# BASIC EMERGENCY MATERNAL AND NEONATAL CARE STATUS OF SOUTH GONDAR ZONE, NORTH CENTRAL ETHIOPIA: INSTITUTIONAL DESCRIPTIVE SURVEY, JUNE 2016

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## ABSTRACT

**BACKGROUND:** Globally; an estimated 303,000 maternal deaths, two million intrapartum-related stillbirths and neonatal deaths occur annually. The majority of the deaths occur around the time of childbirth and three fourth are preventable with BEmONC services.

**OBJECTIVE:** To assessed status of emergency maternal and neonatal care in south Gondar zone, North central Ethiopia.

**METHODS:** Institutional descriptive survey was conducted from January to June 2016 on 89 public health facilities including one general hospital using WHO and AMDD questionnaires. The signal functions of BEmONC were determined.

**RESULT:** About 94.4%, 96.6% and 79.8% of health facilities administered parenteral antibiotics, parenteral oxytocics and parenteral anti-convulsant three months before the study period respectively. More than nine in ten (91%) of facilities had performed removal of retained products in the last 3 months. More than nine in ten 93.3% of health facilities were used partograph to manage labor. The hospital performed all CEmONC signal functions. Nineteen percent of the health facilities provided intensive care to a preterm or low birth weight. Majority of health facilities (80.9%) were not provided the service due to 50.7% no separate pediatric or intensive care unit for infants, (25.4%) lack of supplies, lack of training16.9% and no indication (4.2%).

**CONCLUSION:** About one in three of the health facilities had performed newborn resuscitation and used partograph. Majority of the health facilities had not provided special or intensive care to a preterm or low birth weight baby in the last three months. The regional health bureau and other responsible stake holders should train professionals on breech delivery and avail supplies and solve management issues.

**KEY WORDS:** Signal functions, BEmONC, Ethiopia.

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## INTRODUCTION

**BACKGROUND:** Globally high number of maternal, intrapartum-related stillbirths and neonatal deaths occur annually. The majority of the deaths are occurring around the time of childbirth and about 75% of these deaths are preventable with emergency obstetric care (EmOC) services. Birth is a critical time for both mothers and foetus [1,2,3,4].

Maternal mortality ratio (MMR) reduction is one of important goals for Sustainable Development Goals (SDGs). One way of reducing maternal and neonatal mortality is by improving the availability, accessibility, quality and utilization of services for the treatment of complications that arise during pregnancy and childbirth [1,5,6].

About 15% of pregnant women develop a complication during pregnancy, childbirth or postnatal time; this complications accounts 75% of maternal deaths. Thus, at least 15% of all this births in the population should take place in Basic Emergency Obstetric Care (BEmONC) facilities and timely and quality care is a solution for mitigating the consequences of the complication [1,7,8].

There is increasing availability of BEmONC facilities provided by government and non-government organizations but it is still a public health concern as to high maternal and perinatal mortality [3,9]. Some of them die because they were not admitted until their condition was critical; and many others die because they did not receive timely treatment at a health facility or the treatment they received was inadequate [10].

The seven signal functions for availability of BEmONC are administration of parenteral antibiotics, anticonvulsants, uterotonics, removal of retained products, assisted vaginal delivery, manual removal of placenta, and resuscitation of newborn. The signal functions for comprehensive BEmONC include all BEmONC services plus caesarean section and blood transfusion [1].

Ethiopia had achieved target of reducing child mortality three years ahead, which indicate that under-five mortality rate (U5MR) was reduced to 64/1000 live birth in 2013. Despite this, reducing Neonatal Mortality Rate (NMR) showed slow progress and the neonatal mortality rate was 29 deaths per 1,000 live births, accounted for 42% of under-five deaths [11,12].

The researcher did not get a research conducted to assess the status of BEmONC the signal functions in the study area. Thus, this study assessed the status of emergency in maternal obstetric and neonatal care services in South Gondar Zone, North Central

Ethiopia.

