REPORT OF THE AUDITOR GENERAL

on the Provision of Comprehensive Emergency Obstetric and Newborn Care in Maternal Health

JUNE, 2015

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ACRONYMS

EmONC	Emergency Obstetric and Newborn Care
MDGs	Millennium Development Goals
MoH	Ministry of Health
NHSP	National Health Strategic Plan 2011-2015
PMOs	Provincial Medical Offices
WHO	World Health Organisation

EXECUTIVE SUMMARY

Emergency Obstetric and Newborn Care (EmONC) refers to care given to women and newborn experiencing complications occurring during pregnancy, labor and immediately after childbirth. The EmONC are a set of interventions developed to be implemented within the health system. The interventions in the provision of EmONC are important as they aim at reducing the rates of maternal and neonatal (newborn) mortalities that arise due to obstetric complications and assist in meeting the Millennium Development Goal (MDG) No. 5 whose target is to improve maternal health by 2015.

The introduction of EmONC emphasizes that certain aspects are in place for the efficient and effective management of complications during pregnancy, childbirth and after delivery. These aspects address issues of the availability of trained medical staff, infrastructure, equipment and supplies in attending to expectant mothers with complications.

This Report highlights a number of challenges in the provision of comprehensive EmONC by level 2[1] and level 3[2] hospitals in Zambia.

This audit was motivated by a number of factors such as debates in Parliament on the adequacy of maternal health care services as well as Government's efforts to attain the Millennium Development Goal on improvement of maternal health.

The audit objectives were to assess:

a. The measures put in place by the Ministry of Health in providing Comprehensive Emergency Obstetric and Newborn Care under maternal health.
b. The preparedness of the hospitals in the provision of Comprehensive Emergency Obstetric and Newborn Care under maternal health.

The following were the major findings:

a. EmONC Training - Insufficient Enhancement of EmONC Skills

Out of 226 officers providing EmONC services to mothers during pregnancy, childbirth and after delivery at the health facilities visited, only 52 officers representing 23%had been trained. It was further observed that out of the 52 officers trained, only 31 officers were providing EmONC services while the remaining 21 officers were deployed to other departments and were not involved in the provision of EmONC services.

[1]level 2 Hospitals are all General and Central hospitals
[2]level 3 Hospitals are Tertiary hospitals

b. Essential EmONC Equipment

i. Non-Functioning Autoclaves

A check at Kabwe General Hospital revealed that the two (2) pieces of equipment (autoclaves) that were necessary for the sterilisation of equipment used during the provision of EmONC were not functioning.

ii. Broken Down Essential Equipment

A check at four(4) out of the five (5) hospitals visited revealed that some of the essential equipment that should be used to provide EmONC had broken down.

Conclusions

The Ministry has not put in place adequate measures to ensure provision of comprehensive EmONC services. The shortage of trained staff, equipment and infrastructure needed to provide EmONC services are detailed below.

a. Insufficient Enhancement of EmONC Skills

The lack of training of staff in EmONC affects the response time to emergencies by the health staff and decision making for adequate and prompt interventions in cases of complications during pregnancy, childbirth and after delivery thus impacting negatively on the provision of EmONC services.

b. Essential EmONC Equipment

- **Non-functioning Autoclaves**
  The time period within which instruments need to be sterilised were not met for the instruments that were sterilized outside the theater leading into high risk infections spreading to patients.

- **Un-serviceability of Essential Equipment**
  The breaking down of the essential EmONC equipment was due to low level of equipment maintenance, non-enforcement of guidelines on after sales service and the overwhelming number of patients being attended to at the hospital.

Recommendations

Based on the findings, the following are the recommendations:

i. EmONC Training

MoH should put in place a system that promotes the training of staff providing EmONC services in hospitals. The training of the staff will strengthen the implementation of the interventions that the EmONC programme has introduced to reduce the maternal and neonatal mortalities.

ii. Essential EmONC Equipment

The MoH should re-enforce the medical equipment management guidelines to ensure that essential equipment needed is available and well maintained. This will include ensuring that all the necessary accessories, manuals and service contracts that have adequate provisions on after sales services are in place. This will ensure that the health facilities have adequate EmONC equipment at their disposal.

1. INTRODUCTION

a. Background

The Government of the Republic of Zambia (GRZ) recognises health as one of the priority sectors that contributes to the well being of the nation. The Government has identified reproductive health as a crucial part of general health and has in this regard, put in place the National Reproductive Health Policy of 2008 which is targeted at achieving the highest possible level of quality integrated reproductive health for all Zambians.

The Government's commitment to the attainment of quality integrated reproductive health for all Zambians is reflected in its recognition of the importance of the life cycle phase of pregnancy, birth, postnatal and newborn and the need to reduce maternal mortality rate. It has also subscribed to the attainment of Goal No. 5 of the United Nations' Millenium Development Goals (MDGs) which aims at improving maternal health.

The Ministry of Health (MoH) is committed to managing the health sector in an efficient, effective and prudent manner that would significantly improve health service delivery. It has the responsibility for the overall co-ordination and management of the health sector in Zambia.[3]

The integrated reproductive health incorporates family planning, maternal, neonatal and child health services. The main objective of Integrated Reproductive Health is to scale up high impact of family planning and maternal health interventions and significantly reduce maternal mortalities.

