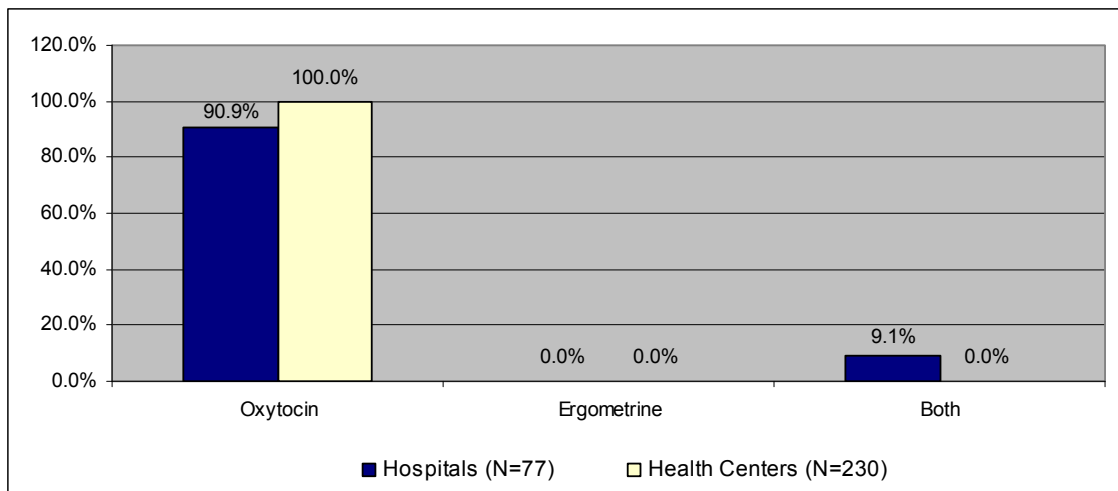
5. Findings: Current and Best Practice

5.1 Current Practice

Use of Oxytocics

All hospitals and health centers surveyed had administered parenteral oxytocics in the three months preceding the survey. Figure 5-1 shows that most hospitals (90.9%) and all health centers used oxytocin while only 9.1% of hospitals used both oxytocin and ergometrine.

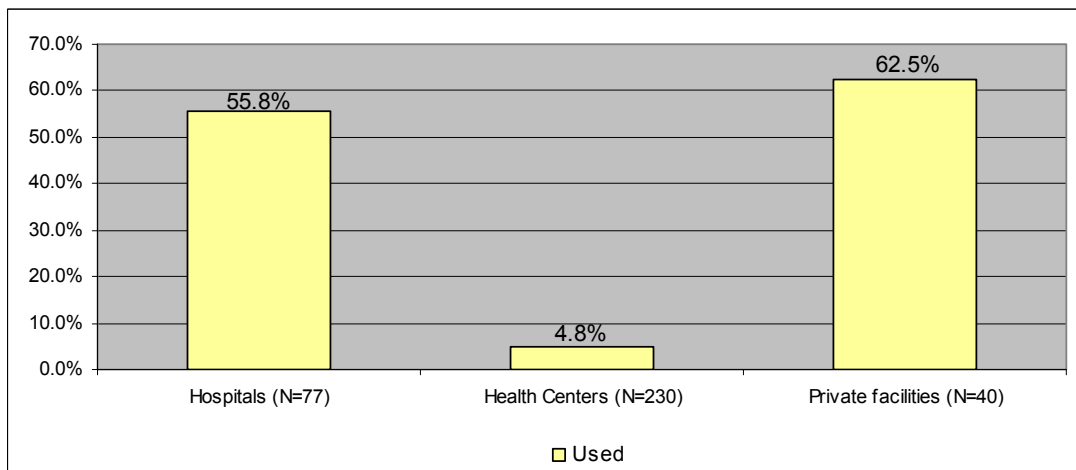
Figure 5-1 Type of Oxytocics used in Hospitals and Health Centers



Use of Misoprostol

Figure 5-2 shows that misoprostol is available in over half of hospitals and private clinics and 4.8% of the health centers. **Misoprostol** is not on the essential drug list for health centers; this is possibly why usage is low.

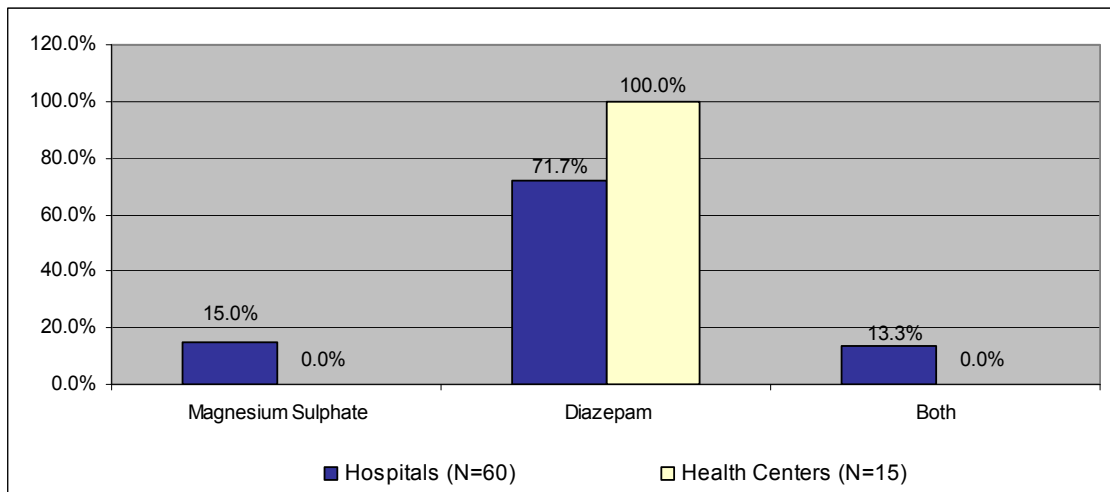
Figure 5-2 Use of Misoprostol in Hospitals, Health Centers and Private Clinics



Use of Anticonvulsants

Diazepam was the most popular anticonvulsant for both hospitals (71.7%) and health centers (100%) Refer to figure 5-3. Magnesium sulphate which has been shown³⁴ to be more superior to diazepam was only used in 15% of hospitals.

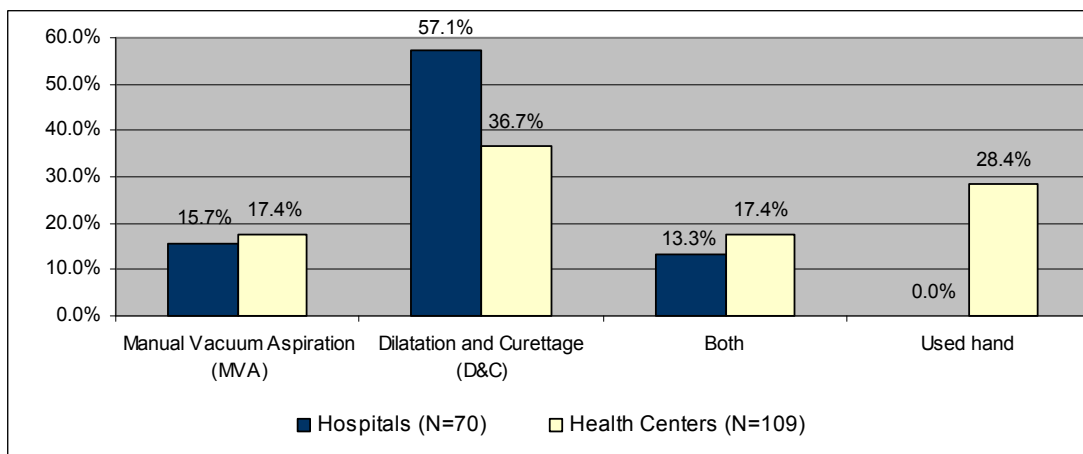
Figure 5-3 Use Different Types of Anticonvulsants in Hospitals and Health Centers



Methods Used to Remove Products of Conception

Figure 5-4 shows that dilatation & curettage was the most popular method for removal of products of conception for both hospitals (57.1%) and health centers (36.7%). MVA (15.7%) and ‘both’ (13.3%) were the other methods of choice for hospitals. However, at 28.4% of health centers, staff indicated that they preferred to use their hand.

Figure 5-4 Type of Method Used to Remove Retained Products of Conception

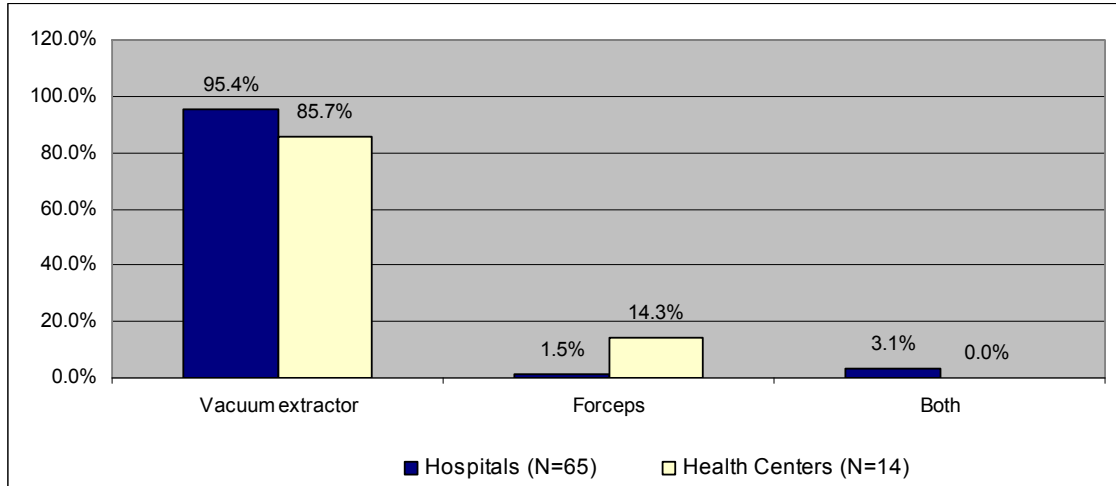


³⁴ Chien PFW, Khan KS, Arnott N. (1996), Magnesium sulphate in the treatment of eclampsia and preeclampsia: an overview of the evidence from randomised trials BJOG: An International Journal of Obstetrics & Gynaecology (1996) V103: 11 pg.1085-1091

Instruments Used for Assisted Delivery

For both hospitals (95.4%) and health centers (85.7%) vacuum extraction was the most popular method for assisted vaginal delivery (figure 5-5). Forceps were rarely used. Overall, the use of instruments is low. This is reflected in the signal functions where only 25.7% of all hospital and health centers performed assisted vaginal delivery.

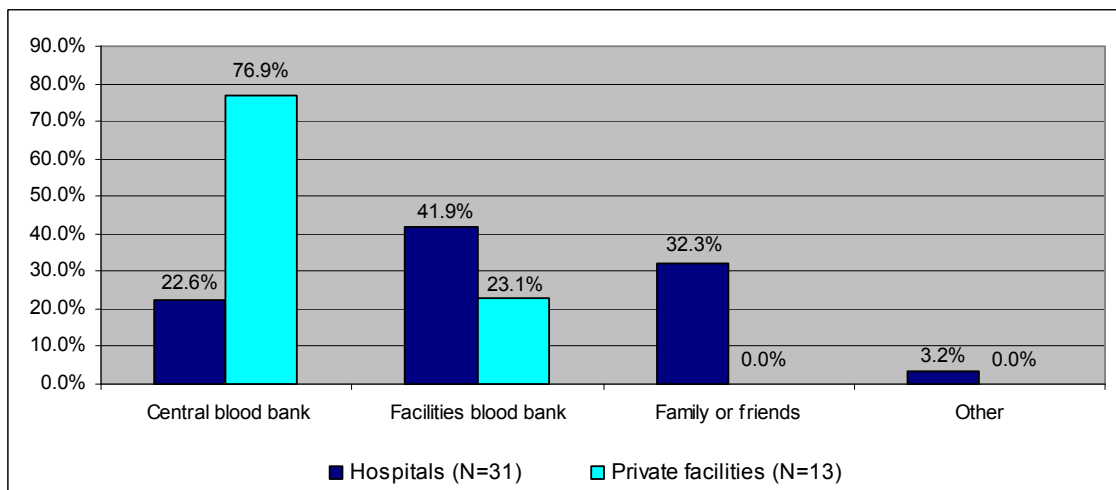
Figure 5-5 Type of Instrument Used for Assisted Vaginal Delivery



Source of Blood Supply

The source of blood for obstetric emergencies differs between public and private hospitals (see figure 5-6). For private clinics the main source is the central blood bank (76.9%) followed by the blood bank at the health facility (23.1%). For public hospitals, the source is not so clear. Blood is from 4 sources: the most popular is the facility blood bank (41.9%), followed by family or friends (32.3%), central blood bank (22.6%) and other (3.2%).

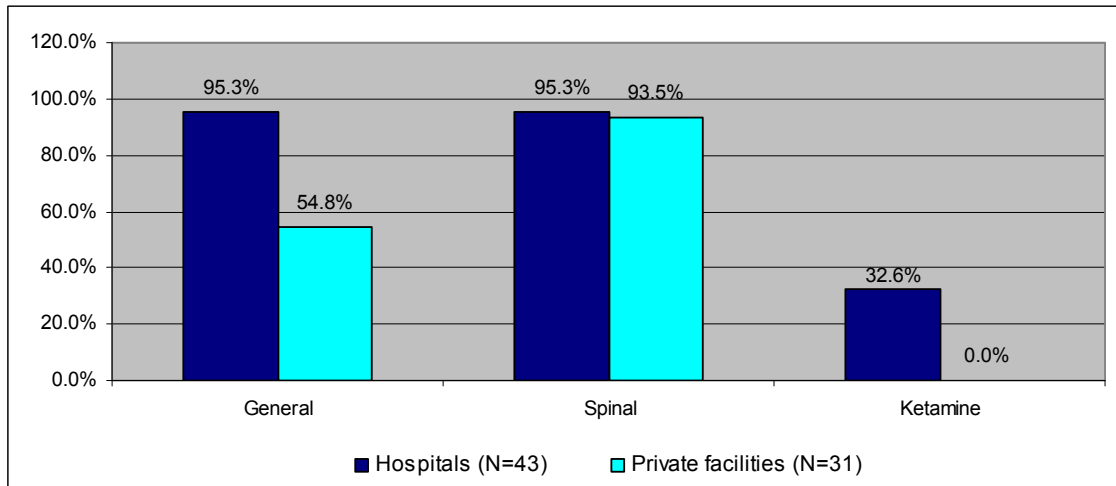
Figure 5-6 Source of Blood Supply for Transfusions in Hospitals and Private Facilities



Type of Anesthesia

Figure 5-7 shows that the most often used form of anesthesia for public hospitals was general (95.3%). For private facilities, spinal (93.5%) was more popular followed by a 'general' (54.8%). Ketamine (32.6%) was less used with hospitals, while private facilities did not use it at all.

Figure 5-7 Type of Anesthesia for Caesarean Sections in Hospitals and Private Clinics



5.2 Best Practice

Magnesium sulphate has been shown to be superior to diazepam, phenytoin and other sedatives or anticonvulsants in the management and prevention of eclampsia.³⁵ It is not always on the national essential drug list which helps explain why only 15% of hospitals had it in stock.

5.3 Safe Motherhood Protocols

When interviewing hospital staff, field workers asked questions about the use and knowledge of Safe Motherhood Protocols. 77.8% of all health centers and 73.7% of hospitals surveyed had safe motherhood protocols in the facility. Most (86.7%) hospital staff and only 67% of health centers staff knew what they were for. More than half (64.3%) of health centers and 78.3% of hospitals were using them.

³⁵ Chien PFW, Khan KS, Arnott N. (1996), Magnesium sulphate in the treatment of eclampsia and preeclampsia: an overview of the evidence from randomised trials BJOG: An International Journal of Obstetrics & Gynaecology (1996) V103: 11 pg.1085-1091

5.4 Summary

Current Practice

Drugs of Choice: All health facilities surveyed had administered parenteral **oxytocics** in the three months preceding the survey. Oxytocin was the drug of choice and was used almost exclusively. **Diazepam** was the **anticonvulsant** of choice for 71.7% all facilities surveyed.

Removal of Products of Conception: Dilatation & curettage was the most popular method for removal of products of conception for 57.1% of hospitals and 36.7% of health centers. MVA (15.7%) was the other methods of choice for hospitals. 28.4% of health centers staff indicated that they preferred to use their hand.

Assisted Vaginal Delivery: For both hospitals (95.4%) and health centers (85.7%) vacuum extraction was the most popular method for assisted vaginal delivery. Forceps were rarely used.

Source of Blood: For private clinics, the main source of blood is the central blood bank (76.9%) followed by the blood bank at the health facility (23.1%). For public hospitals, blood comes from 4 sources: the facility blood bank (41.9%), followed by family or friends (32.3%), central blood bank (22.6%) and other (3.2%). Availability of blood 24-hour a day and laboratory facilities for cross matching and grouping of blood needs improvement.

Best Practice

Magnesium sulphate could reduce maternal mortality in Cambodia. However, it is not always on the national essential drug list which helps explain why only 15% of hospitals had it in stock.

Safe Motherhood protocols were available in more than 73% of all facilities surveyed and more than 64.3% health facilities state they use them.

6. Findings: Availability and Access to Services

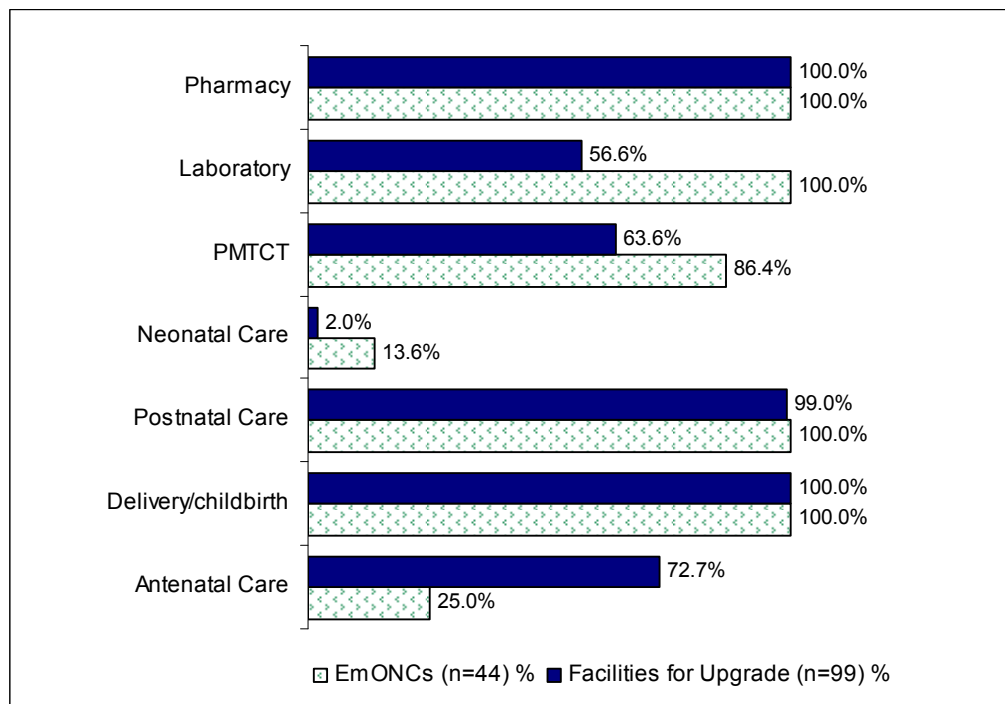
6.1 Availability of Selected Services

The availability of affordable and accessible services, communications and transport ‘around-the-clock’ are essential elements of EmONC.

Selected Services

Each facility was asked about the availability of specific services vital to the outcomes of EmONC. Figure 6-1 shows pharmacy; post natal care and delivery services were available in all facilities. The care of newborns, with complications, is an area that needs improvement. Less than 14% of EmONC facilities and 2% of facilities for upgrade had provision for neonatal care.

Figure 6-1 Availability of Selected Services in EmONC and Facilities for Upgrade

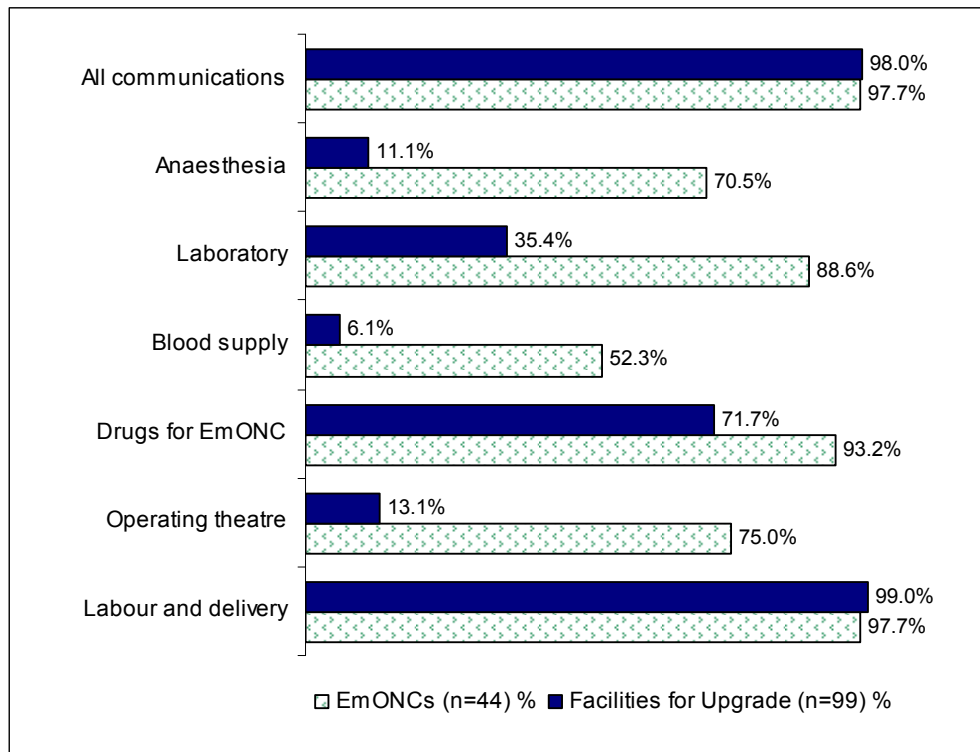


6.2 Availability of Services “Around-the-Clock”

The delivery of a child cannot be delayed, waiting for facilities to open for business. All-round-the-clock availability of services was investigated by asking health managers about the provision of 24-hour services vital to EmONC.

Figure 6-2 shows that most EmONC facilities and facilities for upgrade are providing delivery services and have some form of communications, phone, radio or mobile, 24-hours a day. 64.6% of facilities for upgrade and 11.4% of EmONC facilities were not providing laboratory services and EmONC drugs ‘around-the-clock’. Only 52.3% of EmONC facilities and 6.1% of facilities for upgrade have access to blood bank facilities 24-hours a day and the availability of operating theatres and anesthesia needs improving.

Figure 6-2 24-Hour Availability of Services Provided by EmONC and Facilities for Upgrade



6.3 Bed Capacity and Special Care for Mothers and Newborns

For each facility surveyed the following information was recorded: the total number of beds available in the health facility; the number available for women requiring maternity services; cribs for neonates with complications and the average stay for services. Service providers were also asked about the care of the mother and newborn.

Bed Capacity – All Hospitals Surveyed

The number of beds in CPA 1 hospitals ranged from 25 and 112, with the average being 55 beds. CPA 2 facilities have a Bed Capacity of between 25 and 120 beds with an average of 72 beds. For CPA 3 referral hospitals, the number of beds ranged from 87 to 270, and the average was 174. The number of beds in a national hospital varied between 150 and 500, with an average of 350 beds.

Bed Capacity for Maternity Cases

For all hospitals, there were specific beds dedicated to maternity cases. Table 6.1 shows most (95.4%) EmONC hospitals had more than 5 beds, 3 facilities for upgrade had no beds and 32.3% had more than 5 beds.

Table 6.1 Distribution of Maternity Beds for Different Types of Health Facilities

Number of beds for Maternity Cases	EmONCs (N=44)		Facilities for upgrade (N=99)		Health Center (N=230)	
	No	%	No	%	No	%
0	0	0.0	3	3.0	18	7.8
1-2	0	0.0	28	28.3	132	57.4
3-5	2	4.6	36	36.4	67	29.1
>5	42	95.4	32	32.3	13	5.7

Special Cribs for Neonates with Complications

Most (87%) of the surveyed hospitals had no special cribs dedicated to neonatal care. There are 13 cribs at Calmetre Hospital, 6 cribs at NMCHC, 3 cribs at Kampong Chnang referral hospital and another 7 referral hospitals have 1 crib each. However most of the cribs at referral hospitals were not being used or maintained.

Length of Stay

The length of patient stay varied between the different types of facilities. Health centers had the shortest stay for all facilities. This is to be expected as health centers refer complicated cases to hospitals. The mean length of stay for a caesarean section in CEmONC facilities was 7.5 days. Length of stay for normal deliveries and post partum hemorrhage is shown in table 6.2.

Table 6.2 Length of Stay in Days for Selected Services in all Facilities Surveyed

		EmONCs (N=44)	Facilities for Upgrade (N=99)	Health Centers (N=230)
Normal delivery	Range	1-7	0-5	0-5
	Mean	3.5	2	1
	Mode	3	1	1
Post partum hemorrhage	Range	2-7	0-7	0-7
	Mean	5	3	2
	Mode	3	5	1

6.4 Maternity Care

Service providers were asked specific questions related to maternity care. In more than 90% of facilities, mothers and babies were kept together, clean beds were ready to accept new arrivals, there was easy access to water and soap for daily hygiene and sarongs were available to keep newborns warm. However, in 46% of facilities, there were no clean towels to dry newborns, mothers were unable to deliver in a preferred position or have a companion with her when delivering.

6.5 Cost of Services

Health services are not free in Cambodia. Government health facilities have a cost recovery scheme in place. At least 59% of all health facilities charged a registration fee of 500-2500 Riels. In all facilities, a fee was not required in order to receive the emergency treatment. Table 6.3 shows that the cost of services varied between facilities with EmONC being more expensive. The reason why a normal delivery should cost more in an EmONC facility is unclear when in some situations it should actually be lower if economies of scale come into play (more deliveries per staff, bulk supplies cheaper, etc.)

Table 6.3 Distribution of Total Cost Riels for Payment for the Services

		EmONCs (N=44)	Facilities for Upgrade (N=99)	Health Centers (N=230)
Normal delivery	Range	15,000-200,000	10,000-100,000	0-120,000
	Mean	54,500	36,700	30,300
	Mode	50,000	20,000	30,000
Caesarean section	Range	100,000-1,115,000	100,000-300,000	NA
	Mean	297,000	252,000	NA
	Mode	200,000	300,000	NA
Abortion care	Range	25,000-160,000	1,000-100,000	0-80,000
	Mean	62,800	32,500	22,500
	Mode	50,000	30,000	20,000
Registration fee	Range	NA	500-2,500	500-2,000
	Mean	NA	971	1,000
	Mode	NA	1,000	1,000

Accessing the Equity Fund

In some locations, there are “health equity funds” which cover the costs for poor people to access health services (service costs+transport costs+ food). However not all locations have equity funds. Table 6.4 shows that 66.2% of the hospitals said poor women were accessing equity funds, while the other 33.8% said “no”. Only 29.5% of health centers said that poor women were able to access equity funds. The percentage of health centers with equity funds was less than half that of hospitals.

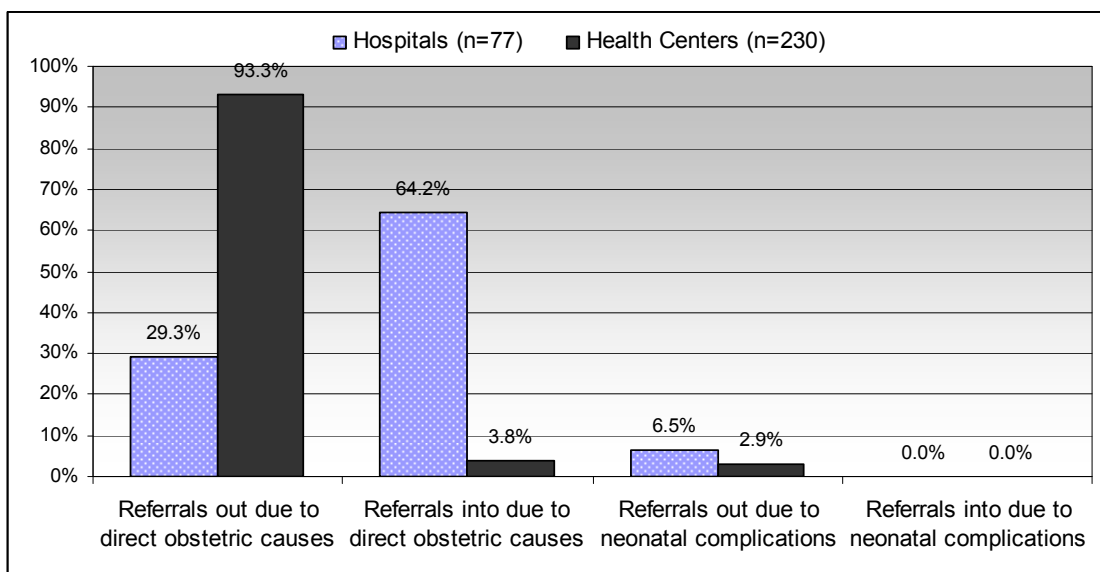
Table 6.4 Percentage of Facilities where Poor Women have access to Health Equity Funds

Facility	Women Accessing Health Equity Fund	
	No.	%
Hospitals surveyed	51	66.2
Health Center surveyed	68	29.5

6.6 Referrals in and Out

Figure 6.3 shows that health centers refer more women with direct obstetric complications to higher levels of care. However, referrals into the hospitals are less than the number of referrals from health centers. Explanations might be poor record keeping, the referral chain needs strengthening, or women are accessing services at facilities that did not participate in the survey. Neonatal complications are referred less frequently. Only 6.5% of hospitals and 2.9% of health centers referred neonates out. Data was not collected on where neonates were referred to but it has been assumed that it is for more specialized neonatal care. Neonatal referrals are not being recorded as coming into maternity services. This needs to be investigated further.

Figure 6-3 Referrals in and Out of Obstetric and Newborn Cases



Reporting of Referrals

Overall the quality of referral data is poor. The records do not show: the type of complication; the source of referral; where mothers and newborns are referred to and from and the outcome of the referral. The referral system for mothers and especially newborns could be improved.

6.7 Possible Barriers to Referral

Health workers asked questions concerning referral health facilities. The questions related to transport, communications, time and distance.

Referral Transport

Transport is a key component of referral. All facilities had access to transportation 24-hours a day. Table 6.5 shows that the most common means of transport for referral for EmONC facilities was car and ambulance. Cars were available in 40 facilities (90.9%) and ambulances in 38 facilities (86.4%). For facilities for upgrade and health centers, the most common mode of transport was either car or motorcycle, which indicates that facilities at the lower level rely on private transport.

More traditional modes of transport such as three wheel moto, ox/horse cart and remork moto were used less frequently. Most poor women are unable to afford transportation by car so this may be a barrier to accessing EmONC.

Table 6.5 Means of Transport for EmONC Facilities and Facilities for Upgrade

	EmONCs (N=44)		Facilities for Upgrade (N=99)	
	No	%	No	%
Three wheel moto	14	31.8	16	16.2
Ambulance	38	86.4	42	42.4
Ambulance from other health facility	28	63.6	45	45.5
Car	40	90.9	75	75.8
Motorecycle	32	72.7	61	61.6
Ox/horse cart	10	22.7	27	27.3
Remork moto	25	56.8	44	44.4
Others	16	36.4	28	28.3

Maintenance of Vehicles: 90% of all facilities surveyed had access to a source of maintenance for vehicles. However funds for maintenance and sufficient fuel are problems for 20.5% EmONC facilities, 63.9% facilities for upgrade and 92% of health centers.

Communication

The main means of communication was personal mobile phones, supplied and paid for by staff. Public telephone lines were available in half of EmONC facilities and radio communication in nearly a quarter of all facilities.

Time and Distance

It is estimated³⁶ that 75% of maternal deaths occur as a result of direct obstetric complications. If untreated, death occurs on average in:

- 2 hours: From postpartum hemorrhage
- 12 hours: From antepartum hemorrhage
- 2 days: From obstructed labor
- 6 days: From infection

Timely intervention is vital. The assessment found that 81.8% of EmONC facilities were within 50km of a higher level referral hospital (refer to table 6.6) and for more than 72.6% health facilities, the referral hospital could be reached within one hour's travel (refer to table 6.7). If health facilities are upgraded successfully, there will a maximum of 2 hours' travel between facilities.

Table 6.6 Distance in Kilometers from the Facility to Nearest Referral Hospital

Distance	EmONCs (N=44)		Facilities for Upgrade (N=99)		Health Center (N=230)	
	No	%	No	%	No	%
0-50 km	36	81.8	90	90.9	220	95.7
51-100 km	3	6.8	8	8.1	8	3.5
>100 km	5	11.4	1	1.0	2	0.8

Table 6.7 Minutes to Nearest Referral Hospital Using Common Means of Transport

Time	EmONCs (N=44)		Facilities for Upgrade (N=99)		Health Center (N=230)	
	No	%	No	%	No	%
0-60 minutes	32	72.6	81	81.8	202	87.8
61-120 minutes	6	13.7	13	13.1	22	9.6
> 120 minutes	6	13.7	5	5.1	6	2.6

6.8 Summary

The availability of affordable and accessible services, communications and transport 'around-the-clock' are essential elements of EmONC.

Newborn Care: The care of newborns, with complications, is an area that needs improvement. Less than 14% of EmONC facilities and 2% of hospitals had provision for neonatal care. A total of 29 cribs across 10 hospitals were identified. However most of these cribs at referral hospitals were not being used or maintained.

³⁶ UNFPA, (2001), Distance Learning System in Population Issues, Course 6 Maternal Deaths: Selecting Priorities, Tracing Progress. Module 1: Understanding the Causes of Maternal Deaths

“Around-the-Clock” Services: Most facilities are providing delivery services and have some form of communications 24-hours a day. 64.6% of facilities for upgrade and 11.4% of EmONC facilities were not providing laboratory services and EmONC drugs ‘around-the-clock’. Only 52.3% of EmONC facilities and 6.1% of facilities for upgrade have access to a blood bank 24-hours a day and the availability of operating theatres and anesthesia needs improving.

Bed Capacity for Maternity Cases: Most facilities have more than 5 beds. However with facilities for upgrade, 3 facilities had no beds. This will need to be addressed as part of the upgrade process.

Maternity Care: In most facilities, mothers and babies were kept together, clean beds were ready to accept new arrivals, there was easy access to water and soap for daily hygiene and sarongs were available to keep newborns warm. However, in 46% of facilities there were no clean towels to dry newborns, mothers were unable to deliver in a preferred position or have a companion with her when delivering.

Cost of Services: At least 59% of all health facilities charged a registration fee of 500-2500 Riels. In all facilities a fee was not required in order to receive the emergency treatment. The cost of services varied between facilities, with EmONC being more expensive.

Equity Funds: More than half (61.0%) of the hospitals and only 29.5% of health centers said poor women were accessing equity funds. The percentage of health centers with equity funds was less than half of that of hospitals.

Referrals in and Out: Referrals into the hospitals are less than the number of referrals out of health centers. Explanations might be poor record keeping, the referral chain needs strengthening, or women are accessing services at facilities that did not participate in the survey. Neonatal complications are referred less frequently. Only 6.5% of hospitals and 2.9% of health centers referred neonates out.

Referral Transport: All facilities had access to transportation 24-hours a day. The most common means of referral transport was car, ambulance or motorcycle. More traditional modes of transport such as three wheel moto, ox/horse cart and remork moto were used less frequently. As most poor women are unable to afford travel by car, transport could be a barrier to accessing EmONC.

Vehicle Maintenance: Most facilities surveyed had access to maintenance for vehicles. Funds and sufficient fuel are problems for 20.5% EmONC facilities, 63.9% facilities for upgrade.

Communication: The main means of communication was personal mobile phones, supplied and paid for by staff. If staff decided not to continue to pay for local phone calls on a voluntary basis then communications would be a problem as public telephone lines were only available in half of EmONC facilities and radio communication in nearly a quarter of all facilities.

Time and Distance: The assessment found that 81.8% of facilities were within 50km of a higher level referral hospital. For more than 72.6% of the facilities, the referral hospital could be reached within one hour’s travel. If all facilities are upgraded successfully, there will a maximum of 2 hours’ travel between health facilities.

7. Findings: Human Resources

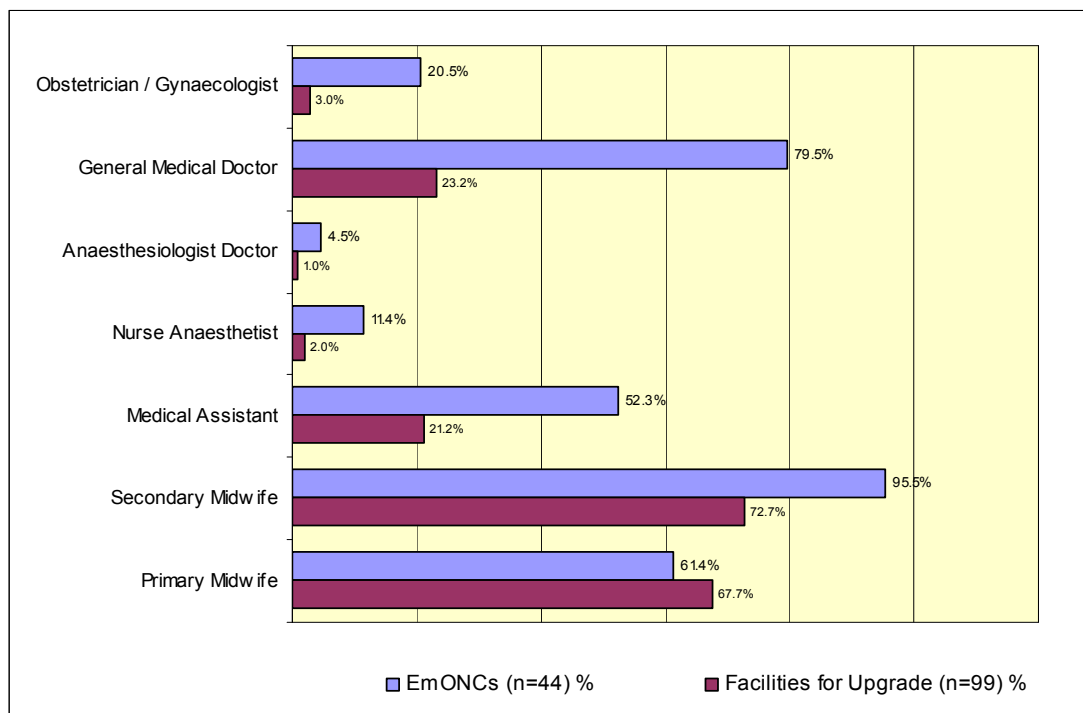
7.1 Availability of Staff

Human resources play a central role in providing EmONC services. A workforce with the right skills set, in the required numbers and with the enabling authority to perform their duties, is needed for effective delivery of EmONC services.

