



DEBRE BERHAN UNIVERSITY INSTITUTE OF MEDICINE AND HEALTH SCIENCE
COLLEGE OF HEALTH SCIENCE
DEPARTMENT OF PUBLIC HEALTH

**ASSESSMENT OF UNMET OBSTETRIC NEED IN EMERGENCY OBSTETRIC
SERVICES IN DEBRE BERHAN REFERRAL HOSPITAL, NORTH SHOA ZONE,
AMHARA REGIONAL STATE, ETHIOPIA.**

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Assessment of Unmet obstetric need in emergency obstetric services in Debre Berhan referral hospital, North Shoa zone, Amhara Regional state, Ethiopia.

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ABBREVIATION AND ACRONYM

AIDS	Acquired Immune Deficiency Syndrome
AMI	Absolute Maternal Indication
APH	Ante partum Hemorrhage
CS	Caesarean Section
CPD	Cephalo Pelvic Disproportion
CPR	Contraceptive Prevalence Rate
DC	Data Collector
EB	Expected Birth
EmONC	Emergency Obstetric and Neonatal Care
MOI	Major Obstetric Intervention
MMR	Maternal Mortality Ratio
PI	Principal Investigator
PPH	Post-Partum Hemorrhage
RR	Relative Ratio
SDG	Sustainable Development Goal
SPSS	Statistical Software for Social Science
SUP	Supervisor
TFR	Total Fertility Rate
UN	Unmet Need
UON	Unmet Obstetric Need
WHO	World Health Organization

ABSTRACT

Introduction: Complications and obstetric emergencies were taken as an indicator of obstetric need. Obstetric needs are a health problem that needs Emergency Obstetric intervention. The assessment of Unmet Obstetric Need has never been articulated in studies conducted on Emergency Obstetric Care in the study area. This study identifies gap and deficit of Major Obstetric Intervention for Absolute Maternal Indication in relation to the existing need.

Objective: To assess Unmet Obstetric Need in Emergency Obstetric services in Debre Berhan referral hospital

Method: A one year facility based cross-sectional retrospective study was conducted from July 8/2017-July 7/2018 G.C on mothers who delivered with Major Obstetric Intervention (Absolute Maternal Indication and non-Absolute Maternal Indication) at Debre Berhan Referral Hospital. Data was collected using structured and pre-tested format by four midwife trained data collectors from patient medical records. To explain study population in relation to relevant variables, frequencies and summary statistics was used. Rates of major obstetric interventions performed for absolute maternal indications among all expected births was calculated to assess unmet obstetric need. Training and using structured format were used to ensure the data quality in addition to supervision

Result: A total of 363 major obstetric interventions were conducted in the study area. The result revealed that the unmet obstetric need of the area was 31.4%. Caesarean sections took the largest share of MOIs 358(98.6%). Out of 153 women with AMI majority were cephalo-pelvic disproportion (CPD) which account 87(24%). The number of MOI done without AMI was 210(57.8%) where majority 78(29.5%) were done for fetal distress.

Conclusion: There was higher unmet obstetric needs in rural than urban areas. Even though maternal mortality has been declining and no death was observed. The caesarean section rate was 2.3% this was below the WHO recommendation 5% to 15%. Estimating the amount of unmet need for major obstetric interventions provide the information necessary for planning and prioritizing the development of services; and lead to action for the reduction of maternal mortality at local level.

Key words: Unmet obstetric need, Major obstetric intervention, Absolute maternal indication

1. INTRODUCTION

1.1 BACK GROUND

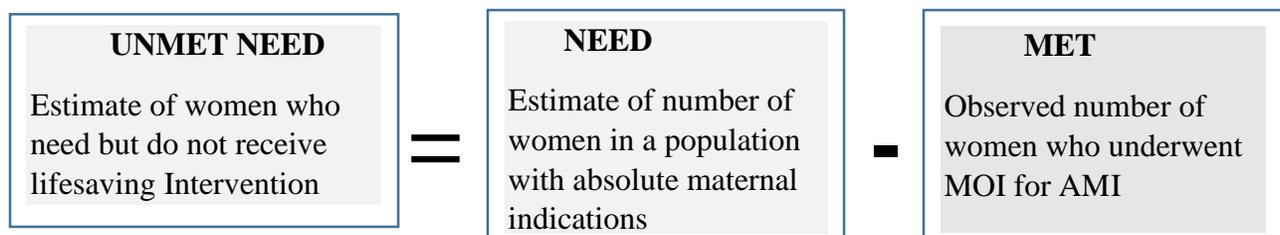
The concept of UON refers to the discrepancy between what the health care system should do to deal with the obstetric problem in a given population, and the care it actually delivers. Operationally, UON is expressed in terms of women who should have benefited from an obstetric interventions, but for whom this intervention did not take place(1).

The unmet obstetric need network is the system that bring together ministers of health, development organization, scientific institution and practitioners who want to plan unmet need for major obstetric for absolute maternal indications as a starting point not just to improve maternal health but also the overall functioning of the health care system. The unmet obstetric need network provides technical support national teams involved in this kind of work, as well as opportunities to learn from each other(2).

The European commission and a number of other agencies decided to launch a formal UON network. The Unmet Obstetric Need Network brought together ministries of health, development organizations, scientific institutions and practitioners who wanted to map unmet need for “major obstetric interventions for absolute maternal indications” as a straight point to improve maternal health care and the overall functioning of their health care system(1).

The unmet obstetric need concept developed by the unmet obstetric need network considers unmet need by including major obstetric interventions that are done for absolute maternal indications and the gap between those expected and those actually done(2,3).

The discrepancy between the expected and observed major obstetric intervention rate for Absolute Maternal Indications, including CS, hysterectomy and destructive operations, is a powerful indicator of the unmet need for life saving obstetric care(4). The concept elaborated as:



Operational expression of the unmet obstetric needs concept adopted from previous study

The obstetric need is expressed in terms of the health problems, which necessitate an intervention, by the health care system. Among indications for intervention some are more essential to the survival of the mother and the child and others. These are called “absolute maternal indications (AMI) “; and it is on this basis that the indicator of obstetric is constructed. It is necessary, if the indicator is confined to major obstetric interventions for absolute maternal indications (MOI/AMI), in a way that is most relevant to the planning of the minimum interventions required. The AMI are severe ante partum hemorrhages caused by the placenta praevia or a retro placental hematoma (premature detachment of a normally inserted placenta), incoercible post- partum hemorrhages, major foeto-pelvic disproportions (due to narrow pelvis or a hydrocephaly), transverse positions (shoulders neglected) and face presentation(5,6).