Emergency Obstetric and Newborn Care (EmONC) is an intervention that was introduced by the Ministry of Health in 2006 in order to help prevent the maternal and neonatal mortalities. This intervention is a vital component that was meant to update knowledge and skills to allow health care providers contribute to the reduction of maternal and neonatal mortalities.

EmONC is mainly focused on the management of the complications in pregnancy, child birth and after child birth thatmay lead to maternal and neonatal (newborn) mortalities.

There are two (2) types of EmONC namely Basic[4] and Comprehensive[5] EmONC.

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[3]Page i of the NHSP 2011-2015

[4]Basic EmOC is provided in facilities that are able to offer the following services:
treatment of sepsis, eclampsia, prolonged or obstructed labour and incomplete miscarriage, Post Abortion Care (PAC), removal of the placenta and assisted delivery using forceps or suction.

[5]Comprehensive EmONC is provided in facilities that offer all services under basic EmONC as well as surgery (caesarean section), anaesthesia and safe blood transfusion observing Universal Human Immuno Virus (HIV) precautions

b. Motivation

The audit was motivated by the following factors:

i. There have been debates in Parliament on whether adequate measures are being undertaken to improve maternal health care and further, if the Government will attain the MDGNo. 5, by 2015, which seeks to improve maternal health by reducing the maternal mortality rates. *(Source: National Assembly debates Thursday 3rd March 2011*)

ii. Over the past 10 years, significant improvements have been reported. According to the Zambia Demographic Health Survey (ZDHS) of 2007, Maternal Mortality Ratio (MMR) reduced from 729 per 100,000 live births in 2002 to 591 in 2007.Whilst these gains in maternal mortality reductions are acknowledged, the prevailing rates are still unacceptably high, and of major concern to the health sector.[6]

iii. Despite having one (1) in every twenty seven (27) women dying of maternal causes, it is not known to what extent EmONC services are available.

Although most pregnancies and births are uneventful, approximately 15% of all pregnant women develop a potentially life-threatening complication that calls for skilled care and some require a major obstetrical intervention to survive.[7]

According to the Zambia National Health Strategic Plan of 2011 – 2015, even though 53 out of 72 districts in Zambia have EmONC trained health workers, there is need to address gaps in respect of the availability of essential equipment and infrastructure. There are obvious urban rural disparities and significant differentials among the districts.

[6]Zambia Demographic Survey, 2007.
[7]Article on measuring access to EmONC in rural Zambia byAdam C. Levine, Regan H. Marsh, Sara W. Nelson, Lynda Tyer-Viola and Thomas F. Burke

2. AUDIT DESIGN

a. Audit Objectives

The objectives of the audit were:

i. To assess the measures put in place by the MoH in providing Comprehensive EmONC under maternal health.

ii. To assess the preparedness of hospitals and other health facilities in providing Comprehensive EmONC under maternal health.

b. Audit Questions

In order to achieve the audit objectives, answers to the following questions were sought:

1. To what extent has the Ministry put in place measures to ensure provision of EmONC services?

1.1 Training

1.1.1 Has the Ministry ensured that the skills of the medical staff providing EmONC have been enhanced through training?

1.1.2. How many medical staff providing EmONC have been trained?

1.1.3 Are the medical staff trained in EmONC providing EmONC services?

1.2 Staffing Levels

1.2.1 Does the Ministry have adequate key staff to provide EmONC services?

1.3 Infrastructure and Equipment

1.3.1 Does the Ministry have adequate facilities in terms of infrastructure and equipment to provide EmONC services?

1.4 Guidelines and UN process indicators

1.4.1 Has the Ministry put in place specific guidelines on how EmONC should be monitored in the Health facilities?

1.4.2 Has the Ministry customized the WHO process indicators to suit the Zambian situation?

1.5 Monitoring and Evaluation/Risk assessment of EmONC package

1.5.1 Is the provision of EmONC being monitored?

1.5.2 Has the Ministry carried out an evaluation of the EmONC programme?

c. Criteria and Sources

The Mission and Vision of the MoH to provide equitable access to cost effective, quality health services as close to the family as possible and to have a nation of healthy and productive people.[8]

[8]Page X of the NHSP 2011-2015

In order to evaluate the findings against the standard, the following criteria were used:

1. **EmONC Training**
   - 1.1 Staff should receive training and continuing professional development.[9]

2. **Staffing levels**
   - 2.1 To distribute human resources equitably and ensure appropriate skills mix for achieving the MDGs.[10]
   - 2.2 To improve the availability of and distribution of qualified health workers in the Country.[11]
   - 2.3 Increase numbers of specialist doctors to provide specialised services in hospitals and contribute to the strengthening of referral services.[12]

3. **Infrastructure**
   - 3.1 Health facilities should provide the health care services in the environment that is accessible, well maintained, fit for the purpose, safe, secure and in line with legislation, directions and guidance.[13]
   - 3.2 To ensure optimal availability, appropriateness, distribution and conditions of essential infrastructure, in order to facilitate equity of access to essential health services.[14]

4. **Essential Equipment**
   - 4.1 To improve on the availability, distribution and condition of essential equipment in order to ensure equity of access to essential health services.[15]
   - 4.2 Operating rooms are serviced by a sterilisation service compliant with infection control procedures.[16]
   - 4.3 All equipment must be provided with a full set of technical documents i.e. documents for installation, for user operation, for repair and maintenance (manuals).[17]