The health facilities visited were asked to list all the cadre of staff that performed deliveries in the facility. Figure 7-1 shows the availability of staff providing maternity services in identified EmONC facilities and facilities for upgrade.

Most (95.5%) EmONC facilities had secondary midwives, followed by general medical doctors (79.5%), primary midwives (61.4%) and medical assistants (52.3%). Facilities for upgrade have a similar pattern. 72.7% of facilities had secondary midwives followed by primary midwives (67.7%) general medical doctors (23.2%), and medical assistants (21.2%).

Figure 7-1 Availability of Cadre in EmONC Facilities and Facilities for Upgrade



7.2 Distribution of Staff

There are inadequate numbers of staff to support a network of 143 EmONC facilities, distributed throughout the country. There are more secondary midwives working in hospitals than primary midwives. The reverse is true for health centers. There are more primary midwives than secondary midwives. Table 7.1 shows the current distribution of different cadre of health workers in identified EmONC facilities and facilities recommended for upgrade.

- There is only one facility with a pediatrician/neonatologist. 91.6% of facilities have no obstetricians, 59.4% have no general medical doctors and 69.2% no medical assistants.
- Most (97.9%) EmONC facilities or facilities for upgrade have no anesthesiologist doctors. However, 4.9% of facilities have nurse anesthetists.
- About 20.3% of facilities have no secondary midwives and 34.3% have no primary midwives.

Table 7.1 Distribution of Different Cadre in EmONC Facilities and Facilities for Upgrade

		EmONCs (n=44)		Facilities for Upgrade (n=99)		Total	
		No	%	No	%	No	%
Obstetrician /Gynecologist	0	35	79.5	96	97.0	131	91.6
	1	4	9.1	3	3.0	7	4.9
	≥2	5	11.4	0	0.0	5	3.5
Pediatrician/ Neonatologist	0	43	97.7	99	100.0	142	99.3
	1	1	2.3	0	0.0	1	0.7
	≥2	0	0.0	0	0.0	0	0.0
General Medical Doctor	0	9	20.5	76	76.8	85	59.4
	1	23	52.3	19	19.2	42	29.4
	≥2	12	27.3	4	4.0	16	11.2
Anesthesiologist Doctor	0	42	95.5	98	99.0	140	97.9
	1	0	0.0	1	1.0	1	0.7
	≥2	2	4.5	0	0.0	2	1.4
Nurse Anesthetist	0	39	88.6	97	98.0	136	95.1
	1	2	4.5	1	1.0	3	2.1
	≥2	3	6.8	1	1.0	4	2.8
Medical Assistant	0	21	47.7	78	78.8	99	69.2
	1	17	38.6	19	19.2	36	25.2
	≥2	6	13.6	3	3.0	9	6.3
Secondary Midwife	0	2	4.5	27	27.3	29	20.3
	1	5	11.4	27	27.3	32	22.4
	≥2	37	84.1	45	45.5	82	57.3
Primary Midwife	0	17	38.6	32	32.3	49	34.3
	1	16	36.4	36	36.4	52	36.4
	≥2	11	25.0	31	31.3	42	29.4
Secondary Nurse	0	39	88.6	94	94.9	133	93.0
	1	2	4.5	5	5.1	7	4.9
	≥2	3	6.8	0	0.0	3	2.1
Primary Nurse	0	43	97.7	94	94.9	137	95.8
	1	0	0.0	4	4.0	4	2.8
	≥2	1	2.3	1	1.0	2	1.4

7.3 Around-the-Clock Availability of Staff

Availability of staff, trained to perform essential EmONC services, is the starting point for providing 24-hour services. Without staff, services are not delivered.

All hospitals and health centers surveyed were asked three questions about staff availability:

1. Was there at least one person physically present 24-hours a day in the health facility?
2. Was at least one person available for each working day (Monday-Friday)?
3. Was there at least one person on call 24-hours a day?

The 24-hour availability of staff varied, with some facilities having poor coverage of services. Secondary midwives were the main staff available in hospitals and primary midwives in health centers. The only exception to this was in 7% of the health centers where secondary midwives were the main cadre “physically available” 24-hours a day. Other cadres were available, however the numbers were small and in most cases they co-exist with midwives. See Table 7.2

Table 7.2 Availability of at least One Staff at Work 24-Hours a Day for all Facilities Surveyed

Staff category	Hospitals (N = 77)		Health Centers (N = 230)	
	No.	%	No.	%
Secondary midwife	47	61.0	16	7.0
General medical doctor	10	13.0	0	0.0
Primary midwife	10	13.0	27	1.7
Nurse anesthetist	5	6.5	0	0.0
Secondary nurse	4	5.2	0	0.0
Obstetrician/gynecologist	3	3.9	0	0.0
Medical assistant	3	3.9	0	0.0
Pediatrician/ neonatologist	1	1.3	0	0.0
Anesthesiologist doctor	1	1.3	0	0.0
Primary nurse	1	1.3	1	0.4
Other	1	1.3	3	1.3

7.4 Staff Turnover and Transfer

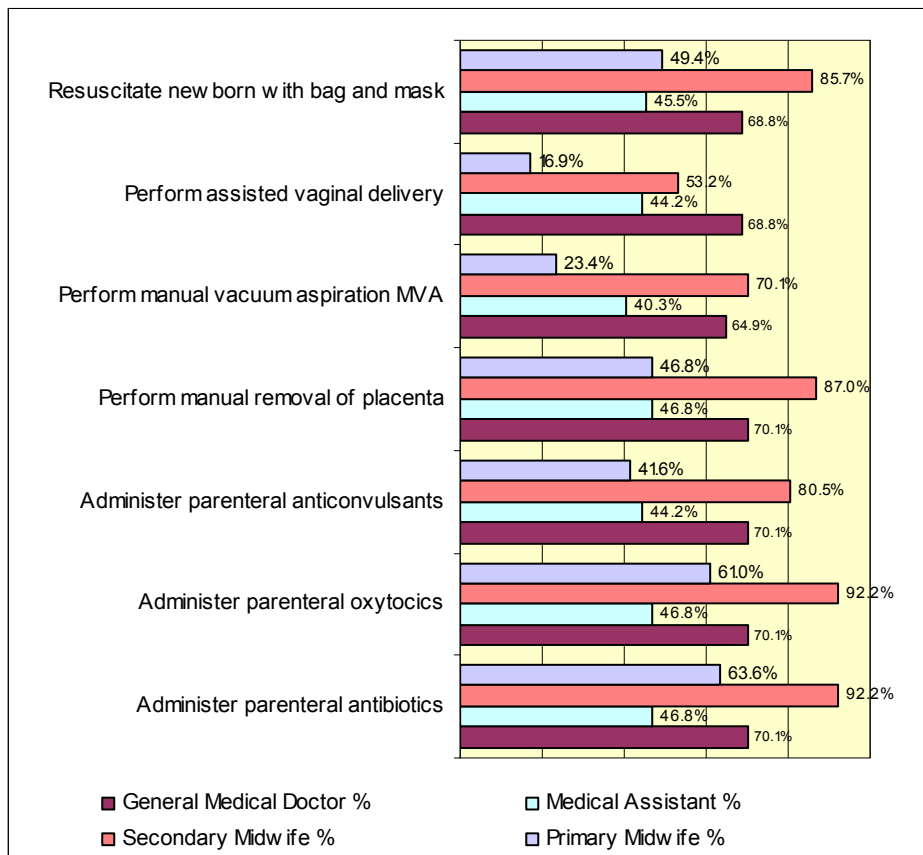
Field workers asked about staff turnover and transfers in the past year. Where staff was transferred out, replacements were found. Most movement occurred with general medical doctors and primary and secondary midwives. This affected less than 10% of EmONC facilities and facilities for upgrade. Staff turnover and transfer does not appear to be a significant issue at present.

7.5 Health Cadre Performing Vital Signal Functions

Basic Signal Functions

Performance of the 7 basic signal functions relies on health providers. Staff members were asked if they were performing the functions as part of their work. The responses of health facility staff on performance of selected functions, are shown in Figure 7-2

Figure 7-2 Selected Health Cadre Performing Signal Functions in all Hospitals



Assisted Vaginal Delivery (AVD) was the signal function which the least proportion of all the selected cadres performed. When performed: general medical doctors performed AVD more than any other cadre. Secondary midwives administered more parenteral antibiotics and oxytocics and resuscitated more newborns than the other categories of health workers.

However, when the signal functions were analyzed by hospital and health center, secondary midwives perform more functions in hospitals (figure 7-3) than at health centers (figure 7-4). This is linked to the distribution of primary and secondary midwives. Secondary midwives are employed by 92.2% of hospitals surveyed and 55.2% of health centers, whereas 63.6% of primary midwives are employed in hospitals and 78.7% in health centers.

Figure 7-3 Performance of Signal Functions by Midwives in all Hospitals Surveyed

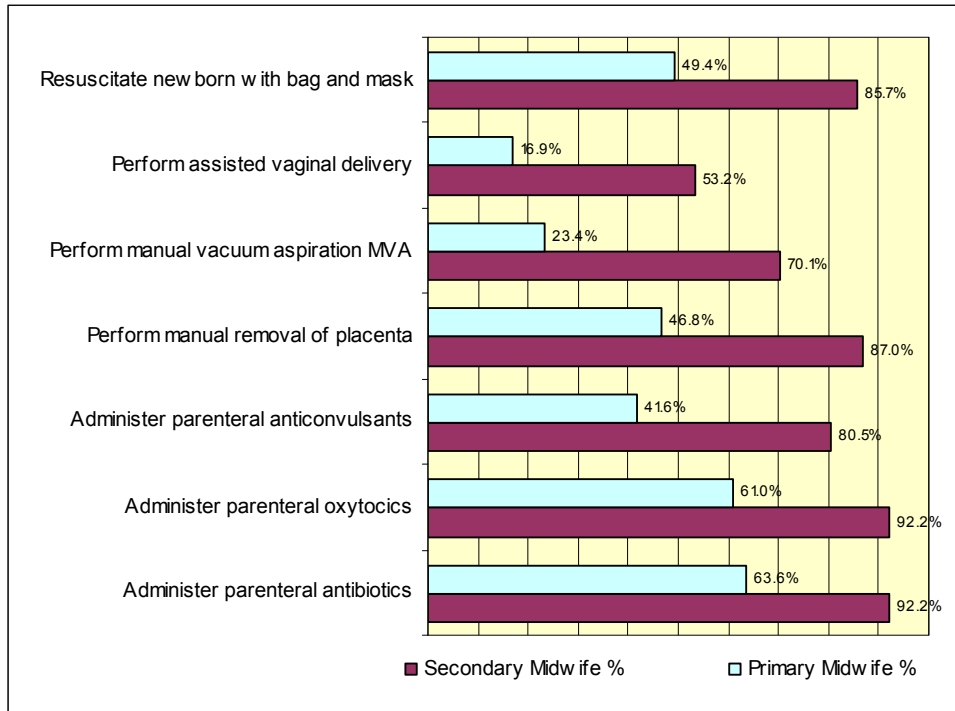
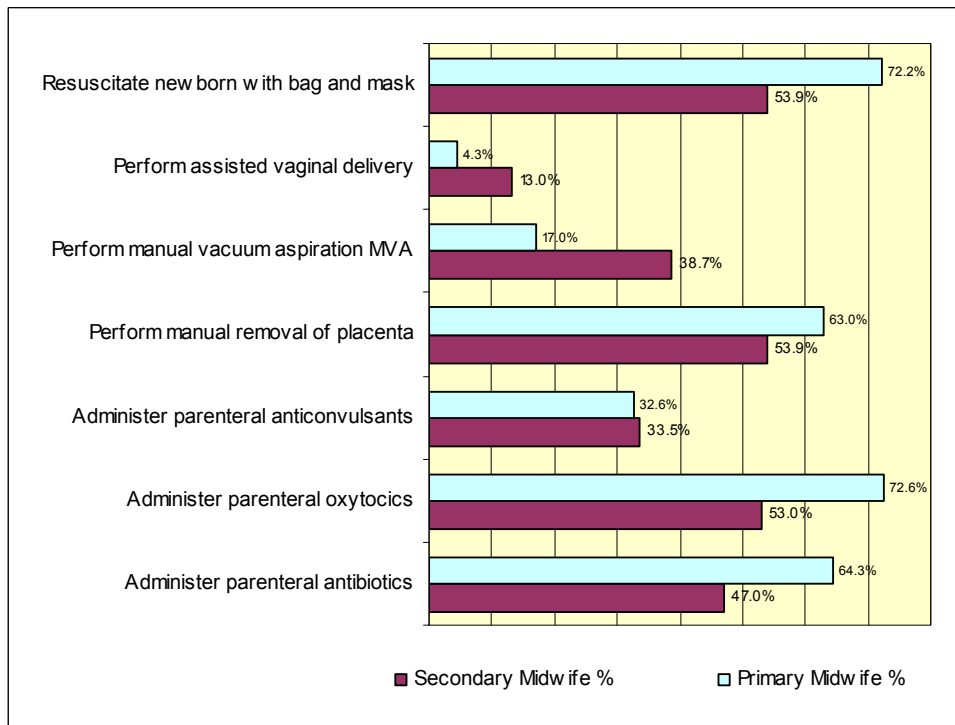


Figure 7-4 Performance of Signal Functions by Midwives in all Health Centers Surveyed

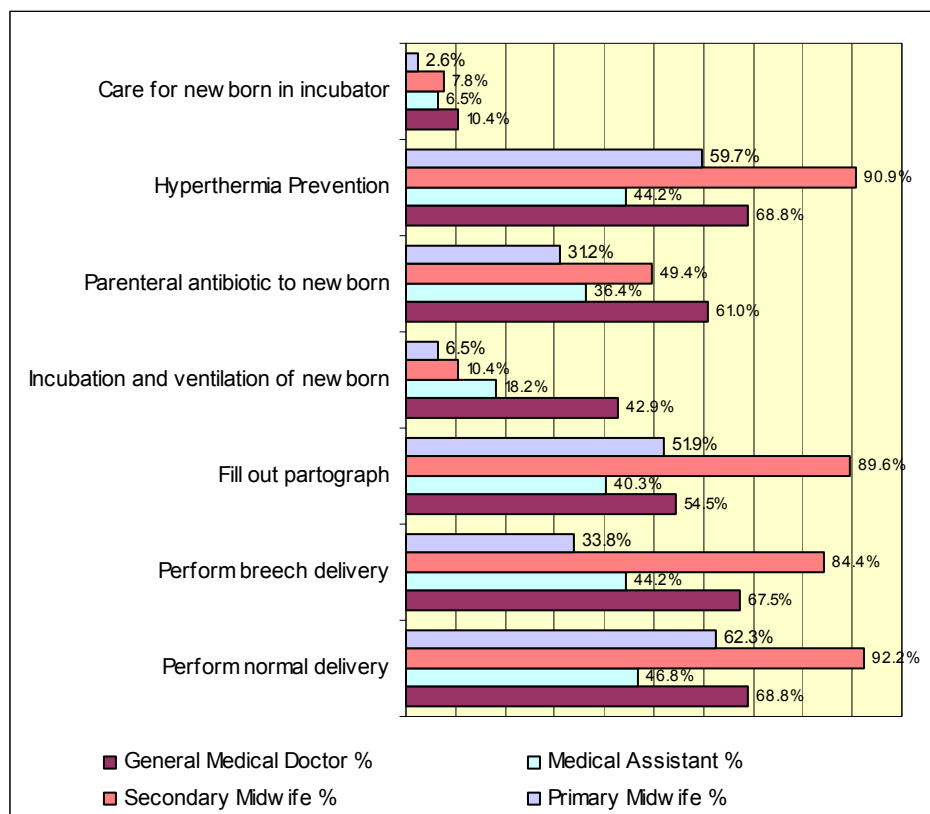


7.6 Health Cadre Performing Vital Services for Mothers and Newborns

Hospitals

Secondary midwives (92.2%) are performing deliveries, filling in partographs (89.6%) and practicing hyperthermia prevention (90.9%). This is more than primary midwives and general doctors and medical assistants. Administration of parenteral antibiotics, care of a newborn in an incubator and incubation and ventilation of newborns are performed the least of any services. Doctors and medical assistants are more likely to perform newborn care functions than any other professional group, even though there are fewer doctors than midwives. Refer to Figure 7.5

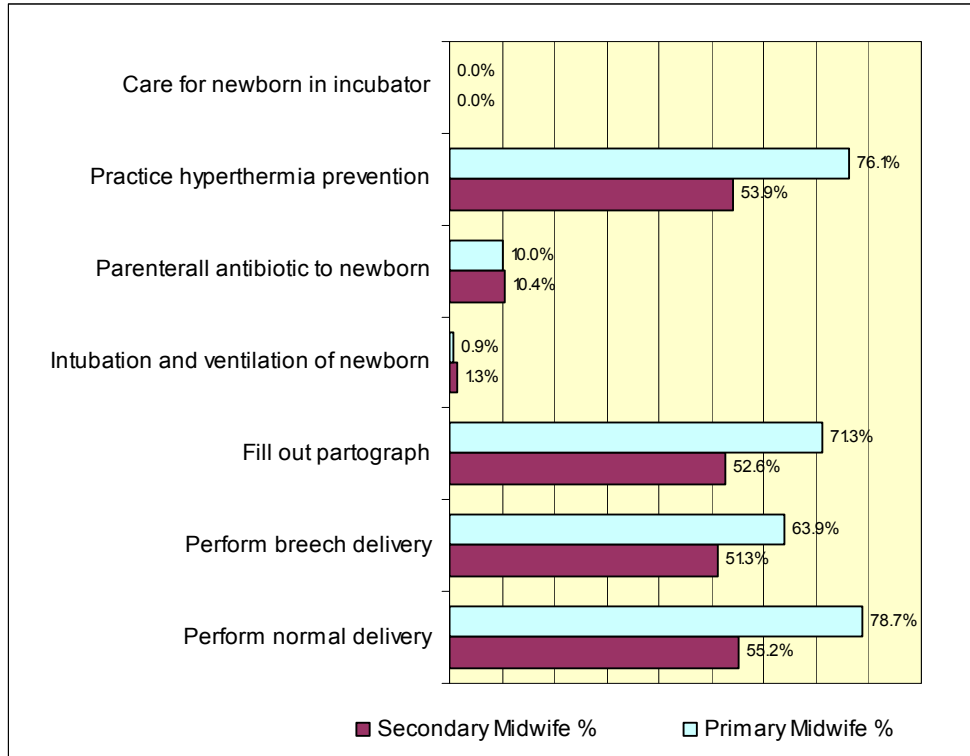
Figure 7-5 Who Performs Services for Mothers and Newborns in Hospitals Surveyed



Health Centers

Less than 5% of health centers have a general medical doctor or medical assistant. Primary midwives perform most to the vital services in Figure 7-6. Specialized newborn services such as intubation and ventilation and administration of parenteral antibiotics are hardly performed.

Figure 7-6 Who Performs Vital Services for Mothers and Newborns in Health Centers Surveyed



7.7 Summary

A workforce with the right skills set, in the required numbers and with the enabling authority to perform their duties is needed for effective delivery of EmONC services.

Availability of Staff: Most (95.5%) EmONC facilities had secondary midwives followed by general medical doctors (79.5%), primary midwives (61.4%) and medical assistants (52.3%). Facilities for upgrade have a similar pattern. 72.7% of facilities had secondary midwives followed by primary midwives (67.7%) general medical doctors (23.2%), and medical assistants (21.2%).

Distribution of Staff: There is an inadequate number of staff to support a network of 143 EmONC facilities distributed throughout the country. There are more secondary midwives working in hospitals than primary midwives. The reverse is true for health centers. A summary of the current staffing include the following:

- There is only one facility with a pediatrician/neonatologist. 91.6% of facilities have no obstetricians, 59.4% have no general medical doctors and 69.2% no medical assistants

- Most (97.7%) EmONC facilities or facilities for upgrade have no anesthesiologist doctors. However, 4.9% of facilities have nurse anesthetists.
- About 20.3% of facilities have no secondary midwives and 34.3% have no primary midwives.

24-hour availability of staff varied, with some facilities having poor coverage of services. Secondary midwives were the main staff available in hospitals and primary midwives in health centers. The only exception to this was in 7% of the health center, where secondary midwives were the main cadre “physically available” 24-hours a day. Other cadres were available, however the numbers were small and in most cases they co-exist with midwives.

Health cadre performing vital signal functions: Assisted Vaginal Delivery (AVD) was the signal function which the least proportion of all the selected cadres performed. When performed: general medical doctors performed AVD more than any other cadre. Secondary midwives administered more parenteral antibiotics and oxytocics and resuscitated more newborns than the other categories of health workers. However, when the signal functions were analyzed by hospital and health center, secondary midwives perform more functions in hospitals than at health centers.

Health cadre performing vital services for mothers and newborns: In hospitals secondary midwives (92.2%) are performing deliveries, filling in partographs (89.5%) and practicing hyperthermia prevention (90.9%). Administration of parenteral antibiotics, care of a newborn in an incubator and incubation and ventilation of newborns are performed the least of any services. Doctors and medical assistants are more likely to perform newborn care functions than any other professional group.

In **health centers**, primary midwives perform most of the vital services. Specialized newborn services such as intubation and ventilation and administration of parenteral antibiotics are hardly performed.

8. Findings: Knowledge, Training and Experience

8.1 Knowledge Assessment

A health provider knowledge tool was administered to 347 respondents from all hospitals, health centers and private facilities surveyed. Respondents were any health cadre who was most likely to take charge of a delivery if one were to present at the time of the field visit. A total of 347 respondents were assessed. About half (48.4%) of respondents were secondary midwives and 40.1% were primary midwives. See table 8.1 for the professional qualifications of respondents.

Table 8.1 Professional Qualifications of Respondents in all Health Facilities Surveyed

Qualification of respondents	No	%
Obstetrician / Gynecologist	1	0.3
General Medical Doctor	18	5.2
Medical Assistant	9	2.6
Secondary Midwife	168	48.4
Primary Midwife	139	40.1
Secondary Nurse	7	2.0
Other, specify	5	1.4
Total Respondents	347	100%

Within the month prior to taking the knowledge test, respondents had attended or delivered an average of 10-13 deliveries. The average length of employment for respondents in the public sector was 12-15 years and 5 years in the private sector.

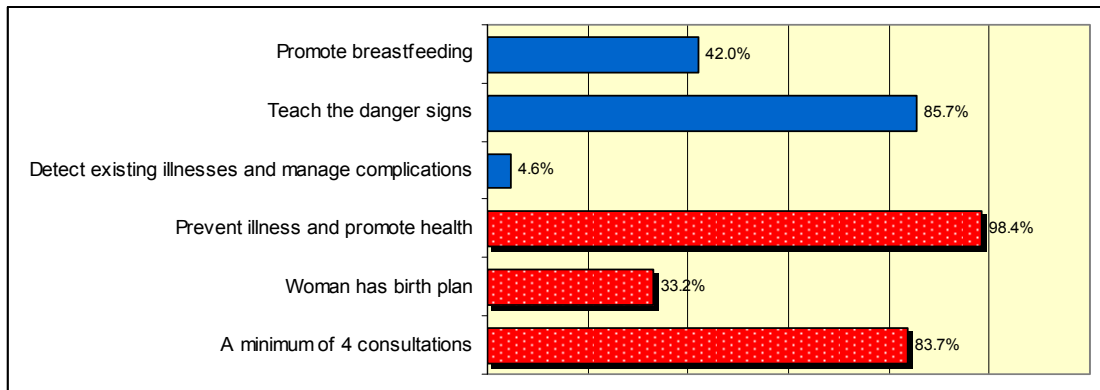
Data was analyzed for hospitals and health centers (N=307) in 6 knowledge areas:


1. Antenatal Care
2. Labor and Delivery
3. Post-Partum Care
4. Newborn Care
5. Post-Abortion Care
6. Gender Based Violence

Antenatal Care

Respondents were asked for the key components of a quality antenatal service. A correct response was to include four comprehensive visits, ensuring the women have a birth plan and preventing illness and promoting health. As can be seen from figure 8-1, only 33.2% of responses acknowledged a birth plan while 83.7% mentioned the other essential criteria. Only 42% of respondents acknowledged the important of breast feeding.

Figure 8-1 Response to Question on Quality Antenatal Care

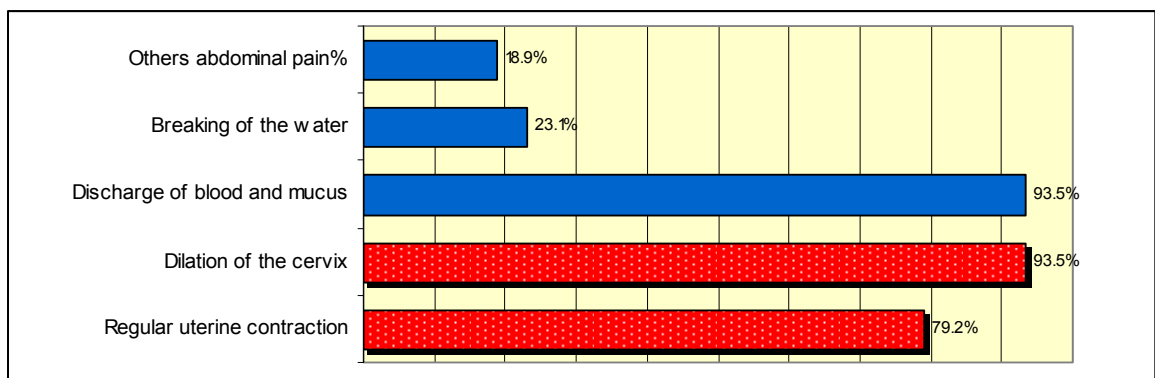



 Correct Response requires these options

Labor and Delivery

In labor there are many steps at which the life of the pregnant woman or the unborn child may be in danger. A checklist of the important parameters monitored during labor was ticked-off. Figure 8-2 shows that about 80% of respondents were able to list one or two of the signs that signify the onset of labor.

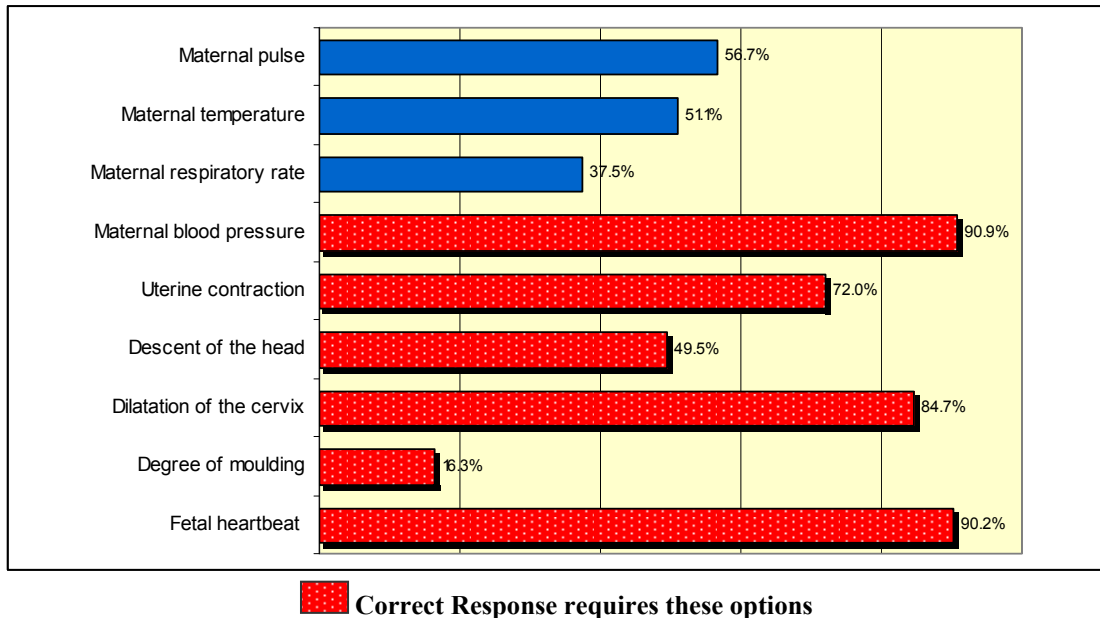
Figure 8-2 Response to Questions on Diagnosis of Labor



 Correct Response requires these options

About 70% of participants were able to name 3 of the 5 required observations made when monitoring the progress of labor. However, less than 57% of respondents were able to list maternal pulse, temperature, respiratory rate, descent of head or degree of moulding. Refer to figure 8-3

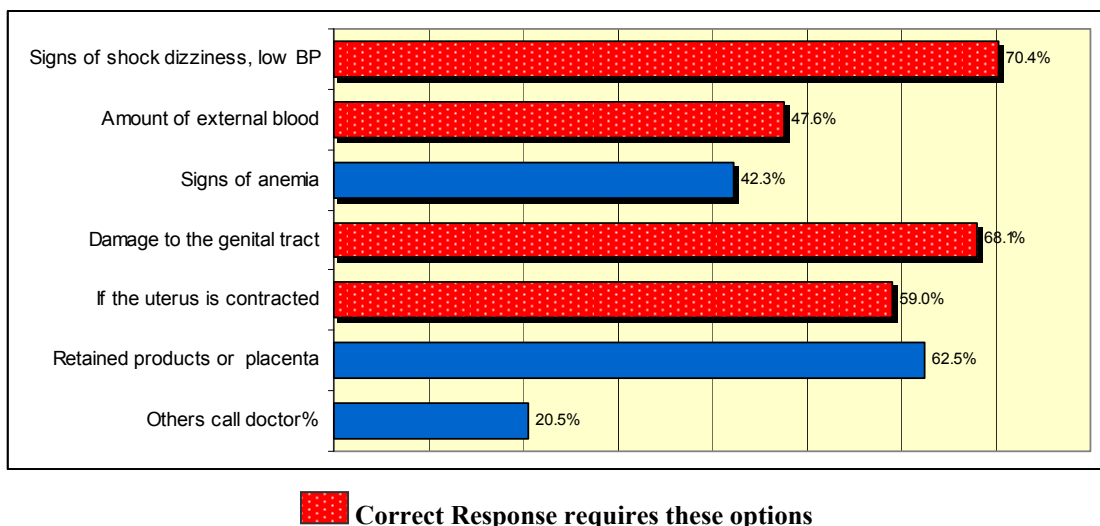
Figure 8-3 Response to Questions on Monitoring of Labor



Post-Partum Care

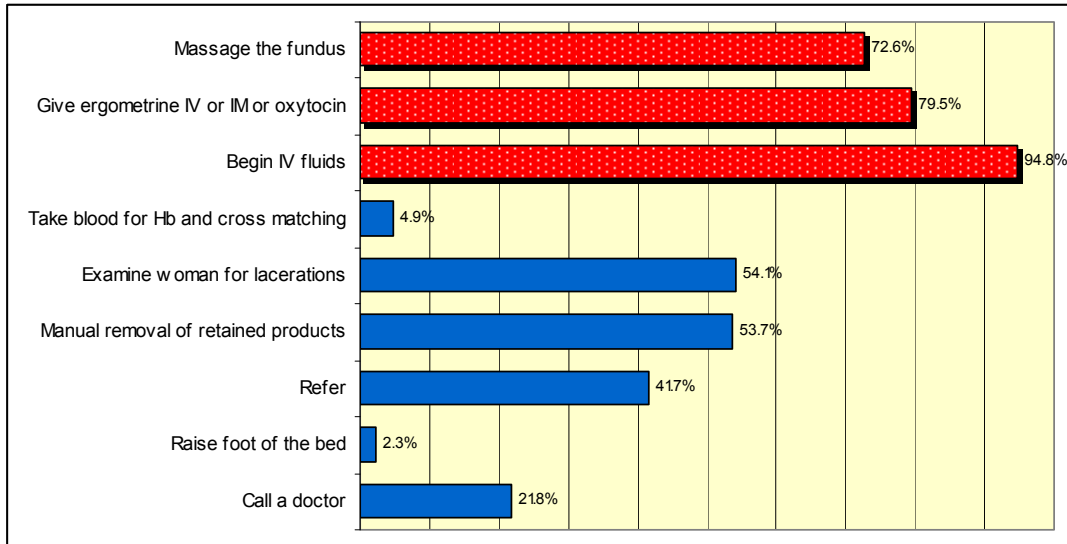
Even after the birth of the baby, mothers are still at risk of developing a number of potential complications. Health care providers must be diligent in recognizing these complications. A leading cause of maternal death is postpartum hemorrhage (PPH). Figure 8-4 shows that 47% to 70% of respondents were able to list individual signs of what to look for when a woman arrives at a facility with heavy bleeding or if a women developed severe bleeding after giving birth.


Figure 8-4 Response to Questions on Signs of Postpartum Hemorrhage



In the event that a woman develops PPH there has to be timely intervention if her life is to be saved. Respondents were asked for the interventions that they would implement for the management of PPH. Figure 8-5 shows that between 72.6% and 94.5% of respondents mentioned one, two or three of the life saving interventions.

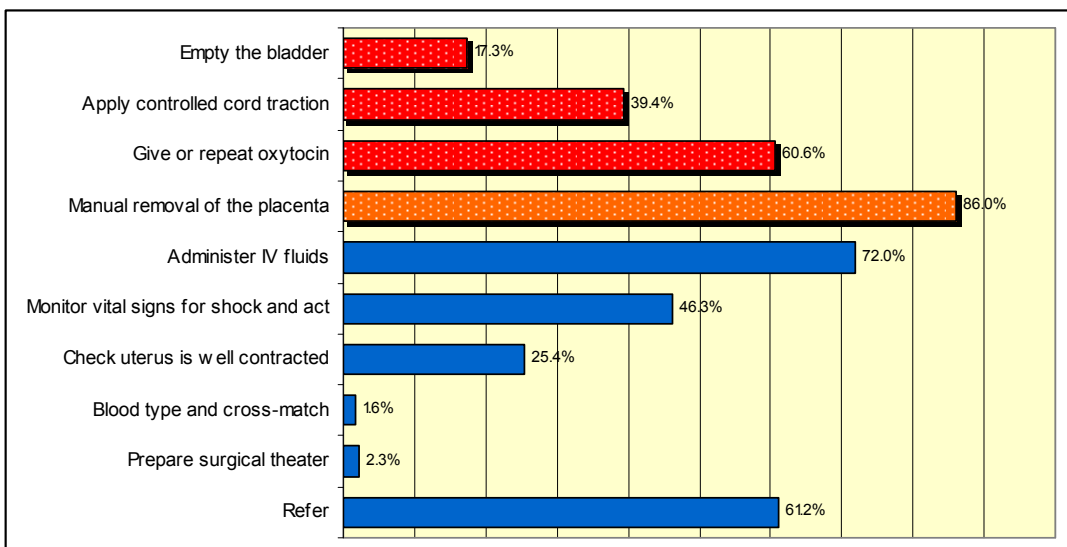
Figure 8-5 Responses to Questions on Interventions on PPH




 Correct Response requires these options

The placenta may be retained partially or entirely after the delivery of the baby, thus predisposing the mother to PPH or postpartum sepsis. Between 20% and 86% of respondents were able to name individual vital interventions required for a retained placenta See figure 8-6

Figure 8-6 Responses to Questions on Interventions for Retained Placenta



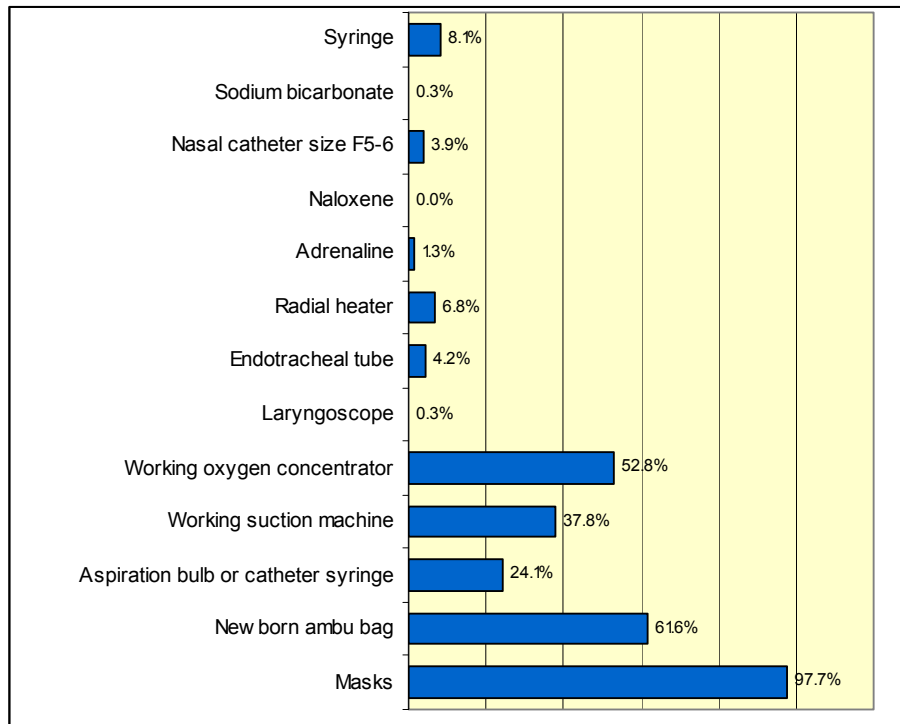
 Correct Response requires these options

Newborn Care

Just like the mother, the newborn is faced with many potential complications in the immediate peri-partum period and into the early neonatal period.