The major obstetric interventions for absolute maternal indications comprises caesarean section, laparotomies, hysterectomies, internal versions, craniotomies or embryotomies and Symphysiotomy which may be carried out to avoid a caesarean in a case of Cephalo-pelvic disproportion(7).

The common type of bias in this type of study is information bias. There is variation in diagnosis from one to other facility. The AMI should therefore be specified and one should also limit the range of MOI. The major source of information for such studies are delivery books and operation theatre records Measuring rates of MOI for AMI is theoretically simple, and limiting calculations to a group of indications for which an incidence can be estimated makes it easy to calculate deficit(8).

The WHO definition of maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of pregnancy, from any causes related to or aggravated by the pregnancy or its management, but not from accidental causes(9).

Globally, the MMR fell by nearly 44% over the past 25 years, to an estimated 216 maternal death per 100 000 live birth in 2015(9). Developing region account for approximately 99% of the global maternal deaths in 2015, with sub-Sahara Africa alone accounting for 66%, followed by South Asia(9). The MMR in Ethiopia is estimated to be 412/100 000(10).

1.2 STATEMENT OF THE PROBLEM

Achieving the sustainable development goal target of global MMR below 70 will require reducing global MMR by an average 7.5% each year between 2016 and 2030. This will require more than three times the 2.3% annual rate of reduction observed globally between 1990 and 2015(9).

Although most maternal death and complications are avoidable there is still high MMR, in Ethiopia estimated to be 412/100,000(10). About 15% of all pregnant women have child birth complications that require emergency obstetric care(11), yet few (18%) are able to access such services in Ethiopia. Major obstetric interventions used as tracer conditions for assessing the responsiveness of the healthcare systems to life-threatening maternal conditions(12).

Unmet obstetric need is indicator that have been proposed for monitoring interventions aimed at reducing maternal mortality that have been challenged by lack of resources (13) and limited evidence about how many people use emergency obstetric care(9).

In countries with high level of maternal mortality policy makers and health care providers are unaware of the extent of the unmet need for essential obstetric care and often real possibility to improve things(2).

In low resource settings various factors including educational status of women, antenatal checkup, place of residence, prolonged and obstructed labor had been identified risk factors(14) previous cesarean delivery, mal presentation and augmentation are predisposing factors for emergency obstetric complications(5,15).

Evidences showed that ante partum hemorrhage, post-partum hemorrhage, Cephalo-pelvic disproportion are most common indications of major obstetric interventions(5) which needs prompt diagnosis and treatment before progressing serious maternal and perinatal outcomes(16).

The federal ministry of health is providing curative health service to the community as one of the priorities, and as a result, the number of government hospitals in the country has increased. It is also trying to change the cultural preference of home delivery, better transport, access to antenatal care, obstetric training and exempted service charges for laboring mothers(17).

Despite all these, evidences are lacking as to the magnitude of unmet obstetric need in the study area. In addition there was limited effort to measure changes in management outcome as a result of improvement of obstetric service. Therefore the aim of this study is to measure the magnitude of unmet obstetric need among pregnant women who underwent obstetric intervention at Debrebrehan referral hospital.

1.3 SIGNIFICANCE OF THE STUDY

Accurate measurement of maternal mortality level remains a huge challenge, but the overall message is clear: hundreds of thousands of women are still dying due to complications of pregnancy and/or child birth each year. Many of these death go uncounted(9).

The new global strategy for women's health will spearhead an enhanced global collaborative response aimed at ending all preventable maternal death(9).

By 2030, all countries should reduce MMR by at least two third of their 2010 baseline level. The average global target is a MMR less than 70/100 000 live birth by 2030. The supplementary national target is that no country should have a MMR greater than 140/100 000 live birth(18).

Studies done in Ethiopia have addressed the barriers to Obstetric service utilization, preference of place of delivery, quality of family planning service, post abortion care, ANC attendance etc. These have provided indirect information on obstetric services and the level of utilization. There had been no direct way of informing policy on the deficits of Obstetric needs through MOI for AMI. This study will focus on the assessment of Unmet Obstetric Need as a gaps existed in the provision of EmONC service.

One main focus for making pregnancy safer in Ethiopia is proper provision of EmONC through both development of infrastructure and ensuring optimal functionality. This study therefore attempts to identify deficits in MOI for AMI in comparison to the existing need (Do those who need EmONC service actually receive them?). The information will also highlight where exactly to focus on planning interventions. Strategies to reduce maternal mortality in the country require such kind of information for decision making. So far this type of study was not conducted in the study area and also in the region.

There should be functioning and accessible EmONC to decrease maternal mortality and need to provide information to decision maker on why women are dying where and what can be done improve the survival of women. The Unmet Obstetric Need concept takes this idea including major obstetric intervention and stratifying them according to indications.

2. LITERATURE REVIEW

2.1 UNMET O NEED FOR EmONC

The fifth WHO Millennium Development Goal aimed to reduce maternal mortality by 75% by 2015 but made the least progress among the MDGs, that is 45% was achieved from 1990 level of 543,000 maternal death(9). Globally, 289,000 women died from pregnancy related complications in 2015(9), half of them due to hemorrhage, hypertensive disorders and sepsis(19).

Number of facilities with emergency obstetric service is an important indicator. According to UN recommendations, there should be at least one comprehensive and four basic EmOC facilities per 500,000 populations. An estimated 15% of pregnant women develop major direct obstetric complications that require medical care, so the recommendation is that at least 15% births should take place in EmOC. This estimated through the met obstetric need which is an indicator for the interventions conducted for those with AMI should be 100% with the expectation that all women in need of major intervention get it from the health system(8,20).

The international recommendation is a minimum of 5 EmONC facilities for every 500 000 population(21). In Ethiopia 921 EmONC facilities were recommended and only 370 were fully functioning as EmONC (40% of the recommended number), leaving a gap of 551 EmONC facilities(11).

A global met need for EmOC level of 45% was estimated, 21% in low income countries, 28% in lower middle income countries, 51% in upper middle income countries and 99% in high income countries. Worldwide, 951 million women of reproductive age do not have access to EmOC should they become pregnant. This corresponds to 11 million untreated complications every year and more than half of women with maternal complications lack access to EmOC that could be used to treat the direct obstetric complications that make up 70-80% of maternal deaths globally (21).