5. **Guidelines and UN process indicators**
   - 5.1 Formulate all policies and procedures, guidelines, standards and manuals to be used in the hospitals.[18]
   - 5.2 Specific national guidelines, protocols and procedures or internationally agreed guidelines are available to relevant members of staff.[19]

[9] National Health Care Standards for Zambia
[10] National Human Resource for Health Plan for Zambia (NHRH SP)2011-15
[11] NHRH SP 2011-2015 Page 10
[12] Page x of the NHSP 2011-2015
[13] National Health Care Standards for Zambia
[14] Page X of the NHSP 2011-2015
[15] Page 47 of the NHSP 2011-2015
[16] National Health Care Standards for Zambia
[17] National Health Care Standards for Zambia
[18] National Health Care Standards for Zambia, page 10
[19] National Health Care Standards for Zambia, page 8

6. Monitoring and Evaluation/Risk Assessment of EmONC package

The MoH has the mandate to provide leadership in establishing appropriate systems and procedures for reliable monitoring and evaluation (M & E) of the sector's performance at all levels. In this respect, the Ministry has established structures and systems to guide.[20]

d. Audit Scope

The audit focused on the assessment of the effectiveness in the provision of Comprehensive EmONC to mothers with complications during pregnancy, at the time of delivery and soon after delivery under the MoH. The audit covered activities undertaken by the MoH, Provincial Medical Office (PMO) and 2nd and 3rd level hospitals during the years 2010 to 2013.

This audit was focused on comprehensive EmONC provided by the tertiary, general and central hospitals in levels 2 and 3 in four (4) provinces namely Lusaka, Central, Copperbelt and North-Western.

There are twenty four (24) 2nd level hospitals and six (6) 3rd level hospitals in Zambia out of which three (3) 2nd level and two (2) 3rd level hospitals were sampled for investigation in Central, Copperbelt, and North-Western Provinces.
The details are as shown at *Appendix I.*

e. Audit Methodology

The audit was conducted in accordance with International Standards for Supreme Audit Institutions (ISSAIs) and involved the following:

i. Documentary Review and Data Analysis

The following documents were reviewed:

- National Reproductive Health Policy (2008).
- National Health Policy (2013)
- National Health Strategic Plan 2011 to 2015.
- National Human Resources for Health Strategic Plan 2011 to 2015
- National Health Care Standards for Zambia.
- Medical Equipment Management Guidelines.
- Monitoring of Emergency Obstetric Care Handbook.
- Integrated Management of Pregnancy and Childbirth (IMPAC).

[20]Page 24, National Health Policy of 2013

ii. Enquiry – Interviews and Questionnaires

Interviews were carried out in order to collect data used to assess the extent of the provision of comprehensive EmONC and also to confirm information obtained from the documentary review. The key personnel interviewed are detailed at **Appendix II**

iii. Physical Inspections

Physical site inspections were carried out at all the selected hospitals to verify the information obtained from documentary reviews, interviews and questionnaires.

The following sites were visited:

- University Teaching Hospital.
- Kabwe General Hospital.
- Levy Mwanawasa General Hospital.
- Ndola Central Hospital.
- Kitwe Central Hospital.
- Solwezi General Hospital.

3. DESCRIPTION OF AUDIT AREA

3.1 Emergency Obstetric and Newborn Care

EmONC refers to the care of women and newborns during pregnancy, child delivery and soon after delivery and is a vital component in reducing maternal and neonatal deaths. EmONC has been identified as the most important intervention to improve maternal survival in Zambia. The aim of the Government is to reduce the maternal mortality ratio from the current 591 deaths per 100,000 live births to 159 deaths per 100,000 live births by 2015.

There are two levels of EmONC which are distinguished through the signal functions that are performed at the health facilities. The levels are:

3.1.1 Basic EmONC

Basic EmONC is provided in health facilities, large or small and it includes the following signal functions:

i. Administration of parenteral antibiotics;
ii. Administration of uterotonic drugs (i.e. parenteral oxytocin);
iii. Administration of parenteral anti convulsants for pre-eclampsia and eclampsia (i.e. magnesium sulphate);
iv. Manual removal of the placenta;
v. Removal of retained products (e.g. manual vacuum aspiration);
vi. Perform assisted vaginal delivery (e.g., vacuum extraction, forceps)
vii. Newborn resuscitation[21]

3.1.2 Comprehensive EmONC

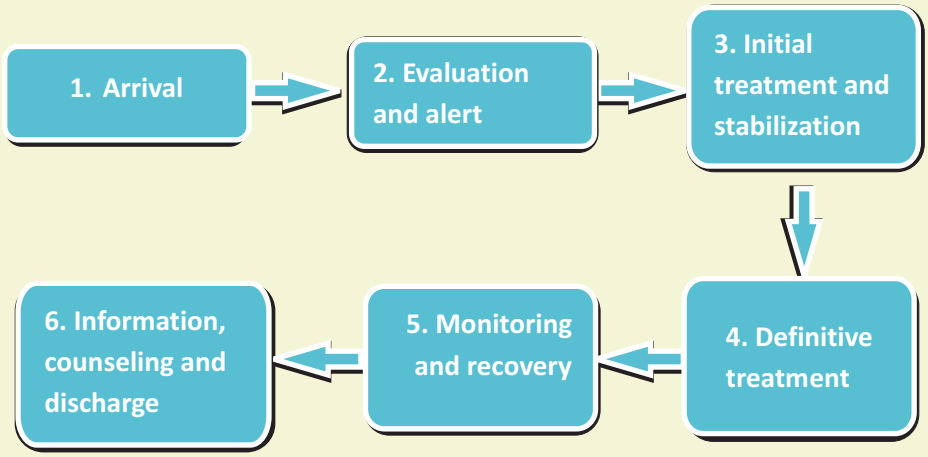
Comprehensive EmONC comprises all the functions under Basic EmONC plus performing surgery (caesarean section) and safe blood transfusion. Comprehensive EmONC is typically delivered in Level 1, Level 2 and Level 3 hospitals.