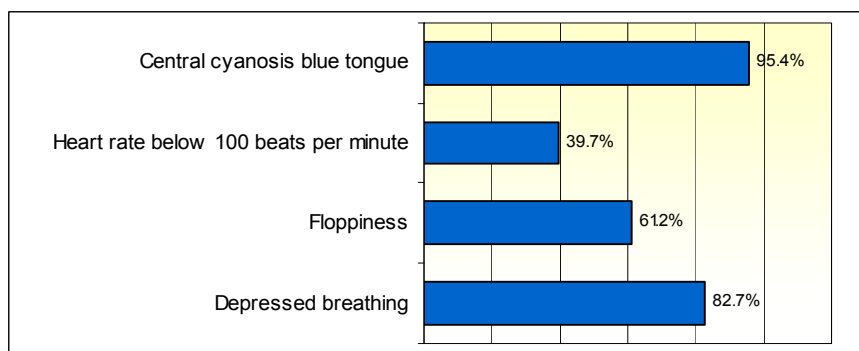
Respondents were asked what equipment they would assemble for resuscitating a baby. Figure 8-7 shows that more than 50% of respondents were able to mention oxygen concentrator, ambu bag and masks. However there were 8 items which fewer than 10% of respondents could list.

Figure 8-7 Responses to Questions on Equipment for Newborn Resuscitation



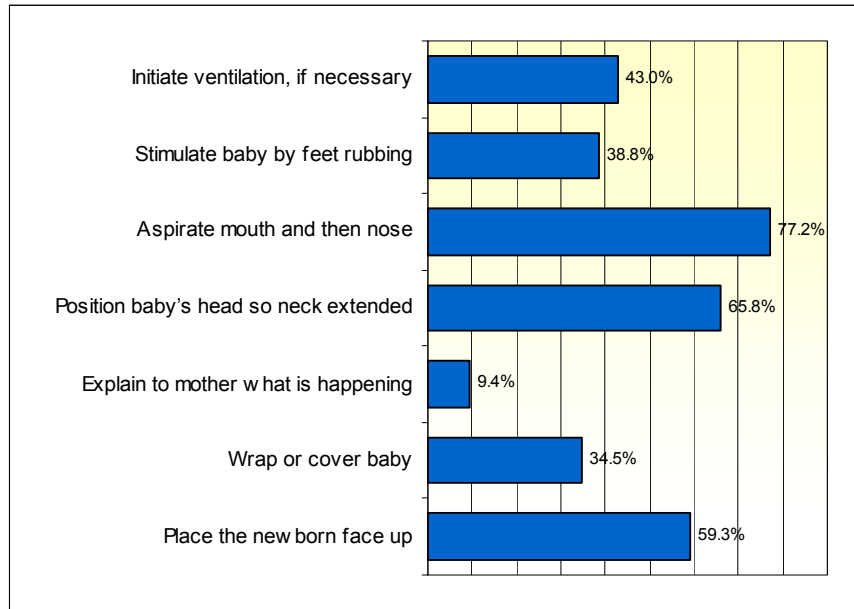
Birth asphyxia is common and it is essential that health providers promptly identify the signs without delay. When respondents were asked how to diagnose birth asphyxia more than 80% of respondents listed depressed breathing and central cyanosis. However only about 60% mentioned floppiness and 40% heart below 100 beats a minute. See figure 8-8.

Figure 8-8 Responses to Questions on Diagnosing Birth Asphyxia



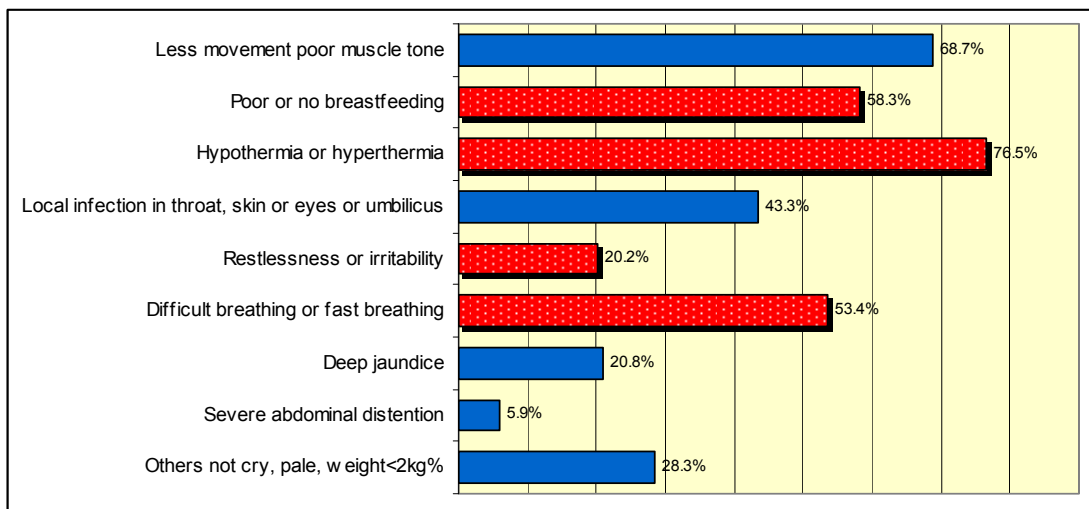
When asked about the primary steps to resuscitation, more than 65% of respondents mentioned positioning the baby's head so neck is extended and aspirating the mouth and nose. However, from figure 8-9 it can be seen that only 10-60% of respondents could list some of the other steps.


Figure 8-9 Responses to Questions on Steps to Resuscitation of Newborn



Newborn sepsis is a major contributor to neonatal morbidity, as it presents quite unlike sepsis in adults and children. Respondents were asked for the signs and symptoms of newborn sepsis. 20% to 75.6% of respondents were able to list the key signs and symptoms. However no individual respondent was able to list all of them. Refer to figure 8-10.

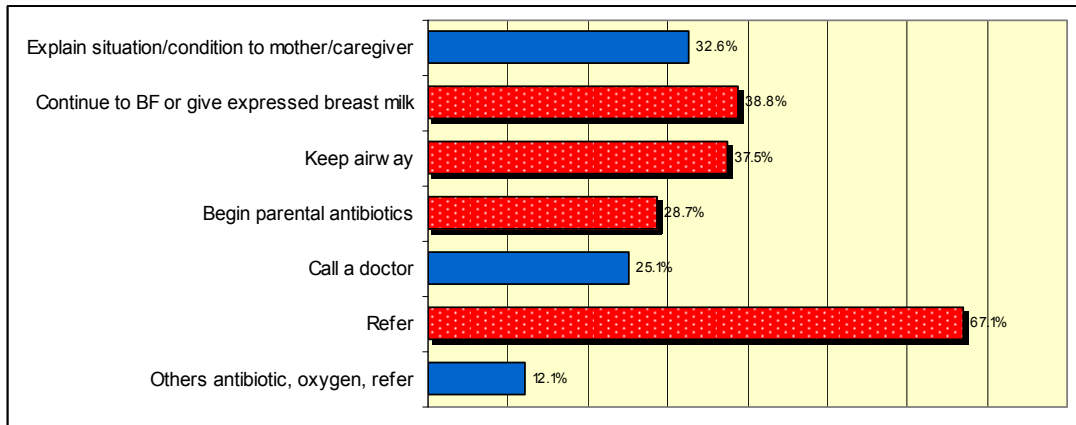
Figure 8-10 Responses to Questions on Signs of Neonatal Sepsis




 Correct Response requires these options

Because of the poor immune system in newborns, infections spread rapidly and health care providers must promptly intervene to save their lives. From figure 8-11, it can be seen that between about 29% and 67% of respondents were able to list at least one of the interventions needed for the prompt and successful management of neonatal sepsis. No respondents could list all of them.

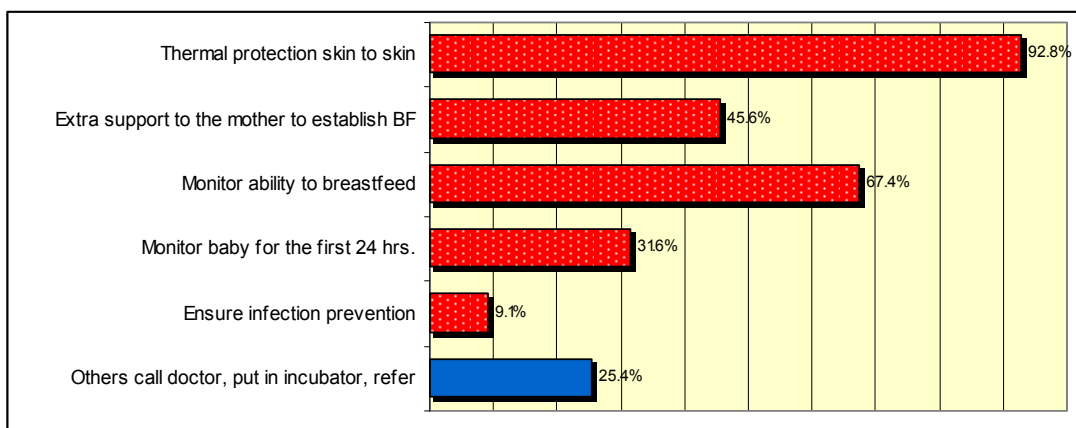
Figure 8-11 Responses to Questions on Interventions for Neonatal Sepsis




 Correct Response requires these options

No respondent was able list all interventions for the survival of the LBW newborns. However Figure 8-12 shows that between 9% and 92.8% of participants could list at least one intervention. The most popular response was skin to skin contact; support for breast feeding, monitoring baby for the first 24-hours and ensuring infection prevention were less frequently mentioned.

Figure 8-12 Responses to Questions on Interventions for the Care of a Low Birth Weight Newborn

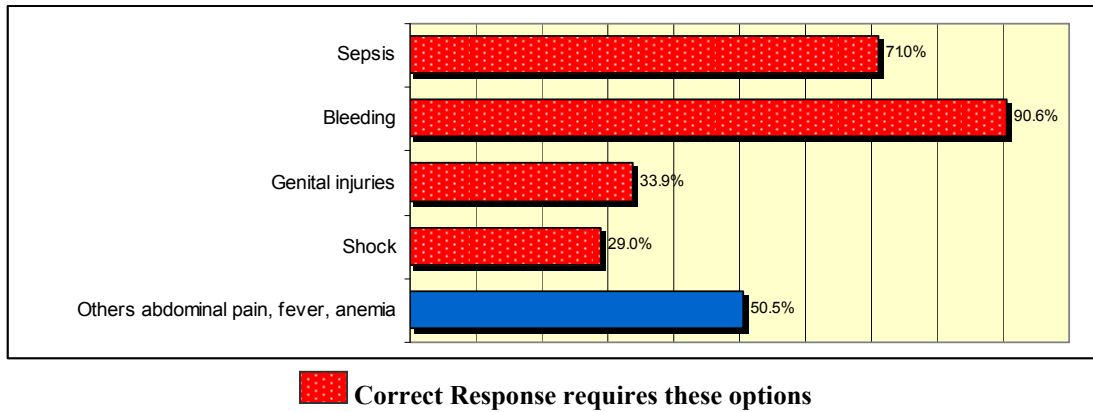


 Correct Response requires these options

Post Abortion Care

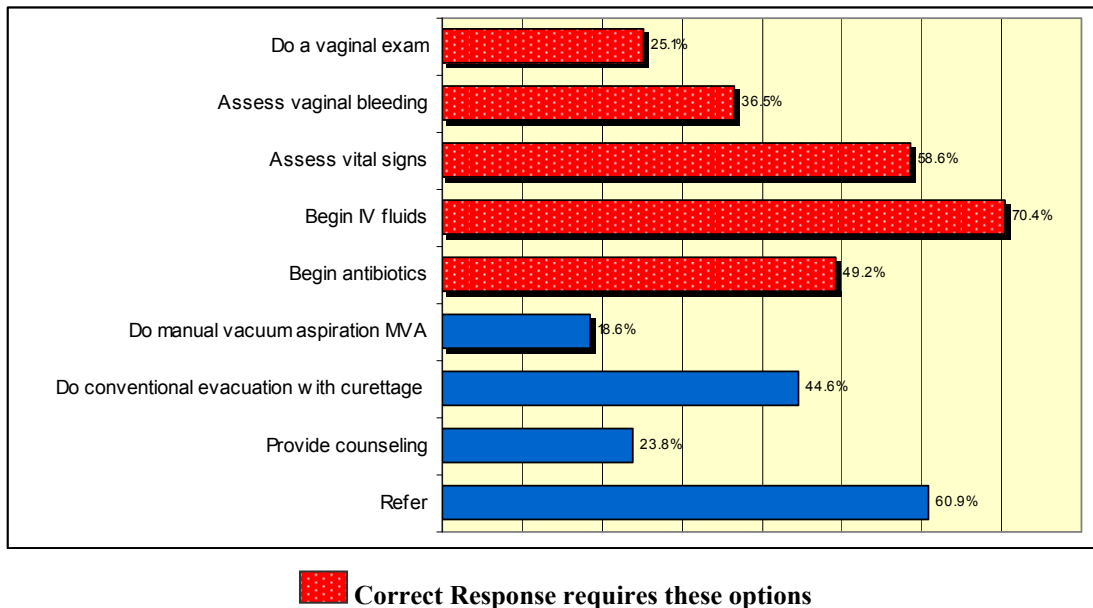
Abortion is legal in Cambodia. Health providers must be prepared to manage the immediate and potentially long-term complications of safe and unsafe abortion. Between 29% and 90% of respondents could name at least one complication of unsafe abortion. Refer to figure 8-13.

Figure 8-13 Response to Questions on Immediate Complications of Unsafe Abortion



Respondents were also asked for specific interventions that they would offer to those suffering from the complications of an unsafe or incomplete abortion. No respondents mentioned all the essential interventions, but 25% to 70% mentioned at least one intervention. Refer to figure 8-14.

Figure 8-14 Response to Questions on Interventions for Unsafe or Incomplete Abortion

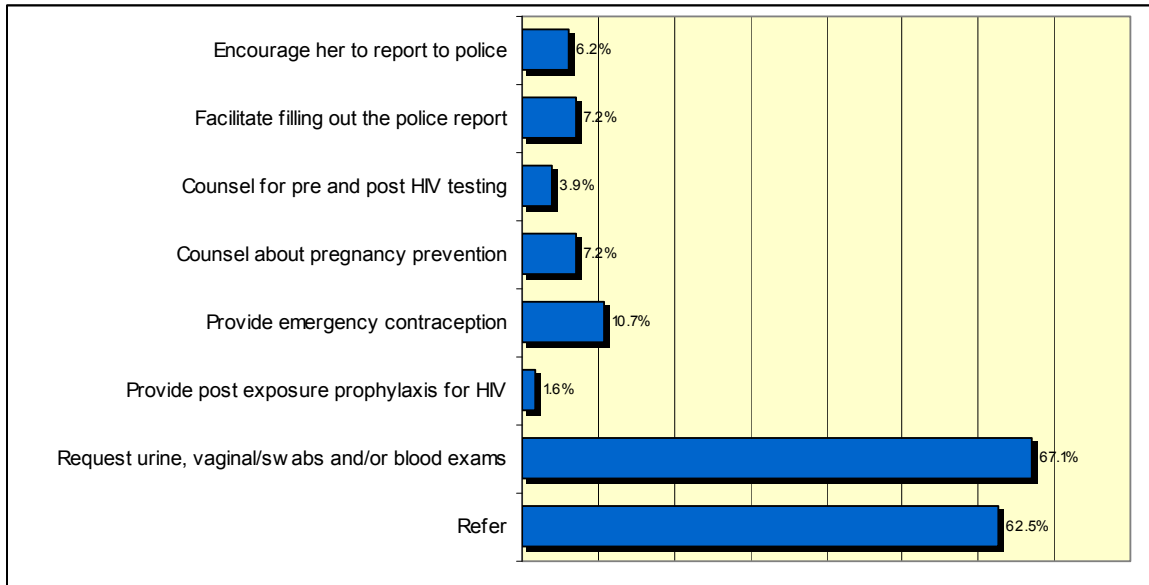


Gender Based Violence.

When rape occurs, health care providers are often the first to be contacted by victims. Therefore midwives ought to be prepared to serve as first-responders.

More than 62% of respondents would refer the patient on: less than 10% would advise the victim to report to the police, or provide pre and post-test counseling for HIV or provide emergency contraception. Refer to Figure 8-15.

Figure 8-15 Response to Question on Interventions for Physical Abuse or Rape



8.2 Training and Experience

A challenge for Cambodia is that midwives and other cadre providing midwifery services are inadequately trained for their role and are unable to function at the level a Skilled Birth Attendant (SBA).

Skilled Birth Attendance is defined as a SBA working in an enabling environment with – or linked to – a referral system. Three inter-connected elements comprise the fundamental international standard for saving mother’s lives.

1. SBA knows how to do the right things (knowledge) in the right way (skills)
2. Enabling environment means that both the policies and the work place conditions support the provision of necessary care
3. Referral requires a reliable system to support transport to a higher and suitable level of care

Box 7.1 summarizes the functions a SBA would need to perform at a BEmONC level.

Box 7.1 Skilled Birth Attendant (SBA)^{37,38}

A SBA should be able to perform the following functions at BEmONC level

1. Safely conduct normal delivery using aseptic techniques
2. Use partograph to recognize obstructed labor
3. Active management of the third stage of labor
4. Provide immediate care of the newborn including resuscitation
5. Initial management of post partum hemorrhage through use of parenteral oxytocics and abdominal massage
6. Initial management of pre-eclampsia and eclampsia through use of magnesium sulphate
7. Recognize and manage post partum infection through use of parenteral antibiotics
8. Know how and when to refer women to the next level of care and stabilize before transfer

And in the delivery facility, all the above plus

9. Repair of tears
10. Manually remove the placenta
11. Perform assisted vaginal delivery through the use of a vacuum extractor
12. Manage incomplete abortion with manual vacuum aspiration (MVA)

³⁷ Adapted from M. Carlough, M. McCall (2005); Skilled birth attendance: What does it mean and how can it be measured? A clinical skills assessment of maternal and child health workers in Nepal, International Journal of Gynecology & Obstetrics (Vol. 89, Issue 2, Pages 200-208)

³⁸ Adapted from: UNFPA – MoH Lao PDR (2008); Assessment of Skilled Birth Attendance in Lao PDR

The Comprehensive Midwifery Review³⁹ found that a challenge for Cambodia is the skills of midwives, especially primary midwives working at the health center level. Midwives are inadequately trained to function at the level of competency and proficiency required of a SBA.

Experience and Training of Health Staff to Function as a SBA

Fieldworkers asked respondents in health facilities their experience and training for selected functions to be performed by a SBA at a BEmONC level in the 3 months prior to the assessment. Tables 8.2 and 8.3 show the responses to 9 of the SBA functions in functions box 7.1.

Table 8.2 Experience and Training of Health Staff to Function as SBA in all Hospitals

Item	Hospitals			
	Were you trained?		Have you provided this service in the past 3 months?	
	Yes	%	Yes	%
Use the partogram	72	93.5	69	89.6
Do manual removal of the placenta	63	81.8	48	62.3
Resuscitate the newborn with ambu bag	64	83.1	43	55.8
Do bimanual uterine compression (external)	51	66.2	25	32.5
Suture vaginal laceration	27	35.1	23	29.9
Do bimanual uterine compression (internal)	49	63.6	21	27.3
Apply vacuum extractor (AVD)	25	32.5	19	24.7
Perform MVA	18	23.4	12	15.6
Administer magnesium sulphate for treatment of severe pre-eclampsia or eclampsia	26	33.8	9	11.7

The responses were similar for both hospital and health center staff. As can be seen from tables 8.2 and 8.3 between 23% and 35% of hospital staff and only between 3.5% to 10% of health center staff had been trained in suturing a vaginal laceration, applying a vacuum extractor, performing MVA and administering magnesium sulphate for the treatment of severe pre-eclampsia or eclampsia in the last 3 months. These vital life saving functions had only been performed by less than 30.0% of hospital staff and less than 6% of health center staff in the same time frame.

Other skills such as manual removal of a placenta and use of the partogram had been performed more frequently and staff had been trained more recently. Overall, the level of training and skills for functions to support SBA were inadequate.

³⁹ MoH, (2006), Comprehensive Midwifery Review –with support of UNFPA Cambodia

Table 8.3 Experience and Training of Health Staff to Function as SBA in all Health Centers

Item	Health Centers			
	Were you trained?		Have you provided this service in the past 3 months?	
	Yes	(%)	Yes	(%)
Use the partogram	209	90.9	199	86.5
Do manual removal of the placenta	182	79.1	95	41.5
Resuscitate the newborn with ambu bag	215	93.5	80	34.8
Do bimanual uterine compression (external)	159	69.4	55	23.9
Do bimanual uterine compression (internal)	151	65.9	34	14.8
Perform MVA	24	10.4	14	6.1
Administer magnesium sulphate for treatment of severe pre-eclampsia or eclampsia	8	3.5	8	3.5
Apply vacuum extractor (AVD)	8	3.5	3	1.3
Suture cervical laceration	9	3.9	1	0.4

8.3 Summary

A health provider knowledge tool was administered to 347 respondents from all facilities surveyed. Respondents were any health cadre, most likely to take charge of a delivery if one were to present at the time of the field visit. About half (48.4%) of respondents were secondary midwives and 40.1% were primary midwives.

Knowledge maternal and neonatal care: Data was analyzed for all health facilities in 6 knowledge areas: antenatal care, labor and delivery, post-partum care, newborn care, post-abortion care and gender based violence. The needs assessment showed that a large number of health staff have extreme deficiencies in skills and knowledge, regarding basic actions to deal with maternal and neonatal complications.

Experience and training to function as a SBA: Fieldworkers asked respondents their experience and training for functions performed by a SBA at BEmONC level in the 3 months prior to the assessment. Between 23% and 35% of hospital staff and only 3.5% to 10% of health center staff had been trained in suturing a vaginal laceration, applying a vacuum extractor, performing MVA and administering magnesium sulphate for the treatment of severe pre-eclampsia or eclampsia. These vital life saving functions had only been performed by less than 30.0% of hospital staff and less than 6% of health center staff in the same time frame.

Other skills such as manual removal of a placenta and use of the partogram had been performed more frequently and staff had been trained more recently. However, overall the level of training and skills to support these functions were inadequate.

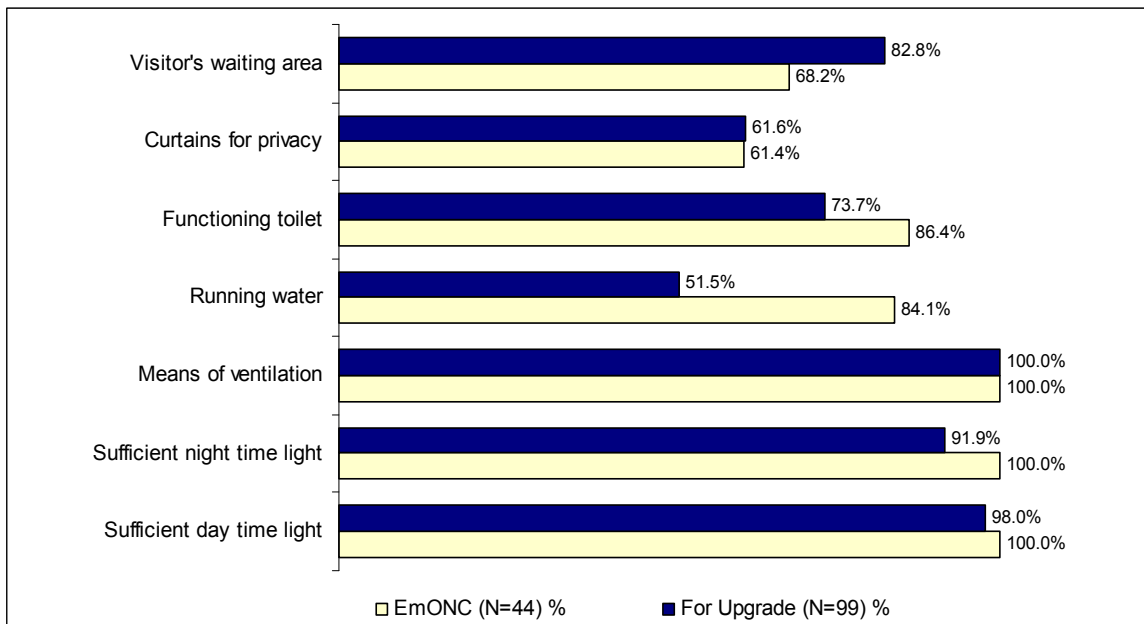
9. Findings: Infrastructure

Facilities that provide services for obstetric complications must have appropriate physical infrastructure to support timely emergency obstetric care. It is crucial to backup the support services with well functioning systems.

9.1 Basic Infrastructure

The infrastructure was assessed for availability in seven areas: visitors' waiting area, curtains for privacy, functioning toilet, running water, means of ventilation, and sufficient light sources for day and night. Findings are presented in Figure 9-1

Figure 9-1 Infrastructure Support for EmONC Facilities and Facilities for Upgrade



The assessment found that ventilation and lighting are adequate for most service areas in hospitals and health centers surveyed. However, only 51% of facilities for upgrade have running water and 73.7% have a functioning toilet. There is a need for curtains for patient privacy in 39% of EmONC facilities and facilities for upgrade. These facilities would also benefit from additional waiting areas for visitors and families.

Electricity

All surveyed referral hospitals had functioning electricity. Table 9.1 shows that the main source of power was from private providers. Only 16% of hospitals used a generator. The remainder of facilities used either a government supply or a mix of different sources. (75%) of health centers had functioning electricity. 6 facilities that have been recommended for upgrade to BEmONC status will require infrastructure support for an improved power supply.

Table 9.1 Source of Power in all Hospitals and Health Centers Surveyed

Source of Electricity	Hospitals (N =77)		Health Centers (N=230)	
	No	%	No	%
Solar	0	0	63	36
Private power line	24	31	58	34
Government power line	21	27	30	17
Generator	12	16	18	11
Power line and generator	20	26	4	2
Total	77	100	173	100

Water

All hospitals and 98.3% of health centers have access to clean water. For 57% of hospitals and 59% of health centers, the main source of water was either a well or bore hole. However, on a room-by-room basis the supply of water is variable. Table 9.2 shows that for identified EmONC facilities, water was available to 77% of operating theatres and 84% of post natal rooms. The situation is worse for facilities for upgrade; 14% of operating theatres and 50% of post natal rooms have water.

Table 9.2 Water Supply in Selected Rooms of EmONC Facilities and Facilities for Upgrade

	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Operating theatre	34	77	14	14
Delivery room	44	100	94	95
Post natal room	37	84	49	50

9.2 Summary

The assessment found that ventilation and lighting are adequate for most service areas in hospitals and health centers surveyed. However, only 51% of facilities for upgrade have running water and 73.7% have a functioning toilet. There is a need for curtains for patient privacy in 39% of EmONC facilities and facilities for upgrade. These facilities would also benefit from additional waiting areas for visitors and families.

Electricity: The main source of power was from private providers. Only 16% of hospitals used a generator. 6 facilities that have been recommended for upgrade to BEmONC status will require infrastructure support for an improved reliable power supply.

Water: All hospitals and 98.3% of health centers have clean water. On a room-by-room basis, the supply of water is variable. More than 33% of CEmONC operating theatres and 16% of post natal rooms will require improvements in water supply.

10. Findings: Equipment and Supplies

All hospitals and health centers visited during the assessment were inspected for the availability of equipment, supplies and essential drugs required to support the efficient delivery of EmONC services.

A room by room assessment was not undertaken, as most facilities shared space with other services. There were only 4 facilities with operating theatres for the exclusive use by obstetric and gynecological patients. There were no lists for standard equipment, supplies or essential drugs for EmONC. MoH lists of equipment have essential items missing.

10.1 Emergency, Labor and Delivery Rooms

Basic Items

Fieldworkers assessed facilities for 52 different basic items. For each item on the list there had to be at least 1 functional item for it to be recorded as available.

When the data was grouped and compared with other facilities, a clear pattern emerged on the type of equipment that was available and the equipment that was missing. More common items, like blood pressure machines, stethoscopes, bowls, basins and syringes were readily available. Specialized items, such as those shown in table 10.1 for essential newborn care, were missing.

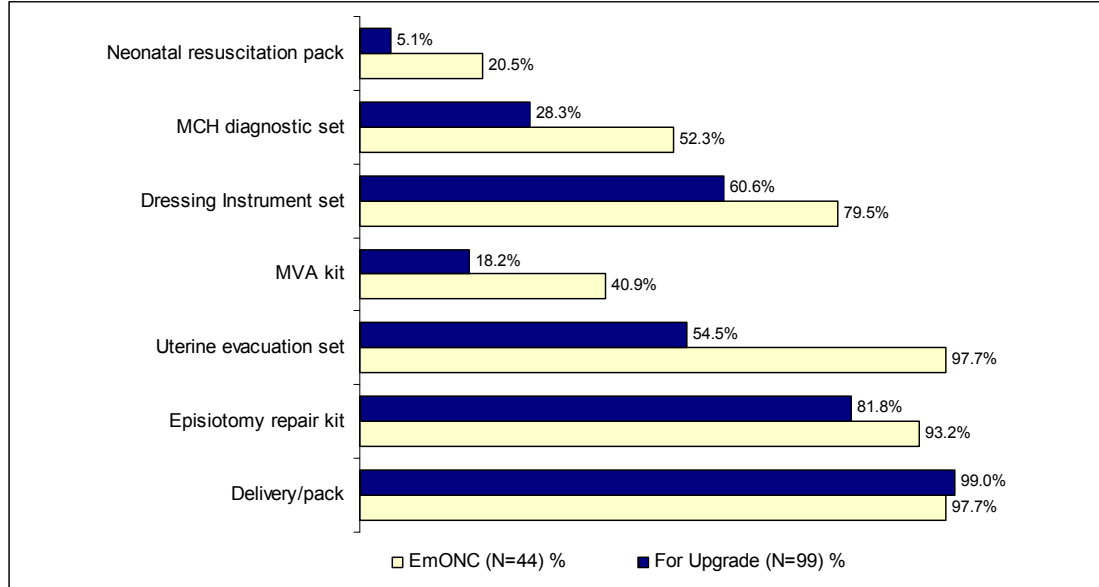
Table 10.1 Basic Items to Support Obstetric Services in EmONC Facilities and Facilities for Upgrade

Basic items	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Adult ventilator bag and mask	36	81.8	37	37.4
Wheelchair	25	65.8	18	18.2
Apnea monitor	23	52.3	18	18.2
Towels or cloth for newborn	17	38.6	13	13.1
Neonatal resuscitating table	16	36.4	13	13.1
Rectal thermometer for newborn	15	34.1	11	11.1
IV set (neonatal giving set) / Umbilical catheter	9	20.5	4	4.0
Incubator	7	15.9	3	3.0
Pulse oximeter	7	15.9	2	2.0
Radiant warmer	6	13.6	4	4.0%

Emergency, Labor and Delivery Rooms – Sets / Packs

The availability of at least 1 functional kit or pack for neonatal resuscitation, delivery, and a range of obstetric and gynecological procedures were assessed at each facility. Figure 10-1 shows the difference in availability between EmONC facilities and facilities for upgrade, for each type of pack/kit. Overall, EmONC facilities were better equipped.

Figure 10-1 Basic Kits / Packs in EmONC Facilities and Facilities for Upgrade



In facilities for upgrade, uterine evacuation sets (54.5%), MVA kits (18.2%) and dressing instrument sets (60.6%) are in short supply. There is critical shortage of more specialized kits/packs such as neonatal resuscitation kits/packs.

Instruments for Delivery

As can be seen by Table 10.2 vacuum extractors were available in all EmONC facilities and only 45.5% of facilities for upgrade. Only 27.3% of EmONC facilities had outlet forceps and 11.1% of facilities for upgrade.

Table 10.2 Obstetric Delivery Instruments in EmONC Facilities and Facilities for Upgrade

	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Vacuum extractor with different size cups	44	100.0	45	45.5
Obstetric forceps, outlet	12	27.3	11	11.1
Obstetric forceps, mid-cavity	4	9.1	0	0.0
Obstetric forceps, breech	2	4.5	0	0.0

10.2 Operating Theaters

Thirty five (79.5%) EmONC facilities and 15 (15.2%) facilities for upgrade have operating theaters. Only 4 theaters cater for obstetric patients exclusively (refer to table 10.3).

Table 10.3 Operating Theaters in EmONC Facilities and Facilities for Upgrade

	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Availability of operating theater	35	79.5	15	15.2
Availability of operating theater for obstetric patients only	3	8.6	1	6.7

As already discussed in section 3.2 of this report, 12 additional CEmONC facilities are required throughout the country. There are enough operating theaters in the facilities for upgrade to cover this need.

Operating Theaters: Basic Items, Sets and Packs

With the exception of 66.7% of the facilities for upgrade lacking in some syringes, the availability of basic items was adequate.

The more commonly used packs for obstetric laparotomy and caesarean sections were available. The shortfall was with more specialized packs. Only 48.6% of EmONC facilities and 26.7% of facilities for upgrade had craniotomy equipment available.

10.3 Laboratory Equipment and Supplies

Laboratory services are needed for the provision of delivery of blood transfusion, HIV testing, diagnosis of malaria, etc. All of the identified EmONC facilities and 26% of the facilities for upgrade have laboratories.

Overall, laboratory equipment and services need improvement. A full list of the items assessed is in appendix 6.

Table 10.4 shows equipment which is comparable to the draft Safe Motherhood Clinical Management Protocols⁴⁰ to be introduced throughout Cambodia. There is a shortage in specific items e.g. less than 40.9% of facilities had artery forceps and 22.7% had Bovine albumin.

⁴⁰ Safe Motherhood Clinical Management Protocols for Referral Hospitals, November (2009), National Reproductive Health Program with support from UNFPA

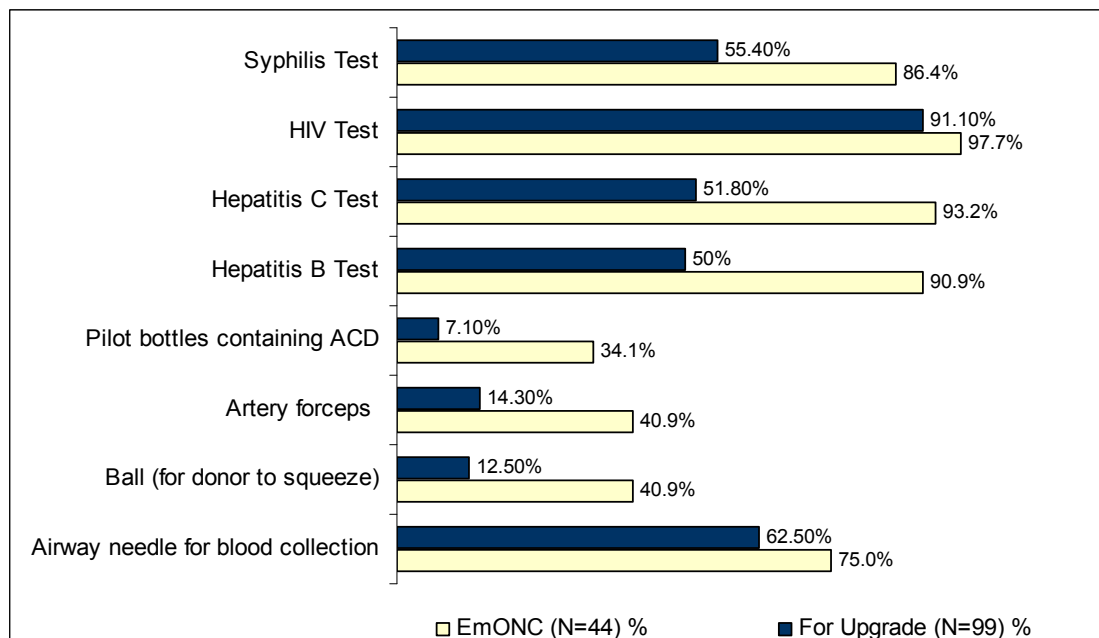
Table 10.4 Laboratory Supplies and Equipment for EmONC Facilities and Facilities for Upgrade**

	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Blood Machine and cuff	44	100.0	97	98.0
Centrifuge (electric)	44	100.0	43	76.8
Test tubes	43	97.7	45	80.4
Pipettes Volumetric	39	88.6	35	62.5
Microscope illuminator	38	86.4	39	69.6
Compound microscope	33	75.0	29	51.8
Airway needle for collecting blood	33	75.0	35	62.5
8.5 g/l Sodium Chloride solution	28	63.6	26	46.4
Water bath (or incubator)	24	54.5	21	37.5
Artery forceps	18	40.9	8	14.3
Pilot bottles (containing 1 ml ACD solution)	15	34.1	4	7.1
20% Bovine albumin	10	22.7	5	8.9

** Based on New Safe Motherhood Guidelines November 2008 (blood giving set not included)

Figure 10.2 shows the availability of equipment and supplies for blood collection and screening tests. Once again, availability is variable with facilities for upgrade being worse.