The Unmet Obstetric Need assessment in five African countries, Benin, Burkina Faso, Mali and Niger shows that the percentage of deliveries receiving surgery for Absolute Maternal Indications was 1.4% in urban areas with functioning hospitals(22) the UON network states, 1.4% was practical low end estimate of the proportion of deliveries that require MOI to avoid maternal death(3).

A survey conducted in seven poor African countries only 1.1% of urban and 0.3% of rural mothers actually benefited from major obstetric interventions. In other word the deficit if unmet obstetric need was 25% in urban and 79% in rural areas(2).

Study conducted to assess UON in Zambia, revealed that unmet obstetric need was 41%. The rural population that suffered the entire deficit, was 73% implying that 77 out of 106 women and unmet needs in 2010. Further, the likelihood of undergoing a major obstetric intervention was 5.5 times higher in women from urban compared to rural areas, which underscores the unacceptably large inequity between urban and rural societies. The substantial rural-urban disparity demonstrated in the present analysis of unmet obstetric needs should alert policy makers and the health care system to improve lifesaving services to rural areas. The commonest indication for major obstetric intervention was Cephalo-pelvic disproportion(13).

Post-operative complications significantly dropped between 2008 and 2012 among patients presenting with non-AMI (P=0.008). No significant change was observed in patient AMI. The most frequent AMI were CPD 71% versus 70%, followed by uterine rupture and pre-rupture. Previous C/S was the main non AMI in 2008 (35%) and 2012 (37%)(23)

Retrospective assessment of UON in Dawro zone, 585 of mother with life threatening was obstetric complications was unable to get intervention and this was interpreted as the number of women who should have helped from a lifesaving intervention but actually did not. Major obstetric interventions for AMI rate of 0.8% and caesarean section took the largest share (81.5%) and the commonest AMI was obstructed labor 39.5%(5).

Met need for EmONC in all facilities was below 50% in all regions even as low as 3% in Gambela, Somali and Diredawa and higher in Addis Ababa 83%. The fully functioning of comprehensive EmONC was 148% of the 184 recommended leaving a gap of 36 facilities. The least available facility was in SNNP and Diredawa (22%) and the greatest in Harari (126%) which exceeded the minimum recommended number of EmONC facilities while other regions were below the national average (40%)(24)

Among all maternal deaths, 43% were related to direct obstetric complications, 5% indirect causes and 52% were due to unknown or unspecified causes. In this assessment the leading known cause of death were PPH/retained placenta and APH together responsible for 12% of death and severe pre-

eclampsia or eclampsia for 10%, more over 26% of maternal complications were due to other direct obstetric complications but responsible for 12% death(25).

A review of caesarean cases 74% were found to be maternal indications, 22% were due to foetal indications- i.e. foetal distress and mal presentation. Indication related to CPD, prolonged and obstructed labor and arrest disorder 39%, foetal distress and non-reassuring foetal heart rate 13% and previous scar 13% was the leading indication for CS. Elective CS were most common among women with a previous scar was 47%(24)

A cross-sectional study conducted in Zambia revealed that, Major obstetric intervention for AMI were higher in urban 2.1% than in rural areas 0.4%, with an urban to rural rate ratio of 5.5. (13)

There is an important gap regarding the availability of service in women living in areas classified as urban, and thus residing within 10km of the hospital, the 55 MOIs for AMI represents 0.9% of all deliveries and 183 MOIs for AMI in rural women represents 0.5% of all deliveries.(5)

The proportion of birth attended by health personnel was found to be a predictor for met need. Met need for EmOC was significantly associated with all investigated access and demographic indicators, as well as female primary school enrollment. The result confirms that increasing skilled birth attendance acts in synergy with increased EmOC access there by women attended by midwife are more likely to reach an EmOC facility in time.(21)

According to a study conducted in Debremarkos, obstructed labor had 15.32 odds of having uterine rupture and living in distance >10km from the hospital had 5.26 odds of having emergency obstetrics.(14) Poor geographical access is a major determinant of maternal and perinatal mortality and morbidity. This is mainly a problem of rural areas and in low income countries(26).

A systematic review of West African countries on unmet reproductive health need shows an increase unmet need. Socio-cultural norms and practice resulting in discontinuation of service use, economic constraints, travel distance to access services and low educational levels of women were found to be key predictors of service utilization for obstetric care service(27).

Being well prepared was associated with maternal education level and occupation of spouse. Educated women have better pregnancy outcome compared with uneducated women, possibly due

to better understanding of health messages or financial stability to make the necessary decision in case of obstetric emergencies(28).

According to a study conducted in Mali the high cost of prescription drugs and transportation are still the main obstacle to access to emergency obstetric care(29)

There is evidence elsewhere indicating a direct link between wealth and utilization of obstetric service. A population living in urban area is likely to be more educated and wealthier than that living in the rural areas. A study conducted in Sudan shows a clear inequity between the different payams in terms of met obstetric need, with Nyong payam being the better of the three payams(30).

Obstetric emergencies occur suddenly and unexpectedly. A well-organized referral system should therefore be operational. Social and educational backwardness contributes to the delay in seeking help. Lack of family authority figure, financial resources and transport facility could affect decision making and cause delay(15) a study conducted in Tigray revealed that competency of midwives was found to be low to provide safe and quality maternity care in the region(31).

The proportion of birth attended by health personnel was found to be a predictor for met need. Which has been described as one of the most useful indicators of the performance of a health system in meeting women's obstetric needs(21).

About one in seven maternal deaths during or after caesarean section was due to anesthesia, a very high mortality rate compared with developed countries. The increased mortality and morbidity that was identified with general anesthesia could be due to the following reason: inadequate training and resources, poor general condition of the mother, or concomitant complications such as post-partum hemorrhage(19). Different primary causes of death require different strategies and interventions(18).

A major contributor to the high maternal and perinatal mortality and morbidity in developing countries is the poor access to life-saving obstetric care when complications arises. Such poor access may be due to personal or cultural barriers, failure to reach facilities in time and inadequate care at health facilities. Delays in the decision to seek care usually occur at the household level and include problems related to recognition of the complication and its nature as a life-threatening condition or an emergency(26).

3. OBJECTIVES

3.1 GENERAL OBJECTIVE

- Assessment of Unmet Obstetric Need in emergency obstetric services in Debre Berhan referral hospital.

3.2 SPECIFIC OBJECTIVES

- To measure the differences in provision of Major obstetric intervention for Absolute maternal indications and non-Absolute maternal indications in Debre Berhan referral hospital, 2018.
- To determine unmet obstetric need among women attending hospitals for delivery in Debre Berhan referral hospital, 2018.