3.1.3 EmONC Systems and Process Description

Level 1 health facilities provide basic EmONC services. However, when complications arise, such cases are referred to Level 2 and 3 facilities. The critical steps in caring for an EmONC client are as detailed in the chart below.

[21]Previously basic EmONC was defined by six signal functions, newborn resuscitation has been added.

Figure 1. Critical Steps in Caring for an EmONC Client.[22]



The procedures administered at the health facility in managing the complications that arise during pregnancy, child birth and after are explained below:

i. Upon Arrival

Upon arrival, a rapid initial assessment is conducted on a pregnant mother in order to recognise the specific problem and quick action to be undertaken.

ii. Evaluation and Alert Staff

The clinical staff will take quick history with regards to pregnancy and make provisional diagnosis.

iii. Initial Treatment and Stabilisation

After evaluation, treatment where necessary is initiated to stabilise the client's vital signs such as blood loss and infections among others as well as sending samples for laboratory tests and preparing for definitive treatment.

[22]EmONC participants guide

iv. Definitive Treatment

Once laboratory tests are availed and diagnosis confirmed, definitive treatment is administered. Definitive treatment is a life-saving procedure which involves the following:

i. Blood transfusion
ii. Manual placenta removal
iii. Uterine evacuation
iv. Vacuum /forceps delivery
v. Surgery (cesarean section)
vi. Laceration repair
vii. Laparoscopy

v. Monitoring and Recovery

The client is provided with intense monitoring for 24 to 48 hours in order to recognise warnings and emergencies. This involves monitoring of vital signs like bleeding, fluid intake and output, blood pressure and blood sugar levels among others.

vi. Discharge

Before the client is discharged, the following are conducted:

- Evaluate the stability
- Counsel client and family
- Provide individual discharge planning including family planning counseling and provide pain control as needed for post caesarean.

3.2 Roles and Responsibilities of Key Players

The key players in the provision of Comprehensive EmONC services are the Ministry of Health, Cooperating Partners and Health Professions Council of Zambia whose responsibilities are as follows:

3.2.1 Ministry of Health Headquarters

The Ministry of Health is responsible for coordinating planning, implementation and monitoring of the provision of Comprehensive EmONC

3.2.2 Cooperating Partners

Cooperating partners contribute to the implementation of EmONC activities through the provision of financial and technical support to the MoH.

3.2.3 Health Professions Council of Zambia

Health Professions Council of Zambia is responsible for the regulation of the health sector which includes registration and accreditation of health practitioners and the approval of training programmes.

a. Insufficient Enhancement of EmONC Skills through EmONC Training

Interviews with key personnel at Levy Mwanawasa, Solwezi, Kitwe, Ndola and Kabwe General Hospitals revealed that out 226 officers providing EmONC services to mothers during pregnancy, childbirth and after delivery at these health facilities, only 52 officers representing 23%had been trained. It was further observed that out of the 52 officers trained, only 31 officers were actually providing EmONC services while the remaining 21 officers were deployed to other departments and were not involved in the provision of EmONC services. See table below.

Table 1: Medical Staff trained in EmONC against the staff in Department

Health Facility	Levy Mwanawasa General Hospital	Solwezi General Hospital	Kitwe General Hospital	Ndola General Hospital	Kabwe General Hospital	Total
Medical Consultants	1	0	2	1	0	4
Obstericians	0	0	6	0	0	6
Medical Registrar	1	0	1	2	0	4
General Medical Officers	1	3	0	1	3	8
Registered Midwives	10	2	33	30	11	86
Enrolled Midwives	15	22	0	21	25	83
Certified Midwives	4	0	0	12	2	18
General Nurses	0	0	0	0	9	9
Anaesthetists	1	2	0	2	2	7
Clinical Officer	1	0	0	0	0	1
Total staff	34	29	42	69	52	226
Trained staff	3	7	20	19	3	52
EmONC providers	1	5	13	11	1	31

Health workers interacted with at the five (5) institutions also pointed out that despite having received training in their various fields, it was important for them to be trained in EmONC in order for them to provide the services effectively.

b. Misplacement of EmONC Trained Staff

A check at Levy Mwanawasa, Solwezi, Kitwe, Ndola and Kabwe General Hospitals revealed that staff that had been trained in EmONCwere not providing emergency obstetric and newborn care. Out of the total number of staff trained in EmONC as shown in table 2 above, the percentage of staff providing EmONC is reduced further due to the hospital management's staff rotation practice, which requires midwives and general medical doctors to rotate to other departments within the hospital. The staff rotation practice is good because it enables staff to acquire different types of skills within the medical field. However, the interviews conducted revealed that the rotation of staff trained in EmONChas resulted in staff not providing and practicing their skills in emergency obstetric and newborn care.

c. Inadequate Staff

Obstetricians are key personnel in providing EmONC services. Some of their roles include; recommending when labor should be induced, deciding when a cesarean delivery is needed and postpartum care. Interviews conducted with key personnel and documentary review of the establishments revealed that Levy Mwanawasa, Solwezi, Ndola and Kabwe general hospitals did not have obstetricians despite the hospital staff establishment having vacancies for obstetricians. Levy Mwanawasa and Ndola Central hospitals had medical consultants to assist in managing the departments but the General Medical Officers (GMOs) played the role of the obstetrician of which the general doctors at Kabwe General Hospital had not been trained in EmONC as at 2nd March, 2014.