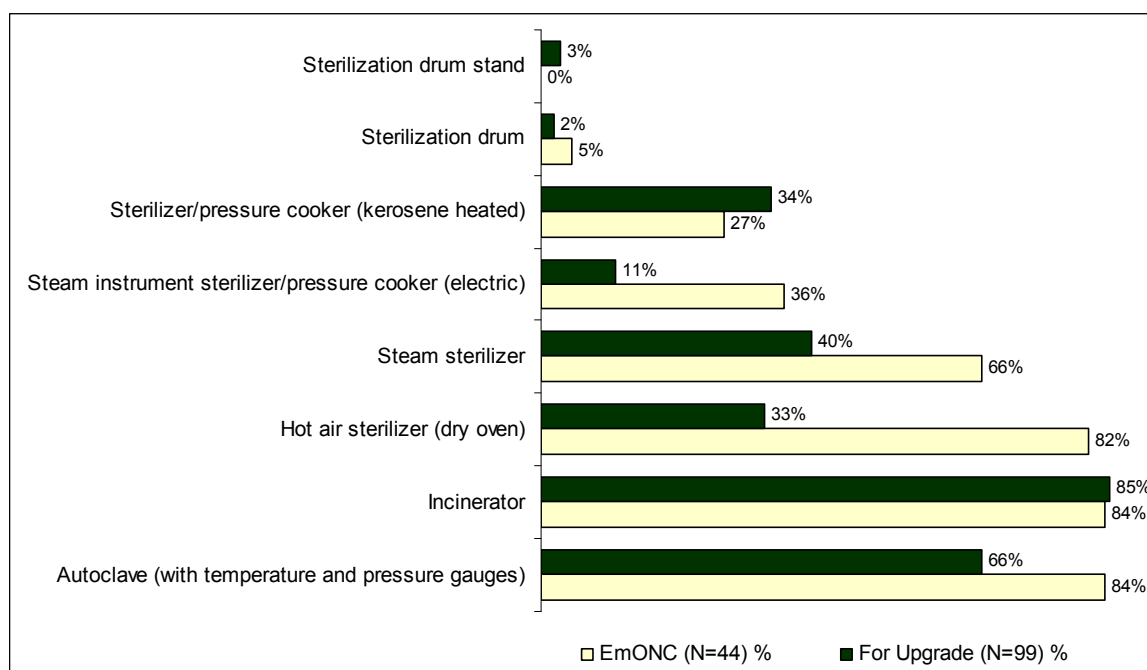
Figure 10-2 Blood Collection and Screening Tests in EmONC Facilities and Facilities for Upgrade



10.4 Autoclaves

Facilities were assessed for the availability and type of autoclave and if the facility had a separate autoclave room. 88.6% of all EmONC facilities had an autoclave compared with only 27.3% for facilities for upgrade. Where a facility did have an autoclave, it usually only had one. As can be seen by figure 10-3, 84% of EmONC facilities had an autoclave with temperature gauges and incinerator. 85% of facilities for upgrade had an incinerator and 66% an autoclave with temperature gauges. The least used autoclaves were those with a sterilization drum.

Figure 10-3 Autoclaves used in EmONC Facilities and Facilities for Upgrade



10.5 Infection Prevention

Equipment and supplies to support infection prevention were relatively good. Missing items in 20.5% of facilities included non-sterile protective clothing, prepared disinfection and separate trolley for a sterile field. Polyvidone iodine was the main antiseptic available in 96% of EmONC facilities and 86.6% of facilities for upgrade. Ethanol was available in less than 36.5% of facilities.

10.6 Pharmacy

Facilities were inspected for the availability of drugs to treat obstetric emergencies. Refer to table 10.5, all EmONC facilities and 99% of facilities for upgrade had pharmacies. 62.5% of EmONC facilities and 72.7% facilities for upgrade had up-to-date drug inventory registers and ward supply requests.

About 72% of EmONC facilities and 76.8% of facilities for upgrade used the first-in-first-out supply management technique and had a mechanism to prevent the use of expired drugs and 'stock outs'. Up to 90.9% of EmONC facilities and 87.9% of facilities for upgrade had storage facilities to protect the drugs from moisture, heat or infestation.

Availability of Drugs by Class

Common drugs are grouped on pharmaceutical class and subsets of the group. The availability of the different members of selected drug classes is found in table 10.5. EmONC facilities had a good supply of most drug groups, except antiretroviral for PMTCT/HIV care (68.2%) and antimalarials (79.5%). The facilities for upgrade were not so well supplied, with inadequate antiretroviral (35.4%), steroids (65.7%), antimalarials (69.7%) and anticonvulsants 81.8%.

Table 10.5 Drugs by Class in all EmONC Facilities and Facilities for Upgrade

Drugs	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Antibiotics	44	100.0	98	99.0
Anticonvulsants	44	100.0	81	81.8
Antihypertensives	44	100.0	91	91.9
Oxytocics/ prostaglandins	43	97.7	95	96.0
Emergency Drugs	44	100.0	96	97.0
Anesthetics	44	100.0	91	91.9
Analgesics	44	100.0	99	100.0
Tocolytics	44	100.0	95	96.0
Steroids	42	95.5	65	65.7
IV Fluids	44	100.0	99	100.0
Antimalarials	35	79.5	69	69.7
Antiretroviral for PMTCT / HIV	30	68.2	35	35.4

Availability of Drugs within Class

There were critical shortages of particular drugs within all drug groups, including antibiotics, anticonvulsants, drugs used in emergencies and for anesthetics, analgesics, IV fluids, antimalarials, drugs for PMTCT/HIV care and more. See appendix 7 for more details on these shortages.

10.7 Summary

Overall, EmONC facilities were better equipped than facilities for upgrade. There were no lists for standard equipment, supplies or essential drugs for EmONC. MoH lists of equipment have essential items missing.

Basic supplies and equipment: More common items, like blood pressure machines, stethoscopes, bowls, basins and syringes were mostly available. More specialized items, such as emergency equipment for newborn care, uterine evacuation sets, MVA kits and instruments for assisted vaginal delivery, were often missing.

Operating Theaters: Nearly 80% of identified CEmONC facilities have a functioning operating theater and there are enough operating theaters in the facilities for upgrade to cover any shortfall. No new theaters will need to be built; however existing infrastructure needs strengthening in areas such as improving the water supply on a room by room basis.

Laboratories: All of the identified EmONC facilities and 26% of the facilities for upgrade have laboratories. Overall, laboratory equipment and services could improve. There is an overall shortage in all equipment and supplies with facilities for upgrade being in greater need.

Autoclaves: 88.6% of EmONC facilities had an autoclave compared with only 27.3% for facilities for upgrade. Autoclaves with temperature gauges and incinerator were mostly available. The least used autoclaves were those with a sterilization drum.

Infection Prevention: Equipment and supplies to support infection prevention were good. Missing items in less than 25% of facilities included non-sterile protective clothing, prepared disinfection and a separate trolley for a sterile field.

Pharmacy: Most facilities have a pharmacy and a system in place based on the first-in-first-out supply management technique and a mechanism to prevent the use of expired drugs and 'stock-out'. Drug inventory registers and ward supply requests sheets were mostly up to date. Nearly all facilities had storage facilities to protect the drugs from moisture, heat or infestation and most drugs classes were in stock.

Drugs: Despite management systems being in place and most facilities having a good supply of most drug groups there is a critical shortage of particular drugs within each drug group including antibiotics, anticonvulsants, drugs used in emergencies and for anesthetics, analgesics, IV fluids, antimalarials, drugs for PMTCT/HIV care and more. **See appendix 7 for more information on these shortages.**

11. Main Findings and Conclusions

11.1 Introduction

The findings of the study are discussed in the following sections, based on literature review, field visits, researchers' own experience and interactions with experts, program managers and policy makers. The discussion starts with the limitations of the study to be followed by the availability, functioning and utilization of current EmONC services in Cambodia, followed by barriers to the development of a network of EmONC facilities throughout Cambodia.

11.2 Limitations of the Study

Selection of Facilities:

The selection of health centers for this assessment was a purposive selection of 3 health centers in each OD. Technically speaking health centers included in the survey are not representative of all health centers in an OD.

Quality of Data:

The study methodology depended entirely on the quality of data maintained at the health facilities. However, significant gaps were present in the availability and the quality of the information, which has been a challenge and constraint of the study.

The quality of referral data was poor. The records do not show: the type of complication; the source of referral; where a mother and newborn is referred to and from and the outcome of the referral. The referral system for mothers and especially newborns could be improved.

Under Reporting of Maternal Deaths

The under reporting of maternal deaths is a particular concern. Only 57 maternal deaths from direct causes were recorded in all facilities surveyed from July 2007-June 2008. The indirect causes of maternal death were lower (22). When consideration is given to the official⁴¹ Cambodian maternal mortality ratio of 472, per 100,000 births and the fact that in all facilities studied the number of women giving birth was 94,120, it would seem deaths are being under reported. Therefore care must be taken when interpreting indicators which use maternal deaths in the calculations.

Under Reporting of maternal deaths is a common problem in many countries⁴². However; as Cambodia becomes more familiar with the indicators, reporting of deaths and other data to support the indicators should improve dramatically. This in itself can make "improvements" difficult to assess because it is often difficult to determine if the improvement are "real" or a function of better reporting.

⁴¹ National Institute of Public Health and National Institute of Statistics, (2005), Cambodia Demographic and Health Survey, Cambodia

⁴² Feedback from AMDD team member

Inclusion of Private Sector

The survey included the majority of maternity clinics registered with the MoH. According to CDHS⁴³ 16.8% of all deliveries take place in public health facilities while 3.9% are in private facilities. This division of maternity care is not reflected in the study sample or findings. This needs to be taken into consideration when interpreting the findings. For example; in Siem Reap the Jay Varaman Hospital, a large private hospital which absorbs almost all maternity services in that province was not included in the study. This is possibly the reason why the caesarean section rate (0.2%) for all facilities in the Seam Reap was low.

The MoH will need to determine if private facilities are going to be included in future plans for EmONC throughout the country. There is no doubt the private sector is contributing significantly to EmONC. However, the capacity of the Ministry to monitor these private services, and expecting the service providers to conform to specific standards in an unregulated environment, could present a challenge.

11.3 Availability, Functioning and Utilization of EmONC Services

Availability of EmONC Services

There are 1.6 EmONC and 0.9 CEmONC services per 500,000 people. This falls short of the recommended level of *at least five* EmONC facilities which includes *at least one* CEmONC facility per 500,000 people. An additional 99 non-EmONC facilities will need to be upgraded to fill the current shortfall.

Distribution of EmONC Facilities

EmONC facilities are poorly distributed. Five provinces are without any form of EmONC services, 2 provinces lack CEmONC facilities and another 8 have no BEmONC coverage. Identified EmONC facilities are clustered around towns and cities. This absence of BEmONC facilities is similar to the experience of other developing countries.⁴⁴

Utilization and Functioning of EmONC Services

11.4 % of all expected births in Cambodia took place in EmONC facilities. The UN recommends that 15% or above of all births should be in EmONC facilities. Only 3 out of 24 provinces in Cambodia met or exceeded the level. When the number of births occurring in all facilities surveyed is weighted to represent all health centers, the proportion of births increased to 30.71%. This suggests that up to 70% of women are delivering outside the health service. TBAs would conduct the bulk of these non-institutional deliveries.

The low number of institutional deliveries, the lack of BEmONC services coupled with poor distribution of EmONC, translates to poor met need for EmONC services. Only 12.7% of the 15% of all women who develop obstetric complications were treated in EmONC facilities. This is below the

⁴³ Ibid

⁴⁴ Paxton A., Bailey P., Lobis S., Fry D. (2006) Global patterns in availability of emergency obstetric care International Journal of Gynecology and Obstetrics (2006) 93, 300—307

recommended level of 100%. This means that the needs of women with complications of pregnancy are not being met in all provinces of Cambodia. It is clear that the majority of women with obstetric complications are not receiving much needed EmONC in health facilities throughout Cambodia.

There are women who require critical services, such as caesarean sections, who are not receiving them. Only 1.3% of all births in the identified EmONC facilities were by caesarean section. This is well below the recommended minimum level of 5% - 15% and means that many women and their newborns could be suffering unnecessarily, or are at risk of continued morbidity and mortality.

The DOCFR, which is a crude indicator for quality, was 0.8% for all EmONC facilities and 0.75% for all facilities for upgrade. This meets the UN recommended level of 1% or less. 7 out of 24 provinces were below the UN recommended level of 1%. However, maternal deaths are under-reported in most provinces, so the interpretation of this indicator this needs to be interpreted in the context of the previous indicators, which show that women are not utilizing EmONC services and their need for EmONC is not being met.

Provinces

The provinces have been ranked according to met need from highest to lowest (see table 3.20). As expected, Phnom Penh was the best performing area and treated the most complications with a met need of 66.1%. Kampong Speu, Kandal, Mondul Kiri, Oddar Mean Chey and Kep recorded no complications. These were also the provinces that had no EmONC facilities. This is either a failure to record complications, or the province does not have the population to support CEmONC. It could be that women are not being treated, or are being directly referred to more specialized health facilities.

Some of the largest provinces were also toward the bottom of the list. This could be because all private facilities providing maternity services were not captured in the study. For example, in Seam Reap, Jay Varaman Private Hospital provides maternity services but was not included, as it is not registered with the MoH.

Performance of Signal Functions and Services Vital to Mothers and Newborns

All facilities were asked about the performance of signal functions and services vital to mothers and newborns in the three months prior to the survey.

Signal Functions: The administration of oxytocics (100%) was the most frequently performed signal function for both hospitals and health centers. Less than 62% of facilities administer parenteral anticonvulsants and antibiotics, and performed assisted vaginal delivery, neonatal resuscitation, blood transfusion, removal of retained products and manual removal of placenta.

Service Vital to Mothers and Newborns: Less than 22% of hospitals and only 2.6% of health centers gave parenteral antibiotics to newborns. Breech deliveries were performed by 83.1% of hospitals and 47.4% of health centers. Rapid testing for HIV was done by less than 36% of hospitals and health centers. 51.9% of hospitals provided antiretroviral to newborns and 44.2% to mothers, while only 3.9% of health centers provided the same services.

11.4 Barriers to the Availability, Functioning and Utilization of EmONC

Barriers to the availability, functioning and utilization of EmONC services include the following:-

Standards, Guidelines and Protocols

There are no EmONC standards or guidelines in place to guide service delivery. Standardized lists of EmONC equipment, supplies and essential drugs are missing. MoH equipment lists are inadequate and newly revised safe motherhood protocols need to be reviewed to ensure EmONC best practice is included.

Policy Issues

The main reasons for non-performance of signal function were 'policy issues'. This relates to MPA and CPA guidelines, which only allow health centers and referral hospitals to perform certain procedures and keep specific drugs in stock. For example, 41% of health facilities were not administering parenteral antibiotics and staff were not trained or authorized to provide life saving signal functions. For health centers to be upgraded to BEmONC status; there will need to be policy in place to support practice and administration of life saving signal functions.

Infrastructure

No new health centers, hospitals or theaters will need to be built, but existing infrastructure needs to be improved and upgraded to support a standardized EmONC 'package'.

Ventilation and lighting are adequate for most facilities surveyed. However, there is a need for curtains for patient privacy in 39% of EmONC facilities and facilities for upgrade. Facilities would also benefit from additional waiting areas for visitors and families.

Most EmONC facilities have clean water and functioning toilets. However, nearly half of the facilities for upgrade require improvements in the supply of water and the functioning of toilets.

Supplies and Equipment

Many of the facilities have missing supplies and equipment to support good quality EmONC.

Basic supplies and equipment: Common items, like blood pressure machines, stethoscopes, bowls, basins and syringes were mostly available. More specialized items such as emergency equipment for newborn care, uterine evacuation sets, MVA kits and instruments for assisted vaginal delivery were often missing.

Laboratories: All of the identified EmONC facilities and 26% of the facilities for upgrade have laboratories. Overall, laboratory equipment and services could improve.

Autoclaves: 88.6% of EmONC facilities had an autoclave compared with only 27.3% for facilities for upgrade. Autoclaves with temperature gauges and incinerator were mostly available. The least used autoclaves were those with a sterilization drum.

Pharmacy: Most facilities have a pharmacy and a system in place based on the first-in-first-out supply management technique. There are also mechanisms in place to prevent the use of expired drugs, minimize stock-outs and proper storage of drugs. Despite this, there is a critical shortage of

particular drugs within all drug groups, including antibiotics, anticonvulsants, drugs used in emergencies, analgesics, IV fluids, antimalarials, drugs for PMTCT/HIV care and more. This is possibly more an indication of a shortage of funds or problems with the procurement and distribution system, which was beyond the scope of the assessment.

Staff Coverage

A workforce with the right skills set, with the required numbers and with the enabling authority to perform their duties, is needed for effective delivery of EmONC services.

The needs assessment found that health facilities are critically understaffed and health providers are not always available in the right number and skills mix to provide good quality EmONC.

- There is only one facility with a pediatrician/neonatologist. 91.6% of facilities have no obstetricians, 59.4% have no general medical doctors and 69.2% no medical assistants.
- Most (97.9%) EmONC facilities or facilities for upgrade have no anesthesiologist doctors. However, 4.9% of facilities have nurse anesthetists.
- About 20.3% of facilities have no secondary midwives and 34.3% have no primary midwives.

More anesthetists, obstetricians and midwives are required to support ‘around the clock services’. Staffing norms for EmONC need to be developed and the current workforce reviewed and redistributed to ensure an optimum skills mix to support EmONC functions. There should also be an upgrade of clinical skills to ensure a competent and proficient workforce is paramount.

Skilled and Proficient Providers

The needs assessment showed that a large number of health staff have extreme deficiencies in skills and knowledge regarding basic actions to deal with maternal and neonatal complications. EmONC signal functions are not taught to midwives in pre service training and are not widely practiced throughout Cambodia. The provision of training for: the administration of parenteral drugs; provision of Assisted Vaginal Delivery (AVD) services (especially vacuum delivery); manual vacuum aspirator services; dealing with neonatal emergencies, will go a long way in improving maternal health services.

Gaps in Services

Pharmacy, post natal care and delivery services were available in all facilities; however there were gaps in services which will need to be addressed during the upgrade of facilities.

Newborn Care: The care of newborns, with complications, is an area that needs improvement. Less than 14% of EmONC facilities and 2% of hospitals had provision for neonatal care. A total of 29 cribs across 10 hospitals were identified. However most of these cribs at referral hospitals were not being used or maintained.

Maternity Beds: Most (95.4%) EmONC hospitals had more than 5 beds, 32.3% of the facilities for upgrade had more than 5 beds. 3 facilities for upgrade had no beds. This will need to be addressed as part of the upgrade process.

Maternity Care: In most facilities mothers and babies were kept together, clean beds were ready to

accept arrivals, there was easy access to daily hygiene needs and sarongs were available to keep newborns warm. However, in less than 46% of facilities there were no clean towels to dry newborns, mothers were unable to deliver in a preferred position or have a companion with her when delivering. These needs are taken for granted but are important for mothers and newborns.

“Around-the-Clock” Services

Availability of staff trained to perform essential EmONC services is the starting point for providing 24-hour services. Secondary midwives are the main providers of 24-hour “on-site care” Only 61% of hospitals and 7% of health centers have a secondary midwife on site 24-hours a day.

Most EmONC facilities and facilities for upgrade are providing delivery services and have some form of communications 24-hours a day. 64.6% of facilities for upgrade and 11.4% of EmONC facilities were not providing laboratory services and EmONC drugs ‘around-the-clock’. Only 52.3% of EmONC facilities and 6.1% of facilities for upgrade have access to blood bank facilities 24-hours a day and the availability of operating theaters and anesthesia needs improving.

Availability of Blood

For public facilities, blood is available for transfusions through facility blood banks, families and friends and the central blood bank. However adequate technical support and equipment for ensuring a safe supply of blood is missing. It is vital that blood is screened for a number of tests including HIV and Hep B. Most private facilities source blood from the Central Blood Bank, which is a safe supply. However poor women in the public system cannot afford this service.

Referrals, Transport and Communications

Referrals ‘In and Out’: Referrals into the hospitals are less than the number of referrals out of health centers. An explanation might be poor record keeping or the referral chain needs strengthening.

Neonatal complications are referred less frequently. Only 6.5% of hospitals and 2.9% of health centers referred neonates out. Data was not being collected to track where neonates were referred. This needs further investigation.

Referral Transport: Transport is a key component of referral. All facilities had transportation available 24-hours a day. The most common means of transport for referral was car, ambulance or motorcycle. More traditional modes of transport such as three wheel moto, ox/horse cart and remork moto were used less frequently. As most poor women are unable to afford transport by car, cost of transport is likely to be a barrier to accessing EmONC.

Most facilities surveyed had access to maintenance for vehicles. However maintenance funds and sufficient fuel are problems for 20.5% EmONC facilities, 63.9% facilities for upgrade.

Communication: The main method of communication was personal mobile phones, supplied and paid for by staff. If staff decides not to continue to pay for local phone calls on a voluntary basis then communications would be a problem, as public telephone lines were only available in half of EmONC facilities and radio communication in nearly a quarter of all facilities.

Time and Distance: It is estimated⁴⁵ that 75% of maternal deaths occur as a result of direct obstetric complications. If untreated, death occurs on average in:

- 2 hours: From postpartum hemorrhage
- 12 hours: From antepartum hemorrhage
- 2 days: From obstructed labor
- 6 days: From infection

Timely intervention is vital. The assessment found that 81.8% of facilities were within 50km of a higher level referral hospital and for more than 72.6% of the facilities, the referral hospital could be reached within one hours travel. If all facilities are upgraded successfully, there will be a maximum of 2 hours travel between health facilities.

User Fees

User fees may deter women from prompt use of health services for themselves and their newborns. It is unclear if poor women are accessing EmONC. To learn more about where women are coming from, a study should be undertaken to determine who is accessing services, where they are coming from, what help they are getting and how much they are being charged.

Service Costs: Health services are not free in Cambodia. Government health facilities have a cost recovery scheme in place. At least 59% of all health facilities charged a registration fee of 500-2500 Riels. In all facilities a fee was not required in order to receive the emergency treatment. The cost of services varied between facilities, with EmONC being more expensive.

Equity Funds: There is an “equity fund” which poor women can access if they are unable to pay. However not all health facilities have access to this fund. More than half (61.0%) of the hospitals and only 29.5% of health centers said poor women were accessing equity funds. The percentage of health centers with equity funds was less than half of that of hospitals.

Best Practice

Magnesium sulphate has been shown to be superior to diazepam, phenytoin and other sedatives or anticonvulsants in the management and prevention of eclampsia.⁴⁶ It is not on the national essential drug list which helps explain why only 15% of hospitals had it in stock.

Safe motherhood protocols were available in more than 73% of all facilities surveyed and more than 64.3% health facilities state they use them. The use of these protocols needs to be encouraged.

⁴⁵ UNFPA, (2001), Distance Learning System in Population Issues, Course 6 Maternal Deaths: Selecting Priorities, Tracing Progress. Module 1: Understanding the Causes of Maternal Deaths

⁴⁶ Chien PFW, Khan KS, Arnott N. (1996), Magnesium sulphate in the treatment of eclampsia and preeclampsia: an overview of the evidence from randomised trials BJOG: An International Journal of Obstetrics & Gynaecology (1996) V103: 11 pg.1085-1091

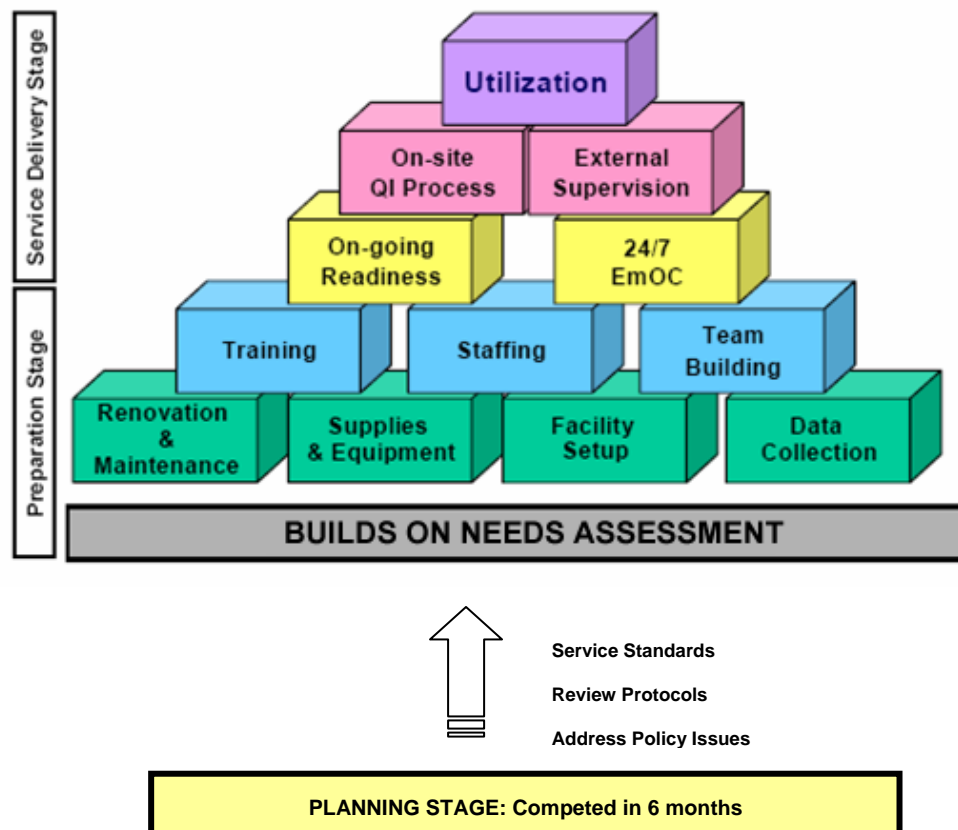
12. Strategic Approach

That EmONC services be strengthened over 3 stages:

1. Development of Improvement Plan: where policy issues are addressed, service standards and improvement plan developed
2. Preparation Stage: where EmONC is managed centrally with decentralization to Regional Training Centers
3. Service Delivery Stage: where EmONC is decentralized fully to the provinces with training support from Regional Training Centers

That the preparation and planning stage be guided by the AMDD building block model, a useful tool that shows what activities must be carried out and how each activity relates to the other and in what sequence they will be initiated. Refer to Figure 12-1

Figure 12-1 AMDD EmONC Building Blocks Framework⁴⁷



⁴⁷ Adapted from a model developed by AMDD

13. Recommendations

Based on study findings, the following short and medium term recommendations are made:

13.1 Short Term Recommendations: Improvement Plan

1. Continue with consultative meetings and disseminate needs assessment findings at all levels with stakeholders and agree on next steps.
 - Get support from policy makers, propose changes and agree on the coordination body
 - Work with Provincial Health Department /Operational Directors and Ministry of Health central departments, agree on EmONC improvement plan
 - Get support from other sectors (e.g. Ministry of Education, Ministry of Interior, Ministry of Women Affairs and others), and professional societies (Obstetrician-Gynecologists, Midwives, Anesthetists, Pediatricians)
2. Develop a ‘fully costed’ National EmONC improvement plan with involvement of stakeholders, including provinces and development partners. Have a clear timetable and objectives with UN EmONC Indicators as a tool for monitoring.
3. Agree on service standards and guidelines for EmONC facilities. Standards should include specifications for infrastructure, human resources, essential EmONC drugs, equipment and supplies etc, and be easily integrated with the new revised Safe Motherhood Protocols.
4. Provide feedback on the Safe Motherhood Protocols to ensure all signal functions, other vital services and best practice (e.g. magnesium sulphate) to support EmONC are included and make recommendation for changes if required.
5. Review National Guidelines on CPA and MPA activities for referral Hospitals and health centers and make recommendations for changes to support EmONC e.g. allowing health centers providing BEmONC to provide a wider range of drugs.
6. Review the recommended level for the UN EmONC Indicators, in consultation with the MoH, and if required, adjust to suit the Cambodia context.

13.2 Medium Term Recommendations: Implementation of Improvement Plan

Management

Implementation of EmONC throughout the country will require a process which ensures local capacity is in place to support and sustain EmONC.

7. Mobilize resources to support the EmONC improvement plan on with support from:
 - Government
 - Development partners
 - Professional societies.

8. Oversee and support EmONC services centrally, then gradually decentralize as local capacity is developed and EmONC strengthened. Steps for decentralization should be as follows:
 - Establish a core EMONC team in the NMCHC that will oversee and lead EmONC throughout the country.
 - Upgrade facilities; then begin to decentralize by having core team develop capacity of regional teams attached to the 5 Regional Training Centers.
 - Continue to decentralize by having regional teams develop capacity of provinces. Transfer oversight and support to provinces within two years of establishing regional teams.
- 9 Consider introducing a non-financial award program to strengthen the quality of services and raise the profile of EmONC in the community. A concept note is provided in appendix 7.

Renovation and maintenance of facilities

To ensure access and equitable distribution of EmONC across Cambodia:

10. Appoint an EmONC officer within the NMCHC core team, to coordinate and monitor the renovations and maintenance of EmONC facilities, according to standards, guidelines and specifications.
11. Upgrade 99 non-EmONC facilities to fill the current shortfall of 12 CEmONC and 87 BEmONC facilities. This should be under the direction of MoH and with support from the EmONC core team; for a list of facilities see appendix 2.

Supplies and Equipment Acquisition

Many of the facilities were found to be missing items essential to good quality EmONC. There were inconsistencies between different kinds of packs, sets and equipment and between MoH essential supply, equipment and drug lists, and Safe Motherhood protocols.

12. Work with MoH to streamline procurement by:
 - Preparing a list to show what each EmONC facility requires.
 - Sending a directive, with the list attached, to procurement, central medical stores (CMS) and the person in charge of the facility being upgraded.
13. To ensure important equipment and supplies are available and standardized, consider supplying selected essential equipment and supplies in EmONC kits/boxes.
14. Deploy maintenance teams to attend to the repair of existing equipment. This could also be part of the strategy employed to address infrastructure needs.

Facility Setup

As facilities are renovated, repairs completed and new equipment installed, pay attention to the readiness of each room and area of a facility, to serve its designated function.

15. In each EmONC facility, identify an existing committee within the facility to be responsible for:

- Opening and setting up equipment and providing training in “room by room” facility setup.
- Preparing an inventory list and recording in the inventory register.
- Seeing that all equipment is installed and functional.
- Posting lists in appropriate rooms of instruments, supplies and emergency drugs.

Training

Particular attention should be given to updating skills of staff, to reflect current evidence-based practices through practical, skills-based training and not just theoretical lectures.

16. Pay particular attention to developing and upgrading skills of local EmONC specialists, i.e. anesthetists, neonatologists and obstetricians and gynecologists.
17. Adapt and establish a competency-based training (CBT) program in EmONC and neonatal care and provide national recognition for the training. For example: AMDD and JHPIEGO collaborated to develop a CBT curriculum for EmONC and for Anesthesia⁴⁸. The curriculum is based on WHO’s ‘Managing Complications in Pregnancy and Childbirth’⁴⁹.
18. Consider upgrading the skills of primary midwives for obstetric first-aid.
19. Use a team approach to training in the workplace (or as close to where team members work) using real life problems and cases. This will reinforce the teamwork required to respond effectively in emergencies.
20. Ensure CBT learning is followed through with visits by trainers to the worksites, to review progress and assess workers’ confidence and competence in using new skills.
21. Ensure clinical skills are maintained, implement regular skills assessment where EmONC service providers are required to practice and then demonstrate their skills on a yearly basis. To ensure there is opportunity to do this, and out of respect for the women upon whom these skills might be practiced, use models.
22. Particular attention needs to be given to training of midwives and medical officers for proficiency in the performance of signal functions and the management of complications – including assisted vaginal delivery, neonatal resuscitation, MVA, the use of magnesium sulphate for eclampsia and the routine use of partographs for the monitoring of labor and delivery.
23. Make use of existing local program to support training. It was obvious during the assessment that RACHA and NMCHC have done a good job with teaching and supporting Life Saving Skills. Such initiatives need to be scaled up.

⁴⁸ JHPIEGO, AMDD. (2003). Emergency Obstetric Care for Doctors and Midwives, and Anesthesia for Emergency Obstetric Care for Doctors and Midwives.

⁴⁹ WHO, UNFPA, UNICEF, World Bank (2000), Managing Complications in Pregnancy and Childbirth; A Guide for midwives and doctors. WHO/RHR/00.7 (Available in English, French and Spanish)

Data Management

The availability and quality of data varies from facility to facility. In some facilities, complete records were not available, whereas in others, entries in the registers were not maintained. There is a need to improve the quality of data being recorded and reported.

24. Negotiate with Siem Reap Provincial Health Department to collect facility data from Jay Varaman Hospital for inclusion with existing baseline data.
25. Facilitate a series of workshops to promote the use of the UN EmONC indicators at a national, provincial and district level. They are the key method for monitoring and evaluating the availability, quality and utilization of EmONC.
26. Pay special attention to the definition of different kinds of cases, for example how to define the different types of direct and indirect obstetric and neonatal complications / terms e.g. spontaneous abortion, and stillbirth.
27. Conduct a series of workshops with facility staff as well as district and provincial managers on the calculation and interpretation of UN EmONC Indicators and encourage the use of a simple Excel work sheet at a local level.

Integration and Monitoring

28. Ensure EmONC improvement plan is integrated into Provincial Annual Operational Plans (AOPs), 3 year rolling plans and the updated Health Strategic Plan and the Reproductive and Sexual Health Strategy.
29. Review recommended levels for each UN EmONC Indicator and decide whether the level is appropriate for Cambodia, if not then adapt to local context
30. Develop CEmONC/BEmONC monitoring checklist and reporting format, implement then integrate it into the routine Health Information System (09-10).
31. Help Provincial Health Department and Operational Districts translate the results and recommendations into their annual operational plan (on-going).
32. Monitor and review annually as part of the Joint Annual Performance Report starting 2010.

Research

33. Maternal death audits should be instituted nationwide in all health facilities across the country.
34. There is a need to understand where women are coming from, what services they are using and the barriers they face when accessing services. A study could be undertaken to better understand this.
35. A study is required to understand if, and to where neonates are being referred and what happens to women who are referred onto the next level.
36. Evaluate progress made with a follow-up assessment of EmONC nationwide in 2015.