4. METHODOLOGY

4.1 STUDY DESIGN

Descriptive cross-sectional study was conducted in Debre Berhan referral hospital

4.2 STUDY AREA AND PERIOD

Institutional based cross-sectional study was conducted from March 14 to 25, 2019 in Debre Berhan which is located in north shoa zone, Amhara region. Debre Berhan is capital city of North shoa which is found 130km from Addis Ababa in the Northeast direction and also 665km far from Bahirdar the capital of Amhara region. The study includes five woreda (Debre Berhan, Baso, Angolela tera, Asagirt and Ankober) those who do not have primary or district hospital for comprehensive emergency obstetric care (CEmOC). According to CSA the urban total population was 113,693 out of which 56,995 were male and 56,698 were female and the rural total population was 386,376(32). There is one referral hospital which provides obstetric services.

4.3 POPULATION

4.3.1 TARGET POPULATION

All pregnant women delivering in Debre Berhan referral hospital.

4.3.2 STUDY POPULATION

All mothers who had Absolute Maternal Indications and who had received Major Obstetric Intervention in Debre Berhan referral hospital from July 8/2017-July 7/2018 G.C.

4.3.2.1 Inclusion criteria

The study included all women who underwent a major obstetric intervention (between 28th of pregnancy and 42nd day post-partum).

4.3.2.2 Exclusion criteria

Incomplete records that misses major variable were excluded

4.4 SAMPLE SIZE DETERMINATION

The population projection for 2017 in this study area was calculated from the 2007 census to be 113,693(32). Assuming the crude birth rate of Amhara is 31.8 /1000 population then a total of 3616 (Population * CBR) births from urban and 12287 birth from rural were expected in 2018(10). Benchmark of the median for five sub-Saharan African countries, Haiti, Morocco and Pakistan 1.4% (EB *1.4%)of births were expected to get Major Obstetric complications that needs

Intervention(6,8,11,22) was considered. Therefore a total of **223** birth needs Major obstetric interventions for both urban and rural of the study area.

4.5 SAMPLING TECHNIQUE

First the main registration book of the Operation room where all emergencies registered according to their order was used to list all Absolute Maternal Indications. All the Name of the mother and medical registration number (MRN) was selected from register and their chart were selected from medical record unit. All mothers who would get emergency and elective procedures were included. The inclusion criteria was based on the list of diagnosis as recorded by the physicians:

- ✓ Any mother with Absolute maternal indications
- ✓ Any mother who had received Major obstetric interventions

4.6 DATA COLLECTION

The information was gathered from hospital records. These are theatre registries, delivery books or obstetric records and other relevant documents. A structured format from previous study was used to gather maternal information as a secondary data.

Four midwife data collectors were recruited. They were preferred because of their orientation on the technical terms stated in the formats and the fact that they read the registries better as they are familiar with the records. The format then was piloted and appropriateness was tested and no modification was done. A form was filled for every woman who underwent a major obstetric intervention or died in the health facilities in the target district. The possibility of women from the study district having received MOI in other district was rare since this hospital is referral. The data collection was conducted from March 14 to 25/2019 for twelve days.

The Unmet Obstetric Need indicator restricts its scope to a standard list of Absolute Maternal Indication, that is, maternal life threatening conditions for which major obstetric intervention is performed to solve the problem(2). The list of AMI is based on the degree of severity of the indication, the relative stability of its incidence and relatively reproducible diagnosis(1)The standard list of Absolute Maternal Indications adopted for this study includes:(6)

- Antepartum hemorrhage (placenta praevia or abruption placenta)
- Abnormal presentation (transverse lie or shoulder presentation, face with persistent mento-posterior position or brow presentation)

- Major CPD (due to small pelvis or hydrocephalus; including pre-rupture and rupture of uterus)
- Uncontrollable post-partum hemorrhage

The list of Major Obstetric Intervention includes:

- Caesarean section
- Hysterectomy
- Laparotomy for uterine rupture

A woman presented with more than one complication, the data collectors were only select the complications believed to be the most life-threatening. The number of women with complications was counted, not the number of complications. If more than one MOI had been reported for the same woman, the data collector would select the one believed to be the greatest impact on the survival of women (hysterectomy>Laparotomy for repair of uterus>CS>other).

The principal data source was the operating theatre register, where most MOI were recorded. Information about the indications for the intervention and other personal data on the women was obtained from patient delivery files, maternity ward registers and admission records for maternity ward.

4.7 VARIABLES OF THE STUDY

- Unmet obstetric need
- Demographic and socio economic characteristics like age, marital status, educational status, place of residence
- Obstetric factor like parity, C/S

4.8 OPERATIONAL DEFINITIONS

Unmet obstetric need: An estimate of the number of women needing a major obstetric intervention for absolute (life-threatening) complications but for whom this intervention did not take place.

Absolute Maternal Indication: Indications arising from pregnant mother that needs major obstetric interventions to save the mother's life.

Ante-partum hemorrhage: Vaginal bleeding during pregnancy after 28 completed weeks of pregnancy due to placenta praevia or abruptio placenta.

Abruptio placenta: Premature detachment of the placenta that results in blood clot behind the placenta.

Cephalo-pelvic disproportion (CPD): Refers to a large size of fetal head relative to maternal pelvis. It is a dynamic situation and many cases of suspected CPD do deliver normally after an adequate trial of labor. To arrive at this diagnosis there should be lack of progress of labor in the presence of adequate uterine contraction on the partograph, the pattern will be protracted descent and/or arrest dilation, crossing the action line and no response to oxytocin.

Obstructed labor: Absolute mechanical (foeto-pelvic) problem and no further progress is possible without intervention. Associated clinical signs include excessive caput and molding.

NB. Prolonged labor or poor progress very often given as an indication for CS.

Malpresentation: This should be clearly specified e.g. breach, transverse lie, brow presentation.

One previous CS: Indicate the reason for a repeat CS (Previous CS is not by itself an indication for another CS)

Two or more previous CS: This is an absolute indication for repeat CS

Ruptured Uterine: indicate whether spontaneous rupture or rupture of previous CS scar includes

Hypertensive disorder: Severe pre-eclampsia and eclampsia give the reason for CS in each case

Severe anemia: Hemoglobin <5mg/dl and 36 weeks gestation

Comprehensive Emergency Obstetric Care (CEmOC): Emergency obstetric care plus performance of surgery and blood transfusion.