The table below shows the comparison between the establishment and the actual structure for obstetrician.

Table 2. Comparisons between Establishment and Actual Structures for Obstetrician

Health Facility	Establishment	Actual	Variance
Levy Mwanawasa General Hospital	1	0	1
Ndola Central Hospital	0	0	0
Kabwe General Hospital	1	0	1

d. Inadequate Infrastructure

A physical inspection of the maternity wards of the Solwezi and Kabwe General Hospitals revealed that there was not enough buildings and physical space to separate the units under maternal health providing the different services. It was found that the labour ward, delivery room, post-natal ward for both normal and caesarean section deliveries and special care baby unit were all operating in the same ward. .

Further, Ndola Central Hospital did not have a special care baby unit and had to refer the neonates (newborns) with complications to Arthur Davison Children's Hospital. It was also observed that although Levy Mwanawasa General Hospital had separate wards for labour, ante-natal and post-natal did not have a special baby care unit. Interviews revealed that neonates requiring special attention had to be transported to the University Teaching Hospital

The infrastructure in place has not been upgraded despite the increase in population which in turn has brought about an increase in the cases which relate to emergence obstetric and newborn babies being attended to. The table below shows the increase in annual deliveries in the hospitals visited.

Change in annual deliveries in the hospitals visited.

Table 3. Change in Annual Deliveries in the Hospitals Visited

Year	Levy Mwanawasa	Solwezi General	Kitwe Central	Ndola Central	Kabwe General
2012	3277	3290	4903	5421	2106
2013	3626	3447	5004	5313	2246
2014	4184	3598	4611	6080	3027

e. Lack of Essential EmONC Equipment

The health facility has procedures and protocols organising connections of emergency services, in order to ensure speed processes in maternity to operate without disruptions during operating time in the field of availability of emergency and resuscitation equipment for basic and advanced life support. *(Source: National Health Care Standards for Zambia)*

f. Use of Inappropriate Equipment

A physical check at the five (5) hospitals revealed that at Ndola Central and Solwezi General Hospitals,ordinary beds were improvised in the labour wards instead of the ideal delivery beds which are adjustable in case of complications arising during delivery.

g. Broken-downEssential Equipment

Levy Mwanawasa General Hospital was commissioned in 2008. It has sufficient equipment in the labour and antenatal wards that is relatively new and is able to accommodate the patients unlike the other four (4) hospitals visited. It is clear that the hospital equipment was planned for to meet the high numbers of annual deliveries.

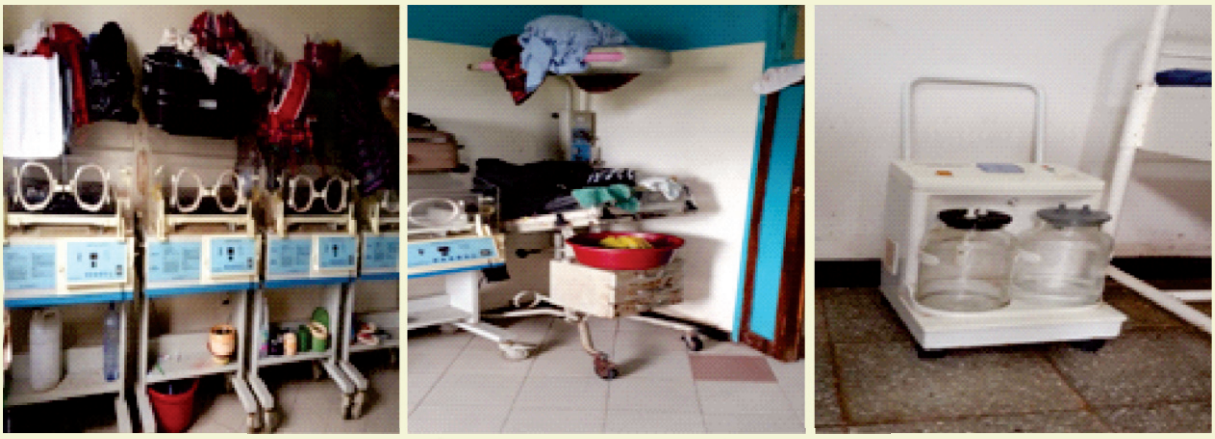
Table 4. Equipment in the Hospitals Visited

	Kitwe General Hospital			Kabwe General Hospital			Solwezi General Hospital			Ndola Central Hospital		
	Total	Working	Broken-down	Total	Working	Broken-down	Total	Working	Broken-down	Total	Working	Broken-down
Essential Equipment												
Delivery Beds	11	11	0	4	1	3	7	2	5	6	1	5
Autoclaves	1	1	0	3	1	2	11	4	7	1	0	1
Suction Machine	2	1	1	4	2	2	2	1	1	2	2	0
Infant incubator	6	3	3	5	3	2	3	3	0	5	5	0
infant Resuscitation unit	4	3	1	1	1	0	4	3	1	6	1	5

Further, a check at Ndola Central, Kitwe Central, Kabwe and Solwezi General Hospitals revealed that essential equipment that should be used to provide EmONC services had broken down. The breaking down of equipment was caused by the following reasons among others, the age of the equipment, the limited number of the essential EmONC equipment given the overwhelming number of mothers being referred and self-referred to these hospitals, low level of equipment maintenance and non-enforcement of guidelines on after sales service. **Appendix III**.