14. Appendices

Appendix 1: List of all facilities surveyed

I. NATIONAL HOSPITALS:

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
1	Phnom Penh	12	Nat.H	Doun Penh	2	Calmetre Hospital	101	Ntl. Hospital	NA
2	Phnom Penh	12	Nat.H	Doun Penh	2	NMCHC	102	Ntl. Hospital	NA
3	Phnom Penh	12	Nat.H	Tuol Kouk	4	Preah Kosmak	103	Ntl. Hospital	NA
4	Phnom Penh	12	Nat.H	Chamkar Mon	1	Mitapheap Khmer-Soviet	104	Ntl. Hospital	NA

II. REFERRAL HOSPITALS

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
1	Banteay Meanchey	1	Mongkol Borei	Mongkol Borei	2	Provincial Hospital	201	RH	CPA3
2	Banteay Meanchey	1	Preah Net Preah	Preah Net Preah	4	Preah Net Preah	202	RH	CPA1
3	Banteay Meanchey	1	Ou Chrov	Ou Chrov	5	Ou Chrov	203	RH	CPA1
4	Banteay Meanchey	1	Thmor Puok	Thmor Puok	7	Thma Puok	204	RH	CPA1
5	Battambang	2	Thmor Kol	Thmor Kol	5	Thmor Kol	205	RH	CPA1
6	Battambang	2	Battambang	Battambang	3	Provincial Hospital	206	RH	CPA3
7	Battambang	2	Mong Russei	Mong Russei	6	Mong Russei	207	RH	CPA2
8	Battambang	2	Sampov Luon	Sampov Luon	10	Sampov Luon	208	RH	CPA2
9	Kampong Cham	3	Chamkar Leu	Chamkar Leu	2	Chamkar Leu	209	RH	CPA1
10	Kampong Cham	3	Choeung Prey	Choeung Prey	3	Choeung Prey	210	RH	CPA1
11	Kampong Cham	3	Kampong Cham	Kampong Cham	5	Provincial Hospital	211	RH	CPA3
12	Kampong Cham	3	Kroch Chhmar	Kroch Chhmar	9	Kroch Chhmar	212	RH	CPA1
13	Kampong Cham	3	Memut	Memut	10	Memut	213	RH	CPA2
14	Kampong Cham	3	Ou Reang Ov	Ou Reang Ov	11	Ou Reang Ov	214	RH	CPA1
15	Kampong Cham	3	Ponhea Krek	Ponhea Krek	12	Ponhea Krek	215	RH	CPA1
16	Kampong Cham	3	Prey Chhor	Prey Chhor	13	Prey Chhor	216	RH	CPA1
17	Kampong Cham	3	Srey Santhor	Srey Santhor	14	Srey Santhor	217	RH	CPA1
18	Kampong Cham	3	Tbong Khmum	Tbong Khmum	16	Tbong Khmum	218	RH	CPA2
19	Kampong Chhnang	4	Kampong Tralach	Kampong Tralach	5	Kampong Tralach	219	RH	CPA1
20	Kampong Chhnang	4	Kampong Chhnang	Kampong Chhnang	3	Provincial Hospital	220	RH	CPA3

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
21	Kampong Speu	5	Kampong Speu	Chbar Mon	2	Provincial Hospital	221	RH	CPA3
22	Kampong Speu	5	Kong Pisey	Kong Pisey	3	Kong Pisey	222	RH	CPA1
23	Kampong Speu	5	Ou Dong	Ou Dong	5	Ou Dong	223	RH	CPA1
24	Kampong Thom	6	Baray-Santuk	Baray	1	Baray-Santuk	224	RH	CPA1
25	Kampong Thom	6	Kampong Thom	Steung Saen	3	Provincial Hospital	225	RH	CPA3
26	Kampong Thom	6	Stong	Stong	8	Stong	226	RH	CPA2
27	Kampot	7	Angkor Chey	Angkor Chey	1	Angkor Chey	227	RH	CPA1
28	Kampot	7	Chhouk	Chhouk	3	Chhouk	228	RH	CPA2
29	Kampot	7	Kampong Trach	Kampong Trach	6	Kampong Trach	229	RH	CPA2
30	Kampot	7	Kampot	Kampong Bay	8	Provincial Hospital	230	RH	CPA3
31	Kandal	8	Kien Svay	Kean Svay	2	Kean Svay	231	RH	CPA1
32	Kandal	8	Ksach Kandal	Ksach Kandal	3	Ksach Kandal	232	RH	CPA1
33	Kandal	8	Koh Thom	Koh Thom	4	Koh Thom	233	RH	CPA2
34	Kandal	8	Saang	Saang	10	Saang	234	RH	CPA1
35	Kandal	8	Takhmau	Takhmau	11	Chey Chumneah	235	RH	CPA3
36	Koh Kong	9	Smach Mean Chey	Smach Mean Chey	4	Provincial Hospital	236	RH	CPA3
37	Koh Kong	9	Srae Ambel	Srae Ambel	6	Srae Ambel	237	RH	CPA1
38	Kratie	10	Chhlong	Chhlong	1	Chhlong	238	RH	CPA2
39	Kratie	10	Kratie	Kratie	2	Provincial Hospital	239	RH	CPA3
40	Mondul Kiri	11	Sen Monorom	Sen Monorom	5	Provincial Hospital	240	RH	CPA2
41	Phnom Penh	12	Kandal	Chamkar Mon	1	Chamkar Mon	241	RH	
42	Phnom Penh	12	N/A	7 Makara	3	Municipal Hospital	242	RH	CPA3
43	Phnom Penh	12	Lech	Dang Kao	5	Pochintong	243	RH	CPA1
44	Phnom Penh	12	Cheung	Russei Keo	7	Samdech Ov	244	RH	CPA1
45	Phnom Penh	12	Tboung	Mean Chey	6	Mean Chey	245	RH	CPA1
46	Preah Vihear	13	Preah Vihear	Tbaeng Meanchey	7	Provincial Hospital	246	RH	CPA2
47	Prey Veng	14	Kamchay Mear	Kamchay Mear	2	Kamchay Mear	247	RH	CPA1
48	Prey Veng	14	Kampong Trabek	Kampong Trabek	3	Kampong Trabek	248	RH	CPA2
49	Prey Veng	14	Mesang	Mesang	5	Mesang	249	RH	CPA1
50	Prey Veng	14	Neak Loeung	Peam Ro	7	Neak Loeung	250	RH	CPA2
51	Prey Veng	14	Peareang	Peareang	8	Peareang	251	RH	CPA2
52	Prey Veng	14	Preah Sdach	Preah Sdach	9	Preah Sdach	252	RH	CPA1
53	Prey Veng	14	Prey Veng	Prey Veng	10	Provincial Hospital	253	RH	CPA3
54	Pursat	15	Bakan	Bakan	1	Bakan	254	RH	CPA1

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
55	Pursat	15	Sampov Meas	Sampov Meas	5	Provincial Hospital	255	RH	CPA3
56	Ratanak Kiri	16	Ratanak Kiri	Banlung	2	Provincial Hospital	256	RH	CPA2
57	Seim Reap	17	Angkor Chhum	Angkor Chhum	1	Ankor Chhum	257	RH	CPA1
58	Seim Reap	17	Kralanh	Kralanh	6	Kralanh	258	RH	CPA2
59	Seim Reap	17	Siem Reap	Siem Reap	10	Provincial Hospital	259	RH	CPA3
60	Seim Reap	17	Sotr Nikum	Sotr Nikum	11	Sotr Nikum	260	RH	CPA2
61	Sihanouk ville	18	Sihanouk ville	Mitapheap	1	Provincial Hospital	261	RH	CPA3
62	Steung Treng	19	Steung Treng	Steung Treng	4	Provincial Hospital	262	RH	CPA3
63	Svay Rieng	20	Chi Phu	ChanTrea	1	Chi Phu	263	RH	CPA1
64	Svay Rieng	20	Romeas Hek	Romeas Hek	4	Romeas Hek	264	RH	CPA2
65	Svay Rieng	20	Svay Rieng	Svay Rieng	6	Provincial Hospital	265	RH	CPA3
66	Takeo	21	Bati	Bati	2	Bati	266	RH	CPA1
67	Takeo	21	Kirivong	Kirivong	4	Kirivong	267	RH	CPA2
68	Takeo	21	Prey Kabass	Prey Kabass	6	Prey Kabass	268	RH	CPA1
69	Takeo	21	Daun Keo	Daun Keo	8	Provincial Hospital	269	RH	CPA3
70	Takeo	21	Ang Rokar	Tramkak	9	Ang Rokar	270	RH	CPA1
71	Oddor Meanchey	22	Samraong	Samraong	4	Provincial Hospital	271	RH	CPA2
72	Kep	23	Kep	Kep Ville	2	Kep	272	RH	CPA1
73	Pailin	24	Pailin	Pailin	1	Provincial Hospital	273	RH	CPA2

III. HEALTH CENTERS

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
1	Banteay Meanchey	1	Mongkol Borei	Serey Sophorn	06	Kampong Svay	6001	HC	MPA
2		1		Mongkol Borei	02	Koy Maeng	6002	HC	MPA
3		1		Mongkol Borei	02	Ou Prasat	6003	HC	MPA
4	Banteay Meanchey	1	Preah Net Preah	Phnom Srok	03	Srah chik	6004	FDH	CPA+MPA
5		1		Phnom Srok	03	Pon Ley	6005	HC	MPA
6		1		Preah Net Preah	04	Chob Va Ry	6006	HC	MPA
7	Banteay Meanchey	1	Ou Chrov	Malai	09	Malai	6007	FDH	CPA+MPA
8		1		Ou Chrov	05	Nimit	6008	HC	MPA
9		1		Ou Chrov	05	Kob	6009	FDH	CPA+MPA
10	Banteay Meanchey	1	Thma Puok	Thma Puok	07	Banteay Chmar	6010	HC	MPA
11		1		Thma Puok	07	Beoung Trakuon	6011	HC	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
12		1		Svay Chek	08	Ta Phou	6012	HC	MPA
13	Battambang	2	Sangke	Sangke	08	Ou Dambang I	6013	HC	MPA
14		2		Ek Phnom	01	Samrong Knong	6014	HC	MPA
15		2		Ek Phnom	01	Prek Norint	6015	FDH	CPA+MPA
16	Battambang	2	Thmor Kol	Thmor Kol	05	Boeung Pring	6016	HC	MPA
17		2		Bavel	04	Khnach Romeas	6017	HC	MPA
18		2		Thmor Kol	05	Bansay Treng	6018	HC	MPA
19	Battambang	2	Battambang	Thmor Koul	02	Chrey	6019	HC	MPA
20		2		Samlout	07	Ta Sanh	6020	FDH	CPA+MPA
21		2		Battambang	02	Tuol Ta Aek	6021	HC	MPA
22	Battambang	2	Mong Russei	Mong Russei	06	Prey Svay	6022	HC	MPA
23		2		Kas kralor	13	Kaos Kralor	6023	HC	MPA
24		2		Mong Russei	06	Prey Tralach	6024	HC	MPA
25	Battambang	2	Sampov Luon	Sampov Luon	10	Serei Meanchey	6025	HC	MPA
26		2		Kam rieng	12	Ta Krey	6026	HC	MPA
27		2		Phnom Preuk	11	Chakrei	6027	HC	MPA
28	Kampong Cham	3	Chamkar Leu	Steung Trang	15	Me Sar Chrey	6028	HC	MPA
29		3		Steung Trang	15	Dang Kdar	6029	HC	MPA
30		3		Chamkar Leu	02	Speu	6030	HC	MPA
31	Kampong Cham	3	Choeung Prey	Batheay	01	Cheung Chhnok	6031	HC	MPA
32		3		Batheay	01	Ph'av	6032	HC	MPA
33		3		Batheay	01	Tumnob	6033	Hc	MPA
34	Kampong Cham	3	Kampong Cham	Kampong Siem	06	Kien Chrey	6034	HC	MPA
35		3		Steung Trang	15	Prek Kak	6035	FDH	CPA+MPA
36		3		Kampong Cham	05	Sambour Meas	6036	HC	MPA
37	Kampong Cham	3	Kroch Chhmar	Krouch Chhmar	09	Kampong Treas	6037	HC	MPA
38		3		Krouch Chhmar	09	Peus Pir	6038	HC	MPA
39		3		Krouch Chhmar	09	Praches Kandal	6039	HC	MPA
40	Kampong Cham	3	Memut	Memut	10	Dar	6040	HC	MPA
41		3		Memut	10	Kampoan	6041	HC	MPA
42		3		Memut	10	Samsaong	6042	HC	MPA
43	Kampong Cham	3	Ou Reang Ov	Ou Reang Ov	11	Chak	6043	HC	MPA
44		3		Ou Reang Ov	11	Thnal Kaeng	6044	HC	MPA
45		3		Koh Soutin	08	Pongro Mohaleaph	6045	HC	MPA
46	Kampong Cham	3	Ponhea Krek	Ponhea Krek	12	Chong Cheach	6046	FDH	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
47		3		Dambae	04	Tuek Chrov	6047	HC	MPA
48		3		Ponhea Krek	12	Krek 1	6048	HC	MPA
49	Kampong Cham	3	Prey Chhor	Prey Chhor	13	Chrey Vien	6049	HC	MPA
50		3		Prey Chhor	13	Tong Rong	6050	HC	MPA
51		3		Prey Chhor	13	Krouch	6051	HC	MPA
52	Kampong Cham	3	Srey Santhor	Srey Santhor	14	Prek Rumdeng	6052	HC	MPA
53		3		Srey Santhor	14	Mean Chey	6053	HC	MPA
54		3		Kang Meas	07	Sdao	6054	HC	MPA
55	Kampong Cham	3	Tbong Khmum	Tbong Khmum	16	Chub Mong Riev	6055	HC	MPA
56		3		Tbong Khmum	16	Roka Pou Pram 2	6056	HC	MPA
57		3		Tbong Khmum	16	Vihear Lournng	6057	HC	MPA
58	Kampong Chhnang	4	Kampong Chhnang	Kampong Leng	04	Kampong Hav	6058	FDH	CPA+MPA
59		4		Rolea Pear	06	Prey Khmer	6059	HC	MPA
60		4		Tuek Phos	08	Cheab	6060	HC	MPA
61	Kampong Chhnang	4	Kampong Tralach	Samaki MeanChey	07	Svay Chuk	6061	HC	MPA
62		4		Samaki MeanChey	07	Krang Lvea	6062	HC	MPA
63		4		Kampong Tralach	05	Ta Ches	6063	HC	MPA
64	Kampong Chhnang	4	Boribour	Boribour	01	Ponley	6064	FDH	CPA+MPA
65		4		Boribour	01	Trapong Chan	6065	HC	MPA
66		4		Boribour	01	Phsar	6066	HC	MPA
67	Kampong Speu	5	Kampong Speu	Samraong Tong	07	Kraing Skuh	6067	HC	MPA
68		5		Samraong Tong	07	Kraing Pneay	6068	HC	MPA
69		5		Samraong Tong	07	Roleang Chak	6069	HC	MPA
70	Kampong Speu	5	Kong Pisey	Kong Pisey	03	Veal Angpopel	6070	HC	MPA
71		5		Baseth	01	Kak Preah Khe	6071	HC	MPA
72		5		Baseth	01	Pou Angkrang	6072	HC	MPA
73	Kampong Speu	5	Ou Dong	Ou Dong	05	Cheung Ros Samaki	6073	HC	MPA
74		5		Ou Dong	05	Dom Kvet	6074	HC	MPA
75		5		Thpong	08	Monor Rung Roeung	6075	FDH	MPA
76	Kampong Thom	6	Baray-Santuk	Santuk	07	Tang Krasaing	6076	FDH	CPA+MPA
77		6		Baray	01	Treal	6077	HC	MPA
78		6		Baray	01	Taing Kouk	6078	HC	MPA
79	Kampong Thom	6	Kampong Thom	Steung Saen	02	Achar Leak	6079	HC	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
80		6		Steung Saen	03	Srayov	6080	HC	MPA
81		6		Prasat Sambour	05	Tang Krasau	6081	HC	MPA
82	Kampong Thom	6	Stong	Stong	08	Stong	6082	HC	MPA
83		6		Stong	05	Pralay	6083	HC	MPA
84		6		Stong	08	Chamnar Krom	6084	HC	MPA
85	Kampot	7	Angkor Chey	Angkor Chey	01	Champey	6085	HC	MPA
86		7		Angkor Chey	01	Dambouk Khpos	6086	HC	MPA
87		7		Angkor Chey	01	Dan Koum	6087	HC	MPA
88	Kampot	7	Chhouk	Chum Kiri	04	Trapaing Reang	6088	FDH	CPA+MPA
89		7		Dang Tong	05	Ang Romeas	6089	HC	MPA
90		7		Dang Tong	05	Dang Tong	6090	FDH	CPA+MPA
91	Kampot	7	Kampong Trach	Banteay Meas	02	Touk Meas	6091	FDH	CPA+MPA
92		7		Kampong Trach	06	Damnak KanTuot	6092	HC	MPA
93		7		Kampong Trach	06	Russei Srok	6093	HC	MPA
94	Kampot	7	Kampot	Kampong Bay	08	Treyu Koh	6094	HC	MPA
95		7		Kampot	07	Koun Satv	6095	HC	MPA
96		7		Kampot	07	Trapaing Ropov	6096	HC	MPA
97	Kandal	8	Ang Snoul	Ang Snoul	08	Damnak Ampil	6097	HC	MPA
98		8		Ang Snoul	08	Peuk	6098	HC	MPA
99		8		Ang Snoul	08	Snao	6099	HC	MPA
100	Kandal	8	Kien Svay	Kien Svay	02	Kokir Thum	6100	HC	MPA
101		8		Kien Svay	02	Dei Edth	6101	HC	MPA
102		8		Lvea Aem	06	Tuek Khleang	6102	HC	MPA
103	Kandal	8	Ksach Kandal	Ksach Kandal	03	Prek Ampil	6103	HC	MPA
104		8		Ksach Kandal	03	Prek Luong	6104	HC	MPA
105		8		Ksach Kandal	03	Vihear Suor	6105	HC	MPA
106	Kandal	8	Koh Thom	Koh Thom	04	Chrouy Takeo	6106	HC	MPA
107		8		Koh Thom	04	Pou Reamea	6107	HC	MPA
108		8		Koh Thom	04	Prek Sdey	6108	HC	MPA
109	Kandal	8	Saang	S'aang	10	Khporp	6109	HC	MPA
110		8		S'aang	10	Kraing Yov	6110	HC	MPA
111		8		S'aang	10	Ta Lun	6111	HC	MPA
112	Kandal	8	Takhmau	Kandal Steung	01	Anlong Romiet	6112	FDH	CPA+MPA
113		8		Kandal Steung	01	Siem Reap	6113	HC	MPA
114		8		S'aang	10	Svay Rolum	6114	HC	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
115	Kandal	8	Muk Kam Poul	Muk Kam Poul	07	Prek Anhchanh	6115	FDH	CPA+MPA
116		8		Muk Kam Poul	07	Roka Kaong	6116	HC	MPA
117		8		Muk Kam Poul	07	Koh Dach	6117	HC	MPA
118	Kandal	8	Ponhea Leu	Ponhea Leu	09	Phnom Bat	6118	HC	MPA
119		8		Ponhea Leu	09	Prek Pnov	6119	HC	MPA
120		8		Ponhea Leu	09	Tumnob Thom	6120	HC	MPA
121	Koh Kong	9	Smach Mean Chey	Mondul Seima	05	Bak khlang	6121	HC	MPA
122		9		Mondul Seima	05	Neang Kok	6122	HC	MPA
123		9		Smach Mean Chey	04	Steung veng	6123	HC	MPA
124	Koh Kong	9	Srae Ambel	Botum Sakor	01	Thmar sar	6124	HC	MPA
125		9		Kampong Seila	08	Kampong Seila (Takavit)	6125	HC	MPA
126		9		Sre Ambel	06	Sre Ambel	6126	HC	MPA
127	Kratie	10	Chhlong	Chhlong	01	Khsach Andet	6127	HC	MPA
128		10		Prek Prasob	03	Chambak	6128	HC	MPA
129		10		Prek Prasob	03	Prek Prasob	6129	FDH	CPA+MPA
130	Kratie	10	Kratie	Kratie	02	Ou Russei	6130	HC	MPA
131		10		Sambour	04	Sambour	6131	FDH	CPA+MPA
132		10		Sambour	04	Sandan	6132	HC	MPA
133	Mondul Kiri	11	Sen Monorom	Kaev Seima	01	Kaev Seima	6133	FDH	MPA
134		11		Pech Chenda	04	Pechreada	6134	FDH	MPA
135		11		Koh Nhek	02	Koh Nhek	6135	FDH	MPA
136	Phnom Penh	12	Kandal	Chamkar Mon	01	Phsar Deum Thkov	6136	HC	MPA
137		12		Chamkar Mon	01	Tuol Svay Prey	6137	HC	MPA
139	Phnom Penh	12	Lech	Toul Kork	04	Teuk Thla	6139	HC	MPA
140		12		Toul Kork	04	Toul Kork	6140	FDH	MPA
141		12		Dang Kao	05	Pong Tuek	6141	HC	MPA
142	Phnom Penh	12	Cheung	Daun penh	02	Daun Penh	6142	FDH	MPA
143		12		Russey keo	07	Anlong Kngan	6143	HC	MPA
144		12		Russey keo	07	Chroy Changva	6144	HC	MPA
145	Phnom Penh	12	Tboung	Mean Chey	06	Nirodh	6145	FDH	MPA
146		12		Mean Chey	06	Steung Meanchey	6146	HC	MPA
147		12		Mean Chey	06	Chak Angre	6147	HC	MPA
148	Preah Vihear	13	Preah Vihear	Ro Vieng	05	Ro Vieng	6148	FDH	MPA
149		13		Ro Vieng	05	Phnom Dek	6149	HC	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
150		13		Kou Len	04	Kou len	6150	FDH	MPA
151	Prey Veng	14	Kamchay Mear	Kamchay Mear	02	Cheach	6151	HC	MPA
152		14		Kamchay Mear	02	Smaung Cheung	6152	HC	MPA
153		14		Kamchay Mear	02	Seang Khveang	6153	HC	MPA
154	Prey Veng	14	Kampong Trabek	Kampong Trabek	03	Prey Chhor	6154	HC	MPA
155		14		Kampong Trabek	03	Prey Poun	6155	HC	MPA
156		14		Kampong Trabek	03	Thkov	6156	HC	MPA
157	Prey Veng	14	Mesang	Mesang	05	Svay Chrum	6157	HC	MPA
158		14		Mesang	05	Prey Toteung	6158	HC	MPA
159		14		Baphnum	01	Boeng Preah	6159	HC	MPA
160	Prey Veng	14	Neak Loeung	Ba Phnom	01	Cheung Phnom	6160	FDH	MPA
161		14		Ba Phnom	01	Roung Damrei	6161	HC	MPA
162		14		Preah Sdach	09	Kampong Soeng	6162	HC	MPA
163	Prey Veng	14	Peareang	Peareang	08	Kampong Popil	6163	HC	MPA
164		14		Peareang	08	Prey Pnau	6164	HC	MPA
165		14		Sithor Kamdal	12	Pou Ti	6165	HC	MPA
166	Prey Veng	14	Preah Sdach	Preah Sdach	09	Sena Reach Otdam	6166	HC	MPA
167		14		Preah Sdach	09	Chey Kampok	6167	HC	MPA
168		14		Peam Chor	06	Kampong Prasat	6168	HC	MPA
169	Prey Veng	14	Prey Veng	Prey Veng	10	Svay Antor	6169	FDH	MPA
170		14		Prey Veng	10	Popoes	6170	HC	MPA
171		14		Kampong Leav	11	Prey Kandieng	6171	HC	MPA
172	Pursat	15	Bakan	Bakan	01	Rumlech	6172	HC	MPA
173		15		Bakan	01	Ou Tapaong	6173	HC	MPA
174		15		Bakan	01	Snam Preah	6174	HC	MPA
175	Pursat	15	Sampov Meas	Phnom Kravanh	04	Phnom Kravanh	6175	FDH	MPA
176		15		Phnom Kravanh	04	Ta Sah	6176	HC	MPA
177		15		Krakor	03	Ansa Chambak	6177	HC	MPA
178	Ratanak Kiri	16	Ratanak Kiri	Banlung	02	Ban Lung	6178	HC	MPA
179		16		Bor Keo	03	BarKeo	6179	FDH	MPA
180		16		Veun Sei	09	Veun Sai	6180	FDH	MPA
181	Siem Reap	17	Angkor Chhum	Puok	07	Puok	6181	FDH	MPA
182		17		Puok	07	Sasar Sdam	6182	HC	MPA
183		17		Puok	07	Reul	6183	Hc	MPA
184	Siem Reap	17	Kralanh	Puork	07	Prey Chrouk	6184	HC	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
185		17		Srey snam	12	Srey snam	6185	FDH	MPA
186		17		Kralanh	06	Sranal	6186	HC	MPA
187	Siem Reap	17	Siem Reap	Banteay srey	03	Banteay srey	6187	FDH	MPA
188		17		Angkor thom	02	Peak Sneng	6188	HC	MPA
189		17		Prasat Bakong	09	Kan Treang	6189	HC	MPA
190	Siem Reap	17	Sotr Nikum	Soth Nikum	11	Samraong	6190	HC	MPA
191		17		Soth Nikum	11	Kean Sangkae	6191	HC	MPA
192		17		Chi Kreng	04	Anloun Samnor	6192	HC	MPA
193	Sihanouk ville	18	Sihanouk ville	Mitapheap	01	Sangkat 1	6193	HC	MPA
194		18		Prey Nob	02	Ou Oknha Heng	6194	HC	MPA
195		18		Prey Nob	02	Cheung Kou	6195	HC	MPA
196	Steung Treng	19	Steung Treng	Sesan	01	Kampun	6196	FDH	MPA
197		19		Siem Pang	03	Siem Pang	6197	FDH	CPA+MPA
198		19		Siem Bouk	02	Srae Krasaing	6198	FDH	CPA+MPA
199	Svay Rieng	20	Chi Phu	ChanTrea	01	Mesar Thngak	6199	FDH	MPA
200		20		Kampong Ro	01	Tnaot	6200	HC	MPA
201		20		ChanTrea	01	Prey Koki	6201	HC	MPA
202	Svay Rieng	20	Romeas Hek	Romeas Hek	04	Chrey Thum	6202	HC	MPA
203		20		Romeas Hek	04	Doung	6203	HC	MPA
204		20		Romeas Hek	04	Krasaing	6204	HC	MPA
205	Svay Rieng	20	Svay Rieng	Svay Chrum	05	Kruos	6205	HC	MPA
206		20		Svay Chrum	05	Svay Chrum	6206	FDH	MPA
207		20		Svay Chrum	05	Krol Kor	6207	HC	MPA
208	Takeo	21	Bati	Samrong	07	Rovieng	6208	HC	MPA
209		21		Samrong	07	Khvav	6209	HC	MPA
210		21		Bati	02	Dong	6210	HC	MPA
211	Takeo	21	Kirivong	Kirivong	04	Kouk Prech	6211	HC	MPA
212		21		Koh Andet	05	Romenh	6212	FDH	MPA
213		21		Treang	10	Prambei Mum	6213	HC	MPA
214	Takeo	21	Prey Kabass	Prey Kabass	06	Krang Sla (Khen Lak)	6214	HC	MPA
215		21		Prey Kabass	06	Champa	6215	HC	MPA
216		21		Samrong	07	Sla (phnom chiso)	6216	HC	MPA
217	Takeo	21	Daun Keo	Treang	10	Srangae	6217	HC	MPA
218		21		Treang	10	Roneam	6218	HC	MPA
219		21		Tram Kak	09	Sre Ronoung	6219	HC	MPA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
220	Takeo	21	Ang Rokar	Tramkak	09	Ang ta som	6220	HC	MPA
221		21		Tramkak	09	Tram Kak	6221	HC	MPA
222		21		Tramkak	09	Trapaing Andeuk	6222	HC	MPA
223	Oddor Meanchey	22	Samraong	Trapaing Prasat	01	Tomnob Dach	6223	HC	MPA
224		22		Samsaong	04	Ou Smach	6224	HC	MPA
225		22		Chong Cal	03	Pongro-TaPean	6225	HC	MPA
226	Kep	23	Kep	Damnak Chang'eur	01	Ou Krasa	6226	HC	MPA
227		23		Damnak Chang'eur	01	Pong Tuek	6227	HC	MPA
228		23		Damnak Chang'eur	01	Angkol	6228	HC	MPA
229	Pailin	24	Pailin	Pailin	01	Ou Chra	6229	HC	MPA
230		24		Sala Krau	02	Phnom Spung	6230	HC	MPA
231		24		Sala Krau	02	Phsar Prum	6231	HC	MPA

IV. PRIVATE FACILITIES

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
1	Phnom Penh	12	NA	Chamkar Mon	1	Visalsok	301	Polyclinic	NA
2	Phnom Penh	12	NA	Chamkar Mon	1	Bayon	302	Polyclinic	NA
3	Phnom Penh	12	NA	Chamkar Mon	1	Chhuon Minh	303	Polyclinic	NA
4	Phnom Penh	12	NA	Chamkar Mon	1	Vechabot	304	Polyclinic	NA
5	Phnom Penh	12	NA	7 Makara	3	Sokreat	305	Polyclinic	NA
6	Phnom Penh	12	NA	7 Makara	3	Oror	306	Polyclinic	NA
7	Phnom Penh	12	NA	7 Makara	3	Sok Hok	307	Polyclinic	NA
8	Phnom Penh	12	NA	7 Makara	3	Banteay Srei	308	Polyclinic	NA
9	Phnom Penh	12	NA	7 Makara	3	Vibol Sok	309	Polyclinic	NA
10	Phnom Penh	12	NA	Tuol Kok	4	Angkor Thum	310	Polyclinic	NA
11	Phnom Penh	12	NA	Tuol Kok	4	Sophea Clinic	311	Polyclinic	NA
12	Phnom Penh	12	NA	Dangkao	5	Angkor	312	Polyclinic	NA
13	Phnom Penh	12	NA	Dangkao	5	Chauchao	313	Polyclinic	NA
14	Phnom Penh	12	NA	Dangkao	5	Lam Bun Than	314	Polyclinic	NA
15	Phnom Penh	12	NA	Mean Chey	6	Chan Trea	315	Polyclinic	NA

No	PROVINCE/ CITY	P_CODE	OD-NAME	DISTRICT NAME	D_CODE	HEALTH FACILITY NAME	FAC_ID	TYPE OF HEALTH FACILITY	CLASSIFICATION OF FACILITY
16	Battambang	2	NA	Battambang	2	Visal Sok	316	Polyclinic	NA
17	Battambang	2	NA	Battambang	2	Phsar Nat	317	Polyclinic	NA
18	Seim Reap	17	NA	Seim Reap	10	Samaki	318	Polyclinic	NA
19	Seim Reap	17	NA	Seim Reap	10	Phsar Krom	319	Polyclinic	NA
20	Phnom Penh	12	NA	7 Makara	3	Panha	401	Maternity	NA
21	Phnom Penh	12	NA	7 Makara	3	Sauphea	402	Maternity	NA
22	Kampong Cham	3	NA	Kampong Cham	5	Thida	403	Maternity	NA
23	Kandal	8	NA	Takhmau	11	Keo San	404	Maternity	NA
24	Phnom Penh	12	NA	Chamkar Mon	1	Sokhapheap Thmei	501	Clinic	NA
25	Phnom Penh	12	NA	Doun Penh	2	Clinic Samphopvisal	502	Clinic	NA
26	Phnom Penh	12	NA	Doun Penh	2	Thang Long	503	Clinic	NA
27	Phnom Penh	12	NA	Tuol Kok	4	Tep Phorn	504	Clinic	NA
28	Phnom Penh	12	NA	Tuol Kok	4	Prom Vihear	505	Clinic	NA
29	Phnom Penh	12	NA	Tuol Kok	4	Vornida	506	Clinic	NA
30	Phnom Penh	12	NA	Dangkao	5	Sorypheaktra	507	Clinic	NA
31	Phnom Penh	12	NA	Dangkao	5	Ekreach	508	Clinic	NA
32	Phnom Penh	12	NA	Dangkao	5	Chan Ven	509	Clinic	NA
33	Phnom Penh	12	NA	Mean Chey	6	Kbal Thnal	510	Clinic	NA
34	Kandal	8	NA	Takhmau	11	Sokha Panha	511	Clinic	NA
35	Kandal	8	NA	Kean Svay	2	Narom Tyda	512	Clinic	NA
36	Seim Reap	17	NA	Seim Reap	10	Ly Srei Vina	513	Clinic	NA
37	Seim Reap	17	NA	Seim Reap	10	Serei Roth	514	Clinic	NA
38	Sihanouk ville	19	NA	Mitapheap	1	Se Te	515	Clinic	NA
39	Svay Rieng	21	NA	Svay Rieng	6	Phasokhapheap	516	Clinic	NA
40	Svay Rieng	22	NA	Svay Rieng	6	Saravorn	517	Clinic	NA

Appendix 2: Facility data from July 2007 to June 2008

I. DATA FROM NATIONAL AND REFERRAL HOSPITALS

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)			
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	
Phnom Penh - NH																						
Calmetre Hospital	0	1	0	0	5861	0	0	1267	0	0	1194	0	0	2	0	0	4	0	0	28	0	
NMCHC	0	1	0	0	8082	0	0	1179	0	0	1031	0	0	11	0	0	3	0	0	144	0	
Preah Kosmak	0	1	0	0	330	0	0	57	0	0	74	0	0	0	0	0	1	0	0	3	0	
Mitapheap Khmer-Soviet	0	1	0	0	1261	0	0	96	0	0	100	0	0	0	0	0	1	0	0	9	0	
Province Total	0	4	0	0	15534	0	0	2599	0	0	2399	0	0	13	0	0	9	0	0	184	0	
BMC																						
Provincial Hospital	0	1	0	0	537	0	0	129	0	0	53	0	0	2	0	0	0	0	0	17	0	
Preah Net Preah	0	0	1	0	0	96	0	0	19	0	0	0	0	0	0	0	0	0	0	0	1	
Ou Chrov	1	0	0	280	0	0	31	0	0	13	0	0	1	0	0	0	0	0	0	0	0	
Thma Puok	1	0	0	186	0	0	16	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
Province Total	2	1	1	466	537	96	47	129	19	13	53	0	1	2	0	0	0	0	2	17	1	
Battambang																						
Thma Korl	1	0	0	209	0	0	17	0	0	0	0	0	0	0	0	0	0	0	3	0	0	
Provincial Hospital	0	1	0	0	2224	0	0	285	0	0	292	0	0	2	0	0	1	0	0	19	0	
Mong Russei	0	0	1	0	0	753	0	0	70	0	0	39	0	0	1	0	0	0	0	0	2	
Sampov Luon	0	1	0	0	216	0	0	25	0	0	5	0	0	1	0	0	0	0	0	4	0	
Province Total	1	2	1	209	2440	753	17	310	70	0	297	39	0	3	1	0	1	0	3	23	2	
Kampong Cham																						
Chamkar Leu	1	0	0	360	0	0	47	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
Choeung Prey	1	0	0	338	0	0	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Provincial Hospital	0	1	0	0	1554	0	0	587	0	0	426	0	0	0	0	0	0	0	0	30	0	
Kroch Chhmar	0	0	1	0	0	32	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	
Memut	1	0	0	467	0	0	99	0	0	17	0	0	0	0	0	0	0	0	0	0	0	
Ou Reang Ov	0	0	1	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ponhea Krek	1	0	0	395	0	0	88	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Prey Chhor	0	0	1	0	0	152	0	0	14	0	0	0	0	0	0	0	0	0	0	0	1	

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Srei Santhor	1	0	0	201	0	0	47	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Tbong Khmum	1	0	0	134	0	0	36	0	0	11	0	0	0	0	0	0	0	0	0	0	0
Province Total	6	1	3	1895	1554	219	404	587	18	28	426	0	1	0	0	0	0	0	3	30	1
Kg. Chhang																					
Kampong Tralach	1	0	0	533	0	0	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Provincial Hospital	0	1	0	0	1154	0	0	147	0	0	210	0	0	1	0	0	0	0	0	27	0
Province Total	1	1	0	533	1154	0	98	147	0	0	210	0	0	1	0	0	0	0	0	27	0
Kampong Speu																					
Provincial Hospital	0	0	1	0	0	862	0	0	67	0	0	132	0	0	4	0	0	0	0	0	23
Kong Pisey	0	0	1	0	0	92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ou Dong	0	0	1	0	0	277	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	3	0	0	1231	0	0	78	0	0	132	0	0	4	0	0	0	0	0	24
Kampong Thom																					
Baray-Santuk	1	0	0	181	0	0	39	0	0	1	0	0	0	0	0	0	0	0	1	0	0
Provincial Hospital	0	1	0	0	795	0	0	148	0	0	78	0	0	2	0	0	0	0	0	18	0
Stong	0	1	0	0	186	0	0	46	0	0	12	0	0	0	0	0	0	0	0	7	0
Province Total	1	2	0	181	981	0	39	194	0	1	90	0	0	2	0	0	0	0	1	25	0
Kampot																					
Angkor Chey	1	0	0	261	0	0	26	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Chhouk	0	0	1	0	0	221	0	0	34	0	0	0	0	0	0	0	0	0	0	0	1
Kampong Trach	0	0	1	0	0	97	0	0	25	0	0	30	0	0	0	0	0	0	0	0	0
Provincial Hospital	0	0	1	0	0	820	0	0	87	0	0	69	0	0	0	0	0	1	0	0	15
Province Total	1	0	3	261	0	1138	26	0	146	0	0	99	0	0	0	0	0	1	1	0	16
Kandal																					
Kean Svay	0	0	1	0	0	308	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0
Ksach Kandal	0	0	1	0	0	323	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0
Koh Thom	0	0	1	0	0	288	0	0	7	0	0	16	0	0	0	0	0	0	0	0	6
Saang	0	0	1	0	0	207	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Chey Chumneah	0	0	1	0	0	379	0	0	13	0	0	15	0	0	0	0	0	0	0	0	5
Province Total	0	0	5	0	0	1505	0	0	78	0	0	31	0	0	0	0	0	0	0	0	11
Koh Kong																					
Provincial Hospital	0	1	0	0	513	0	0	20	0	0	8	0	0	0	0	0	1	0	0	4	0
Srae Ambel	0	0	1	0	0	157	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	1	1	0	513	157	0	20	9	0	8	0	0	0	0	0	1	0	0	4	0
Kratie																					
Chhlong	0	0	1	0	0	278	0	0	71	0	0	7	0	0	0	0	0	0	0	0	5
Provincial Hospital	0	1	0	0	709	0	0	174	0	0	102	0	0	7	0	0	2	0	0	17	0
Province Total	0	1	1	0	709	278	0	174	71	0	102	7	0	7	0	0	2	0	0	17	5
Mondul Kri																					
Provincial Hospital	0	0	1	0	0	168	0	0	10	0	0	15	0	0	0	0	0	0	0	0	6
Province Total	0	0	1	0	0	168	0	0	10	0	0	15	0	0	0	0	0	0	0	0	6
Phnom Penh - RH																					
Kakbatkraham	1	0	0	1626	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Municipal Hospital	0	1	0	0	2191	0	0	28	0	0	62	0	0	1	0	0	0	0	0	4	0
Pochintong	0	0	1	0	0	674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Samdech Ov	0	0	1	0	0	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Chbar Ampouv	0	0	1	0	0	368	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	1	1	3	1626	2191	1650	2	28	0	0	62	0	0	1	0	0	0	0	0	4	1
Preah Vihear																					
Provincial Hospital	0	1	0	0	368	0	0	45	0	0	21	0	0	1	0	0	1	0	0	14	0
Province Total	0	1	0	0	368	0	0	45	0	0	21	0	0	1	0	0	1	0	0	14	0
Prey Veng																					
Kamchay Mear	0	0	1	0	0	21	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Kampong Trabek	1	0	0	229	0	0	66	0	0	22	0	0	0	0	0	0	0	0	1	0	0
Mesang	1	0	0	119	0	0	36	0	0	0	0	0	0	0	0	0	0	0	4	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Neak Loeung	0	1	0	0	211	0	0	47	0	0	43	0	0	0	0	0	0	0	0	1	0
Peareang	1	0	0	252	0	0	170	0	0	40	0	0	0	0	0	0	0	0	7	0	0
Preah Sdach	0	0	1	0	0	26	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
Provincial Hospital	0	1	0	0	420	0	0	131	0	0	79	0	0	2	0	0	0	0	0	13	0
Province Total	3	2	2	600	631	47	272	178	7	62	122	0	0	2	0	0	0	0	12	14	0
Pursat																					
Bakan	0	0	1	0	0	226	0	0	30	0	0	0	0	0	0	0	0	0	0	0	1
Provincial Hospital	0	1	0	0	801	0	0	240	0	0	155	0	0	4	0	0	0	0	0	34	0
Province Total	0	1	1	0	801	226	0	240	30	0	155	0	0	4	0	0	0	0	0	34	1
Ratanak Kiri																					
Provincial Hospital	0	1	0	0	529	0	0	95	0	0	38	0	0	0	0	0	0	0	0	2	0
Province Total	0	1	0	0	529	0	0	95	0	0	38	0	0	0	0	0	0	0	0	2	0
Seim Reap																					
Angkor Chum	0	0	1	0	0	170	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Kralanh	1	0	0	274	0	0	45	0	0	7	0	0	1	0	0	0	0	0	1	0	0
Provincial Hospital	0	0	1	0	0	644	0	0	78	0	0	39	0	0	0	0	0	0	0	0	7
Sotr Nikum	1	0	0	99	0	0	46	0	0	3	0	0	0	0	0	0	0	0	2	0	0
Province Total	2	0	2	373	0	814	91	0	79	10	0	39	1	0	0	0	0	0	3	0	8
Sihanouk Ville																					
Provincial Hospital	0	1	0	0	1078	0	0	38	0	0	102	0	0	0	0	0	0	0	0	10	0
Province Total	0	1	0	0	1078	0	0	38	0	0	102	0	0	0	0	0	0	0	0	10	0
Steung Treng																					
Provincial Hospital	0	1	0	0	495	0	0	145	0	0	26	0	0	0	0	0	0	0	0	9	0
Province Total	0	1	0	0	495	0	0	145	0	0	26	0	0	0	0	0	0	0	0	9	0
Svay Rieng																					
Chi Phu	0	0	1	0	0	148	0	0	29	0	0	0	0	0	0	0	0	0	0	0	2
Romeas Hek	1	0	0	128	0	0	28	0	0	0	0	0	1	0	0	0	0	0	3	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Provincial Hospital	0	1	0	0	1073	0	0	459	0	0	88	0	0	5	0	0	6	0	0	30	0
Province Total	1	1	1	128	1073	148	28	459	29	0	88	0	1	5	0	0	6	0	3	30	2
Takeo																					
Bati	0	0	1	0	0	215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirivong	0	1	0	0	883	0	0	18	0	0	53	0	0	1	0	0	0	0	0	9	0
Prey Kabass	0	0	1	0	0	105	0	0	13	0	0	0	0	0	0	0	0	0	0	0	2
Provincial Hospital	0	1	0	0	789	0	0	33	0	0	113	0	0	3	0	0	0	0	0	0	0
Ang Rokar	0	0	1	0	0	114	0	0	16	0	0	0	0	0	0	0	0	0	0	0	1
Province Total	0	2	3	0	1672	434	0	51	29	0	166	0	0	4	0	0	0	0	0	9	3
Oddor Meanchey																					
Provincial Hospital	0	0	1	0	0	297	0	0	58	0	0	23	0	0	0	0	0	0	0	0	3
Province Total	0	0	1	0	0	297	0	0	58	0	0	23	0	0	0	0	0	0	0	0	3
Kep																					
Kep	0	0	1	0	0	118	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	1	0	0	118	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0
Pallin																					
Provincial Hospital	0	1	0	0	449	0	0	54	0	0	17	0	0	0	0	0	0	0	0	2	0
Province Total	0	1	0	0	449	0	0	54	0	0	17	0	0	0	0	0	0	0	0	2	0
Column totals	19	25	33	6272	32709	9279	1024	5493	766	114	4382	385	4	45	5	0	20	1	28	455	84