Eclampsia: Loss of consciousness and convulsion otherwise healthy pregnant women with elevated blood pressure, body swelling and protein in urine.

Emergency obstetric care: Medical interventions that are used to treat the direct obstetric complications that causes the vast majority of maternal death.

Basic Emergency obstetric care (BEmOC): Comprises of services like administration of parenteral antibiotics, parenteral oxytocic drugs, and parenteral anticonvulsants for pregnancy induced hypertension, removal of retained products, and manual removal of placenta, assisted vaginal delivery.

Essential obstetric services: Clean and safe delivery with clean umbilical cord care.

Met Obstetric Need: The proportion of women who are expected to have a major direct obstetric complication who are treated or seen in facilities.

Major Obstetric intervention: The intervention provided to save the life of a mother in life threatening emergency situation majorly C/S, Craniotomy, hysterectomy and Laparotomy.

Placenta praevia: A placenta implanted near the outlet of the uterus, so that at the time of delivery the placenta precedes the baby.

Parity: Number of deliveries

Preeclampsia: A condition in pregnancy characterized by abrupt hypertension, large amounts of protein in the urine and swelling of hand, feet and face.

Symphiotomy: A procedure done to avoid C-section during an obstructed labor by widening the pelvic diameter through dissection of the symphysis pubis.

Rural resident: Women residing more than 10 kilometers from Debre Berhan referral hospital

Urban resident: Women residing within a radius of 10 kilometers from Debre Berhan referral hospital

4.9 DATA QUALITY CONTROL

The quality of data was assured by proper designing of the forms and training of the data collectors and supervisor before the actual data collection. Every day after data collection, forms were reviewed and checked for completeness and relevance by the supervisor and principal investigator and the necessary feedback was offered to data collectors.

4.10 DATA PROCESSING AND ANALYSIS

The collected data was checked for completeness, cleaned manually and entered in to Epi data version 3.1 statistical software and then transferred to SPSS window version 21.0 for further analysis. The data was cleaned again for inconsistencies and missing values. Frequencies was used to summarize descriptive statistics of the data and tables and graphs was used for data presentation.

The indicator of unmet need for major obstetric interventions for a given population in a given period will be calculated as:

$$\text{Unmet obstetric need} = (\text{Complicated BE} \times \text{RR}) - (\text{Number of MOI for AMI})$$

BE = number of births expected on in the period under study

RR = reference ratio or low end estimates or benchmark of MOI for AMI from other study

Number of MOI for AMI = number of major obstetric interventions for absolute maternal indications carried out in the same population during the same period(6).

When calculating Met Need, only one obstetric complication per women should be counted. Data on obstetric complications treated more accurately should be called data on women who experienced at least one major obstetric complication.

4.11 ETHICAL CONSIDERATION

Ethical clearance was obtained from Debre Berhan University department of public health. Formal letter of cooperation was written for North shoa zone health office and from zone to the hospital.

In this study human subjects were not interviewed rather record was reviewed. The selected hospital was free to enroll and withdraw from the study. The consent form was attached as annex.

The researcher used hospital records which would have individual addresses and names. But these were not taken as part of the study. Subjects involved in data collection and supervision were under close supervision by the researcher. The data was not used other than the purpose of the study which are specified in the objectives.

5. RESULTS

Socio-demographic characteristics of mother with major obstetric intervention in DBRH

The mean age of mothers was 27.5 (SD \pm 4.8). Majority 339 (93.4%) are married 15(4.1%) are single and 8(2.2) are divorced. Concerning education, none educated 344 (94.4%), read and write 19(5.2%) While considering the address from patient's charts, the distance from living area to the Hospital in KM was analyzed and 167(46%) cases more than 10KM far from the Hospital and 196 (54%) cases within 10KM of radius from Hospital. The timing of admission, 286 (78.8%) were during the day while 77 (21.2%) were during the night.

Table 1 Socio-demographic characteristic of mother with major obstetric intervention in Debre Berhan referral hospital from July 1, 2017-June 30, 2018.

Age (years)	Frequency	Percent
15-19	6	1.7
20-24	93	25.6
25-29	153	42.1
30-34	67	18.5
35-39	41	11.3
40-44	3	0.8
Total	363	100
Marital status		
Married	339	93.4
Single	15	4.1
Divorced	8	2.2
Widowed	1	0.3
Total	363	100
Education		
None	344	94.8
Read and write	19	5.2
Total	363	100
Distance from the hospital in KM		
Urban(<10km)	196	54
Rural(>10km)	167	46
Total	363	100
Place of delivery		
Debre Brehan referral hospital	356	98.1
Home	6	1.7
Other institution institution	1	0.3
Total	363	100
Time of admission		
Day	286	78.8
Night	77	21.2
Total	363	100

Obstetrics profile

Among 363 patient with MOI, majority of mother were Primi 182 (50.1%) Multi 160(44.1%) and the least one Grand multi 21(5.9%). Most 284(78.2%) of the mothers have history of ANC follow up, 79 (21.8%) of patient had not ANC follow up. Many of the women 356 (98%) delivered in Debrebrehan referral hospital, while 6(1.7%) delivered at home and 1(0.3%) delivered in other institution. About 309(85.1%) mothers had no specific illness, among the mothers who had specific illness and risk at the present pregnancy 54(14.9%), majority had preeclampsia during the present pregnancy 16(4.4%) followed by HIV and multiple pregnancy 7(1.9%) and the least one was diabetes 1 (0.3%).

Table 2 Frequency distribution of Obstetric profile of MOIs in DBRH from July 1, 2017-June 30, 2018

Parity	Frequency	%
Primi	182	50.1
Multi	160	44.1
Grand multi	21	5.9
Total	363	100
ANC		
Yes	284	78.2
No	79	21.8
Total	363	100
Present obstetric problem		
Anemia	7	1.9
Preeclampsia	22	6.1
Diabetes	1	0.3
Heart disease	4	1.1
Multiple gestation	11	3
HIV	9	2.5
Total	54	14.9

The predominant MOI was a CS 358 (98.6%) which was the largest share. Caesarean sections were performed more often in urban (<10km) areas 195(53.9%) than in rural areas 167 (46.1%). The crude CS rate, regardless of indication was 2.3% per expected birth in the study area.

Hysterectomy counted for 5 (1.4%) of all MOIs cases. There were also differences in the percentage of hysterectomy done in urban and rural areas 0 and 1.4% respectively.