## METHODS AND MATERIALS

The study was conducted in South Gondar Zone. South Gondar zone is located 666KM to the north of Addis Ababa, the capital of Ethiopia. The zone has one general hospital, five district hospitals (two nonfunctional) and 93 health centers. According to the 2007 census result it has a population of 2,047,206 and of this 1,038,913 were males and 1,008,293 were females. With an area of 14,095.19 square kilometers, South Gondar has a population density of 145.56. The study period was from January 2015 to June 2016.

Institution based cross sectional study design used. All public health facilities of south Gondar zone were considered as source population while study population were all public health facilities which performed signal functions before three months in the zone. Public health facilities of that providing BEmONC services were included. Facilities which are not currently providing BEmONC services were excluded.

The sample size was calculated using the WHO, UNFPA and UNICEF agreed handbook for monitoring emergency obstetric care services. Because the number of both hospitals (if less than 25) and the number of health centers in the zone was less than hundred, all public facilities (both hospitals and health centers) will be included in the study [1]. Three supervisors who have bachelor science degree and health in background having experience in supervision were assigned after training for supervision.

Interview was conducted by using UN obstetric monitoring guideline standard questionnaire to obtain quantitative data. The performance of BEmONC facilities, availability of equipments and problems related to the facilities will be interviewed. Data was collected by five trained diploma nurses who had experienced in the procedures.

Data was first checked manually for completeness and then was coded and entered in to Epidata version 3.1. After double entry of 10%, the data was transferred to SPSS version 20.00 for analysis. The data was cleaned by visualizing, calculating frequencies and sorting. Results were presented in text and graphs. Data quality was ensured during collection, coding, entry and analysis. During data collection, training and follow up was provided for data collectors and supervisors for two consecutive days. Supervision of data collectors included observation of how are they administering questions and approaching the respondents. The filled questionnaires were checked for completeness by data collectors, supervisors and principal investigators on a daily basis. Consequently, any problems encountered were discussed among the survey team and solved immediately.

The questionnaire was pre-tested with 5% of total sample size on eligible facilities that are not included as study subjects in the main survey. Findings of pretest was discussed among data collectors and supervisors, so that, the tool was modified for inconsistency before actual data collection. The final interview was conducted using the modified questionnaire. Every problem during data collection was solved through contact with supervisors on daily basis.

Ethical clearance was obtained from Debre Tabor University ethical committee. Letter of permission was obtained from the zonal health department, the Woreda health offices and respective health facilities. The purpose of the study was explained to the study participants, verbal consent was secured and confidentiality of the information was ensured. Health information on the appropriate topic was given to all study subjects individually.

## OPERATIONAL DEFINITIONS

**Maternal mortality**: refers to the death of a woman while pregnant or within 42 days of termination of

pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental causes.

**Functioning basic BEmOC:** When staff has carried out the seven signal functions of basic EmOC in the 3-month period before the assessment, the facility is considered to be a fully functioning basic facility.

**Functioning comprehensive EmOC:** The facility is classified as functioning at the comprehensive level when it offers the seven signal functions plus surgery (e.g. caesarean) and blood transfusion.

**Signal functions:** refers to administration of parenteral antibiotics, uterotonic drugs and anti convulsants, removal of placenta, removal of retained products, performing assisted vaginal delivery, and performing neonatal resuscitation.

## RESULT

A total of 89 health facilities (88 health centers and one hospital) out of 94 public health facilities were interviewed making a response rate of 94.6%. Basic emergency obstetric and neonatal care signal functions were assessed for all studied health facilities and comprehensive emergency maternal obstetric and neonatal care signal functions was assessed for the hospital.