II. DATA FROM HEALTH CENTERS

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)					
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC			
BMC																								
Kampong Svay	0	0	1	0	0	165	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Koy Maeng	0	0	1	0	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ou Prasat	0	0	1	0	0	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Srah chik	0	0	1	0	0	150	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Pon Ley	0	0	1	0	0	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chob Va Ry	0	0	1	0	0	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malai	0	0	1	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Nimit	0	0	1	0	0	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kob	0	0	1	0	0	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Banteay Chmar	0	0	1	0	0	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beoung Trakuon	0	0	1	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ta Phou	0	0	1	0	0	156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Province Total	0	0	12	0	0	1783	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Battambang																								
Ou Dambang I	0	0	1	0	0	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Samrong Knong	0	0	1	0	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Norint	0	0	1	0	0	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Boeung Pring	0	0	1	0	0	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Khnach Romeas	0	0	1	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bansay Treng	0	0	1	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrey	0	0	1	0	0	122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ta Sanh	0	0	1	0	0	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tuol Ta Aek	0	0	1	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prey Svay	0	0	1	0	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kaos Kralor	0	0	1	0	0	115	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Prey Tralach	0	0	1	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Serei Meanchey	0	0	1	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ta Krey	0	0	1	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chakrei	0	0	1	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)			
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	
Province Total	0	0	15	0	0	1198	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
Kampong Cham																						
Me Sar Chrey	0	0	1	0	0	217	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1
Dang Kdar	0	0	1	0	0	162	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0
Speu	0	0	1	0	0	126	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheung Chhnok	0	0	1	0	0	214	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0
Ph'av	0	0	1	0	0	219	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0
Tumnob	0	0	1	0	0	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kien Chrey	0	0	1	0	0	70	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Kak	0	0	1	0	0	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sambour Meas	0	0	1	0	0	107	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Kampong Treas	0	0	1	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peus Pir	0	0	1	0	0	62	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Praches Kandal	0	0	1	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dar	0	0	1	0	0	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kampoan	0	0	1	0	0	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Samsaong	0	0	1	0	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chak	0	0	1	0	0	89	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Thnal Kaeng	0	0	1	0	0	54	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1
Pongro Mohaleaph	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chong Cheach	0	0	1	0	0	337	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tuek Chrov	0	0	1	0	0	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Krek 1	0	0	1	0	0	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrey Vien	0	0	1	0	0	88	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Tong Rong	0	0	1	0	0	152	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Krouch	0	0	1	0	0	133	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Rumdeng	0	0	1	0	0	151	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean Chey	0	0	1	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sdao	0	0	1	0	0	101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chub Mong Riev	0	0	1	0	0	26	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Roka Pou Pram 2	0	0	1	0	0	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vihear Luong	0	0	1	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)			
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	
Province Total	0	0	30	0	0	3410	0	0	91	0	0	0	0	0	0	0	0	0	0	0	0	7
Kg. Chhang																						
Kampong Hav	0	0	1	0	0	326	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Prey Khmer	0	0	1	0	0	268	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheab	0	0	1	0	0	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Svay Chuk	0	0	1	0	0	273	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Krang Lvea	0	0	1	0	0	244	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ta Ches	0	0	1	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Ponley	0	0	1	0	0	372	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Trapong Chan	0	0	1	0	0	314	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phsar	0	0	1	0	0	364	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	9	0	0	2670	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	1
Kampong Speu																						
Kraing Skuh	0	0	1	0	0	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kraing Pneyay	0	0	1	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roleang Chak	0	0	1	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Veal Angpopel	0	0	1	0	0	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kak Preah Khe	0	0	1	0	0	92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pou Angkrang	0	0	1	0	0	76	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Cheung Ros Samaki	0	0	1	0	0	205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dom Kvet	0	0	1	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monor Rung Roeung	0	0	1	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	9	0	0	802	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Kampong Thom																						
Tang Krasaing	0	0	1	0	0	78	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Treal	0	0	1	0	0	166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taing Kouk	0	0	1	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Achar Leak	0	0	1	0	0	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Srayov	0	0	1	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tang Krasau	0	0	1	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Stong	0	0	1	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pralay	0	0	1	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chamnar Krom	0	0	1	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	9	0	0	521	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Kampot																					
Champeï	0	0	1	0	0	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dambouk Khpos	0	0	1	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dan Koum	0	0	1	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trapaing Reang	0	0	1	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ang Romeas	0	0	1	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dang Tong	0	0	1	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Touk Meas	0	0	1	0	0	83	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0
Damnak KanTuot	0	0	1	0	0	196	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Russei Srok	0	0	1	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Treuy Koh	0	0	1	0	0	115	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
Koun Satv	0	0	1	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trapaing Ropov	0	0	1	0	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	12	0	0	891	0	0	38	0	0	0	0	0	0	0	0	0	0	0	2
Kandal																					
Damnak Ampil	0	0	1	0	0	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peuk	0	0	1	0	0	226	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snao	0	0	1	0	0	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kokir Thum	0	0	1	0	0	369	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dei Edth	0	0	1	0	0	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuek Khleang	0	0	1	0	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Ampil	0	0	1	0	0	165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Luong	0	0	1	0	0	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vihear Suor	0	0	1	0	0	333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrouy Takeo	0	0	1	0	0	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pou Reamea	0	0	1	0	0	192	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Sdey	0	0	1	0	0	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Khporp	0	0	1	0	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kraing Yov	0	0	1	0	0	118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ta Lun	0	0	1	0	0	186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anlong Romiet	0	0	1	0	0	610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Siem Reap	0	0	1	0	0	452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Svay Rolum	0	0	1	0	0	247	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Prek Anhchanh	0	0	1	0	0	386	0	0	6	0	0	0	0	0	0	0	0	0	0	0	1
Roka Kaong	0	0	1	0	0	230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Koh Dach	0	0	1	0	0	251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phnom Bat	0	0	1	0	0	279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prek Pnov	0	0	1	0	0	470	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tumnob Thom	0	0	1	0	0	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	24	0	0	5869	0	0	7	0	0	0	0	0	1	0	0	0	0	0	1
Koh Kong																					
Bak khlang	0	0	1	0	0	51	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Neang Kok	0	0	1	0	0	58	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Steung veng	0	0	1	0	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Thmar sar	0	0	1	0	0	71	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Kampong Seila (Takavit)	0	0	1	0	0	103	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Sre Ambel	0	0	1	0	0	83	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	6	0	0	408	0	0	5	0	0	0	0	0	0	0	0	0	0	0	1
Kratie																					
Ta Mao	0	0	1	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chambak	0	0	1	0	0	41	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Prek Prasob	0	0	1	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ou Russei	0	0	1	0	0	58	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0
Sambour	0	0	1	0	0	58	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Sandan	0	0	1	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	6	0	0	260	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)			
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	
Mondul Kri																						
Kaev Seima	0	0	1	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Pechreada	0	0	1	0	0	56	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	
Koh Nhek	0	0	1	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Province Total	0	0	3	0	0	197	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2	
Phnom Penh																						
Phsar Deum Thkov	0	0	1	0	0	317	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Tuol Svay Prey	0	0	1	0	0	189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Teuk Thla	0	0	1	0	0	1251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Toul Kork	0	0	1	0	0	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pong Tuek	0	0	1	0	0	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Daun Penh	0	0	1	0	0	1035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Anlong Kngan	0	0	1	0	0	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Chroy Changva	0	0	1	0	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ni Rodh	0	0	1	0	0	215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Steung Meanchey	0	0	1	0	0	588	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Chak Angre	0	0	1	0	0	377	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Province Total	0	0	11	0	0	4452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Preah Vihear																						
Ro Vieng	0	0	1	0	0	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Phnom Dek	0	0	1	0	0	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Kou Ien	0	0	1	0	0	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Province Total	0	0	3	0	0	492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Prey Veng																						
Cheach	0	0	1	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Smaung Cheung	0	0	1	0	0	85	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
Seang Khveang	0	0	1	0	0	36	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Prey Chhor	0	0	1	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prey Poun	0	0	1	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Thkov	0	0	1	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	
Svay Chrum	0	0	1	0	0	91	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Prey Toteung	0	0	1	0	0	87	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	
Boeng Preah	0	0	1	0	0	114	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	
Cheung Phnom	0	0	1	0	0	64	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
Roung Damrei	0	0	1	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Kampong Soeng	0	0	1	0	0	127	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	
Kampong Popil	0	0	1	0	0	269	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prey Pnau	0	0	1	0	0	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pou Ti	0	0	1	0	0	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sena Reach Otdam	0	0	1	0	0	136	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	
Chey Kampok	0	0	1	0	0	125	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Kampong Prasat	0	0	1	0	0	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Svay Antor	0	0	1	0	0	220	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	
Popoes	0	0	1	0	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prey Kandieng	0	0	1	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Province Total	0	0	21	0	0	2250	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	
Pursat																						
Rumlech	0	0	1	0	0	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ou Tapaong	0	0	1	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Snam Preah	0	0	1	0	0	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Phnom Kravanh	0	0	1	0	0	320	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	
Ta Sah	0	0	1	0	0	187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ansa Chambak	0	0	1	0	0	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Province Total	0	0	6	0	0	922	0	0	16	0	0	0	0	0	0	0	0	0	0	0	2	
Ratanak Kiri																						
Ban Lung	0	0	1	0	0	216	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BarKeo	0	0	1	0	0	127	0	0	5	0	0	0	0	0	1	0	0	0	0	0	3	
Veun Sai	0	0	1	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Province Total	0	0	3	0	0	388	0	0	5	0	0	0	0	0	1	0	0	0	0	0	5	
Seim Reap																						

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	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Puok	0	0	1	0	0	264	0	0	20	0	0	0	0	0	0	0	0	0	0	0	5
Sasar Sdam	0	0	1	0	0	277	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Reul	0	0	1	0	0	181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prey Chrouk	0	0	1	0	0	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Srey snam	0	0	1	0	0	186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sranal	0	0	1	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Banteay srey	0	0	1	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Sneng	0	0	1	0	0	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kan Treang	0	0	1	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Samraong	0	0	1	0	0	392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Kean Sangkae	0	0	1	0	0	301	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anloun Samnor	0	0	1	0	0	374	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	12	0	0	2421	0	0	20	0	0	0	0	0	0	0	0	0	0	0	10
Sihanouk Ville																					
Sangkat 1	0	0	1	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ou Oknha Heng	0	0	1	0	0	146	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Cheung Kou	0	0	1	0	0	189	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	3	0	0	416	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Steung Treng																					
Kampun	0	0	1	0	0	71	0	0	23	0	0	0	0	0	0	0	0	0	0	0	1
Siem Pang	0	0	1	0	0	89	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1
Srae Krasing	0	0	1	0	0	61	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
Province Total	0	0	3	0	0	221	0	0	28	0	0	0	0	0	0	0	0	0	0	0	5
Svay Rieng																					
Mesar Thngak	0	0	1	0	0	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tnaot	0	0	1	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prey Koki	0	0	1	0	0	75	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Chrey Thum	0	0	1	0	0	259	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Doung	0	0	1	0	0	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Krasaing	0	0	1	0	0	261	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0

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	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Kruos	0	0	1	0	0	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Svay Chrum	0	0	1	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Krol Kor	0	0	1	0	0	171	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Province Total	0	0	9	0	0	1354	0	0	20	0	0	0	0	0	0	0	0	1	0	0	2
Takeo																					
Rovieng	0	0	1	0	0	417	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0
Khvav	0	0	1	0	0	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dong	0	0	1	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kouk Prech	0	0	1	0	0	207	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Romenh	0	0	1	0	0	234	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Prambei Mum	0	0	1	0	0	197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Krang Sla (Khen Lak)	0	0	1	0	0	273	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Champa	0	0	1	0	0	218	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1
Sla (phnom chiso)	0	0	1	0	0	232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Srangae	0	0	1	0	0	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roneam	0	0	1	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sre Ronoung	0	0	1	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ang ta som	0	0	1	0	0	407	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Tram Kak	0	0	1	0	0	406	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trapaing Andeuk	0	0	1	0	0	460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Province Total	0	0	15	0	0	3696	0	0	24	0	0	0	0	0	0	0	0	0	0	0	4
Oddor Meanchey																					
Tomnob Dach	0	0	1	0	0	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ou Smach	0	0	1	0	0	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pongro-TaPean	0	0	1	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	3	0	0	405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kep																					
Ou Krasa	0	0	1	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pong Tuek	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Angkol	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROVINCE/ FACILITY	EmONC Status			No. women giving birth			No. women w/ complications			No. caesarean sections			No. maternal deaths from direct obstetric causes			No. maternal deaths from indirect causes			No. intrapartum deaths (fresh stillbirths; > 2.5 kg) + No. very early neonatal deaths (≤ 24-hours; > 2.5 kg)		
	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC	Basic EmONC	Comp EmONC	Non-Em ONC
Province Total	0	0	3	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pallin																					
Ou Chra	0	0	1	0	0	166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Phnom Spung	0	0	1	0	0	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phsar Prum	0	0	1	0	0	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Province Total	0	0	3	0	0	408	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Column totals	0	0	230	0	0	35448	0	0	339	0	0	0	0	0	3	0	0	1	0	0	58

Appendix 3: List of current availability of EmONC facilities and facilities for upgrade

P_NAME	FAC_ID	CLASS.	FACILITY NAME	CURRENT STATUS		FOR UPGRADE		RECOMMENDED	
				BEMONC	CEMONC	BEMONC	CEMONC	BEMONC	CEMONC
Phnom Penh	101	Nat.H	Calmetre Hospital		1				
Phnom Penh	102	Nat.H	NMCHC		1				
Phnom Penh	103	Nat.H	Preah Kosamak		1				
Phnom Penh	104	Nat.H	Mitapheap Khmer-Soviet		1				
Phnom Penh	241	CPA1	Chamkarmorn	1					
Phnom Penh	242	CPA3	Municipal Hospital		1				
Phnom Penh	243	CPA1	Pochintong			1			
Phnom Penh	244	CPA1	Samdech Ov			1			
Phnom Penh	245	CPA1	Mean Chey			1			
Phnom Penh	6136	MPA	Phsar Deum Thkov			1			
Phnom Penh	6147	MPA	Chak Angre			1			
Phnom Penh	6143	MPA	Anlong Kngan			1			
Phnom Penh	6144	MPA	Chroy Changva			1			
Phnom Penh	6146	MPA	Steung Meanchey			1			
TOTAL				1	5	8	0	11	3
BMC	201	CPA3	Provincial Hospital		1				
BMC	202	CPA1	Preah Net Preah			1			
BMC	203	CPA2	Ou Chrov	1					
BMC	204	CPA2	Thma Puok	1			1		
BMC	6007	CPA+MPA	Malai			1			
BMC	6011	MPA	Beoung Trakuon			1			
BMC	6004	CPA+MPA	Srah chik			1			
TOTAL				2	1	4	1	5	2
Battambang	205	CPA1	Thma Kol	1					
Battambang	206	CPA3	Provincial Hospital		1				
Battambang	207	CPA2	Mong Russei			1			
Battambang	208	CPA2	Sampov Luon		1				
Battambang	6015	CPA+MPA	Prek Norint			1			
Battambang	6019	MPA	Chrey			1			
Battambang	6023	MPA	Kaos Kralor			1			
Battambang	6026	MPA	Ta Krey			1			
Battambang	6020	CPA+MPA	Ta Sanh			1			
Battambang	6016	MPA	Boeung Pring			1			
TOTAL				1	2	7	0	8	2
Kampong Cham	209	CPA1	Chamkar Leu	1					
Kampong Cham	210	CPA1	Choeung Prey	1					
Kampong Cham	211	CPA3	Provincial Hospital		1				
Kampong Cham	212	CPA1	Kroch Chhmar			1			
Kampong Cham	213	CPA2	Memut	1			1		

P_NAME	FAC_ID	CLASS.	FACILITY NAME	CURRENT STATUS		FOR UPGRADE		RECOMMENDED	
				BEMONC	CEMONC	BEMONC	CEMONC	BEMONC	CEMONC
Kampong Cham	214	CPA1	Ou Reang Ov			1			
Kampong Cham	215	CPA1	Ponhea Krek	1					
Kampong Cham	216	CPA1	Prey Chhor			1			
Kampong Cham	217	CPA1	Srei Santhor	1					
Kampong Cham	218	CPA2	Tbong Khmum	1			1		
Kampong Cham	6035	CPA+MPA	Prek Kak			1			
Kampong Cham	6046	MPA	Chong Cheach			1			
Kampong Cham	6040	MPA	Dar			1			
Kampong Cham	6052	MPA	Prek Rumdeng			1			
Kampong Cham	6032	MPA	Ph'av			1			
Kampong Cham	6028	MPA	Me Sar Chrey			1			
Kampong Cham	6051	MPA	Krouch			1			
TOTAL				6	1	10	2	14	3
Kg. Chhnang	219	CPA1	Kampong Tralach	1					
Kg. Chhnang	220	CPA3	Provincial Hospital		1				
Kg. Chhnang	6064	CPA+MPA	Ponley			1			
Kg. Chhnang	6058	CPA+MPA	Kampong Hav			1			
Kg. Chhnang	6061	MPA	Svay Chuk			1			
TOTAL				1	1	3	0	4	1
Kampong Speu	221	CPA3	Provincial Hospital				1		
Kampong Speu	222	CPA1	Kong Pisey			1			
Kampong Speu	223	CPA2	Ou Dong				1		
Kampong Speu	6070	MPA	Veal Angpopel			1			
Kampong Speu	6071	MPA	Kak Preah Khe			1			
Kampong Speu	6067	MPA	Kraing Skuh			1			
Kampong Speu	6073	MPA	Cheung Ros Samaki			1			
TOTAL				0	0	5	2	5	2
Kampong Thom	224	CPA2	Baray-Santuk	1					
Kampong Thom	225	CPA3	Provincial Hospital		1				
Kampong Thom	226	CPA2	Stong		1				
Kampong Thom	6077	MPA	Treal			1			
Kampong Thom	6079	MPA	Achar Leak			1			
Kampong Thom	6083	MPA	Pralay			1			
TOTAL				1	2	3	0	5	1
Kampot	227	CPA2	Angkor Chey	1					
Kampot	228	CPA2	Chhouk			1			
Kampot	229	CPA2	Kampong Trach			1			
Kampot	230	CPA3	Provincial Hospital				1		
Kampot	6096	MPA	Trapaing Ropov			1			
Kampot	6091	CPA+MPA	Touk Meas			1			

P_NAME	FAC_ID	CLASS.	FACILITY NAME	CURRENT STATUS		FOR UPGRADE		RECOMMENDED	
				BEMONC	CEMONC	BEMONC	CEMONC	BEMONC	CEMONC
TOTAL				1	0	4	1	5	1
Kandal	231	CPA1	Kean Svay			1			
Kandal	232	CPA1	Ksach Kandal			1			
Kandal	233	CPA2	Koh Thom				1		
Kandal	234	CPA1	Saang			1			
Kandal	235	CPA3	Chey Chumneah				1		
Kandal	6097	MPA	Damnak Ampil			1			
Kandal	6100	MPA	Kokir Thum			1			
Kandal	6104	MPA	Prek Luong			1			
Kandal	6107	MPA	Pouthi Reamea			1			
Kandal	6110	MPA	Kraing Yov			1			
Kandal	6112	CPA+MPA	Anlong Romiet			1			
Kandal	6115	CPA+MPA	Prek Anhchanh			1			
Kandal	6119	MPA	Prek Pnov			1			
TOTAL				0	0	11	2	11	2
Koh Kong	236	CPA2	Provincial Hospital		1				
Koh Kong	237	CPA1	Srae Ambel			1			
TOTAL				0	1	1	0	1	1
Kratie	238	CPA2	Chhlong			1			
Kratie	239	CPA3	Provincial Hospital		1				
Kratie	6131	CPA+MPA	Sambour			1			
TOTAL				0	1	2	0	2	1
Mondul Kiri	240	CPA2	Provincial Hospital				1		
TOTAL				0	0	0	1	0	1
Preah Vihear	246	CPA2	Provincial Hospital		1				
Preah Vihear	6148	MPA	Ro Vieng			1			
TOTAL				0	1	1	0	1	1
Prey Veng	247	CPA2	Kamchay Mear			1			
Prey Veng	248	CPA2	Kampong Trabek	1					
Prey Veng	249	CPA1	Mesang	1					
Prey Veng	250	CPA2	Neak Loeung		1				
Prey Veng	251	CPA2	Peareang	1					
Prey Veng	252	CPA1	Preah Sdach			1			
Prey Veng	253	CPA3	Provincial Hospital		1				
Prey Veng	6151	MPA	Cheach			1			
Prey Veng	6169	MPA	Svay Antor			1			
Prey Veng	6162	MPA	Kampong Soeng			1			
TOTAL				3	2	5	0	8	2
Pursat	254	CPA1	Bakan			1			
Pursat	255	CPA3	Provincial Hospital		1				

P_NAME	FAC_ID	CLASS.	FACILITY NAME	CURRENT STATUS		FOR UPGRADE		RECOMMENDED	
				BEMONC	CEMONC	BEMONC	CEMONC	BEMONC	CEMONC
Pursat	6175	MPA	Phnom Kravanh			1			
Pursat	6174	MPA	Snam Preah			1			
TOTAL				0	1	3	0	3	1
Ratanak Kiri	256	CPA2	Provincial Hospital		1				
Ratanak Kiri	6179	MPA	Bar Keo			1			
TOTAL				0	1	1	0	1	1
Seim Reap	257	CPA1	Angkor Chum			1			
Seim Reap	258	CPA2	Kralanh	1					
Seim Reap	259	CPA3	Provincial Hospital				1		
Seim Reap	260	CPA2	Sotr Nikum	1			1		
Seim Reap	6182	MPA	Sasar Sdam			1			
Seim Reap	6185	MPA	Srey snam			1			
Seim Reap	6192	MPA	Anloun Samnor			1			
Seim Reap	6187	MPA	Banteay srey			1			
Seim Reap	6190	MPA	Samraong			1			
TOTAL				2	0	6	2	7	2
Sihanouk ville	261	CPA3	Provincial Hospital		1				
Sihanouk ville	6194	MPA	Ou Oknha Heng			1			
TOTAL				0	1	1	0	1	1
Steung Treng	262	CPA3	Provincial Hospital		1				
Steung Treng	6197	CPA+MPA	Siem Pang			1			
TOTAL				0	1	1	0	1	1
Svay Rieng	263	CPA1	Chi Phu			1			
Svay Rieng	264	CPA2	Romeas Hek	1					
Svay Rieng	265	CPA3	Provincial Hospital		1				
Svay Rieng	6204	MPA	Krasaing			1			
Svay Rieng	6205	MPA	Kruos			1			
TOTAL				1	1	3	0	4	1
Takeo	266	CPA1	Bati			1			
Takeo	267	CPA2	Kirivong		1				
Takeo	268	CPA1	Prey Kabass			1			
Takeo	269	CPA3	Provincial Hospital		1				
Takeo	270	CPA1	Ang Rokar			1			
Takeo	6208	MPA	Rovieng			1			
Takeo	6222	MPA	Trapaing Andeuk			1			
Takeo	6212	MPA	Romenh			1			
TOTAL				0	2	6	0	6	2
Oddor Meanchey	271	CPA2	Provincial Hospital				1		
Oddor Meanchey	6224	MPA	Ou Smach			1			
TOTAL				0	0	1	1	1	1

P_NAME	FAC_ID	CLASS.	FACILITY NAME	CURRENT STATUS		FOR UPGRADE		RECOMMENDED	
				BEMONC	CEMONC	BEMONC	CEMONC	BEMONC	CEMONC
Kep	272	CPA1	Kep			1			
TOTAL				0	0	1	0	1	0
Pailin	273	CPA2	Provincial Hospital		1				
TOTAL				0	1	0	0	1	0
GRAND TOTAL				19	25	87	12	105	34

Appendix 4: List of signal functions for each facility

I. SIGNAL FUNCTIONS PERFORMED AT NATIONAL AND REFERRAL HOSPITALS

PROVINCE/ FACILITY	Type of Facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarien Section		
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	
Phnom Penh - NH																											
Calmetre Hospital	Nat.H		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
NMCHC	Nat.H		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
Preah Kosmak	Nat.H		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
Mitapheap Khmer-Soviet	Nat.H		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
BMC																											
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
Preah Net Preah	CPA1			1	6	6	7	7	1		1		0	1	1		1		1		1		0	0	0	0	0
Ou Chrov	CPA2	1			7	8	7	8	1		1		1		1		1		1		1		0	0	1		
Thma Puok	CPA2	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	0
Battambang																											
Thma Kol	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	0
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
Mong Russei	CPA2			1	6	8	7	9	1		1		0	1	1		1		1		1		1		1		1
Sampov Luon	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
Kampong Cham																											
Chamkar Leu	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	0
Choeung Prey	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	0
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1		1
Kroch Chhmar	CPA1			1	3	3	4	4	0	0	1		0	0	0	1	1		1		1		0	0	0	0	0
Memut	CPA2	1			7	8	7	8	1		1		1		1		1		1		1		0	0	1		
Ou Reang Ov	CPA1			1	6	6	6	6	1		1		0	0	1		1		1		1		0	0	0	0	0
Ponhea Krek	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	0
Prey Chhor	CPA1			1	5	5	5	5	1		1		0	0	1		1		1		1		0	0	0	0	0
Srei Santhor	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	0
Tbong Khmum	CPA2	1			7	8	7	8	1		1		1		1		1		1		1		0	0	1		
Kg. Chhang																											

PROVINCE/ FACILITY	Type of Facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section		
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	
Kampong Tralach	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1		
Kampong Speu																											
Provincial Hospital	CPA3			1	6	7	7	9	1		1		1		0	1	1		1		1		0	1	1		
Kong Pisey	CPA1			1	3	3	3	3	1		1		0	0	0	0	0	0	1		0	0	0	0	0	0	
Ou Dong	CPA2			1	6	6	7	7	1		1		1		0	1	1		1		1		0	0	0	0	
Kampong Thom																											
Baray-Santuk	CPA2	1			7	7	7	8	1		1		1		1		1		1		1		0	0	0	1	
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1		
Stong	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1		
Kampot																											
Angkor Chey	CPA2	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0	
Chhouk	CPA2			1	5	5	7	7	0	1	1		0	1	1		1		1		1		0	0	0	0	
Kampong Trach	CPA2			1	5	7	6	8	1		1		1		0	0	0	1	1		1		1		1		
Provincial Hospital	CPA3			1	6	8	7	9	1		1		1		0	1	1		1		1		1		1		
Kandal																											
Kean Svay	CPA1			1	6	6	6	6	1		1		1		1		1		0	0	1		0	0	0	0	
Ksach Kandal	CPA1			1	5	5	5	5	1		1		1		1		0	0	0	0	1		0	0	0	0	
Koh Thom	CPA2			1	5	6	7	8	1		1		1		0	1	1		1		0	1	0	0	1		
Saang	CPA1			1	5	5	7	7	1		1		0	1	1		1		1		0	1	0	0	0	0	
Chey Chumneah	CPA3			1	4	5	7	9	1		1		0	1	1		0	1	1		0	1	0	1	1		
Koh Kong																											
Provincial Hospital	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1		
Srae Ambel	CPA1			1	6	6	7	7	1		1		0	1	1		1		1		1		0	0	0	0	
Kratie																											
Chhlong	CPA2			1	6	8	6	8	1		1		1		0	0	1		1		1		1		1		
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1		
Mondul Kri																											

PROVINCE/ FACILITY	Type of Facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarien Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Provincial Hospital	CPA3			1	6	8	6	8	0	0	1		1		1		1		1		1		1		1	
Phnom Penh - RH																										
Chamkamorn	CPA1	1			7	7	7	7	1		1		1		1		1		1				0	0	0	0
Municipal Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Pochintong	CPA1			1	5	5	5	5	1		1		0	0	1		1		0	0	1		0	0	0	0
Samdech Ov	CPA1			1	5	5	5	5	1		1		0	0	1		1		0	0	1		0	0	0	0
Mean Chey	CPA1			1	4	4	6	6	1		1		0	0	0	1	1		0	1	1		0	0	0	0
Preah Vihear																										
Provincial Hospital	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Prey Veng																										
Kamchay Mear	CPA2			1	6	6	7	7	1		1		1		1		1		1		0	1	0	0	0	0
Kampong Trabek	CPA2	1			7	8	7	8	1		1		1		1		1		1		1		0	0	1	
Mesang	CPA1	1			7	7	7	7	1		1		1		1		1		1		1		0	0	0	0
Neak Loeung	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Peareang	CPA2	1			7	8	7	8	1		1		1		1		1		1		1		0	0	1	
Preah Sdach	CPA1			1	5	5	7	7	1		1		0	1	0	1	1		1		1		0	0	0	0
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Pursat																										
Bakan	CPA1			1	6	6	7	7	1		1		1		1		1		0	1	1		0	0	0	0
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Ratanak Kiri																										
Provincial Hospital	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Seim Reap																										
Angkor Chum	CPA1			1	6	6	6	6	1		1		1		1		1		0	0	1		0	0	0	0
Kralanh	CPA2	1			7	7	7	8	1		1		1		1		1		1		1		0	0	0	1
Provincial Hospital	CPA3			1	5	7	6	8	1		1		1		0	1	1		0	0	1		1		1	
Sotr Nikum	CPA2	1			7	8	7	9	1		1		1		1		1		1		1		0	1	1	
Sihanouk Ville																										

PROVINCE/ FACILITY	Type of Facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarien Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Steung Treng																										
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Svay Rieng																										
Chi Phu	CPA1			1	6	6	6	6	1		1		1		1		1	0	0	1		0	0	0	0	
Romeas Hek	CPA2	1			7	7	7	7	1		1		1		1		1	1		1		0	0	0	0	
Provincial Hospital	CPA3		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Takeo																										
Bati	CPA1			1	4	4	5	5	1		1		0	0	1		0	0	1		0	1	0	0	0	0
Kirivong	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1	
Prey Kabass	CPA1			1	5	5	6	6	1		1		1		1		0	1	1		0	0	0	0	0	0
Provincial Hospital	CPA3		1		7	8	7	9	1		1		1		1		1		1		1		0	1	1	
Ang Rokar	CPA1			1	4	4	6	6	1		1		0	1	1		1		0	0	0	1	0	0	0	0
Oddor Meanchey																										
Provincial Hospital	CPA2			1	5	7	7	9	1		1		1		0	1	1		0	1	1		1		1	
Kep																										
Kep	CPA1			1	4	4	6	6	1		1		0	0	1		0	1	0	1	1		0	0	0	0
Pallin																										
Provincial Hospital	CPA2		1		7	9	7	9	1		1		1		1		1		1		1		1		1	

II. SIGNAL FUNCTIONS PERFORMED AT HEALTH CENTERS

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarien Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
BMC																										
Kampong Svay	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1					
Koy Maeng	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0				

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Ou Prasat	MPA			1	1		2		0	0	1		0	0	0	0	0	0	0	0	0	1				
Srah chik	CPA+ MPA			1	5		6		1		1		0	1	1		1		0	0	1					
Pon Ley	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1					
Chob Va Ry	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0				
Malai	CPA+ MPA			1	6		7		0	1	1		1		1		1		1		1					
Nimit	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Kob	CPA+ MPA			1	2		2		1		1		0	0	0	0	0	0	0	0	0	0				
Banteay Chmar	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Beoung Trakuon	MPA			1	3		4		0	0	1		1		1		0	0	0	0	0	1				
Ta Phou	MPA			1	4		5		1		1		1		1		0	0	0	0	0	1				
Battambang																										
Ou Dambang I	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0				
Samrong Knong	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0				
Prek Norint	CPA+ MPA			1	5		5		1		1		0	0	1		0	0	1		1					
Boeung Pring	MPA			1	1		2		0	0	1		0	0	0	0	0	0	0	0	0	1				
Khnach Romeas	MPA			1	2		2		0	0	1		0	0	0	0	0	0	0	0	1					
Bansay Treng	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0				
Chrey	MPA			1	4		4		1		1		0	0	1		0	0	0	0	1					
Ta Sanh	CPA+ MPA			1	3		5		1		1		0	0	0	1	1		0	0	0	1				
Tuol Ta Aek	MPA			1	3		4		0	0	1		0	0	1		1		0	0	0	1				
Prey Svay	MPA			1	2		2		1		1		0	0	0	0	0	0	0	0	0	0				
Kaos Kralor				1	2		3		0	0	1		1		0	1	0	0	0	0	0	0				
Prey Tralach	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1					
Serei Meanchey	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0				
Ta Krey	MPA			1	4		4		1		1		0	0	1		1		0	0	0	0				
Chakrei	MPA			1	3		3		1		1		0	0	1		0	0	0	0	0	0				
Kampong Cham																										
Me Sar Chrey	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0				
Dang Kdar	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0				
Speu	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0				

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section		
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	
Cheung Chhnok	MPA			1	1		3		0	0	1		0	0	0	0	0	1	0	0	0	1					
Ph'av	MPA			1	1		2		0	0	1		0	0	0	0	0	0	0	0	0	1					
Tumnob	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0					
Kien Chrey	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1						
Prek Kak	CPA+ MPA			1	5		6		1		1		0	0	0	1	1		1		1						
Sambour Meas	MPA			1	3		5		1		1		0	0	0	1	1		0	0	0	1					
Kampong Treas	MPA			1	1		2		0	0	1		0	0	0	0	0	1	0	0	0	0					
Peus Pir	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0					
Praches Kandal	MPA			1	3		4		1		1		0	0	0	1	1		0	0	0	0					
Dar	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1						
Kampoan	MPA			1	2		4		0	0	1		0	0	0	1	1		0	0	0	1					
Samsaong	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0					
Chak	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1						
Thnal Kaeng	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1						
Pongro Mohaleaph	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0					
Chong Cheach	MPA			1	5		5		1		1		0	0	1		1		0	0	1						
Tuek Chrov	MPA			1	4		4		1		1		0	0	0	0	1		0	0	1						
Krek 1	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1						
Chrey Vien	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0					
Tong Rong	MPA			1	2		2		0	0	1		0	0	0	0	0	0	0	0	1						
Krouch	MPA			1	2		2		0	0	1		0	0	0	0	0	0	0	0	1						
Prek Rumdeng	MPA			1	4		4		1		1		0	0	1		0	0	0	0	1						
Mean Chey	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0					
Sdao	MPA			1	3		3		1		1		0	0	1		0	0	0	0	0	0					
Chub Mong Riev	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0					
Roka Pou Pram 2	MPA			1	4		4		1		1		0	0	0	0	1		1		0	0					
Vihear Luong	MPA			1	4		4		1		1		0	0	0	0	1		0	0	1						
Kg. Chhang																											
Kampong Hav	CPA+ MPA			1	4		5		1		1		0	1	1		1		0	0	0	0					
Prey Khmer	MPA			1	3		4		1		1		0	0	1		0	0	0	0	0	1					
Cheab	MPA			1	4		4		1		1		0	0	1		0	0	0	0	1						
Svay Chuk	MPA			1	4		4		1		1		1		0	0	0	0	0	0	1						
Krang Lvea	MPA			1	2		4		1		1		0	0	0	1	0	0	0	0	0	1					