Table 3 Frequency distribution of Major Obstetric Intervention according to place, July 1, 2017-June 30, 2018

MOI	Frequency in Urban or <10km		Frequency in Rural or >10km		Total	
	N	%	N	%	N	%
C/S	195	53.9	163	45.5	358	98.6
Hysterectomy	0	0	5	1.4	5	1.4
Total	195	53.9	168	46.9	363	100

The number of women with AMI was 153(42%) where majority had Obstructed Labor 87(24%) followed by APH for placenta previa 25(6.3%), two or more C/S 22 (6.1%), APH for placenta abruptio 11(3%), uterine rupture 5(1.4%) and the least one was PPH 4(1.1%).

The number of MOI done without AMI was 210(57.8%) where majority were done for and foetal distress 78(29.5%) previous one C/S scar 36 (9.9%) and preeclampsia 11(3%).

Ante partum hemorrhage (APH) was the indication for 36(9.3%) of all MOIs. The number of MOI done without AMI was 210 (57.8%) where majority were done for Fetal distress which accounts 78(29.5%) of all indications followed by one previous C/S 36(9.9%). Others were mentioned as other 41 (11.3%). The most often given reason were failed induction, cervical arrest, breech presentation cases, triplet pregnancy, and cord prolapse cases.

Table 4. Frequency distribution of indications in urban and rural areas, DBRH from July 1, 2017- June 30, 2018

Absolute maternal indications(AMIs)	<10km or Urban		>10km or Rural		Total	
	Frequency	%	Frequency	%	Frequency	%
Uterine rupture	0	0	5	1.4	5	1.4
Obstructed labor (CPD)	47	13.2	39	10.8	87	24
PPH	3	0.8	1	0.3	4	1.1
APH for placenta abruptio	6	1.6	5	1.4	11	3
APH for placenta previa	11	2.8	14	3.5	25	6.3
Two or more previous C/S	14	3.9	8	2.2	22	6.1
Total	81	22.2	72	19.8	153	42
Preeclampsia	16	4.4	4	1.1	20	5.5
Puerperal infections	1	0.3	1	0.3	2	0.6
One previous C/S	20	5.5	16	4.4	36	9.9
Fetal distress	51	19.3	27	10.2	78	29.5
Eclampsia	0	0	1	0.3	1	0.3
Other	38	5.8	35	5.5	73	11.3
Total	126	35	84	23	210	57.8

Of the total of MOIs conducted 353(97.2%) were born alive and discharged alive, While 1 (0.3%) was born alive and died within 24 hours of delivery and the other 9(2.5%) were still born. The overall neonatal mortality in the group of mothers having undergone a MOI during the study period was 1 per 354 live births or a case fatality rate of 0.28%. The average hospital stay in days was 5 while the maximum stay was 13.

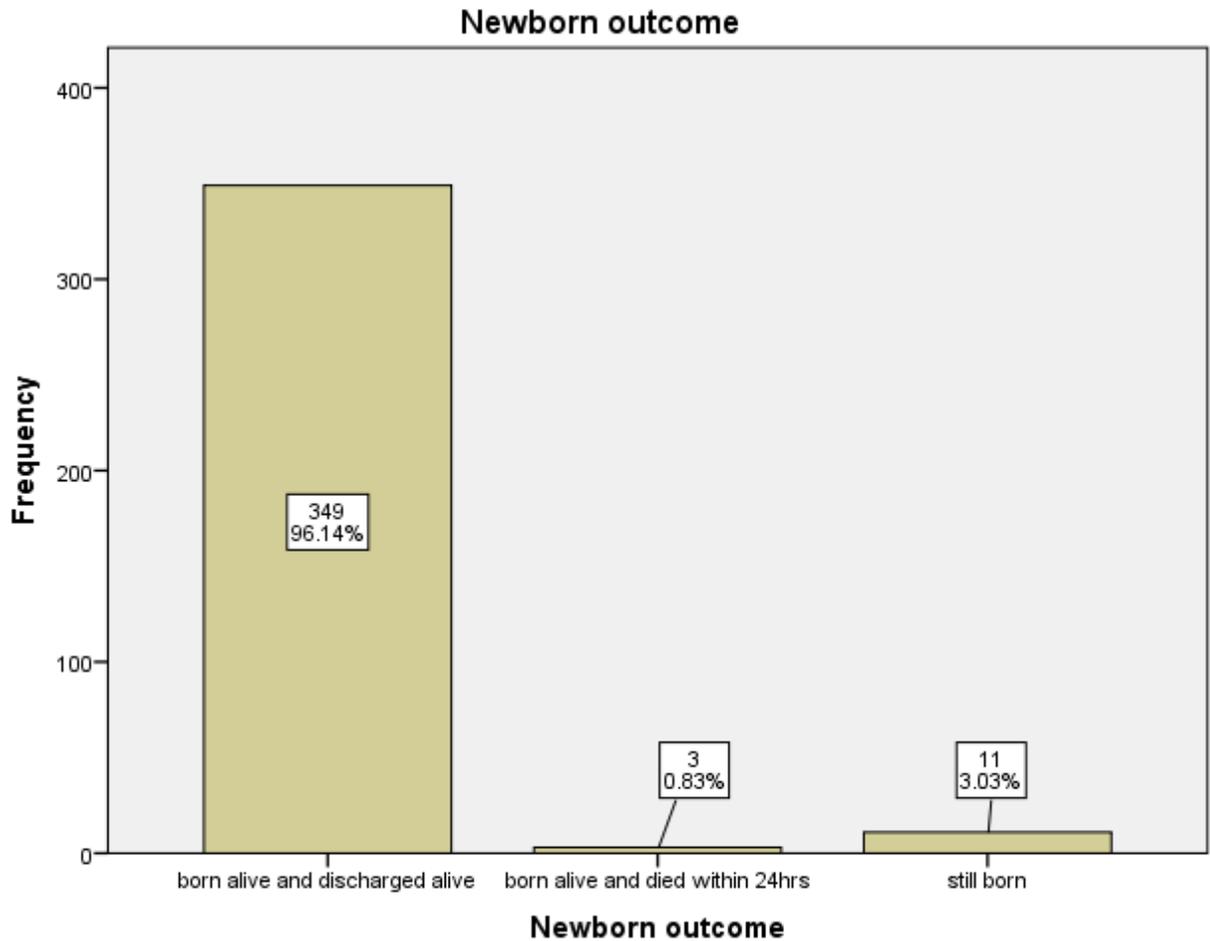


Figure 3 Newborn outcomes in Debrebrehan referral hospital from July 1, 2017-June 30, 2018

Maternal Outcome

Concerning maternal outcome about 360(99.2%) reported MOI survived the intervention with no adverse effects and 3(0.8%) of them develop complication but alive at discharge. About 356(98.1%) mothers did not develop any immediate complication 4 (1.1%) women developed a complication such as hemorrhage 3(0.8) develop sepsis. No maternal death was observed after the interventions.