During the physical verification, it was observed that at Solwezi General Hospital, some mothers did not have bed space and were accommodated on the hospital floors.

A number of broken down equipment were noted at Solwezi General Hospital and Ndola Central Hospital as shown below.



Broken down EmONC at Solwezi Central Hospital

Broken down Resuscitaires and Delivery beds atNdola Central Hospital

h. Non-Functioning Autoclaves

The standard requires each operating room to have sterilisation equipment.[23] However, a check at the five (5) hospitals revealed that at Kabwe General Hospital, two(2) pieces of equipment (autoclaves) that were necessary for the sterilization of instruments used during the provision of EmONC were not functioning. The autoclave in the gynaecology department was not functioning due to the cables having been spoiled and the second autoclave in the main theater did not have a manual to operate it.

[23]Page 34 of Equipment Planning and Monitoring Tool Procedures Manual

Interviews carried out and a check at the health facility revealed that the sterilization equipment in use was small and could not allow for sterilization of a lot of instruments in cases where they had a lot of patients to attend to and this forced the theatre staff to move the instruments that needed sterilization to other departments within the hospital.

This leads to inefficiencies in providing adequate and prompt interventions and care in obstetric emergencies.

- The moving of equipment/tools used while providing emergency intervention from the operating room to another department poses a risk of infections.
- If equipment is non-functioning it becomes difficult to help mothers who need to deliver through c-section. This may lead to the maternal or neonatal mortality or both.

-Non- functioning Autoclave machines in Gynaecology and theater departments - Kabwe General Hospital

A mini-autoclave tied with cloth to keep it closed during sterilization - Kabwe General Hospital

i. Non Availability of Special Freezers for Storing Blood Products

A physical check at all five hospitals revealed that despite the Kabwe General, Solwezi General and Ndola Central Hospitals housing blood banks for the province, the hospitals did not have special freezers with a wide temperature range to store some of the blood products such as fresh frozen plasma.

This impacted negatively on the accessibility of the blood and blood products required to address the conditions that may require blood transfusion.

j. Insufficient Guidelines on Monitoring, and UN Process Indicators of EmONC

Inquiries with key personnel and documentary review at all the five (5) health facilities and the four (4) PMOs revealed that the guidelines provided guidance on how to treat the different types of complications that arose during pregnancy, childbirth and after. The guidelines provided guidance for the treatment of the signal functions and interventions to be undertaken in an emergency are adequate.

However, no guidelines were provided on how to assess and monitor the provision of EmONC to establish the availability, use and quality of services and the specific information needed for detailed planning such as equipment inventories, availability of basic and comprehensive EmONC facilities, the geographical distribution of EmONC facilities, and the proportion of all births in EmONC facilities.

Further, the health facilities and PMOs did not have any guidelines showing the requirement to use the process indicators that were drawn from the World Health Organisation guidelines and how they have been customized to suit the local environment. The guidelines on the process indicators used to assess and monitor the EmONC programme are drawn from World Health Organisation guidelines in part and are not customized to promote an assessment of the local situation e.g. the infrastructure in place where services are being provided

against the increase in the population that gives rise to the increase in pregnant mothers who need the EmONC services. The other components of EmONC on the assessment, monitoring and on process indicators are a prerequisite to the effective provision of EmONC services.

k. Monitoring and Evaluation of EmONC Activities

The MoH and the PMO are required to carry out performance assessments on a quarterly basis at the health facilities which includes an assessment of the component of EmONC services being provided at the health facilities.

Documentary review of the performance assessment reports availed for audit scrutiny by the PMOs and all the hospitals under review revealed that performance assessments were being done bi-annually. The performance assessments that are carried out are an assessment of the activities of the hospital as a whole and not specific to EmONC services.

Further, interviews conducted with key personnel at the MoH, PMO and the hospitals revealed that there has not been any evaluation of the EmONC programme since inception in 2006.

l. Lack of Risk Assessment of the EmONC Package

Inquiries with key personnel at the MoH, PMOs and hospitals under review revealed that risk assessments of the EmONC package were not being done. Further, a review of the performance assessments undertaken quarterly revealed that the MoH and the PMOs only focused on the performance of the hospital as a whole and did not consider the risks attached to implementing EmONC.