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section		
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	
Ta Ches	MPA			1	3		3		1		1		0	0	1		0	0	0	0	0	0					
Ponley	CPA+ MPA			1	5		5		1		1		1		1		0	0	0	0	1						
Trapong Chan	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0					
Phsar	MPA			1	2		3		0	0	1		0	1	1		0	0	0	0	0	0					
Kampong Speu																											
Kraing Skuh	MPA			1	2		2		1		1		0	0	0	0	0	0	0	0	0	0					
Kraing Pnuey	MPA			1	3		5		1		1		0	0	0	1	0	1	0	0	1						
Roleang Chak	MPA			1	2		3		0	0	1		0	0	0	1	0	0	0	0	1						
Veal Angpopel	MPA			1	5		5		1		1		0	0	1		1		0	0	1						
Kak Preah Khe	MPA			1	5		5		1		1		0	0	1		1		0	0	1						
Pou Angkrang	MPA			1	2		5		1		1		0	0	0	1	0	1	0	0	0	1					
Cheung Ros Samaki	MPA			1	2		3		0	0	1		0	0	1		0	0	0	0	0	1					
Dom Kvet	MPA			1	3		4		1		1		0	0	0	1	1		0	0	0	0					
Monor Rung Roeung	MPA			1	2		4		1		1		0	0	0	1	0	0	0	0	0	1					
Kampong Thom																											
Tang Krasaing	CPA+ MPA			1	4		5		1		1		0	0	1		1		0	0	0	1					
Treal	MPA			1	3		5		1		1		0	1	1		0	0	0	0	0	1					
Taing Kouk	MPA			1	1		2		0	1	1		0	0	0	0	0	0	0	0	0	0					
Achar Leak	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1						
Srayov	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0					
Tang Krasau	MPA			1	2		4		1		1		0	0	0	1	0	0	0	0	0	1					
Stong	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1						
Pralay	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0					
Chamnar Krom	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0					
Kampot																											
Champeï	MPA			1	3		4		0	0	1		0	0	1		0	1	0	0	1						
Dambouk Khpos	MPA			1	3		5		1		1		0	0	1		0	1	0	0	0	1					
Dan Koum	MPA			1	1		3		0	0	1		0	0	0	1	0	1	0	0	0	0					
Trapaing Reang	CPA+ MPA			1	2		5		1		1		0	0	0	1	0	1	0	0	0	1					
Ang Romeas	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0					

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarien Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Dang Tong	CPA+ MPA			1	3		5		1		1		0	0	0	1	1		0	0	0	1				
Touk Meas	CPA+ MPA			1	3		5		1		1		0	0	0	1	1		0	0	0	1				
Damnak KanTuot	MPA			1	3		4		1		1		0	0	1		0	0	0	0	0	1				
Russei Srok	MPA			1	1		3		0	0	1		0	0	0	1	0	0	0	0	0	1				
Treyu Koh	MPA			1	2		5		1		1		0	0	0	1	0	1	0	0	0	1				
Koun Satv	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0				
Trapaing Ropov	MPA			1	2		3		1		1		0	0	0	0	0	0	0	0	0	1				
Kandal																										
Damnak Ampil	MPA			1	6		6		1		1		0	0	1		1		1		1					
Peuk	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Snao	MPA			1	3		5		1		1		0	1	1		0	0	0	0	0	1				
Kokir Thum	MPA			1	3		5		1		1		0	1	0	1	0	0	0	0	1					
Dei Edth	MPA			1	3		5		1		1		0	0	1		0	1	0	0	0	1				
Tuek Khleang	MPA			1	3		5		1		1		0	0	1		0	1	0	0	0	1				
Prek Ampil	MPA			1	3		5		1		1		0	0	1		0	1	0	0	0	1				
Prek Luong	MPA			1	4		4		1		1		0	0	1		1		0	0	0	0				
Vihear Suor	MPA			1	2		3		0	0	1		0	0	1		0	0	0	0	0	1				
Chrouy Takeo	MPA			1	4		5		1		1		0	0	1		0	1	0	0	1					
Pou Reamea	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Prek Sdey	MPA			1	2		5		1		1		0	0	0	1	0	1	0	0	0	1				
Khporp	MPA			1	3		5		1		1		0	0	1		0	1	0	0	0	1				
Kraing Yov	MPA			1	4		4		1		1		0	0	0	0	1		0	0	1					
Ta Lun	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0				
Anlong Romiet	CPA+ MPA			1	6		6		1		1		0	0	1		1		1		1					
Siem Reap	MPA			1	2		4		1		1		0	0	0	1	0	1	0	0	0	0				
Svay Rolum	MPA			1	2		4		0	0	1		0	0	0	1	1		0	0	0	1				
Prek Anhchanh	CPA+ MPA			1	5		6		1		1		0	0	1		1		0	1	1					
Roka Kaong	MPA			1	5		6		1		1		1		0	1	1		0	0	1					
Koh Dach	MPA			1	2		4		1		1		0	0	0	1	0	0	0	0	0	1				
Phnom Bat	MPA			1	3		5		1		1		0	0	0	1	0	1	0	0	1					
Prek Pnov	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Tumnob Thom	MPA			1	3		3		1		1		0	0	1		0	0	0	0	0	0				

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Koh Kong																										
Bak khlang	MPA			1	4		5	1		1		0	0	1		1		0	0	0	1					
Neang Kok	MPA			1	3		5	1		1		0	0	0	1	1		0	0	0	1					
Steung veng	MPA			1	2		5	1		1		0	0	0	1	0	1	0	0	0	1					
Thmar sar	MPA			1	3		5	1		1		0	0	0	1	1		0	0	0	1					
Kampong Seila (Takavit)	MPA			1	3		3	1		1		0	0	1		0	0	0	0	0	0					
Sre Ambel	MPA			1	2		2	0	0	1		0	0	0	0	1		0	0	0	0					
Kratie																										
Ta Mao	MPA			1	4		4	1		1		0	0	1		1		0	0	0	0					
Chambak	MPA			1	2		2	0	0	1		0	0	1		0	0	0	0	0	0					
Prek Prasob	CPA+ MPA			1	4		5	1		1		0	0	0	1	1		0	0	1						
Ou Russei	MPA			1	1		2	0	0	1		0	0	0	0	0	1	0	0	0	0					
Sambour	CPA+ MPA			1	5		6	1		1		0	1	1		1		0	0	1						
Sandan	MPA			1	4		4	0	0	1		0	0	1		1		0	0	1						
Mondul Kri																										
Kaev Seima	MPA			1	4		4	0	0	1		0	0	1		1		0	0	1						
Pechreada	MPA			1	5		5	1		1		0	0	1		1		0	0	1						
Koh Nhek	MPA			1	3		4	0	0	1		0	0	0	1	1		0	0	1						
Phnom Penh																										
Phsar Deum Thkov	MPA			1	4		6	1		1		0	0	1		1		0	1	0						
Tuol Svay Prey	MPA			1	2		5	1		1		0	0	0	1	0	1	0	0	0						
Teuk Thla	MPA			1	2		5	1		1		0	0	0	1	0	1	0	0	0						
Toul Kork	MPA			1	5		6	0	1	1		0	0	1		1		1		1						
Pong Tuek	MPA			1	2		3	1		1		0	0	0	1	0	0	0	0	0						
Daun Penh	MPA			1	5		6	1		1		0	0	1		1		1		0						
Anlong Kngan	MPA			1	3		5	1		1		0	0	0	1	1		0	0	0						
Chroy Changva	MPA			1	3		6	1		1		0	0	0	1	1		0	1	0						
Ni Rodh	MPA			1	3		5	0	1	1		0	0	0	0	1		1		0						
Steung Meanchey	MPA			1	3		4	1		1		0	0	1		0	1	0	0	0						
Chak Angre	MPA			1	4		6	1		1		0	0	1		0	1	1		0						

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Preah Vihear																										
Ro Vieng	MPA			1	6		6		1		1		1		1		0	0	1							
Phnom Dek	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Kou Ien	MPA			1	2		4		0	0	1		1		0	0	0	1	0	0	0	1				
Prey Veng																										
Cheach	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Smaung Cheung	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1					
Seang Khveang	MPA			1	2		3		0	0	1		0	0	0	0	1		0	0	0	1				
Prey Chhor	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0				
Prey Poun	MPA			1	6		6		1		1		1		1		1		0	0	1					
Thkov	MPA			1	5		5		0	0	1		1		1		1		0	0	1					
Svay Chrum	MPA			1	3		4		0	0	1		0	0	1		1		0	0	0	1				
Prey Toteung	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1					
Boeng Preah	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1					
Cheung Phnom	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Roung Damrei	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Kampong Soeng				1	4		4		0	0	1		0	0	1		1		0	0	1					
Kampong Popil	MPA			1	4		4		1		1		0	0	1		0	0	0	0	1					
Prey Pnau	MPA			1	2		3		0	0	1		0	0	0	1	1		0	0	0	0				
Pou Ti	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1					
Sena Reach Otdam	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Chey Kampok	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Kampong Prasat				1	5		5		1		1		0	0	1		1	0	0	0	1					
Svay Antor	MPA			1	5		5		1		1		0	0	1		1		1		0	0				
Popoes	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0				
Prey Kandieng	MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Pursat																										
Rumlech	MPA			1	2		3		0	0	1		0	0	1		0	0	0	0	0	1				
Ou Tapaong	MPA			1	1		3		0	0	1		0	0	0	1	0	0	0	0	0	1				
Snam Preah	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Phnom Kravanh	MPA			1	4		5		1		1		0	0	0	0	1		1		0	1				
Ta Sah	MPA			1	1		2		0	0	1		0	0	0	1	0	0	0	0	0	0				

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Ansa Chambak	MPA			1	2		3		0	0	1		1		0	1	0	0	0	0	0	0				
Ratanak Kiri																										
Ban Lung	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0				
BarKeo	MPA			1	3		3		0	0	1		1		0	0	1		0	0	0	0				
Veun Sai	MPA			1	4		4		1		1		0	0	1		1		0	0	0	0				
Seim Reap																										
Puok	MPA			1	5		5		1		1		0	0	1		1		1		0	0				
Sasar Sdam	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1					
Reul	MPA			1	2		3		0	0	1		1		0	1	0	0	0	0	0	0				
Prey Chrouk	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Srey snam	MPA			1	4		5		1		1		0	1	1		0	0	0	0	1					
Sranal	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0				
Banteay srey	MPA			1	2		5		1		1		0	1	0	1	0	1	0	0	0	0				
Peak Sneng	MPA			1	2		3		0	0	1		1		0	1	0	0	0	0	0	0				
Kan Treang	MPA			1	3		4		0	0	1		0	1	1		0	0	0	0	1					
Samraong	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Kean Sangkae	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Anloun Samnor	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Sihanouk Ville																										
Sangkat 1	MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0				
Ou Oknha Heng	MPA			1	2		5		1		1		0	0	0	1	0	1	0	0	0	1				
Cheung Kou	MPA			1	1		4		0	0	1		0	0	0	1	0	1	0	0	0	1				
Steung Treng																										
Kampun	MPA			1	3		5		0	1	1		0	0	1		0	1	0	0	1					
Siem Pang	CPA+ MPA			1	3		3		0	0	1		0	0	1		1		0	0	0	0				
Srae Krasaing	CPA+ MPA			1	5		5		1		1		0	0	1		1		0	0	1					
Svay Rieng																										
Mesar Thngak	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1					
Tnaot	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1					

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarian Section			
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M		
Prey Koki	MPA			1	4		4		0	0	1		0	0	1		1		0	0	1							
Chrey Thum	MPA			1	1		2		0	0	1		0	0	0	1	0	0	0	0	0	0						
Doung	MPA			1	2		2		0		1		0	0	0	0	1		0	0	0	0						
Krasaing	MPA			1	3		3		0	0	1		0	0	0	0	1		0	0	1							
Kruos	MPA			1	3		4		0	0	1		0	0	0	1	1		0	0	1							
Svay Chrum	MPA			1	1		2		0	0	1		0	0	0	0	0	1	0	0	0	0						
Krol Kor	MPA			1	2		2		0	0	1		0	0	0	0	1		0	0	0	0						
Takeo																												
Rovieng	MPA			1	5		5		0	0	1		0	0	1		1		1		1							
Khvav	MPA			1	2		4		0	0	1		0	0	1		0	1	0	0	0	1						
Dong	MPA			1	2		2		0	0	1		0	0	1		0	0	0	0	0	0						
Kouk Prech	MPA			1	2		3		0	0	1		0	0	0	1	0	0	0	0	1							
Romenh	MPA			1	3		6		1		1		0	1	0	1	1		0	1	0	0						
Prambei Mum	MPA			1	2		4		0	0	1		0	0	1		0	1	0	0	0	1						
Krang Sla (Khen Lak)	MPA			1	4		4		1		1		0	0	1		1		0	0	0	0						
Champa	MPA			1	3		4		1		1		0	0	1		0	0	0	0	0	1						
Sla (phnom chiso)	MPA			1	2		5		0	0	1		0	0	0	1	1		0	1	0	1						
Srangae	MPA			1	4		4		1		1		0	0	1		0	0	0	0	1							
Roneam	MPA			1	3		3		1		1		0	0	0	0	1		0	0	0	0						
Sre Ronoung	MPA			1	2		3		0	0	1		0	0	0	1	1		0	0	0	0						
Ang ta som	MPA			1	3		4		0	0	1		0	0	1		1		0	0	0	1						
Tram Kak	MPA			1	2		5		0	0	1		0	0	1		0	1	0	1	0	1						
Trapaing Andeuk	MPA			1	2		3		0	0	1		0	1	0	0	0	0	0	0	1							
Oddor Meanchey																												
Tomnob Dach	MPA			1	2		4		0	0	1		0	1	1		0	1	0	0	0	0						
Ou Smach	MPA			1	2		3		0	0	1		0	0	0	1	0	0	0	0	1							
Pongro-TaPean	MPA			1	2		3		0	0	1		0	0	1		0	0	0	0	0	1						
Kep																												
Ou Krasa	MPA			1	3		4		1		1		0	0	1		0	0	0	0	0	1						
Pong Tuek	MPA			1	2		3		0	0	1		0	0	1		0	0	0	0	0	1						
Angkol	MPA			1	1		1		0	0	1		0	0	0	0	0	0	0	0	0	0						

PROVINCE/ FACILITY	Type of facility	EmONC Status			# function performed last 3 months		# function performed last 3 & 12 months		Antibiotics		Oxytocics		Anti-convulsant		Manual removal placenta		Removal retain products (MVA or D&C)		Assisted Delivery		Neonatal Resuscitation		Blood Transfusion		Cesarien Section	
		BEm ONC	BEm ONC	NON EmONC	1-7	1-9	1-7	1-9	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M	3 M	12 M
Pallin																										
Ou Chra	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Phnom Spung	MPA			1	3		3		0	0	1		0	0	1		0	0	0	0	1					
Phsar Prum	MPA			1	5		5		1		1		0	0	1		1		0	0	1					

Appendix 5: List of available equipments and supplies

8.1. Emergency Room, Labor & Delivery Room(s)

8.1A. Infrastructure

No.	Items	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1A1	Sufficient light source to perform tasks during the day	44	100	97	98.0	76	98.7	229	99.6
8.1A2	Sufficient light source to perform tasks at night	44	100	91	91.9	76	98.7	199	86.5
8.1A3	Means of ventilation	44	100	99	100	77	100	230	100
8.1A4	Running water	37	84.1	51	51.5	62	80.5	66	28.7
8.1A5	Functioning toilet	38	86.4	73	73.7	58	75.3	176	76.5
8.1A6	Heating/heating arrangements (if applicable)	4	9.1	4	4.0	8	10.4	2	0.9
8.1A7	Fan / air conditioning (if applicable)	40	90.9	55	55.6	68	88.3	62	27.0
8.1A8	Curtains/means of providing patient privacy	27	61.4	61	61.6	51	66.2	130	56.5
8.1A9	Waiting area for visitors and family	30	68.2	82	82.8	55	71.4	191	83.0
8.1A10	Posters or wall charts for <u>clinical management of obstetric or newborn complications</u>	35	79.5	77	77.8	62	80.5	167	72.6

8.1B. Equipment and supplies

No.	8.1Ba. Basic items	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Ba1	Filled oxygen cylinder with cylinder carrier and key to open valve	40	90.9	40	40.4	70	90.9	13	5.7
8.1Ba2	Blood Pressure machine and cuff	44	100	97	98.0	76	98.7	227	98.7
8.1Ba3	Stethoscope	44	100	99	100	77	100	230	100
8.1Ba4	Fetal stethoscope	44	100	98	99.0	77	100	227	98.7
8.1Ba5	Kidney basins	44	100	99	100	77	100	226	98.3
8.1Ba6	Sponge bowls	44	100	99	100	77	100	227	98.7
8.1Ba7	Clinical oral thermometer	44	100	96	97.0	77	100	211	91.7
8.1Ba8	Rectal thermometer for newborn	15	34.1	11	11.1	21	27.3	12	5.2
8.1Ba9	Low reading thermometer (32 or 35 degree C)	1	2.3	0	0.0	1	1.3	0	0.0
8.1Ba10	Scissors	44	100	97	98.0	77	100	224	97.4
8.1Ba11	Needles and Syringes (10-20cc)	42	95.5	69	69.7	74	96.1	123	53.5
8.1Ba12	Syringes (1ml, 2ml, 5ml, 10ml)	44	100	95	96.0	76	98.7	217	94.3
8.1Ba13	Needles (23-25 gauge)	42	95.5	78	78.8	69	89.6	155	67.4
8.1Ba14	Suture needles/suture materials	43	97.7	97	98.0	76	98.7	218	94.8
8.1Ba15	Branulla for IV line (16-18)	44	100	88	88.9	77	100	177	77.0
8.1Ba16	IV Infusion stand(s)	44	100	76	76.8	75	97.4	140	60.9
8.1Ba17	Urinary catheters	44	100	81	81.8	76	98.7	155	67.4
8.1Ba18	Uristix (dip stick for protein in urine)	12	27.3	8	8.1	15	19.5	19	8.3
8.1Ba19	Adult ventilator bag and mask	36	81.8	37	37.4	55	71.4	38	16.5

No.	8.1Ba. Basic items	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
8.1Ba20	Mouth gag	33	75.0	33	33.3	48	62.3	47	20.4
8.1Ba21	Wheelchair	25	65.8	18	18.2	41	53.2	21	9.1
8.1Ba22	Stretcher with trolley	26	59.1	29	29.3	43	55.8	32	13.9
8.1Ba23	Examination table	41	93.2	96	97.0	72	93.5	224	97.4
8.1Ba24	Labor/delivery table with stirrups	44	100	88	88.9	72	93.5	207	90.0
8.1Ba25	Labor/delivery table without stirrups	27	61.4	45	45.5	46	59.7	81	35.2
8.1Ba26	Baby weighing scale	43	97.7	95	96.0	76	98.7	215	93.5
8.1Ba27	Partographs (modified form)	43	97.7	95	96.0	76	98.7	219	95.2
8.1Ba28	Neonatal resuscitating table	16	36.4	13	13.1	22	28.6	14	6.1
8.1Ba29	Plain thumb forceps	44	100	84	84.8	75	97.4	174	75.7
8.1Ba30	Dressing forceps	44	100	91	91.9	77	100	184	80.0
8.1Ba31	Surgeon's handbrush w/ nylon bristles	40	90.9	62	62.6	70	90.9	121	52.6
8.1Ba32	Watch or clock with second hand that can be easily seen	39	88.6	71	71.7	66	85.7	142	61.7
8.1Ba33	Incubator	7	15.9	3	3.0	10	13.0	1	0.4
8.1Ba34	Nasogastric tube	30	68.2	22	22.2	42	54.5	14	6.1
8.1Ba35	IV cannulae	44		85	85.9	75	97.4	172	74.8
8.1Ba36	IV fluid set (neonatal giving set) / Umbilical catheter	9	20.5	4	4.0	10	13.0	2	0.9
8.1Ba37	Measuring tape	44		99	100	77	100	230	100
8.1Ba38	Radiant warmer	6	13.6	4	4.0	9	11.7	1	0.4
8.1Ba39	Nasal prongs / Nasogastric tubes for oxygen administration	39	88.6	29	29.3	60	77.9	9	3.9
8.1Ba40	Blood sugar testing sticks	6	13.6	6	6.1	11	14.3	0	0.0
8.1Ba41	Fluorescent tubes for phototherapy to treat jaundice	1	2.3	0	0.0	1	1.3	0	0.0
8.1Ba42	Ictermeter	1	2.3	0	0.0	1	1.3	0	0.0
8.1Ba43	Pulse oximeter	7	15.9	2	2.0	8	10.4	1	0.4
8.1Ba44	Apnoea monitor	23	52.3	18	18.2	32	41.6	7	3.0
8.1Ba45	Paladay / small wide mouthed cup for breast milk expression	24	54.5	18	18.2	36	46.8	10	4.3
8.1Ba46	Instrument trolley	43	07.7	78	78.8	73	94.8	144	62.6
8.1Ba47	Instrument tray	44	100	97	98.0	77	100	221	96.1
8.1Ba48	Beds	43	97.7	95	96.0	73	94.8	210	91.3
8.1Ba49	Linens	32	72.7	80	80.8	58	75.3	159	69.1
8.1Ba50	Towels or cloth for newborn	17	38.6	13	13.1	25	32.5	14	6.1
8.1Ba51	Blankets for cold weather	7	15.9	8	8.1	13	16.9	6	2.6
8.1Ba52	Water filter (or other means to make potable water available to patients and staff)	14	31.0	34	34.3	22	28.6	112	48.7

No.	8.1Bb. Delivery set / pack	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bb1	Delivery set/pack available	43	97.7	98	99.0	76	98.7	227	98.7

No.	8.1Bc. Episiotomy and Perino repair set	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bc1	Episiotomy/ Perineal / vaginal / cervical repair pack available	41	93.2	81	81.8	74	96.1	163	70.9

No.	8.1Bd. Vacuum extraction/ forceps delivery	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bd1	Vacuum extractor with different size cups	44	100	45	45.5	75	97.4	19	8.3
8.1Bd2	Obstetric forceps, outlet	12	27.3	11	11.1	19	24.7	2	0.9
8.1Bd3	Obstetric forceps, mid-cavity	4	9.1	0	0.0	4	5.2	0	0.0
8.1Bd4	Obstetric forceps, breech	2	4.5	0	0.0	2	2.6	0	0.0

No.	8.1Be. Uterine evacuation (Dilatation & Curettage (D&C)) Set	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Be1	uterine evacuation set (Dilatation & Curettage (D&C)) set available	43	97.7	54	54.5	74	96.1	56	24.3

No.	8.1Bf. Manual vacuum aspiration (MVA Kit)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bf1	Manual vacuum aspiration kit/pack available	18	40.9	18	18.2	27	35.1	22	9.6

No.	8.1Bg. Dressing Instrument Set	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bg1	Dressing Instrument Set/ Kit available	35	79.5	60	60.6	63	81.8	98	42.6

No.	8.1Bh. MCH Diagnostic Set (Consultation Gyne/Obs Set)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bh1	MCH Diagnostic Set/Kit available	23	52.3	28	28.3	34	44.2	66	28.7

No.	8.1Bi. Neonatal resuscitation pack	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.1Bi1	Neonatal Resuscitation Pack available	9	20.5	5	5.1	12	15.6	2	0.9

8.2. Obstetric / maternity ward and post-natal ward

No.		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.2.1	Are there empty beds clean and ready to accept new arrivals?	42	95.5	93	93.9	74	96.1	171	74.3
8.2.2	Are there empty cribs clean and ready to accept new arrivals?	14	31.8	26	26.3	32	41.6	31	13.5

No.		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
8.2.3	Are mothers and babies kept together?	43	97.7	99	100	76	98.7	225	97.8
8.2.4	Is there a separate room for high risk babies	3	6.8	1	1.0	3	3.9	1	0.4
8.2.5	Are there clean towels to dry the newborn?	20	45.5	31	31.3	29	37.7	60	26.1
8.2.6	Do the mothers have sarongs to keep the newborns warm?	40	90.9	90	90.9	70	90.9	204	88.7
8.2.7	Are there any liquid spills or trash on the floor?	7	15.9	4	4.0	9	11.7	6	2.6
8.2.8	Do the women and health providers have easy access to water and soap?	41	93.2	97	98.0	74	96.1	223	97.0
8.2.9	Is a companion allowed in the delivery room?	16	36.4	58	58.6	35	45.5	165	71.7
8.2.10	Is the mother allowed to deliver in her preferred positions	6	13.6	16	16.2	10	13.0	37	16.1

8.3. Operating theatre

No.		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.3.1	Does this facility have an operating theatre?	35	79.5	15	15.2	47	61.0	0	0.0
8.3.2	Does this facility have a separate operating theatre only for obstetric patients?	3	8.6	1	6.7	4	8.5		

8.3A. Equipment and supplies (in the operating theatre)

No.	8.3Aa. Basic items	EmONC (N=35)		For Upgrade (N=99)		Hospitals (N=47)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.3Aa1	Operating table	35	100	15	100	47	100		
8.3Aa2	Light- adjustable, shadowless	35	100	15	100	47	100		
8.3Aa3	Surgical drapes	35	100	15	100	47	100		
8.3Aa4	Syringes 5ml	35	100	15	100	47	100		
8.3Aa5	Syringes 10ml	35	100	15	100	47	100		
8.3Aa6	Syringes 20ml	34	97.1	10	66.7	41	87.2		
8.3Aa7	Needles 21, 22, 23	35	100	14	93.3	46	97.9		

No.	8.3Ab. Obstetric laparotomy / cesarean section pack	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=47)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.3Ab1	Obstetric laparotomy / cesarean section pack available	34	97.1	15	100	46	97.9		

No.	8.3Ac. Anesthesia Equipment Set	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=47)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.3Ac1	Anesthesia equipment set available	25	71.4	11	73.3	35	74.5		

No.	8.3Ad. Craniotomy equipment Set	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=47)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.3Ad1	Craniotomy equipment set available	17	48.6	4	26.7	20	42.6		

8.4. Laboratory

No.		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
	Does this facility have a laboratory?	44	100	56	56.6	77	100	33	14.3

8.4A. Equipment and supplies (in the laboratory)

No.	8.4Aa. Provision of donor blood for transfusion	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.4Aa1	Refrigerator	44	100	46	82.1	73	94.8	18	54.5
8.4Aa2	Test tubes - small size	43	97.7	45	80.4	74	96.1	17	51.5
8.4Aa3	Test tubes - medium size	42	95.5	43	76.8	72	93.5	15	45.5
8.4Aa4	Slides (microscope)	44		53	94.6	77	100	28	84.8
8.4Aa5	Compound microscope	33	75.0	29	51.8	51	66.2	13	39.4
8.4Aa6	Microscope illuminator	38	86.4	39	69.6	66	85.7	12	36.4
8.4Aa7	Blood lancets	44	100	56	100	77	100	32	97.0
8.4Aa8	Cotton wool	44	100	56	100	77	100	32	97.0
8.4Aa9	Rack	44	100	56	100	77	100	31	93.9
8.4Aa10	8.5 g/l Sodium Chloride solution	28	63.6	26	46.4	44	57.1	11	33.3
8.4Aa11	20% Bovine albumin	10	22.7	5	8.9	13	16.9	2	6.1
8.4Aa12	Centrifuge (electric)	44	100	43	76.8	74	96.1	12	36.4
8.4Aa13	Centrifuge (hand driven)	3	6.8	6	10.7	5	6.5	5	15.2
8.4Aa14	37° Water bath (or incubator)	24	54.5	8	14.3	29	37.7	1	3.0
8.4Aa15	Pipettes Volumetric – 1 ml	39	88.6	35	62.5	65	84.4	11	33.3
8.4Aa16	- 2 ml	37	84.1	35	62.5	62	80.5	12	36.4
8.4Aa17	- 3 ml	36	81.8	30	53.6	56	72.7	11	33.3
8.4Aa18	- 5 ml	38	86.4	35	62.5	62	80.5	13	39.4
8.4Aa19	- 10 ml	33	75.0	33	58.9	55	71.4	10	30.3
8.4Aa20	- 20 ml	31	70.5	29	51.8	49	63.6	10	30.3
8.4Aa21	Pipette holder of 10 pieces	21	47.7	21	37.5	34	44.2	10	30.3
8.4Aa22	Blood typing and cross-matching reagents	38	86.4	24	42.9	57	74.0	2	6.1
8.4Aa23	Blood collection bags	23	52.3	8	14.3	30	39.0	0	0.0

No.	8.4Ab. Blood collection and screening tests	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.4Ab1	Airway needle for collecting blood	33	75.0	35	62.5	59	76.6	8	24.2
8.4Ab2	Ball (for donor to squeeze)	18	40.9	7	12.5	23	29.9	1	3.0
8.4Ab3	Artery forceps	18	40.9	8	14.3	24	31.2	2	6.1
8.4Ab4	Pilot bottles (containing 1 ml ACD solution)	15	34.1	4	7.1	18	23.4	1	3.0
8.4Ab5	Hepatitis B Test	40	90.9	28	50.0	62	80.5	4	12.1
8.4Ab6	Hepatitis C Test	41	93.2	29	51.8	63	81.8	4	12.1
8.4Ab7	HIV Test	43	97.7	51	91.1	75	97.4	21	63.6
8.4Ab8	Syphilis Test	38	86.4	31	55.4	63	81.8	5	15.2

8.4Ac.	Laboratory supplies	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.4Ac1	Microscope	44	100	52	92.9	77	100	25	75.8
8.4Ac2	Immersion oil	44	100	54	96.4	77	100	28	84.8
8.4Ac3	Glass rods	38	86.4	34	60.7	60	78	13	39.4
8.4Ac4	Sink or staining tank	42	95.5	46	82.1	69	90	25	75.8
8.4Ac5	Measuring cylinder (25 ml) polypropylene	29	65.9	20	35.7	42	55	7	21.2
8.4Ac6	Measuring cylinder (50 ml) polypropylene	31	70.5	23	41.1	47	61	5	15.2
8.4Ac7	Measuring cylinder (100 ml) polypropylene	30	68.2	24	42.9	47	61	8	24.2
8.4Ac8	Measuring cylinder (250 ml) polypropylene	30	68.2	23	41.1	46	60	4	12.1
8.4Ac9	Measuring cylinder (500 ml) polypropylene	29	65.9	18	32.1	40	52	4	12.1
8.4Ac10	Wash bottle containing buffered water	38	86.4	38	67.9	60	78	18	54.5
8.4Ac11	Interval timer clock with alarm	41	93.2	47	83.9	71	92.2	22	66.7
8.4Ac12	Rack for drying slides	37	84.1	38	67.9	64	83.1	19	57.6
8.4Ac13	Leishman stain	42	95.5	44	78.6	67	87.0	27	81.8
8.4Ac14	Methanol	41	93.2	44	78.6	68	88.3	24	72.7
8.4Ac15	Refrigerator	44	100	45	80.4	73	94.8	17	51.5
8.4Ac16	Field stains A and B	18	40.9	12	21.4	28	36.4	2	6.1
8.4Ac17	Glass containers	43	97.7	49	87.5	75	97.4	25	75.8
8.4Ac18	Counting chamber (Differential counter)	33	75.0	18	32.1	45	58.4	3	9.1
8.4Ac19	Pipette (5 ml)	39	88.6	25	44.6	55	71.4	8	24.2
8.4Ac20	Pipette (0.05 ml)	38	86.4	25	44.6	51	66.2	11	33.3
8.4Ac21	Pipette (graduated, 1.0 ml)	37	86.4	27	48.2	54	70.1	10	30.3
8.4Ac22	Dropping pipette	40	90.9	35	62.5	63	81.8	15	45.5
8.4Ac23	Cover slips	41	93.2	41	73.2	70	90.9	15	45.5
8.4Ac24	Petri dishes	5	11.4	4	7.1	8	10.4	1	3.0
8.4Ac25	Bowls, s/s, assorted sizes	21	47.7	14	25.0	32	41.6	3	9.1
8.4Ac26	Tork diluting solution	33	75.0	30	53.6	52	67.5	11	33.3
8.4Ac27	Tally counter, differential if possible	30	68.2	21	37.5	44	57.1	4	12.1
8.4Ac28	Haemoglobinometer	38	86.4	32	57.1	61	79.2	6	18.2
8.4Ac29	Hydrochloric acid solution	26	59.1	19	33.9	38	49.4	6	18.2
8.4Ac30	Microhaematocrit centrifuge (manual or electric)	44	100	40	71.4	74	96.1	12	36.4
8.4Ac31	Scale for reading results	44	100	40	71.4	73	94.8	12	36.4
8.4Ac32	Heparinized capillary tubes (75 mm x 1.5 mm)	43	97.7	42	75.0	74	96.1	14	42.4
8.4Ac33	Spirit lamp	44	100	54	96.4	77	100	28	84.8
8.4Ac34	Ethanol	37	84.1	31	55.4	55	71.4	14	42.4
8.4Ac35	Indicator papers and tablets	10	22.7	3	5.4	11	14.3	2	6.1
8.4Ac36	Benedict solution	4	9.1	2	3.6	6	7.8	0	0.0

8.4Ac.	Laboratory supplies	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
8.4Ac37	Pyrex test-tubes	25	56.8	13	23.2	33	42.9	3	9.1
8.4Ac38	Test-tube holder	33	75.0	20	35.7	47	61.0	5	15.2
8.4Ac39	Beaker: 50 ml	22	50.0	16	28.6	34	44.2	3	9.1
8.4Ac40	Beaker: 150 ml	22	50.0	16	28.6	36	46.8	1	3.0
8.4Ac41	Sodium nitroprusside	6	13.6	1	1.8	7	9.1	0	0.0
8.4Ac42	Glacial acetic acid	35	79.5	28	50.0	58	75.3	3	9.1
8.4Ac43	Ammonia	10	22.7	7	12.5	16	20.8	1	3.0
8.4Ac44	Sulfosalicyclic acid (300 g/l aqueous solution)	10	22.7	3	5.4	12	15.6	0	0.0
8.4Ac45	Lugol's iodine solution	30	68.2	23	41.1	49	63.6	2	6.1
8.4Ac46	Ehrlich reagent	3	6.8	1	1.8	4	5.2	0	0.0

8.5. Autoclave

8.4Ac. Laboratory supplies		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.5.1	Does this facility have a separate autoclave room?	39	88.6	27	27.3	58	75.3	14	6.1

Type of Autoclave		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.5.2	Autoclave (with temperature and pressure gauges)	37	84.1	65	65.7	59	76.6	128	55.7
8.5.3	Incinerator	37	84.1	84	84.8	66	85.7	190	82.6
8.5.4	Hot air Sterilizer (dry oven)	36	81.8	33	33.3	56	72.7	26	11.3
8.5.5	Steam Sterilizer	29	65.9	40	40.4	45	58.4	91	39.6
8.5.6	Steam Instrument Sterilizer / Pressure Cooker (electric)	16	36.4	11	11.1	24	31.2	7	3.0
8.5.7	Sterilizer / Pressure Cooker (kerosene heated)	12	27.3	34	34.3	17	22.1	103	44.8
8.5.8	Sterilization drum	2	4.5	2	2.0	4	5.2	1	0.4
8.5.9	Sterilization drum stand	0	0	3	3.0	3	3.9	1	0.4
8.5.10	Other type of autoclave. Please specify _____	0	0	0	0.0	0	0	0	0.0

8.6. Pharmacy

		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.6.1	Does this facility have a pharmacy?	44	100	99	100	77	100	230	100
8.6.2	Is there a drug inventory register?	26	59.1	99	100	77	100	230	100
8.6.4	Is drug inventory register up to date? (within the last 2 days)	29	65.9	72	72.7	50	64.9	161	70.0
8.6.5	Are records on supply requests from wards up to date? (within last month)	44	100	72	72.7	54	70.1	154	67.0
8.6.10	Is the pharmacy accessible 24-hours / day?	41	93.2	93	93.9	71	92.2	220	95.7
8.6.11	Is 'First-in-First-out' system for supply management used?	32	72.7	76	76.8	57	74.0	167	72.6

		EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.6.12	Is there a regularly used mechanism to ensure that expired drugs are not distributed?	31	70.5	80	80.8	58	75.3	199	86.5
8.6.13	Are drugs protected from moisture, heat or infestation (e.g., placed on shelves or slats, ventilated)?	40	90.9	87	87.9	63	81.8	222	96.5
8.6.14	Are drugs that require refrigeration stored in a refrigerator? (check oxytocin, if available at the facility)	33	75.0	52	52.5	47	61.0	129	56.1

8.7. Essential drugs

No.	Drugs (Antibiotics)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7A	Does this health facility have antibiotics?	44	100	98	99.0	77	100	226	99.1
8.7A1	Amoxicillin	44	100	96	97.0	77	100	224	97.4
8.7A2	Ampicillin	43	97.7	84	84.8	73	94.8	177	77.0
8.7A3	Cephalosporin Sodium	1	2.3	1	1.0	2	2.6	4	1.7
8.7A4	Cefixime	32	72.7	75	75.8	58	75.3	155	67.4
8.7A5	Ceftriaxone	41	93.2	50	50.0	71	92.2	35	15.2
8.7A6	Cefotaxime injection (for newborn)	1	2.3	1	1.0	1	1.3	2	0.9
8.7A7	Chloramphenicol	25	56.8	29	29.3	41	53.2	27	11.7
8.7A8	Clindamycin	2	4.5	1	1.0	2	2.6	3	1.3
8.7A9	Cloxacillin Sodium	34	77	48	48.5	59	76.6	62	27.0
8.7A10	Erythromycin	38	86.4	83	83.8	69	89.6	177	77.0
8.7A11	Oral flucloxacillin (for newborn)	3	6.8	2	2.0	4	5.2	2	0.9
8.7A12	Gentamycin	44	100	79	79.8	76	98.7	153	66.5
8.7A13	Metronidazole (injection)	44	100	42	42.4	71	92.2	28	12.2
8.7A14	Penicillin G (Benzyl)	41	93.2	62	62.6	69	89.6	87	37.8
8.7A15	Procaine benzylpenicillin (procaine penicillin G)	2	4.5	7	7.1	8	10.4	10	4.3
8.7A16	Trimethoprim/Sulfamethoxazole	41	93.2	84	84.8	71	92.2	195	84.8
8.7A17	Tetracycline eye ointment / drops	27	61.4	59	59.6	43	55.8	152	66.1

No.	Drugs (Anticonvulsants)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7B	Does this health facility have anticonvulsants?	44	100	81	81.8	77	100	148	64.3
8.7B1	**Magnesium sulfate	26	59.1	17	17.2	38	49.4	4	1.7
8.7B2	Diazepam (injection)	44	100	80	80.8	77	100	146	63.5
8.7B3	Phenobarbital (injection)	22	50.0	20	20.2	38	49.4	7	3.0
8.7B4	Phenytoin (Diphenylhydantoin)	8	18.2	6	6.1	10	13.0	4	1.7

No.	Drugs (Antihypertensives)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7C	Does this health facility have antihypertensives?	44	100	91	91.9	77	100	203	88.3
8.7C1	Hydralazine	42	95.5	87	87.9	73	94.8	193	83.9
8.7C2	Labetalol	3	6.8	4	4.0	6	7.8	2	0.9
8.7C3	Methyldopa	37	84.1	37	37.4	59	76.6	55	23.9
8.7C4	Nifedipine	38	86.4	40	40.4	61	79.2	34	14.8