The Unmet Obstetric Need

From a total of 363 Major obstetric intervention about 153 major obstetric intervention for absolute maternal indication were carried out during the study period.

Quantification of Unmet obstetric need

The unmet need for major obstetric interventions for a given population in a given period is calculated as follows:

Unmet obstetric need = (EB x RR) – (number of MOI/AMI)

EB = expected birth in the period under study

RR = reference ratio of MOI for AMI, number of major obstetric interventions for absolute maternal indications carried out in the same population during the same period

EB =15,903 (Expected birth; this is taken from the estimate 2017 population projection), rural EB=12,287 urban EB=3616.

The RR (reference ratio) is estimated to be 1.4% (95%CI, 1.27– 1.52) (benchmark the median for five sub-Saharan African countries, Haiti, Morocco and Pakistan.

MOI/AMI= 153 (Major Obstetric Intervention actually performed for Absolute Maternal Indication in the same population in the same period).

The UON is therefore $15903 \times 1.4\% - 153 = 70$ cases or **31.4%** relative need.

For urban $3616 \times 1.4\% - 81 = -30$ cases or -58.8% relative Need

For rural $12287 \times 1.4\% - 72 = 100$ cases or 58.1% relative Need

Around 70 births which needs major obstetric intervention in the study area during the study period did not receive it.

A negative deficit implies that more major obstetric interventions for absolute maternal indications were actually performed than the expected need.

The possibility of some women on admission to hospital giving a temporary address (near hospital) instead of the real address of residence could not be ruled out. Such situation could give rise to overstatement of the number of such women (who gave a temporary address “in town” instead of their real address), thus the negative deficits observed in the urban area.

6. DISCUSSION

This study revealed a substantial deficit in the use of emergency obstetric services. However, it was the rural population that suffered the entire deficit, which was 58.1% implying that 72 out of 172 women who had expected MOI for AMI needs.

The finding showed that the rate of major obstetric intervention for absolute maternal indications in the selected woreda was 0.7. This is below the reference rate of 1.4% used in this study. This indicated that there were unmet obstetric needs. To appreciate the significance of these figures, the deficits in absolute terms meant that 70 (31.4%) out of 223 who were expected to benefit from an intervention did not get it.

This finding was consistent with other Unmet obstetric need studies conducted in other low-income countries. Figures for Benin, Burkina Faso, Mali and Niger ranged from 0.8% to 1.4% in urban areas and 0.15% to 0.9% in rural areas (2).

Caesarean sections was the most prevalent interventions (98.6%). This finding is in line with results of six other UON studies, where the proportion of CSs ranged from 73% (Burkina Faso) to 98% in Pakistan. The proportion of hysterectomy for repair of uterus (1.1%) was very low in this area compared with other UON studies in Africa (Benin 10%, Burkina Faso 19%, Mali 8.2% and Niger 12%)(7,8). This difference might be due to better ANC follow up in this area to identify problems. The majority of mothers with illness during the current pregnancy had Preeclampsia (6.1%) and HIV (2.5%). This is consistent with the findings of a study in rural Ethiopia conducted at Dawro zone Tarcha hospital (5.7%) and (4.5%)(5). Preeclampsia has been incriminated among the indirect and direct causes of maternal deaths globally(9). But the finding of anemia (1.9%) was very low from the finding in Tarcha hospital (60%) this may be due to the difference in geographical location of the two area.

Among the MOI conducted Caesarean section took the largest share (98.6%) giving a C/S rate per 100 births expected 1% which was below the UN range of 5% to 15%. This is comparable with a study in Kenya which was 1.3(6). It is worth to note that the increased rate of C/S is not directly proportional to the quality of care. And also below the low end estimate.

The second most often intervention carried out is hysterectomy for ruptured uterus 5 cases (1.4%) of all MOIs. This intervention was slightly higher than study conducted in Pakistan accounted for 0.8% and lower than study conducted in Burkina Faso accounted 14.8% of all MOIs(3). This difference may be due to the awareness of mother to seek care.

The commonest AMI in this study was Obstructed Labor accounting for 87(24%) which is one of the five commonest causes of maternal death in the world(9). About 57.8% the MOI were done for non AMI mainly for foetal distress. The UON study done in Burkina also showed foetal distress to be the commonest non-AMI(27). The outcomes of the new born stated the majority 96.14% to be alive until discharge while 3.03% were still born and the rest died within 24 hours. The death of a new born within 24 hours may be due to low neonatal resuscitation capacity. The mothers that suffered from complication after delivery accounted for 1.9% whereby majority of the causes were sepsis and hemorrhage. In a study that did a systematic analysis of causes of maternal deaths in different countries situated in Africa, Latin America and Asia found out that Hemorrhage was the commonest cause of death in all continents while deaths due to sepsis were common in Africa as compared to the rest of the world(19).

The deficit of MOI/AMI rate was 0.7% which is lower than the average of ten countries; accounted 22%(2). In the case of Burkina Faso the urban areas range of deficit was 0-4% where the figure in the study area was lower. A study done in Morocco set the value between 1% and 2%(8). This difference may be due to finding in this study was limited to small population. And this study may not be emphasized on setting appropriate reference ratio which is obtained from a recent data or a pilot project.

The main imitations of the study

- The absence of complete and recent demographic data
- The data relied on the diagnosis whose accuracy was assumed on records
- The estimate of the UON provided here could have been underestimated as some women living in the health district might have travelled for care in the neighboring health districts
- There is no national data that can allow comparison to see the variations and learn from different contexts.

The major strengths of the study

- It has quantified both the met and Unmet Obstetric Needs
- The hospital was referral hospital and the only one performing Major Obstetric Interventions in the study area. It is likely that very few women have been able to go to other hospitals in case of complication.
- The use of the UON approach has been proven valid in other settings

7. CONCLUSION AND RECOMMENDATION

In this study area, the prevalence of unmet obstetric need was 31.4%. The overall Major Obstetric Intervention for Absolute maternal indication rate of 0.9% and a caesarean section rate of 2.3% among all expected births, has important unmet obstetric need when the study results are compared with the 5% threshold. The predominant MOI was C/S and obstructed labor was the dominant AMI. There is a considerable discrepancy when the expected and actual MOI for AMI were compared to whether the woman comes from an area classified as rural or urban.