This is due to the inadequate implementation of the EmONC plan. This resulted in lack of development of a plan for quality improvement in the implementation of EmONC and led to challenges in identifying priority areas and areas to focus attention and resources on.

a. Insufficient Enhancement of EmONC Skill through EmONC Training

The lack of training of staff in EmONC affects the response times in emergencies by the health staff and decision making for adequate and prompt interventions in cases of complications during pregnancy, child birth and after causing ineffective delivery of the EmONC service.

b. Staff Trained in EmONC

The number of staff trained in EmONC is lower thereby creating a huge gap in knowledge and skills at the 2nd and 3rd level hospitals to which the complicated cases are referred.

c. Misplacement of EmONC Trained Staff

The transfer of staff trained in EmONCto departments where they do not provide the EmONC services has anadverse effect on achieving the objectives of EmONCand further causedeterioration of the EmONC skill.

d. Inadequate Infrastructure

The infrastructure is inadequate for the effective provision of EmONC. The infrastructure has not provided for the increase in to the number of deliveries at the health facilities and this has caused antenatal, postnatal, labour and special baby care units to be in one ward at two hospitals. This resulted in the risk of infections being spread.

e. Use of Inappropriate Equipment

The use of inappropriate equipment may lead to the inefficiency in service delivery during an emergency.

f. Non-Functioning Auto-Claves

The non-functioning equipment made it difficult to adequately sterilize the instruments used during provision of EmONC services within the required time (10minutes) of completion of the procedure.

g. Monitoring of the EmONC

The lack of a detailed guidelines and actual monitoring plan does not promote factors such as quality improvement as EmONC is being implemented; feedback into the process on whether the intended purpose of the interventions are being achieved; deviations from the plans to allow for realignment to plan or refocusing; and further determination of whether the resources being employed are maximized.

h. Lack of Risk Assessment of the EmONC Package

The lack of risk assessment of EmONC does not promote effective management control of EmONC which is the basis for achieving the intended objective of EmONC. Little or no improvement in EmONC will be achieved as the risks have not been identified and managed which will further lead to non-achievement of the reduction of the maternal and child mortality rates.

6. RECOMMENDATIONS

a. Need to enhance EmONC Skills through Training

The EmONC training is critical in helping overcome the difficulties in emergency obstetric and new born care service delivery. The MoH should put in place a system that promotes the training of staff in EmONC from the 2nd and 3rd level hospitals. Obstetricians, Gynaecologists and other Senior Medical Doctors should be trained as trainer of trainers in EmONC to enhance skills of mentorship and on the job training of Junior Medical Doctors, Clinical Officers, Midwives and Anaesthetists. This will promote more staff being trained during normal work at no cost and certification of staff can be given when fully trained.

b. Ensure EmONC Trained Staff are Properly Allocated

The MoH should re-examine the staff rotation policy to provide for staff trained in EmONCto continue to practice in areas of EmONC competence. The staff that have been trained in EmONC should continue to practice in the provision of EmONC to enable them develop the skills they obtained during the training and improve service delivery.

c. Fill Existing Establishment

The Ministry of Health should ensure that the existing establishment is filled and further,the existing establishment should be revised to provide for the requirements in the National Human Resource for Health plan of 2011-15whose objective is to increase the number of employed and equitably distributed health workforce with appropriate skills mix.

d. Inadequate Infrastructure

The MoH should ensure that a plan is put in place to provide adequate infrastructure. Further, the plan should include strategies of how to respond to the increase in population of pregnant mothers and neonates.

e. Procure Essential EmONC Equipment

The Ministry of Health should ensure that the health facilities are provided with the appropriate essential equipment in order to provide quality EmONC services.

There should be a system of keeping detailed status of equipment maintained in all the hospitals so as to provide information needed for planning, budgeting, procurement and maintenance of medical equipment.

The Ministry should re-examine the plans on implementation of EmONC programme to provide the special essential equipment for specialised services such as separation of blood and blood products and their storage.

Procurement contracts for specialised medical equipment should include a clause for after sales service.

The MoH should ensure that all medical equipment donated have available spare parts to keep them running.

The MoH should ensure that the equipment purchased or donated is fully functional with all the necessary accessories, operational and repair manuals as stated in the Medical Equipment Management Guidelines.

f. Develop Guidelines on Monitoring and UN Process Indicators of EmONC

Ministry of Health should ensure that guidelines on the provision of emergency obstetric care are developed to include aspects of all the process indicators used to assess and monitor EmONC services being implemented. These will help to establish the availability, use and quality of services and the specific information needed for detailed programme planning such as equipment inventories, availability of basic and comprehensive emergency obstetric care facilities, the geographical distribution of emergency obstetric care facilities, and the proportion of all births in emergency obstetric care facilities. In order tomonitor the effect of EmONC activities the WHO process indicators must be more integrated into monitoring and evaluation plans. All staff working within the Obstetrics and Gynaecology departments should be trained in the process indicators to ensure more accurate data is used for monitoring and evaluation. If staff are provided with current EmONC standards, guidelines and training on how to use the guidelines, it will improve the quality of care.

g. Develop Monitoring Programmes of the EmONC Programme

The MoH should ensure that a detailed monitoring plan is developed and implemented for the monitoring of EmONC in Zambia.

h. Undertake Risk Assessment of the EmONC Package

The MoH should adequately plan for and undertake a risk assessment of EmONC to ensure that priority areas are identified and resources are allocated to maximise resource utilization in the provision of EmONC services.