Most 84 (94.4%) health facilities were administered antibiotics parenterally in the last three months before the study period while 5 (5.6%) did not administered. The reasons why they had not administered were management issues (n=3, 60%) and lack of drugs in the facility (n=2, 40%). Likewise, most (n=86, 96.6%) of the health facilities administered parental oxytocics in the past three months. About 3 (3.4%) were not administered both before three months and 12 months due to lack of oxytocics in the facilities. More than two thirds of the health facilities (n=63, 77.8%) were used misoprostol for obstetric indications. Similarly, 71 79.8%) of health facilities administered anticonvulsants parenterally in the last three months. The type of anticonvulsants used were magnesium sulphate (n=37, 51.4%), diazepam (n=3, 4.2%) and both n=31, 43.1%). Among those which had not administered in the past three months, 5 (27.8%) administered in the past 12 months and 13 (72.2%) were still had not administered anticonvulsant. The reason for not administering were lack of anti convulsants (n=16, 88.9%), management issues (n=1, 5.6%) and no indications (n=1, 5.6%).

All 89 of health facilities of the zone had performed manual removal of placenta in the last three months. Nine in ten (n=81, 91%) of the health facilities had performed removal of retained products in the last three months. Manual vacuum aspiration accounted for 80.2% (n=65), dilatation and curettage accounted for 12.4% (n=10, while dilatation and evacuation was used in 6.2% (n=5) and 1 (1.2%) had misoprostol.

About 9% (n=9) of the health facilities did not perform removal of retained products in the last three months due to lack of indication (n=7, 87.5%). More than nine in ten (n=83, 93.3%) of the health facilities conducted assisted vaginal delivery (vacuum or forceps) in the last 3 months. Among those performed, 72 (86.8%), 7 (8.4%) and 4 (4.8%) were assisted by vacuum extractor, forceps and both respectively. The major reason report-

ed for not conducting assisted delivery was lack of supplies/equipment.

Nearly two third (n=65, 73%) of health facilities had resuscitated newborn with bag and mask in the last three months. Only one facility (1.1%), the hospital, had performed cesarean delivery in the last three months. Likewise, the hospital performed blood transfusion from facility blood transfusion bank in the last 3 months. Health centers 98.9% had not performed cesarean delivery and mostly due to policy issues. Similarly, they had not transfused blood due to reasons of policy issues (n=52, 59.1%), management issues (n=20, 22.7%), lack of availability (n=9, 10.1%) and training issues (n=5, 5.7%) and lack of supplies (n=2, 2.3 %) (Figure 1).

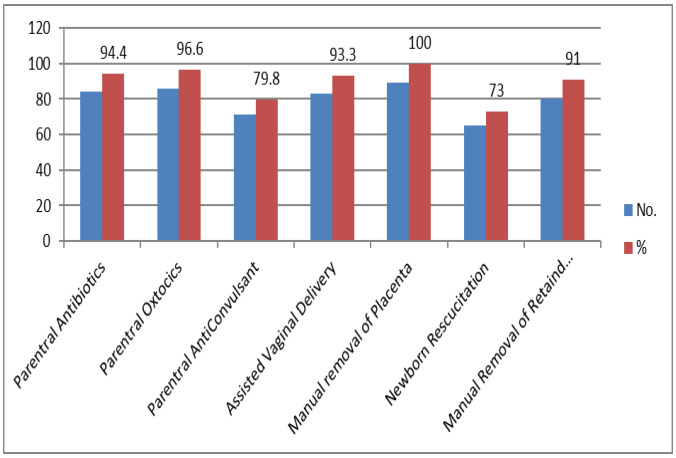


**Figure 1. BEmONC signal function performance of South Gondar Zone Public health facilities, June, 2016.**

In all thr 89 (100%) health facilities, staffs routinely practiced active management of the third stage labor in the last 3 months. More than seven in ten (n=68, 76.4%) of health facilities used partograph to manage labor in the last 3 months and 21 (23.6%) did not used. Lack of indication (n=3, 50%), lack of supplies (n=2, 33.3%), lack of availability of human resource (n=1, 16.7%) were reasons reported for not using partograph. About 83.1% (n=74) of them performed a breech delivery in the last three months whereas 15 (16.9%) were not. According to respondents of the health facilities they were not conducting a breech delivery as a result of policy issues (n=5, 38.5%), no indication (n=4, (30.5%), availability of human resource (n=1, 7.7%) and lack of training (n=1, 7.7%).