The low level of actual MOI for AMI (0.6%) amongst the rural population points to major unmet obstetric need there. The high proportions of negative outcomes in mothers undergoing a MOI (complications 1.9%) and in new born (perinatal mortality 0.8%) raise concern about the quality of care being provided. The UONs in rural areas indicate that access to lifesaving obstetric care is a challenge for rural women.

To make the best use of this study it is essential that structured feedback at the regional and national level is carried out promptly. The zonal health bureau, RHBs has to mobilizing resources, convincing development partners for technical assistance and the health care providers to give Maternal and Neonatal Health priority. A study on where exactly the gap exists in meeting obstetric needs shall be conducted.

The UON-indicator showed to be useful to monitor access to emergency obstetric care and perinatal and maternal mortality using data available through the routine hospital information system.

Therefore, estimating the amount of unmet need for major obstetric interventions provide the information necessary for planning and prioritizing the development of services; and lead to action for the reduction of maternal morbidity at local level by changing certain attitudes, mobilizing resources and more effectively adapting professional practices to the needs of patients. This requires a multidisciplinary approach including refresher training for health professionals, upgrading of peripheral health services with transportation facilities. Improvement in the health care system can lead to decline in the rate of maternal and neonatal morbidity and mortality.

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8. ANNEXES

8. 1 INFORMATION SHEET AND INFORMED CONSENT

My Name is _____ your hospital was selected to quantify UON and its associated factors in emergency obstetric in 2018 GC. The study will be conducted from March 14 to 25, 2019 therefore I would like to collect data in obstetric unit. The purpose of the study is to develop a Master's thesis as a requirement for the degree of Masters of Public Health in Reproductive Health, Debre Berhan University. The study is expected to bring findings improve existing knowledge and report to policy maker pertaining obstetric service provision. I assure that the data collected will be used only for Assessment of met, unmet and associated factors of obstetric need. The summary of the result will be reported to your Hospital. It is free whether to participate or withdraw from the study any time I therefore request your consent and cooperation throughout the period of data collection. If you have any question you can contact the Principal investigator with these address, phone = 09 13 31 04 50, email= shambelmengesha@gmail.com

Representative of the Hospital

Name and Signature _____

Investigator: Shambel Mengesha (BSC N)

Advisor: Wassie Negash (MPH/HSM, Assistant professor)

8.2 QUESTIONNAIRE

A format for data collection on assessment of Unmet Obstetric Needs in Emergency obstetric Service, Debre Berhan 2019.

Maternal Information

S.no	Questions	Code
1	Name of Hospital	
2	Identification of mother MRN:	
3	Date of admission: dd/mm/yyyy	
4	Time of admission 1. Day 2. Night	1.Yes 2. No 1.Yes 2. No
5	Address of mother kebele or town or woreda_____	
6	Age of mother (in completed year)	
7	Educational level 1. None 2. < grade 6 3. Grade 6-12 4. 12+ 5. Diploma 6. Degree and above	1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No
8	Marital status 1. Married 2. Single 3. Divorced 4. Widowed	1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No
9	Number of gravida _____	
10	Number of parity _____	
11	ANC follow up	1.Yes 2. No
12	Place of delivery	

	<ul style="list-style-type: none"> 1. Home 2. This institution 3. Other institution 4. Other 	<ul style="list-style-type: none"> 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 	
13	Present obstetric history <ul style="list-style-type: none"> 1. Anemia 2. Preeclampsia 3. Diabetes 4. Heart disease 5. Multiple gestation 6. Malaria 7. HIV 8. Other specify 	<ul style="list-style-type: none"> 1. Yes 2. No 1. Yes 2. No 1.Yes 2. No 	
14	Major obstetric intervention <ul style="list-style-type: none"> 1. C/S 2. Hysterectomy 3. Laparotomy for uterine rupture 4. Version and Extraction 5. Destructive delivery 6. Symphysiotomy 7. Blood transfusion 8. Other specify ----- 	<ul style="list-style-type: none"> 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2.No 1.Yes 2. No 1.Yes 2.No 	
15	Indications <ul style="list-style-type: none"> 1. Uterine rupture 2. Obstructed labor 3. PPH 4. APH for abruptio placenta 5. APH for placenta paevia 6. Preeclampsia 7. Eclampsia 8. Puerperal infection 	<ul style="list-style-type: none"> 1.Yes 2.No 1.Yes 2. No 1.Yes 2. No 1.Yes 2.No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 1.Yes 2. No 	

	<p>9. Antecedent C/S</p> <p>10. Fetal distress</p> <p>11. Other _____</p> <p>12. Cause not recorded</p>	<p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p>	
16	<p>Newborn outcome</p> <p>1. Born alive and discharged alive</p> <p>2. Born alive and died within 24 hr.</p> <p>3. Born alive and died after 24 hr</p> <p>4. Still born</p> <p>5. Not recorded</p>	<p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p>	
17	<p>Condition of mother at discharge</p> <p>1. Recovered</p> <p>2. Complicated but alive</p> <p>3. Referred to other health facility</p> <p>4. Died (If 1 go to Q19 and Q20)</p>	<p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p>	
18	<p>Type of immediate complication (Within 5 days)</p> <p>1. Sepsis</p> <p>2. Hemorrhage</p> <p>3. Wound dehiscence</p> <p>4. Perforation</p> <p>5. Anesthesia complication</p> <p>6. Other _____</p>	<p>1. Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1. Yes 2.No</p> <p>1.Yes 2.No</p>	
19	<p>When did the mother die?</p> <p>1. Before intervention</p> <p>2. During intervention</p> <p>3. After intervention</p> <p>4. Not recorded</p>	<p>1. Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p>	
20	<p>Cause of maternal death</p> <p>1. Hypertension</p> <p>2. Infection</p> <p>3. Hemorrhage</p>	<p>1.Yes 2.No</p> <p>1.Yes 2.No</p> <p>1.Yes 2.No</p>	

	4. Other	1.Yes 2. No	
	5. Unknown	1.Yes 2. No	
21	Date of discharge: dd/mm/yyyy		
22	Data collector name		
23	Date of data collection: dd/mm/yyyy		
24	End note		