APPENDIX I - LIST OF PLACES VISITED DURING THE MAIN STUDY

PROVINCE	NAME OF INSTITUTION
Lusaka	Lusaka Provincial Medical Office
	Levy Mwanawasa General Hospital
Central	Kabwe Provincial Medical Office
	Kabwe General hospital
Copperbelt	Ndola Provincial Medical Office
	Ndola Central Hospital
	Kitwe Central Hospital
North-Western	Solwezi Provincial Medical Office
	Solwezi General Hospital

APPENDIX II - LIST OF KEY PERSONNEL INTERVIEWED

INSTITUTION	TITLE	TOTAL
Ministry of Health (HQ)	Director - Clinical Care and Diagnostic Department	1
	Human Resources officer	1
	Assistant Director Diseases Control and Surveillance	1
	Planner	2
Ministry of Community Development, Mother and Child Health (MCDMCH)	Director – Mother and Child Health Department	1
Provincial Medical Offices (PMO)	Clinical Care Specialist	1
	Principal Nursing Officer – Mother and Child Health	4
Health Professions Council of Zambia	Registrar	1
Zambia Integrated Systems Strengthening Programme (ZISSP)	In charge of EmONC	1
Hospitals	Medical Superintendant	5
	Registrar	1
	EmONC Specialist	6
	Obstetricians	6
	Principal Nursing Officer	6
	Chief Nursing Officer	1
	Senior Nursing Officers	1
	Nursing Officers	2
	Matron (labour ward in-charge)	6
	Midwives	12
Total		**59**

APPENDIX III – TOTAL ANNUAL DELIVERIES AGAINST TRAINED EMONC PROVIDERS

YEAR	HEALTH FACILITY	TOTAL ANNUAL DELIVERIES	TOTAL TRAINED EMONC PROVIDERS
2012	Levy Mwanawasa General Hospital	3277	3
2013	Levy Mwanawasa General Hospital	3626	
2012	Kabwe General Hospital	3705	3
2013	Kabwe General Hospital	5004	
2012	Ndola Central Hospital	5480	19
2013	Ndola Central Hospital	5313	
2012	Kitwe Central Hospital	4903	20
2013	Kitwe Central Hospital	5004	
2012	Solwezi General Hospital	3290	7
2013	Solwezi General Hospital	3447	

Definitions

Basic Emergency Obstetric Care (Basic EmOC)

A facility is said to have Basic EmOC when it can perform the following six signal functions: Administer parenteral antibiotics, parenteral oxytocics, parenteral anticonvulsants, manual removal of the placenta, removal of retained products of conception and assisted vaginal delivery (instrumental delivery).

Comprehensive Emergency Obstetric Care (Comprehensive EmOC)

A facility is said tohave comprehensive EmOC when all the Basic EmOC signal functions plus Caesarean Section and blood transfusion services are offered in that facility.

Eclampsia

Convulsions of coma in late pregnancy in an individual affected with pre-eclampsia.

Emergency Obstetric Care

This is defined as the care given to pregnant women with complications to prevent maternal deaths. It includes services that can save the lives of the majority of women with obstetric complications.

Maternal Death

This is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration of or site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental causes.

Maternal Mortality Rate (MMR)

This refers to maternal deaths per 100, 000 women of reproductive age 15 – 49 years per year. The denominator leaves out early teenage group and above 49 years who become pregnant and dies.

Postpartum Haemorrhage(PPH)

Bleeding in excess of 500mL after childbirth.

Pre-Eclampsia

A seriouscondition developing in late pregnancy that is characterized by a sudden rise in blood pressure, excess weight gain generalized edema, proteinuria, severe headache and visual disturbances that may result in eclampsia if untreated.

Process Indicators

Process indicators are a measure of the changes in steps leading to the desired outcome. They are used in the monitoring of the availability, utilization and the quality of emergency obstetric services.

Second Level Hospital

These are hospitals found at the provincial level and act as referral hospitals for the first level, with services in internal medicines, general surgery, paedrictrics, obstetrics and gynaecology, dental, psychiatry and intensive care services.

Sepsis

The presence in tissue of harmful bacteria and there toxins typically through infection of a wound.

Signal Functions

These are key medical interventions that are used to treat the direct complications that cause the vast majority of maternal deaths around the globe

- Blood transfusion- is an injection of a volume of blood, previously taken from a healthy person, into a patient.
- Manual placenta removal- is a procedure to ***remove*** a retained ***placenta*** from the uterus after childbirth
- Uterine evacuation
- Vacuum /forceps delivery - delivery in which forceps are inserted through the vagina and used to grasp the head of the fetus and pull it through the birth canal. Vacuum delivery is a procedure where a cup is applied to the baby's scalp while suction is applied to help pull the baby down and out while the mother pushes during a vaginal birth.
- Surgery (cesarean section) - the delivery of a fetus by surgical incision through the abdominal wall and uterus
- Laceration repair - Laceration repair includes all the steps required to treat a wound in order to promote healing and minimize the risks of infection, premature splitting of sutures (dehiscence), and poor cosmetic result.
- Laparoscopy - is a type of surgical procedure in which a small incision is made, usually in the navel, through which a viewing tube (***laparoscope***) is inserted.

Skilled Birth Attendant

Refers to a health professional such as a doctor, midwife, nurse or clinical officer who is trained and competent in the skills needed to manage normal childbirth and postnatal period, and who can identify complication and provide emergency management and / or refer to a higher level of health care

Third Level Hospital

They are referred to as specialist or tertiary Hospitals. These are the highest referral hospitals in Zambia with sub specialization in internal medicines, surgery, paediatrics, obstetrics, gynaecology, intensive care psychiatric, training and research.