Eight in ten (n=72, 80.9%) of health facilities had performed rapid testing for mothers with unknown human immunodeficiency virus (HIV) status in the maternity/labor ward in the last 3 months. Almost one in fifth (n=17, 18.1%) had not performed the test owing to lack of supplies (n=16, 94.1%) and lack of training (n=1, 5.9%).

More than three out of four (n=68, 76.4%) of them had given antiretrovirals (ARVs) to sero positive mothers in maternity/labor ward in the last three months while 21 (23.6%) had not due to lack of supplies (n=13, 61.9%), no indication (n=6, 28.6%), availability of human resource (n=1, 4.8%) and lack of training (n=1, 4.8%). Seventy (78.7%) had given ARVs to newborns in maternity/labor ward in the last three months prevention of mother-to-child transmission (PMTCT). Twenty-one (21.3%) had not given due to lack of indication (n=9, 47.4%), lack of supplies (n=9, 47.4%) and lack of training (n=1, 5.3%).

Seventeen (19.1%) of the health facilities provided special or intensive care to a preterm or low birth weight baby in the last three months. Majority of health facili-

ties (n=82, 80.9%) had not provided the service due to lack of pediatric or intensive care unit for infants (n=36, 50.7%), lack of supplies (n=18, 25.4%), lack of training (n=12, 16.9%), no indication (n=3, 4.2%) lack of availability of human resource (n=1, 1.4%).

Less than one in ten (n=7, 7.9%) health facilities performed craniotomy in the last three months. Majority of the health facilities (n=82, 92.1%) had not performed as a result of, lack of training (n=31, 39.2), lack of supplies (n=25, 8.9%), no indication (n=8, 10.1%), management issues (n=8, 10.1%) and lack of availability of human resource (n=7, 8.9%).

## DISCUSSION

Most of the health facilities (94.4%) had administered antibiotics parenterally in the last three months before the study period. This finding is slightly higher than study conducted in Ethiopia which reported 63% [13, 14] and twelve south African health districts which reported 68% [13]. This could be explained by determination of the Ethiopian government to reduce maternal and child mortality as part of MDGs and time difference among the two studies as these studies were done before ours.

All health facilities of the zone had performed manual removal of placenta in the last three months. This is also higher than study done in Ethiopia and Kenya, Malawi, Sierra Leone, Nigeria, Bangladesh and India between 2009 and 2011 and study conducted in twelve south African health districts which reported about 68% and 58% respectively [13,14,15]. Majority of the health facilities had performed removal of retained products in the last three months of which 78.3% were by manual vacuum aspiration. This is also higher than the study done in Ethiopia and Kenya, Malawi, Sierra Leone, Nigeria, Bangladesh and India which reported 67% and 42.3% respectively [14,16]. This could be due to the timely availability of inputs necessary for the procedures. Another explanation could be time difference as this finding is most recent when compared with those studies. Majority (93.3%) of the health facilities had performed assisted vaginal delivery (vacuum or forceps) in the last 3 months. Similarly, it is higher than study conducted in Ethiopia and Kenya, Malawi, Sierra Leone, Nigeria, Bangladesh and India which reported 83% and 17.5% consequently [13,14,17]. Nevertheless, study from Kenya in 2009 indicated none of the facilities assisted delivery by vacuum or forceps [13]. This could likely be due to the time difference between the two studies and discrepancy in their effort of MDGs implementation in the two study settings. Furthermore, it might be due to the fact that those studies covered a large section of the population whereas this study is limited to one zone.