No.	Drugs (Oxytocics & Prostaglandins)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7D	Does this health facility have oxytocics/prostaglandins?	43	97.7	95	96.0	76	98.7	222	96.5
8.7D1	Ergometrine Maleate (injection)	13	29.5	9	9.1	20	26.0	3	1.3
8.7D2	Ergometrine (tablets)	0	0	0	0.0	0	0	0	0.0
8.7D3	Methylergometrine Maleate	2	4.5	4	4.0	6	7.8	1	0.4
8.7D4	Misoprostol	29	65.9	11	11.1	36	46.8	9	3.9
8.7D5	Oxytocin	44	100	98	99.0	77	100	227	98.7
8.7D6	Prostaglandin E2 (Dinoprostone)	0	0	1	1.0	1	1.3	1	0.4

No.	Drugs (Drugs used in Emergencies)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7E	Does this health facility have drug used in Emergencies?	44	100	96	97.0	77	100	214	93.0
8.7E1	Adrenaline (Epinephrine)	41	93.2	43	43.4	68	88.3	29	12.6
8.7E2	Aminophylline	35	79.5	66	66.7	56	72.7	154	67.0
8.7E3	Atropine sulfate	43	97.7	58	58.6	72	93.5	82	35.7
8.7E4	Calcium gluconate	42	95.5	48	48.5	70	90.9	40	17.4
8.7E5	Digoxin	35	79.5	33	33.3	59	76.6	9	3.9
8.7E6	Diphenhydramine	1	2.3	0	0.0	1	1.3	0	0.0
8.7E7	Ephedrine	24	54.5	13	13.1	35	45.5	2	0.9
8.7E8	Frusemide	43	97.7	69	69.7	73	94.8	130	56.5
8.7E9	Hydrocortisone	43	97.7	61	61.6	76	98.7	59	25.7
8.7E10	Naloxone Hydrochloride	3	6.8	0	0.0	3	3.9	1	0.4
8.7E11	Nitroglycerine	2	4.5	1	1.0	2	2.6	1	0.4
8.7E12	Promethazine Hydrochloride	41	93.2	76	76.8	68	88.3	162	70.4

No.	Drugs (Anesthetics)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7F	Does this health facility have anesthetics?	44	100	91	91.9	76	98.7	210	91.3
8.7F1	Halothane	19	43.2	10	10.1	27	35.1	0	0.0
8.7F2	Ketamine Hydrochloride	35	79.5	16	16.2	46	59.7	1	0.4
8.7F3	Lignocaine / Lidocaine 2% or 1%	43	97.7	91	91.9	75	97.4	212	92.2

No.	Drugs (Analgesics)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7G	Does this health facility have analgesics?	44	100	99	100	77	100	228	99.1
8.7G1	Acetylsalicylic acid	43	97.7	95	96.0	74	96.1	224	97.4
8.7G2	Indomethacin	40	90.9	56	56.6	65	84.4	93	40.4
8.7G3	Morphine Hydrochloride (injection)	21	47.7	7	7.1	28	36.4	0	0.0
8.7G4	Paracetamol	44	100	98	99.0	76	98.7	230	100
8.7G5	Pethidine Hydrochloride	10	22.7	22	22.2	17	22.1	64	27.8

No.	Drugs (Tocolytics)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7H	Does this health facility have Tocolytics?	44	100	95	96.0	77	100	206	89.6
8.7H1	Indomethacin	39	88.6	56	56.6	63	81.8	94	40.9
8.7H2	Nifedipine	38	86.4	39	39.4	61	79.2	34	14.8

No.	Drugs (Tocolytics)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7H3	Ritodrine Hydrochloride	3	6.8	2	2.0	4	5.2	1	0.4
8.7H4	Salbutamol	42	95.5	89	89.9	74	96.1	196	85.2

No.	Drugs (Steroids)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7I	Does this health facility have steroids?	42	95.5	65	65.7	74	96.1	88	38.3
8.7I1	Betamethasone	8	18.2	7	7.1	11	14.3	6	2.6
8.7I2	Dexamethasone	38	86.4	46	46.5	69	89.6	36	15.7
8.7I3	Prednisone	38	86.4	56	56.6	67	87.0	67	29.1
8.7I4	Prednisolone Corticosteriod	9	20.5	5	5.1	10	13.0	11	4.8

No.	Drugs (IV Fluids)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7J	Does this health facility have IV Fluids?	44	100	99	100	77	100	225	97.8
8.7J1	Dextrose	43	97.7	73	73.7	76	98.7	113	49.1
8.7J2	Dextran	28	63.6	17	17.2	42	54.5	6	2.6
8.7J3	Glucose 5%	44		68	68.7	76	98.7	116	50.4
8.7J4	Glucose 10%	43	97.7	66	66.7	74	96.1	94	40.9
8.7J5	Glucose 40% or 50%	39	88.6	46	46.5	64	83.1	36	15.7
8.7J6	Normal saline	41	93.2	58	58.6	67	87.0	90	39.1
8.7J7	Ringer's lactate	44	100	99	100	77	100	225	97.8

No.	Drugs (Antimalarial)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7K	Does this health facility have antimalarial?	35	79.5	69	69.7	58	75.3	138	60.0
8.7K1	Chloroquine	28	63.6	58	58.6	47	61.0	103	44.8
8.7K2	Clindamycin	3	6.8	0	0.0	3	3.9	0	0.0
8.7K3	Co-Artem	16	36.4	14	14.1	25	32.5	4	1.7
8.7K4	Mefloquine	19	43.2	31	31.3	33	42.9	37	16.1
8.7K5	Quinine Dihydrochloride	20	45.5	35	35.4	34	44.2	47	20.4
8.7K6	Sulfadoxine/ Pyrimethamine	1	2.3	0	0.0	1	1.3	1	0.4
8.7K7	A+M	20	45.5	56	56.6	35	45.5	127	55.2
8.7K8	Malarine	3	6.8	4	4.0	4	5.2	10	4.3
8.7K9	Arthemether (Inj)	17	38.6	34	34.3	34	44.2	35	15.2

No.	Drugs (PMTCT / HIV care)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7L	Does this health facility have any antiretroviral?	30	68.2	35	35.4	53	68.8	22	9.6
8.7L1	Nevirapine – mother	31	70.5	32	32.3	53	68.8	15	6.5
8.7L2	Nevirapine – newborn	30	68.2	29	29.3	51	66.2	13	5.7
8.7L3	HIV Rapid testing kit	32	72.7	44	44.4	50	64.9	43	18.7
8.7L4	Post-HIV exposure prophylactic treatment	15	34.1	16	16.2	29	37.7	6	2.6
8.7L5	Stavudine - mother	24	54.5	16	16.2	35	45.5	3	1.3
8.7L6	Zidovudine – mother	32	72.7	28	28.3	51	66.2	12	5.2
8.7L7	Lamivudine – mother	27	61.4	20	20.2	42	54.5	5	2.2
8.7L8	Zidovudine - newborn	29	65.9	25	25.3	47	61.0	10	4.3

No.	Drugs (Contraceptive Methods)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7M	Combined oral contraceptives	12	27.3	67	67.7	19	24.7	225	97.8
8.7M1	Implants	0	0	0	0.0	0	0	0	0.0
8.7M2	3 month injectables	8	18.2	68	68.7	14	18.2	230	100
8.7M3	IUD	6	13.6	47	47.5	12	15.6	145	63.0
8.7M4	Male Condoms	18	40.9	71	71.7	27	35.1	223	97.0
8.7M5	Female Condoms	1	2.3	0	0.0	1	1.3	0	0.0
8.7M6	Tubal ligation	34	77.3	14	14.1	45	58.4	0	0.0
8.7M7	Vasectomy	13	29.5	7	7.1	19	24.7	0	0.0

No.	Drugs (Other drugs)	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7N	Ask about the availability of each drug:	44	100	95	96.0	77	100	217	94.3
8.7N1	Vitamin K (for newborn)	42	95.5	47	47.5	72	93.5	27	11.7
8.7N2	Nystatin (oral) (for newborn)	27	61.4	18	18.2	36	46.8	24	10.4
8.7N3	Oral rehydration solution	38	86.4	89	89.9	66	85.7	204	88.7
8.7N4	Gentian violet paint	39	88.6	93	93.9	68	88.3	215	93.5
8.7N5	Ferrous sulphate or fumerate	42	95.5	94	94.9	72	93.5	225	97.8
8.7N6	Folic acid	34	77.3	62	62.6	54	70.1	177	77.0
8.7N7	Heparin	2	4.5	2	2.0	2	2.6	2	0.9
8.7N8	Magnesium trisilicate	13	29.5	8	8.1	19	24.7	1	0.4
8.7N9	Sodium citrate	5	11.4	2	2.0	7	9.1	1	0.4
8.7N10	Anti-tetanus serum	22	50.0	18	18.2	32	41.6	10	4.3
8.7N11	Tetanus toxoid	7	15.9	66	66.7	13	16.9	214	93.0
8.7N12	Anti Rho (D) Immune Globulin	1	2.3	0	0.0	1	1.3	0	0.0

No.	8.7P. Infection prevention	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7P1	Soap	43	97.7	97	98.0	75	97.4	224	97.4
8.7P2	Antiseptics	42	95.5	89	89.9	74	96.1	207	90.0
8.7P3	Gloves	43	97.7	99	100	76	98.7	229	99.6
8.7P4	Non-sterile protective clothing	35	79.5	67	67.7	62	80.5	150	65.2
8.7P5	Decontamination container	43	97.7	89	89.9	75	97.4	210	91.3
8.7P6	Bleach or bleaching powder	41	93.2	93	93.9	72	93.5	202	87.8
8.7P7	Prepared disinfection solution (Berekina)	30	68.2	58	58.6	52	67.5	112	48.7
8.7P8	Regular trash bin	43	97.7	96	97.0	75	97.4	220	95.7
8.7P9	Covered contaminated waste trash bin	43	97.7	92	92.9	75	97.4	205	89.1
8.7P10	Puncture proof sharps container	44		99	100	77	100	230	100
8.7P11	A separate stand or trolley where a sterile field can be established. (Mayo Stand)	27	61.4	27	27.3	37	48.1	37	16.1

No.	8.7Q. Disinfectants and antiseptics	EmONC (N=44)		For Upgrade (N=99)		Hospitals (N=77)		HC (N=230)	
		N	%	N	%	N	%	N	%
8.7Q1	Chlorhexidine	35	79.5	68	68.7	59	76.6	157	68.3
8.7Q2	Ethanol	16	36.4	15	15.2	24	31.2	16	7.0
8.7Q3	Polyvidone iodine	39	88.6	97	98.0	71	92.2	218	94.8

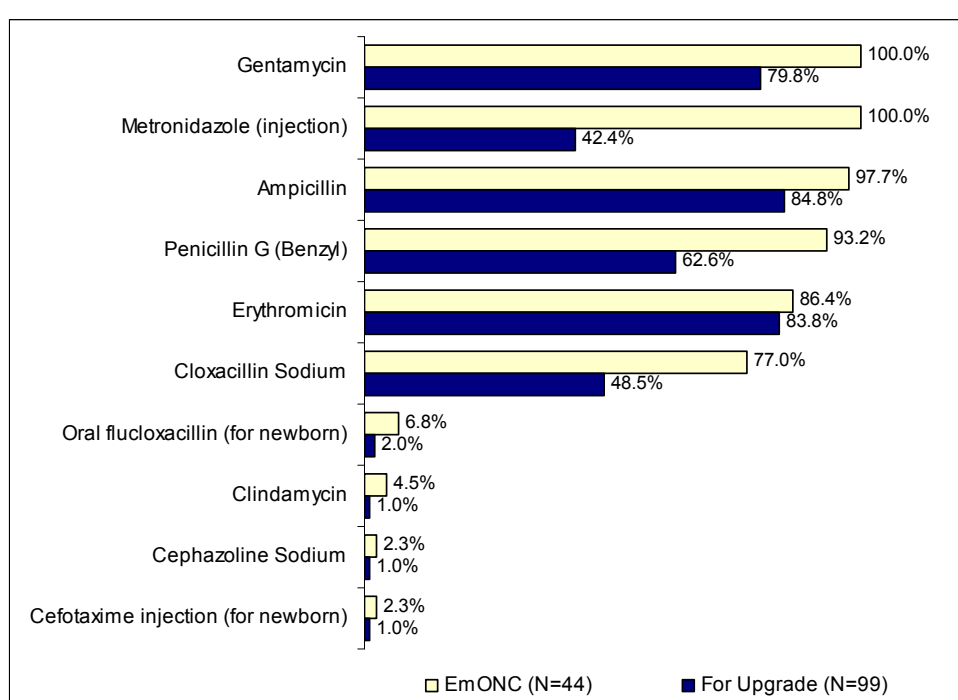
Appendix 6: Availability of Drugs in Different Drug Groups

Antibiotics

Under half (41.7%) of facilities had not given parenteral antibiotics in the three months prior to the survey. When the database was queried for the availability of selected antibiotics, including some in the new Safe Motherhood Protocols, antibiotics for newborns, Clincamycin and Cephazoline Sodium were only available in less than 10% of the facilities. Overall, facilities for upgrade had fewer drugs available. Refer to figure A 6.1

Figure A.6.1

Selected Antibiotics in EmONC Facilities and Facilities for Upgrade



Anticonvulsants

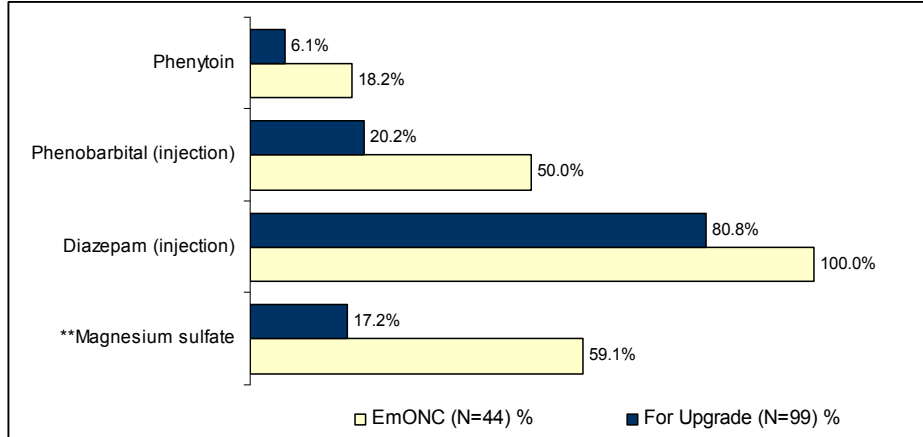
Anticonvulsants were of particular interest because 75.6% of the facilities surveyed had not administered anticonvulsants to an obstetric case in the three months prior to the survey. Of specific interest was magnesium sulphate, as it has been shown to be superior to Diazepam, Phenytoin and other sedatives or anticonvulsants in the management and prevention of eclampsia⁵⁰. Only 59.1% of EmONC facilities and 17.2% of facilities for upgrade had the drug in stock.

Diazepam, which is almost exclusively used in health centers, was available in all EmONC facilities and 80% of facilities for upgrade. 50% and less of facilities had Phenobarbital and Phenytoin. Refer to Figure A.6.2

⁵⁰ Chien PFW, Khan KS, Arnott N. (1996), Magnesium sulphate in the treatment of eclampsia and preeclampsia: an overview of the evidence from randomised trials BJOG: An International Journal of Obstetrics & Gynaecology (1996) V103: 11 pg.1085-1091

Figure A.6.2

Anticonvulsants in EmONC Facilities and Facilities Recommended for Upgrade

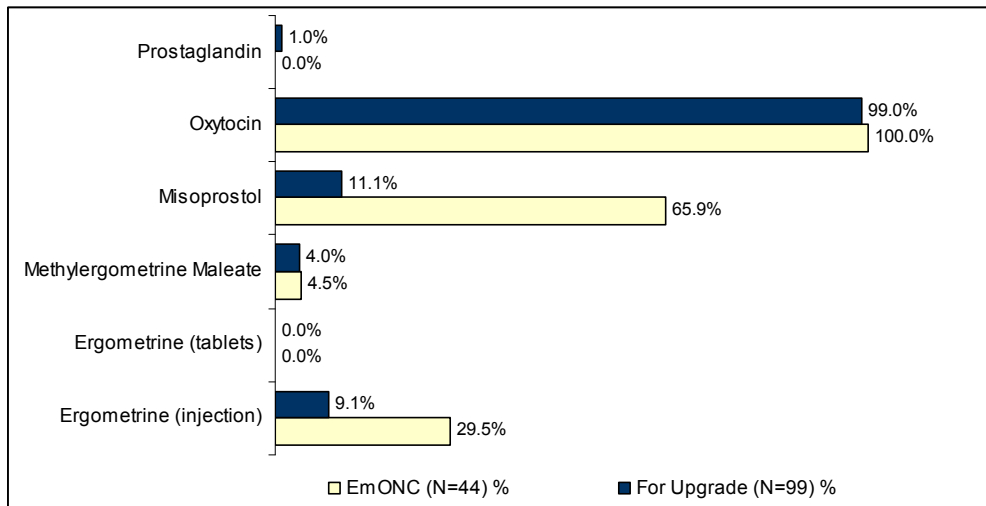


Oxytocics

100% of all facilities surveyed had given oxytocics in the three months prior to the survey. 100% EmONC facilities and 99% of facilities for upgrade had oxytocics in stock. As already discussed, the low usage of misoprostol (11.1%) among facilities for upgrade is possibly because the drug is not on the MoH essential drug list for health centers. All other oxytocics, i.e. ergometrine tablets and injection, methylergometrine maleate and prostaglandin were available in less than 30% of facilities. Refer to Figure A.6.3

Figure A.6.3

Selected Oxytocics in EmONC Facilities and Facilities for Upgrade



Drugs Used in Emergencies

Emergency drugs were available in more than 97% of the facilities surveyed. However individual drugs within the emergency groups were missing. Table A.6.1 shows that less than 79.5% of EmONC facilities were missing aminophylline, digoxin, ephedrine, naloxone hydrochloride, nitroglycerine and diphenhydramine, while facilities for upgrade had even less of these drugs.

Table A.6.1

Emergency Drugs in all EmONC Facilities and Facilities for Upgrade

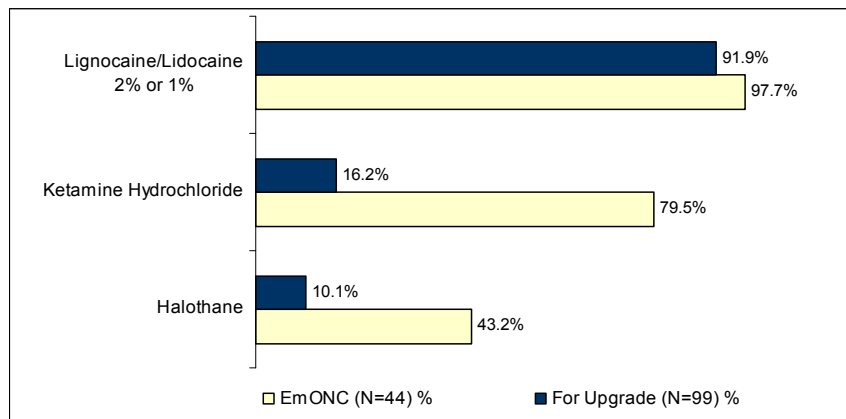
Drugs (Drugs used in Emergencies)	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Atropine sulfate	43	97.7	58	58.6
Frusemide	43	97.7	69	69.7
Hydrocortisone	43	97.7	61	61.6
Calcium gluconate	42	95.5	48	48.5
Adrenaline (Epinephrine)	41	93.2	43	43.4
Promethazine Hydrochloride	41	93.2	76	76.8
Aminophylline	35	79.5	66	66.7
Digoxin	35	79.5	33	33.3
Ephedrine	24	54.5	13	13.1
Naloxone Hydrochloride	3	6.8	0	0
Nitroglycerine	2	4.5	1	1
Diphenhydramine	1	2.3	0	0

Drugs Used in Anesthetics

In EmONC facilities and facilities for upgrade, there was a good supply of Lignocaine. Ketamine and Halothane was in short supply but it is also required in facilities with theaters. See figure A.6.4

Figure A.6.4

Anesthetics in all EmONC Facilities and Facilities for Upgrade

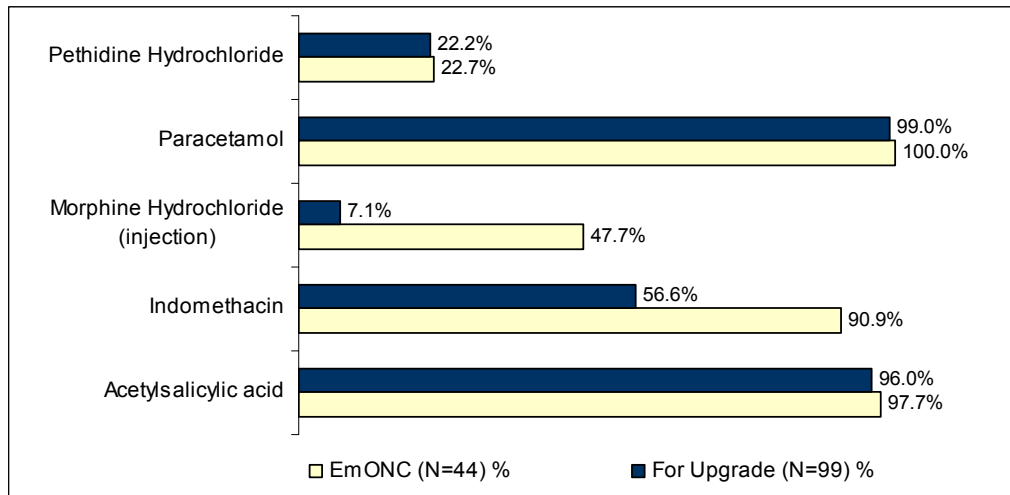


Analgesic

All facilities had a good supply of paracetamol and aspirin (acetylsalicylic acid). However Indomethacin was in short supply for the facilities for upgrade, while pethidine and morphine were only available in less than 48% of both types of facilities. Refer to Figure A.6.5

Figure A.6.5

Availability of Analgesics in all EmONC Facilities and Facilities for Upgrade

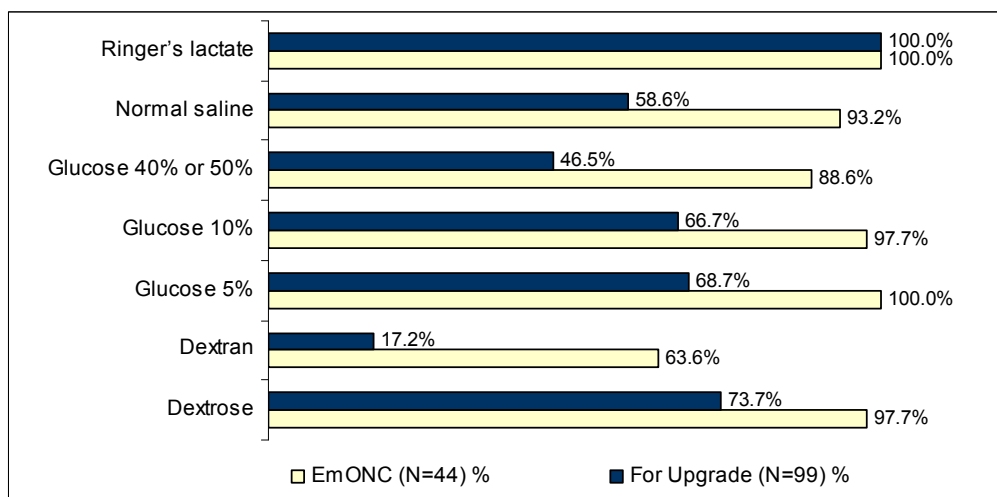


IV Fluids

Except for dextran, IV Fluids were available in all EmONC facilities for upgrade. Less than 70% of facilities for upgrade had supplies of normal saline, glucose and dextran. Refer to figure A.6.6

Figure A.6.6

IV Fluids in all EmONC Facilities and Facilities for Upgrade



Antihypertensives, Tocolytics and Steroids

Most maternity areas had antihypertensives, tocolytics and steroids available as a group; but there are individual drugs within the groups that are in short supply, as can be seen by table A.6.2 With the exception of Labetalol, Ritodrine Hydrochloride and Prednisolone Corticosteroid, EmONC facilities have a good supply. However facilities for upgrade are in short supply of all drugs except for Hydralazine and Salbutamol.

Table A.6.2

Antihypertensives, Tocolytics and Steroids in all EmONC Facilities and Facilities for Upgrade

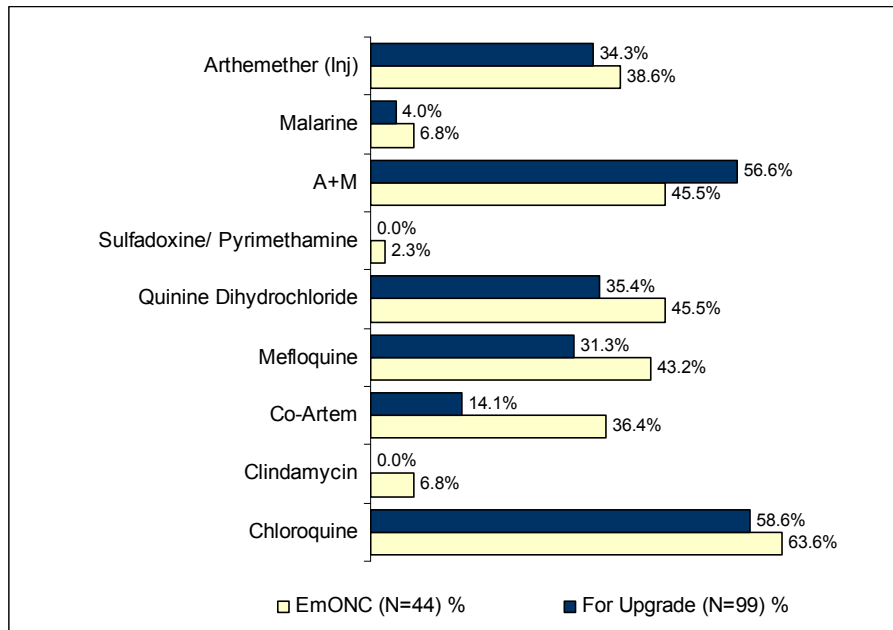
	EmONC (N=44)		For Upgrade (N=99)	
	No	%	No	%
Drugs (Antihypertensives)				
Hydralazine	42	95.5	87	87.9
Labetalol	3	6.8	4	4
Methyldopa	37	84.1	37	37.4
Nifedipine	38	86.4	40	40.4
Drugs (Tocolytics)				
Indomethacin	39	88.6	56	56.6
Nifedipine	35	79.5	39	39.4
Ritodrine Hydrochloride	3	6.8	2	2
Salbutamol	42	95.5	89	89.9
Drugs (Steroids)				
Betamethasone	8	18.2	7	7.1
Dexamethasone	38	86.4	46	46.5
Prednisone	38	86.4	56	56.6
Prednisolone Corticosteroid	9	20.5	5	5.1

Drugs Antimalarials

63.6% and less of all facilities did not have specific types of antimalarials. Chloroquine was available in 63.6% of all EmONC facilities and 58.6% of all facilities for upgrade. The supplies of all other drugs in the antimalarial group were less; facilities for upgrade were worse off. Refer to figure A.6.7

Figure A.6.7

Antimalarials in all EmONC Facilities and Facilities for Upgrade

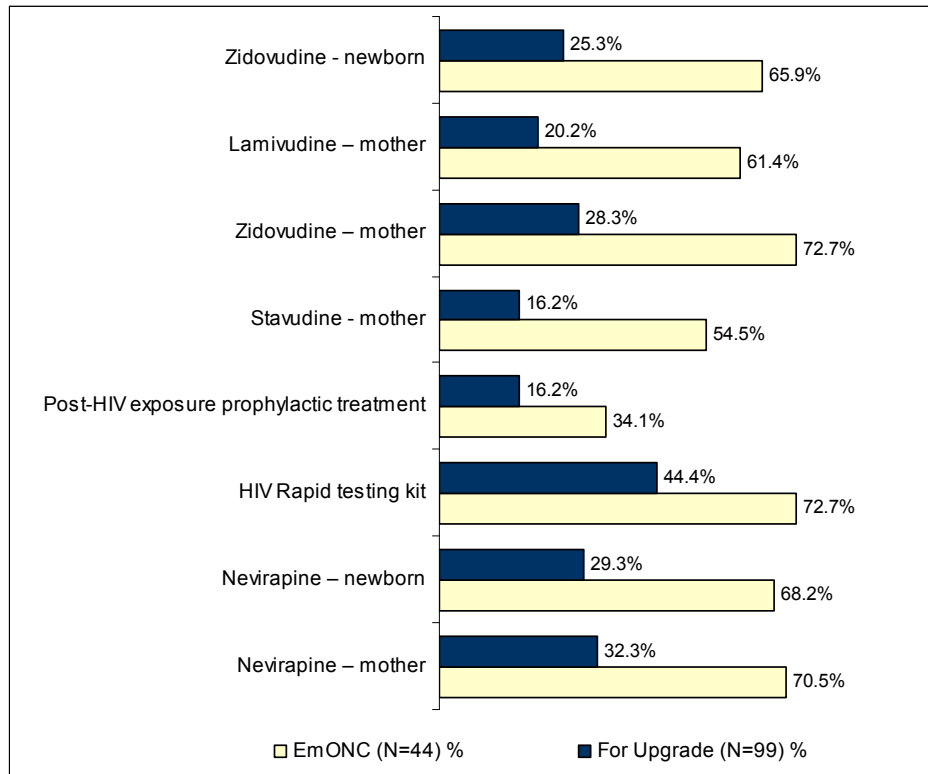


Drugs PMTCT/HIV Care

Drugs for PMTCT/HIV Care are in short supply. 72.2% and less of EmONC facilities had the supplies of individual drugs and 44.4% of facilities for upgrade. See Figure A.6.8

Figure A.6.8

Drugs for PMTCT/HIV Care in all EmONC and Facilities Recommended for Upgrade

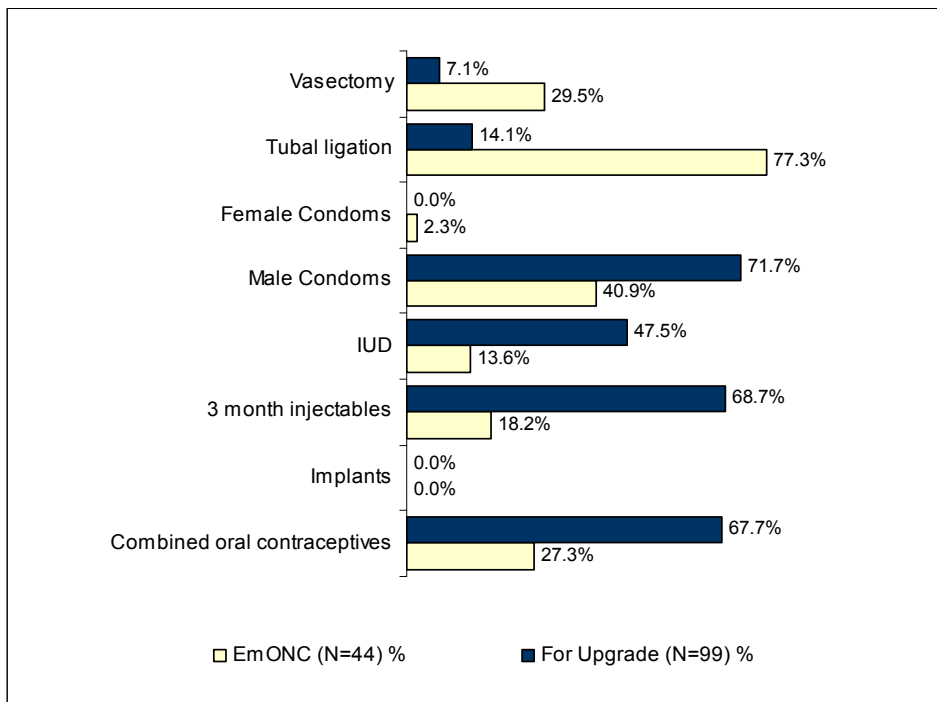


Contraceptive Methods

Different contraceptive methods also are in short supply. 72.3% EmONC facilities and 14.1% of facilities for upgrade were offering tubal ligation. Other methods available in EmONC facilities were male condoms (71.1%), 3 month injectables (68.6%) and combined oral contraceptives. The same drugs were available in lower proportions in facilities for upgrade 40.9%, 18.2% and 27.3% respectively. See Figure A.6.9

Figure A.6.9

Different Contraceptive Methods in all EmONC Facilities and Facilities for Upgrade

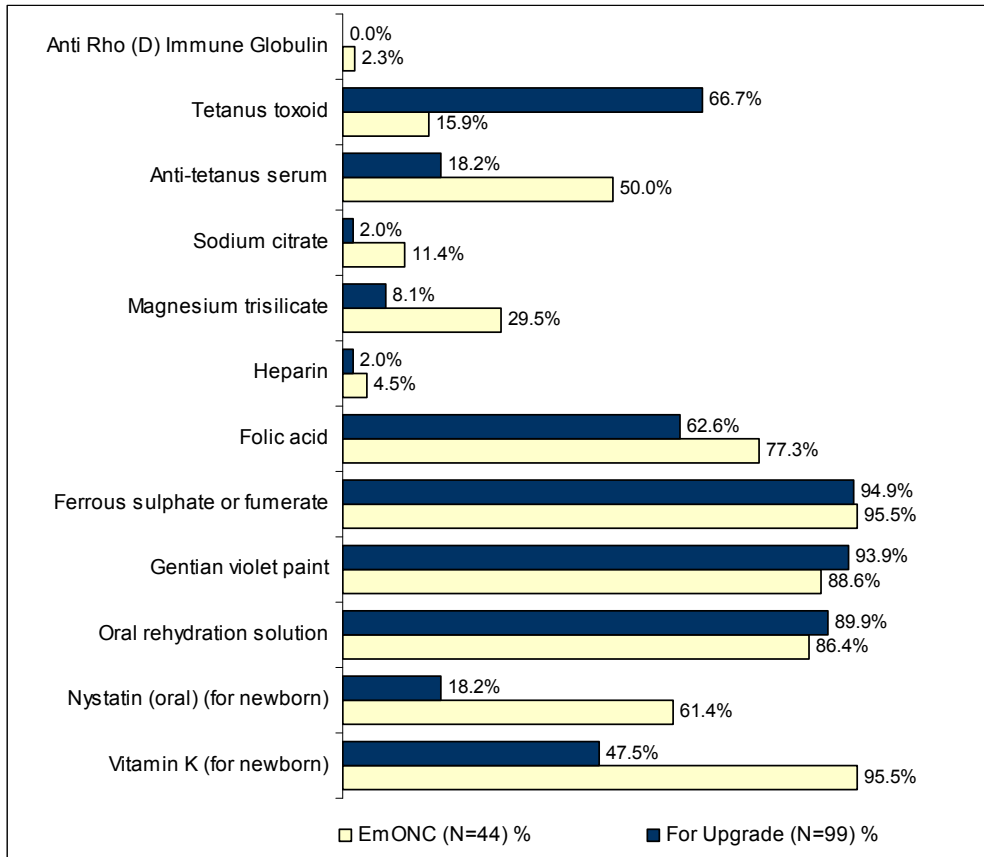


Other Drugs

The availability of the final group of drugs was also variable; between 86.4% and 95.6% of facilities had oral rehydration solution, gentian violet paint and ferrous sulphate. Drugs in short supply, in less than 70% of facilities were Anti Rho (D) immune globulin, tetanus toxoid, anti-tetanus serum, sodium citrate and magnesium trisilicate. See Figure A.6.10

Figure A.6.10

Availability of ‘Other Drugs’ in all EmONC Facilities and Facilities for Upgrade



Appendix 7: Concept note on a Non-Financial Incentive Scheme

A Non Financial Incentive Program to Support the Functioning of EmONC Facilities

Based on successful interventions in Egypt, Brazil and Uganda a program will be designed to maintain and improve the functioning of services provided by EmONC facilities. The program will:

- Enhance service provider self confidence and performance
- Institute a team approach to support better quality services provided by EmONC facilities
- Strengthen data collection and the Health Information System
- Involve communities and/or local institutions in quality improvements of EmONC facilities, and
- Maintain quality through a system of certification and reward

EmONC facilities will be monitored and evaluated on a set of standards based on universally accepted UN EmONC Indicators, using a simple tool during routine support and monitoring visits from national staff.

The standards will be informed by existing MoH policy, protocols and guidelines and internationally accepted best practice in areas such as:

- Procedures required to save lives of mothers and babies (Signal Functions)
- Supplies and Equipment
- Staff Performance (Human Resources)
- Newborn and Maternal Care
- Client Services
- Blood Transfusion Units

When an EmONC facility meets all the standards during 2 consecutive support/monitoring visits (e.g. every 3-6 months) then an independent team from either the provincial or an external institution will verify that the EmONC facilities has met the standards.

If this team confirms the support/monitoring reports, then the EmONC will be certified as a “quality facility” and will receive a special award. Local leaders and provincial health officials will then present an award to the EmONC facility during a highly publicised ceremony.

In order to retain the award EmONC facilities must continue to meet all the “Basic Standards”. If a facility fails to meet all the standards subsequent to receiving the award, the facility will be given three months to improve their problem areas. The EmONC facility will then be reviewed again and if the standards are still not meet, the Award/Certification will be removed.

To effectively improve quality of care at an EmONC facility health, workers, local leaders, provincial health officials and community members must all make an effort. The Award Program will encourage all parties to actively participate in the improvement process (through self-monitoring) and make their EmONC facility a place of which they are proud.

A variety of materials will be developed to educate community members and health workers about the Program. A Logo, Posters, radio announcements, informational leaflets and word of mouth will help everyone to understand what the Program is about.

In addition, capacity building training will be provided to health staff and managers on use of safe motherhood protocols and improving quality of health services and client services.

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