Majority (91%) of the health facilities had performed removal of retained products in the last three months of which 8.3% by manual vacuum aspiration, 11.2% by dilatation and curettage, (5.6%) by dilatation and evacuation and 1.1% by administering misoprostol. This is also higher than study conducted in Kenya, Malawi, Sierra Leone, Nigeria, Bangladesh and India [16].

About 96.6% and 79.8% of health facilities had administered oxytocics and anticonvulsants parenterally in the last three months before the study period respectively. It is lower than study done in Addis Ababa in

2013 which indicated a consistent supply of uterotonic drugs for health centre was 100% [13]. This can be due to location advantage as urban areas had more access to consistent supply of drugs and high need of the drugs by urban health facilities. However, it is higher than study conducted in Ethiopia (Maternal and newborn health service provision in Ethiopia - SPA+) and which revealed 76% and 20% parenteral oxytocics and parenteral anti-convulsant respectively and other study which reported 11.4% [14,15]. This difference could be explained by difference among the two study settings. Furthermore, it might be due to the fact that the aforementioned studies covered a large section of the population, the former is nationwide assessment and the later incorporated 25 selected districts where as this study is limited to one zone. The reason for not administering were also supported by a study conducted in Gondar, Nairobi, Malawi, Uganda, Gambia and Zambia [13,14,15,16,18].

Three fourth of health facilities had used partograph to manage labor in the last three months. This is higher than study done in North Gondar which reported 24% [22]. This could be due to increased training opportunity on the use of partograph, training of BEmONC for health care professionals and raised attention of maternal health service monitoring system in the zone and effort of the health sector in fueling to meet MDG since then.

About two third (73%) of health facilities had resuscitated newborn with bag and mask in the last three months. This is almost similar with maternal and newborn health service provision in Ethiopia - SPA+ survey which was done nationwide in Ethiopia and showed 68% [14]. But it is lower than study conducted in Ethiopia which showed 84% [13]. This could be also due to shortage of expanded training on the issue. However, only 19.1% of the health facilities provided special or intensive care to a preterm or low birth weight baby in the last three months. This could be due to lack of newborn care corner and its necessary equipment in the health facilities.

Majority (80.9%) of health facilities performed rapid testing for mothers with unknown HIV status in the maternity/labor ward in the last 3 months. This disagreed with the study done in Ethiopia which stated "HIV testing and counseling for pregnant women are available in almost all facilities" [13]. This could be due to shortage of HIV testing kit as 94.1% of the health facilities reported lack of supplies. Three fourth (76.4%) of them had given ARVs to sero positive mothers in maternity/labor ward in the last three months. Seventy (78.7%) had given ARVs to newborns in maternity/labor ward in the last three months (PMTCT).

About 83.1% and 7.9% of them performed a breech delivery and craniotomy in the last three months respectively. Only one hospital was present and assessed. Unlike Study conducted in Iraq which indicated that only 26.3% of hospitals had been able to provide at least eight signal functions for CEmOC facility, the hospital performed all nine CEmOC signal functions [13].

## CONCLUSION AND RECOMMENDATIONS

Most south Gondar zone public health facilities had successfully performed the seven BEmONC signal

functions and the hospital had done including cesarean delivery and blood transfusion as intended. However, the blood is from hospital blood bank. Hence, the researchers recommend the zone to establish central blood transfusion with in the hospital. About one in three of the health facilities had performed newborn resuscitation and used partograph. Majority of the health facilities had not provided special or intensive care to a preterm or low birth weight baby in the last three months. There were still limitations in rapid HIV testing for pregnant women and ARVs provision. There were also gaps in conducting breech delivery and performing craniotomy.

The implication of the study findings regarding the practice of BEmONC in the study site was more than average. To that end, appropriate strong training of health care professionals on BEmONC and how to use partograph, how to conduct breech delivery and craniotomy procedure could potentially solve the problem. Training of neonatal nurses needs to be also strengthened. Besides, availing the necessary equipment and supplies and solving management issues by the regional health bureau and concerned stakeholders.

## COMPETING INTEREST

The authors declare that they did not have competing interests.

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